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# 32-Bit TRAVEO™ T1G Family S6J3110 Series Microcontroller Datasheet

The S6J3110 series is a set of 32-bit microcontrollers designed for in-vehicle use. It uses the Arm® Cortex®-R5 CPU as a CPU.

## Features

### Cortex-R5 Core

This section explains the Cortex-R5 CPU core.

- Arm Cortex-R5
- 32-bit Arm architecture
  - 2-instruction issuance super scalar
  - 8-stage pipeline
- Armv7/Thumb®-2 instruction set
- MPU (memory protection) equipped
  - 16-area support
- ECC support for the TCM ports for RAM
  - 1-bit error correction and 2-bit error detection (SEC-DED)
- TCM ports
  - 2 TCM ports
  - ATCM port
  - BTCM port (B0TCM, B1TCM)
- Caches
  - Instruction cache 16 KB
  - Data cache 16 KB
- VIC port
  - Low latency interrupt
- AXI master interface
  - 64-bit AXI interface (instruction/data access)
  - 32-bit AXI interface (I/O access)
- AXI slave interface
  - 64-bit AXI interface (TCM port access)
- ETM-R5 trace

### Peripheral Functions

This section explains peripheral functions.

- Clock generation
  - Main clock oscillation (4 MHz)
  - No sub clock oscillation
  - CR oscillation (100 kHz)
  - CR oscillation (4 MHz)
- Built-in flash memory size
  - Program: 1024 K + 64 KB (S6J311AHAC) / 768 K + 64 KB (S6J3119HAC)
  - Work: 48 KB (S6J311AHAC) / 48 KB (S6J3119HAC)

- Built-in RAM size
    - TCRAM 64 KB (S6J311AHAC) / 48 KB (S6J3119HAC)
    - System SRAM 16 KB (S6J311AHAC) / 16 KB (S6J3119HAC)
    - Backup RAM 8 KB (S6J311AHAC) / Backup RAM 8 KB (S6J3119HAC)
  - General-purpose ports: 116 channels (S6J311AHAC) / 116 channels (S6J3119HAC)
  - DMA controller
    - Up to 16 channels can be activated simultaneously.
  - A/D converter (successive approximation type)
    - 12-bit resolution, 2 units mounted: Max 56 channels (25 channels + 31 channels) (S6J311AHAC) / Max 56 channels (25 channels + 31 channels) (S6J3119HAC) / Max 56 channels (25 channels + 31 channels)
  - External interrupt input: 16 channels
    - Level ("H"/"L") and edge (rising/falling) can be detected.
  - Multi-function serial (transmission and reception FIFOs mounted) :Max 4 channels (S6J311AHAC) / Max 4 channels (S6J3119HAC)
- <I<sup>2</sup>C>
- Full-duplex double buffering system, 64-byte transmission FIFO, 64-byte reception FIFO.
  - Standard mode ( Max. 100 kbps ) is supported only.
  - DMA transfer is supported.
- <UART (asynchronous serial interface) >
- Full duplex, double buffering system; 64-byte transmission FIFO, 64-byte reception FIFO
  - Parity check can be enabled/disabled.
  - Built-in dedicated baud rate generator
  - An external clock can be used as a transfer clock.
  - Parity, frame, overrun error detection functions are available.
  - DMA transfer is supported.

#### <CSIO (synchronous serial interface) >

- Full duplex, double buffering system; 64-byte transmission FIFO, 64-byte reception FIFO
- Support for SPI. Both master and slave roles are supported. Data length in bits can be set to a value from 5 to 16 or one of the values of 20, 24, and 32.
- Built-in dedicated baud rate generator (master operation)
- External clock input is enabled (slave operation).
- Overrun error detection function is available.
- DMA transfer is supported.
- Serial chip select SPI function

#### <LIN-UART (asynchronous serial interface for LIN) >

- Full duplex, double buffering system; 64-byte transmission FIFO, 64-byte reception FIFO
- Support for LIN protocol revision 2.1
- Both master and slave roles are supported.
- Framing error and overrun error detection
- LIN Synch break generation and detection, LIN Synch Delimiter generation
- Built-in dedicated baud rate generator
- The external clock can be adjusted by the reload counter. DMA transfer is supported.
- CAN controller: CAN-FD Max 1 channel
  - CAN-FD (V3.2.0)
  - CAN transfer speed :Max 5 Mbps
  - CAN Clock :Max 40 MHz
  - 192 message buffers/channel (reception message buffer size)
  - 32 message buffer/channel (transmission message buffer size)
- Base timer: Max 30 channels
  - 16-bit Timer.
  - It is selectable by 4 functions of the PWM/PPG/PWC/Reload Timer.
  - 2-channel cascade connection enables operation as a 32-bit timer.(PWC and Reload Timer)
- Free-run timer: Max 6 channels
  - 32-bit Timer.
  - Main clock oscillation and CR oscillation are available.
  - Free-run timer output can work in combination with an input capture and an output compare.
- Input capture: Max 12 channels
  - 32-bit Timer.

- Output compare: Max 12 channels
  - 32-bit Timer.
- Real time clock (RTC) (day/hour/minute/second)
  - Main clock oscillation or CR oscillation (100 kHz) can be selected as an operation clock.
- Calibration: Real time clock (RTC) driven by the CR clock
- Correction can be done by configuring the prescaler of the real time clock based on the ratio between the main clock and the CR clock.
- Clock supervisor
  - Abnormality (such as damaged crystal) of the main clock oscillation (4 MHz) can be monitored.
  - The clock can switch to the CR clock when an abnormality is detected.
  - PLL abnormality can be detected.
- CRC generation
  - Fixed-length CRC
  - CCITT CRC16 generator polynomial: 0x1021
  - IEEE-802.3 CRC32 generator polynomial: 0x04C11DB7
- Watchdog timer
  - Hardware watchdog
  - Software watchdog
- NMI
- I/O relocation
  - Peripheral function pin locations can be changed.
- Low-power consumption control
  - Standby function
  - Power-off function
  - Partial wakeup function
- Power-on reset
- Low-voltage detection reset
- Security
  - Flash security
  - Interface security (JTAG + test port)
  - SHE
  - Unique device ID
- Package: LEU144 (S6J311xHAC)
- CMOS 55 nm technology
- Power supply
  - 5 V single power supply
  - The voltage step-down circuit generates internal 1.2 V from 5 V.
  - 5 V power supply is used for I/O.

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## 1. Product Lineup

The following table lists the product lineup of the S6J3110 series.

**Table 1-1. Memory Size**

|       |             | S6J311AHAC                                  | S6J3119HAC                                 |
|-------|-------------|---------------------------------------------|--------------------------------------------|
| Flash | Program     | 1024 KBytes<br>+<br>Small sector (8 KB x 8) | 768 KBytes<br>+<br>Small sector (8 KB x 8) |
|       | Work        | 48 KBytes                                   | 48 KBytes                                  |
| RAM   | TCRAM       | 64 KBytes                                   | 48 KBytes                                  |
|       | System SRAM | 16 KBytes                                   | 16 KBytes                                  |
|       | Backup RAM  | 8 KBytes                                    | 8 KBytes                                   |

**Table 1-2. SHE option**

|                | S6J311xHAC* |
|----------------|-------------|
| Security (SHE) | ON          |

\* x: A/9

**Table 1-3. Product Lineup**

|                                                    | S6J311xHAC*                                                      |
|----------------------------------------------------|------------------------------------------------------------------|
| CPU core                                           | Coretex-R5                                                       |
| CMOS 55 nm technology                              | 55 nm                                                            |
| Package                                            | LEU144                                                           |
| Main clock                                         | 4 MHz                                                            |
| Built-in CR oscillator                             | 100 kHz                                                          |
|                                                    | 4 MHz                                                            |
| Maximum CPU operating frequency                    | 96 MHz                                                           |
| Watchdog timer                                     | 1 channel (hardware)<br>1 channel (software)                     |
| Clock supervisor                                   | YES                                                              |
| External power supply, low-voltage detection reset | YES                                                              |
| Internal power supply, low-voltage detection reset | YES                                                              |
| NMI request                                        | YES                                                              |
| External interrupt                                 | 16 channels                                                      |
| DMA controller                                     | 16 channels                                                      |
| CAN-FD                                             | 1 channel<br>(192 msg buffers/ch)                                |
| Multi-function serial                              | 4 channels                                                       |
| A/D converter                                      | 12-bit (2 units)<br>Unit 0 x 25 channels<br>Unit 1 x 31 channels |

|                                                   | <b>S6J311xHAC*</b>                                                |
|---------------------------------------------------|-------------------------------------------------------------------|
| Free-run timer                                    | 6 channels                                                        |
| Input capture                                     | 12 channels                                                       |
| Output compare                                    | 12 channels                                                       |
| Base timer (16-bit)                               | 30 channels                                                       |
| Real time clock (RTC)                             | 1 channel                                                         |
| CR clock calibration                              | YES                                                               |
| CRC generation                                    | YES                                                               |
| Low-power consumption mode                        | Standby function<br>Power-off function<br>Partial wakeup function |
| SHE                                               | YES                                                               |
| General-purpose port GPIO                         | 116 channels                                                      |
| Power supply                                      | 5 V + 5% to 10%                                                   |
| Operation assurance temperature (T <sub>A</sub> ) | -40 °C to +125 °C                                                 |
| On-chip debugger (JTAG)                           | YES                                                               |

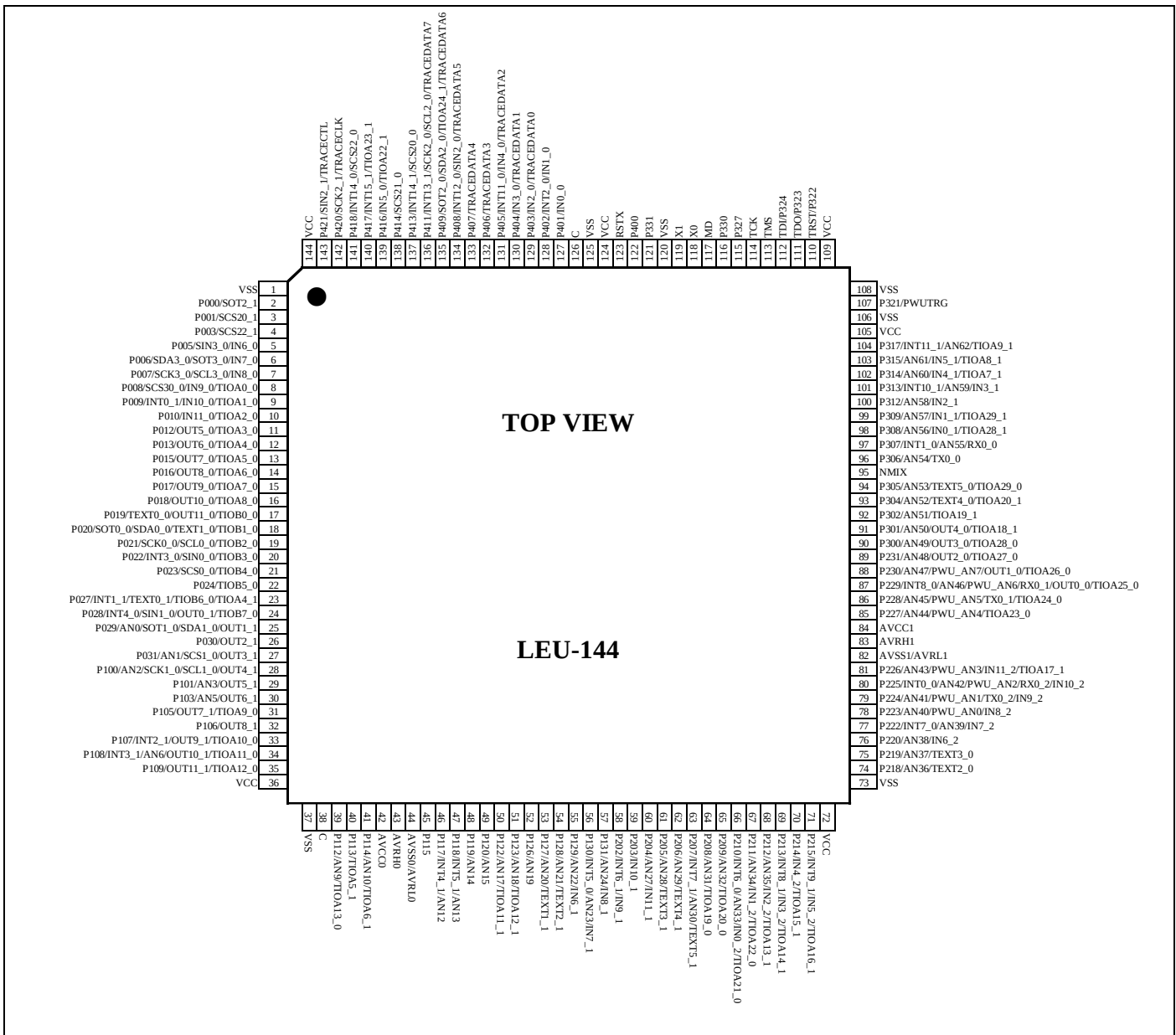
\* x: A/9

## 2. Pin Assignment

The following figures show the pin assignment of the S6J3110 series.

**Figure 2-1. Pin Assignment for S6J311xHAC\***

\* x: A/9



### 3. Pin Description

This section provides a list of the pin functions of the S6J3110 series

**Table 3-1. S6J311xHAC\* Pin Functions**

\* x: A/9

| Pin No.<br>S6J311xHAC | Pin Name                              | Polarity         | I/O<br>Circuit<br>Type | Function                                                                                                                                                               |
|-----------------------|---------------------------------------|------------------|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2                     | P000<br>SOT2_1                        | -<br>-           | P                      | General-purpose I/O port<br>Multi-function serial ch.2 serial data output pin (1)                                                                                      |
| 3                     | P001<br>SCS20_1                       | -<br>-           | P                      | General-purpose I/O port<br>Multi-function serial ch.2 serial chip select 0 I/O pin (1)                                                                                |
| 4                     | P003<br>SCS22_1                       | -<br>-           | P                      | General-purpose I/O port<br>Multi-function serial ch.2 serial chip select 2 output pin (1)                                                                             |
| 5                     | P005<br>IN6_0<br>SIN3_0               | -<br>-<br>-      | P                      | General-purpose I/O port<br>Input capture ch.6 input pin (0)<br>Multi-function serial ch.3 serial data input pin (0)                                                   |
| 6                     | P006<br>IN7_0<br>SOT3_0<br>SDA3_0     | -<br>-<br>-<br>- | P                      | General-purpose I/O port<br>Input capture ch.7 input pin (0)<br>Multi-function serial ch.3 serial data output pin (0)<br>I <sup>2</sup> C bus ch.3 serial data I/O pin |
| 7                     | P007<br>IN8_0<br>SCK3_0<br>SCL3_0     | -<br>-<br>-<br>- | P                      | General-purpose I/O port<br>Input capture ch.8 input pin (0)<br>Multi-function serial ch.3 clock I/O pin (0)<br>I <sup>2</sup> C bus ch.3 serial clock I/O pin         |
| 8                     | P008<br>IN9_0<br>SCS30_0<br>TIOA0_0   | -<br>-<br>-<br>- | P                      | General-purpose I/O port<br>Input capture ch.9 input pin (0)<br>Multi-function serial ch.3 serial chip select 0 I/O pin (0)<br>Base timer ch.0 TIOA output pin (0)     |
| 9                     | P009<br>IN10_0<br>TIOA1_0<br>INT0_1   | -<br>-<br>-<br>- | P                      | General-purpose I/O port<br>Input capture ch.10 input pin (0)<br>Base timer ch.1 TIOA I/O pin (0)<br>INT0 external interrupt input pin (1)                             |
| 10                    | P010<br>IN11_0<br>TIOA2_0             | -<br>-<br>-      | P                      | General-purpose I/O port<br>Input capture ch.11 input pin (0)<br>Base timer ch.2 TIOA output pin (0)                                                                   |
| 11                    | P012<br>TIOA3_0<br>OUT5_0             | -<br>-<br>-      | P                      | General-purpose I/O port<br>Base timer ch.3 TIOA I/O pin (0)<br>Output compare ch.5 output pin (0)                                                                     |
| 12                    | P013<br>TIOA4_0<br>OUT6_0             | -<br>-<br>-      | P                      | General-purpose I/O port<br>Base timer ch.4 TIOA output pin (0)<br>Output compare ch.6 output pin (0)                                                                  |
| 13                    | P015<br>TIOA5_0<br>OUT7_0             | -<br>-<br>-      | P                      | General-purpose I/O port<br>Base timer ch.5 TIOA I/O pin (0)<br>Output compare ch.7 output pin (0)                                                                     |
| 14                    | P016<br>TIOA6_0<br>OUT8_0             | -<br>-<br>-      | P                      | General-purpose I/O port<br>Base timer ch.6 TIOA output pin (0)<br>Output compare ch.8 output pin (0)                                                                  |
| 15                    | P017<br>TIOA7_0<br>OUT9_0             | -<br>-<br>-      | P                      | General-purpose I/O port<br>Base timer ch.7 TIOA I/O pin (0)<br>Output compare ch.9 output pin (0)                                                                     |
| 16                    | P018<br>TIOA8_0<br>OUT10_0            | -<br>-<br>-      | P                      | General-purpose I/O port<br>Base timer ch.8 TIOA output pin (0)<br>Output compare ch.10 output pin (0)                                                                 |
| 17                    | P019<br>OUT11_0<br>TIOB0_0<br>TEXT0_0 | -<br>-<br>-<br>- | P                      | General-purpose I/O port<br>Output compare ch.11 output pin (0)<br>Base timer ch.0 TIOB input pin (0)<br>Free-run timer 0 clock input pin (0)                          |



| Pin No.<br>S6J311xHAC | Pin Name | Polarity | I/O<br>Circuit<br>Type | Function                                                  |
|-----------------------|----------|----------|------------------------|-----------------------------------------------------------|
| 18                    | P020     | -        | P                      | General-purpose I/O port                                  |
|                       | SOT0_0   | -        |                        | Multi-function serial ch.0 serial data output pin (0)     |
|                       | SDA0_0   | -        |                        | I <sup>2</sup> C bus ch.0 serial data I/O pin             |
|                       | TIOB1_0  | -        |                        | Base timer ch.1 TIOB input pin (0)                        |
| 19                    | TEXT1_0  | -        | P                      | Free-run timer 1 clock input pin (0)                      |
|                       | P021     | -        |                        | General-purpose I/O port                                  |
|                       | SCK0_0   | -        |                        | Multi-function serial ch.0 clock I/O pin (0)              |
|                       | SCL0_0   | -        |                        | I <sup>2</sup> C bus ch.0 serial clock I/O pin            |
| 20                    | TIOB2_0  | -        |                        | Base timer ch.2 TIOB input pin (0)                        |
|                       | P022     | -        | P                      | General-purpose I/O port                                  |
|                       | SIN0_0   | -        |                        | Multi-function serial ch.0 serial data input pin (0)      |
|                       | TIOB3_0  | -        |                        | Base timer ch.3 TIOB input pin (0)                        |
| 21                    | INT3_0   | -        |                        | INT3 external interrupt input pin (0)                     |
|                       | P023     | -        | P                      | General-purpose I/O port                                  |
|                       | SCS0_0   | -        |                        | Multi-function serial ch.0 serial chip select I/O pin (0) |
|                       | TIOB4_0  | -        |                        | Base timer ch.4 TIOB input pin (0)                        |
| 22                    | P024     | -        | P                      | General-purpose I/O port                                  |
|                       | TIOB5_0  | -        |                        | Base timer ch.5 TIOB input pin (0)                        |
|                       | P027     | -        | P                      | General-purpose I/O port                                  |
|                       | TIOA4_1  | -        |                        | Base timer ch.4 TIOA output pin (1)                       |
| 23                    | TIOB6_0  | -        |                        | Base timer ch.6 TIOB input pin (0)                        |
|                       | INT1_1   | -        |                        | INT1 external interrupt input pin (1)                     |
|                       | TEXT0_1  | -        |                        | Free-run timer 0 clock input pin (1)                      |
| 24                    | P028     | -        | P                      | General-purpose I/O port                                  |
|                       | SIN1_0   | -        |                        | Multi-function serial ch.1 serial data input pin (0)      |
|                       | TIOB7_0  | -        |                        | Base timer ch.7 TIOB input pin (0)                        |
|                       | INT4_0   | -        |                        | INT4 external interrupt input pin (0)                     |
| 25                    | OUT0_1   | -        | A                      | Output compare ch.0 output pin (1)                        |
|                       | P029     | -        |                        | General-purpose I/O port                                  |
|                       | SOT1_0   | -        |                        | Multi-function serial ch.1 serial data output pin (0)     |
|                       | SDA1_0   | -        |                        | I <sup>2</sup> C bus ch.1 serial data I/O pin             |
| 26                    | AN0      | -        | P                      | ADC analog 0 input pin                                    |
|                       | OUT1_1   | -        |                        | Output compare ch.1 output pin (1)                        |
|                       | P030     | -        |                        | General-purpose I/O port                                  |
|                       | OUT2_1   | -        |                        | Output compare ch.2 output pin (1)                        |
| 27                    | P031     | -        | A                      | General-purpose I/O port                                  |
|                       | SCS1_0   | -        |                        | Multi-function serial ch.1 serial chip select I/O pin (0) |
|                       | AN1      | -        |                        | ADC analog 1 input pin                                    |
|                       | OUT3_1   | -        |                        | Output compare ch.3 output pin (1)                        |
| 28                    | P100     | -        | A                      | General-purpose I/O port                                  |
|                       | SCK1_0   | -        |                        | Multi-function serial ch.1 clock I/O pin (0)              |
|                       | SCL1_0   | -        |                        | I <sup>2</sup> C bus ch.1 serial clock I/O pin            |
|                       | AN2      | -        |                        | ADC analog 2 input pin                                    |
| 29                    | OUT4_1   | -        | A                      | Output compare ch.4 output pin (1)                        |
|                       | P101     | -        |                        | General-purpose I/O port                                  |
|                       | AN3      | -        |                        | ADC analog 3 input pin                                    |
|                       | OUT5_1   | -        |                        | Output compare ch.5 output pin (1)                        |
| 30                    | P103     | -        | A                      | General-purpose I/O port                                  |
|                       | AN5      | -        |                        | ADC analog 5 input pin                                    |
|                       | OUT6_1   | -        |                        | Output compare ch.6 output pin (1)                        |
| 31                    | P105     | -        | P                      | General-purpose I/O port                                  |
|                       | TIOA9_0  | -        |                        | Base timer ch.9 TIOA I/O pin (0)                          |
|                       | OUT7_1   | -        |                        | Output compare ch.7 output pin (1)                        |
| 32                    | P106     | -        | P                      | General-purpose I/O port                                  |
|                       | OUT8_1   | -        |                        | Output compare ch.8 output pin (1)                        |
| 33                    | P107     | -        | P                      | General-purpose I/O port                                  |
|                       | TIOA10_0 | -        |                        | Base timer ch.10 TIOA output pin (0)                      |
|                       | INT2_1   | -        |                        | INT2 external interrupt input pin (1)                     |
|                       | OUT9_1   | -        |                        | Output compare ch.9 output pin (1)                        |

| Pin No.<br>S6J311xHAC | Pin Name | Polarity | I/O<br>Circuit<br>Type | Function                              |
|-----------------------|----------|----------|------------------------|---------------------------------------|
| 34                    | P108     | -        | A                      | General-purpose I/O port              |
|                       | AN6      | -        |                        | ADC analog 6 input pin                |
|                       | TIOA11_0 | -        |                        | Base timer ch.11 TIOA I/O pin (0)     |
|                       | INT3_1   | -        |                        | INT3 external interrupt input pin (1) |
|                       | OUT10_1  | -        |                        | Output compare ch.10 output pin (1)   |
| 35                    | P109     | -        | P                      | General-purpose I/O port              |
|                       | TIOA12_0 | -        |                        | Base timer ch.12 TIOA output pin (0)  |
|                       | OUT11_1  | -        |                        | Output compare ch.11 output pin (1)   |
| 39                    | P112     | -        | A                      | General-purpose I/O port              |
|                       | AN9      | -        |                        | ADC analog 9 input pin                |
|                       | TIOA13_0 | -        |                        | Base timer ch.13 TIOA I/O pin (0)     |
| 40                    | P113     | -        | P                      | General-purpose I/O port              |
|                       | TIOA5_1  | -        |                        | Base timer ch.5 TIOA I/O pin (1)      |
| 41                    | P114     | -        | A                      | General-purpose I/O port              |
|                       | AN10     | -        |                        | ADC analog 10 input pin               |
|                       | TIOA6_1  | -        |                        | Base timer ch.6 TIOA output pin (1)   |
| 45                    | P115     | -        | P                      | General-purpose I/O port              |
| 46                    | P117     | -        | A                      | General-purpose I/O port              |
|                       | AN12     | -        |                        | ADC analog 12 input pin               |
|                       | INT4_1   | -        |                        | INT4 external interrupt input pin (1) |
| 47                    | P118     | -        | A                      | General-purpose I/O port              |
|                       | AN13     | -        |                        | ADC analog 13 input pin               |
|                       | INT5_1   | -        |                        | INT5 external interrupt input pin (1) |
| 48                    | P119     | -        | A                      | General-purpose I/O port              |
|                       | AN14     | -        |                        | ADC analog 14 input pin               |
| 49                    | P120     | -        | A                      | General-purpose I/O port              |
|                       | AN15     | -        |                        | ADC analog 15 input pin               |
| 50                    | P122     | -        | A                      | General-purpose I/O port              |
|                       | AN17     | -        |                        | ADC analog 17 input pin               |
|                       | TIOA11_1 | -        |                        | Base timer ch.11 TIOA I/O pin (1)     |
| 51                    | P123     | -        | A                      | General-purpose I/O port              |
|                       | AN18     | -        |                        | ADC analog 18 input pin               |
|                       | TIOA12_1 | -        |                        | Base timer ch.12 TIOA output pin (1)  |
| 52                    | P126     | -        | A                      | General-purpose I/O port              |
|                       | AN19     | -        |                        | ADC analog 19 input pin               |
| 53                    | P127     | -        | A                      | General-purpose I/O port              |
|                       | AN20     | -        |                        | ADC analog 20 input pin               |
|                       | TEXT1_1  | -        |                        | Free-run timer 1 clock input pin (1)  |
| 54                    | P128     | -        | A                      | General-purpose I/O port              |
|                       | AN21     | -        |                        | ADC analog 21 input pin               |
|                       | TEXT2_1  | -        |                        | Free-run timer 2 clock input pin (1)  |
| 55                    | P129     | -        | A                      | General-purpose I/O port              |
|                       | IN6_1    | -        |                        | Input capture ch.6 input pin (1)      |
|                       | AN22     | -        |                        | ADC analog 22 input pin               |
| 56                    | P130     | -        | A                      | General-purpose I/O port              |
|                       | IN7_1    | -        |                        | Input capture ch.7 input pin (1)      |
|                       | AN23     | -        |                        | ADC analog 23 input pin               |
|                       | INT5_0   | -        |                        | INT5 external interrupt input pin (0) |
| 57                    | P131     | -        | A                      | General-purpose I/O port              |
|                       | IN8_1    | -        |                        | Input capture ch.8 input pin (1)      |
|                       | AN24     | -        |                        | ADC analog 24 input pin               |
| 58                    | P202     | -        | P                      | General-purpose I/O port              |
|                       | IN9_1    | -        |                        | Input capture ch.9 input pin (1)      |
|                       | INT6_1   | -        |                        | INT6 external interrupt input pin (1) |
| 59                    | P203     | -        | P                      | General-purpose I/O port              |
|                       | IN10_1   | -        |                        | Input capture ch.10 input pin (1)     |

| Pin No.<br>S6J311xHAC | Pin Name                                    | Polarity              | I/O<br>Circuit<br>Type | Function                                                                                                                                                              |
|-----------------------|---------------------------------------------|-----------------------|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 60                    | P204<br>IN11_1<br>AN27                      | -<br>-<br>-           | A                      | General-purpose I/O port<br>Input capture ch.11 input pin (1)<br>ADC analog 27 input pin                                                                              |
| 61                    | P205<br>AN28<br>TEXT3_1                     | -<br>-<br>-           | A                      | General-purpose I/O port<br>ADC analog 28 input pin<br>Free-run timer 3 clock input pin (1)                                                                           |
| 62                    | P206<br>AN29<br>TEXT4_1                     | -<br>-<br>-           | A                      | General-purpose I/O port<br>ADC analog 29 input pin<br>Free-run timer 4 clock input pin (1)                                                                           |
| 63                    | P207<br>AN30<br>INT7_1<br>TEXT5_1           | -<br>-<br>-<br>-      | A                      | General-purpose I/O port<br>ADC analog 30 input pin<br>INT7 external interrupt input pin (1)<br>Free-run timer 5 clock input pin (1)                                  |
| 64                    | P208<br>AN31<br>TIOA19_0                    | -<br>-<br>-           | A                      | General-purpose I/O port<br>ADC analog 31 input pin<br>Base timer ch.19 TIOA I/O pin (0)                                                                              |
| 65                    | P209<br>AN32<br>TIOA20_0                    | -<br>-<br>-           | A                      | General-purpose I/O port<br>ADC analog 32 input pin<br>Base timer ch.20 TIOA output pin (0)                                                                           |
| 66                    | P210<br>IN0_2<br>AN33<br>TIOA21_0<br>INT6_0 | -<br>-<br>-<br>-<br>- | A                      | General-purpose I/O port<br>Input capture ch.0 input pin (2)<br>ADC analog 33 input pin<br>Base timer ch.21 TIOA I/O pin (0)<br>INT6 external interrupt input pin (0) |
| 67                    | P211<br>IN1_2<br>AN34<br>TIOA22_0           | -<br>-<br>-<br>-      | A                      | General-purpose I/O port<br>Input capture ch.1 input pin (2)<br>ADC analog 34 input pin<br>Base timer ch.22 TIOA output pin (0)                                       |
| 68                    | P212<br>IN2_2<br>AN35<br>TIOA13_1           | -<br>-<br>-<br>-      | A                      | General-purpose I/O port<br>Input capture ch.2 input pin (2)<br>ADC analog 35 input pin<br>Base timer ch.13 TIOA I/O pin (1)                                          |
| 69                    | P213<br>IN3_2<br>TIOA14_1<br>INT8_1         | -<br>-<br>-<br>-      | P                      | General-purpose I/O port<br>Input capture ch.3 input pin (2)<br>Base timer ch.14 TIOA output pin (1)<br>INT8 external interrupt input pin (1)                         |
| 70                    | P214<br>IN4_2<br>TIOA15_1                   | -<br>-<br>-           | P                      | General-purpose I/O port<br>Input capture ch.4 input pin (2)<br>Base timer ch.15 TIOA I/O pin (1)                                                                     |
| 71                    | P215<br>IN5_2<br>TIOA16_1<br>INT9_1         | -<br>-<br>-<br>-      | P                      | General-purpose I/O port<br>Input capture ch.5 input pin (2)<br>Base timer ch.16 TIOA output pin (1)<br>INT9 external interrupt input pin (1)                         |
| 74                    | P218<br>AN36<br>TEXT2_0                     | -<br>-<br>-           | A                      | General-purpose I/O port<br>ADC analog 36 input pin<br>Free-run timer 2 clock input pin (0)                                                                           |
| 75                    | P219<br>AN37<br>TEXT3_0                     | -<br>-<br>-           | A                      | General-purpose I/O port<br>ADC analog 37 input pin<br>Free-run timer 3 clock input pin (0)                                                                           |
| 76                    | P220<br>IN6_2<br>AN38                       | -<br>-<br>-           | A                      | General-purpose I/O port<br>Input capture ch.6 input pin (2)<br>ADC analog 38 input pin                                                                               |
| 77                    | P222<br>IN7_2<br>AN39<br>INT7_0             | -<br>-<br>-<br>-      | A                      | General-purpose I/O port<br>Input capture ch.7 input pin (2)<br>ADC analog 39 input pin<br>INT7 external interrupt input pin (0)                                      |

| Pin No.<br>S6J311xHAC | Pin Name                                                         | Polarity                        | I/O<br>Circuit<br>Type | Function                                                                                                                                                                                                                                               |
|-----------------------|------------------------------------------------------------------|---------------------------------|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 78                    | P223<br>IN8_2<br>AN40<br>PWU_AN0                                 | -<br>-<br>-<br>-                | A                      | General-purpose I/O port<br>Input capture ch.8 input pin (2)<br>ADC analog 40 input pin<br>Partial wakeup ADC analog 0 input pin                                                                                                                       |
| 79                    | P224<br>IN9_2<br>TX0_2<br>AN41<br>PWU_AN1                        | -<br>-<br>-<br>-<br>-           | A                      | General-purpose I/O port<br>Input capture ch.9 input pin (2)<br>CAN transmission data 0 output pin (2)<br>ADC analog 41 input pin<br>Partial wakeup ADC analog 1 input pin                                                                             |
| 80                    | P225<br>IN10_2<br>RX0_2<br>AN42<br>PWU_AN2<br>INT0_0             | -<br>-<br>-<br>-<br>-<br>-      | A                      | General-purpose I/O port<br>Input capture ch.10 input pin (2)<br>CAN reception data 0 input pin (2)<br>ADC analog 42 input pin<br>Partial wakeup ADC analog 2 input pin<br>INT0 external interrupt input pin (0)                                       |
| 81                    | P226<br>IN11_2<br>AN43<br>PWU_AN3<br>TIOA17_1                    | -<br>-<br>-<br>-<br>-           | A                      | General-purpose I/O port<br>Input capture ch.11 input pin (2)<br>ADC analog 43 input pin<br>Partial wakeup ADC analog 3 input pin<br>Base timer ch.17 TIOA I/O pin (1)                                                                                 |
| 85                    | P227<br>AN44<br>PWU_AN4<br>TIOA23_0                              | -<br>-<br>-<br>-                | A                      | General-purpose I/O port<br>ADC analog 44 input pin<br>Partial wakeup ADC analog 4 input pin<br>Base timer ch.23 TIOA I/O pin (0)                                                                                                                      |
| 86                    | P228<br>TX0_1<br>AN45<br>PWU_AN5<br>TIOA24_0                     | -<br>-<br>-<br>-<br>-           | A                      | General-purpose I/O port<br>CAN transmission data 0 output pin (1)<br>ADC analog 45 input pin<br>Partial wakeup ADC analog 5 input pin<br>Base timer ch.24 TIOA output pin (0)                                                                         |
| 87                    | P229<br>RX0_1<br>AN46<br>PWU_AN6<br>TIOA25_0<br>INT8_0<br>OUT0_0 | -<br>-<br>-<br>-<br>-<br>-<br>- | A                      | General-purpose I/O port<br>CAN reception data 0 input pin (1)<br>ADC analog 46 input pin<br>Partial wakeup ADC analog 6 input pin<br>Base timer ch.25 TIOA I/O pin (0)<br>INT8 external interrupt input pin (0)<br>Output compare ch.0 output pin (0) |
| 88                    | P230<br>AN47<br>PWU_AN7<br>TIOA26_0<br>OUT1_0                    | -<br>-<br>-<br>-<br>-           | A                      | General-purpose I/O port<br>ADC analog 47 input pin<br>Partial wakeup ADC analog 7 input pin<br>Base timer ch.26 TIOA output pin (0)<br>Output compare ch.1 output pin (0)                                                                             |
| 89                    | P231<br>AN48<br>TIOA27_0<br>OUT2_0                               | -<br>-<br>-<br>-                | A                      | General-purpose I/O port<br>ADC analog 48 input pin<br>Base timer ch.27 TIOA I/O pin (0)<br>Output compare ch.2 output pin (0)                                                                                                                         |
| 90                    | P300<br>AN49<br>TIOA28_0<br>OUT3_0                               | -<br>-<br>-<br>-                | A                      | General-purpose I/O port<br>ADC analog 49 input pin<br>Base timer ch.28 TIOA output pin (0)<br>Output compare ch.3 output pin (0)                                                                                                                      |
| 91                    | P301<br>AN50<br>TIOA18_1<br>OUT4_0                               | -<br>-<br>-<br>-                | A                      | General-purpose I/O port<br>ADC analog 50 input pin<br>Base timer ch.18 TIOA output pin (1)<br>Output compare ch.4 output pin (0)                                                                                                                      |
| 92                    | P302<br>AN51<br>TIOA19_1                                         | -<br>-<br>-                     | A                      | General-purpose I/O port<br>ADC analog 51 input pin<br>Base timer ch.19 TIOA I/O pin (1)                                                                                                                                                               |

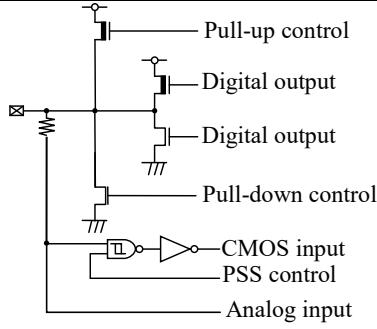
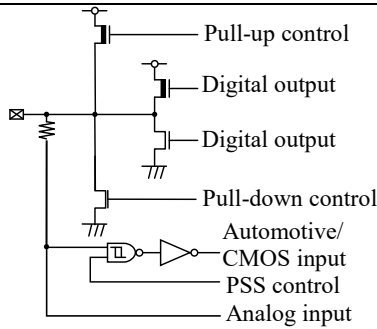
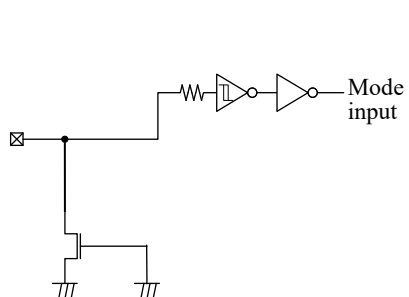
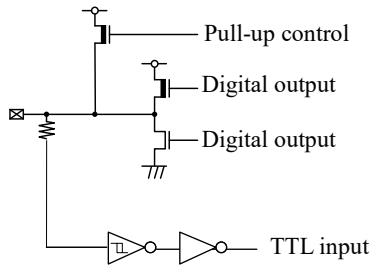
| Pin No.<br>S6J311xHAC | Pin Name | Polarity | I/O<br>Circuit<br>Type | Function                               |
|-----------------------|----------|----------|------------------------|----------------------------------------|
| 93                    | P304     | -        | A                      | General-purpose I/O port               |
|                       | AN52     | -        |                        | ADC analog 52 input pin                |
|                       | TIOA20_1 | -        |                        | Base timer ch.20 TIOA output pin (1)   |
|                       | TEXT4_0  | -        |                        | Free-run timer 4 clock input pin (0)   |
| 94                    | P305     | -        | A                      | General-purpose I/O port               |
|                       | AN53     | -        |                        | ADC analog 53 input pin                |
|                       | TIOA29_0 | -        |                        | Base timer ch.29 TIOA I/O pin (0)      |
|                       | TEXT5_0  | -        |                        | Free-run timer 5 clock input pin (0)   |
| 95                    | NMIX     | N        | F                      | Non-maskable interrupt input pin       |
| 96                    | P306     | -        | A                      | General-purpose I/O port               |
|                       | TX0_0    | -        |                        | CAN transmission data 0 output pin (0) |
|                       | AN54     | -        |                        | ADC analog 54 input pin                |
| 97                    | P307     | -        | A                      | General-purpose I/O port               |
|                       | RX0_0    | -        |                        | CAN reception data 0 input pin (0)     |
|                       | AN55     | -        |                        | ADC analog 55 input pin                |
|                       | INT1_0   | -        |                        | INT1 external interrupt input pin (0)  |
| 98                    | P308     | -        | A                      | General-purpose I/O port               |
|                       | IN0_1    | -        |                        | Input capture ch.0 input pin (1)       |
|                       | AN56     | -        |                        | ADC analog 56 input pin                |
|                       | TIOA28_1 | -        |                        | Base timer ch.28 TIOA output pin (1)   |
| 99                    | P309     | -        | A                      | General-purpose I/O port               |
|                       | IN1_1    | -        |                        | Input capture ch.1 input pin (1)       |
|                       | AN57     | -        |                        | ADC analog 57 input pin                |
|                       | TIOA29_1 | -        |                        | Base timer ch.29 TIOA I/O pin (1)      |
| 100                   | P312     | -        | A                      | General-purpose I/O port               |
|                       | IN2_1    | -        |                        | Input capture ch.2 input pin (1)       |
|                       | AN58     | -        |                        | ADC analog 58 input pin                |
| 101                   | P313     | -        | A                      | General-purpose I/O port               |
|                       | IN3_1    | -        |                        | Input capture ch.3 input pin (1)       |
|                       | AN59     | -        |                        | ADC analog 59 input pin                |
|                       | INT10_1  | -        |                        | INT10 external interrupt input pin (1) |
| 102                   | P314     | -        | A                      | General-purpose I/O port               |
|                       | IN4_1    | -        |                        | Input capture ch.4 input pin (1)       |
|                       | AN60     | -        |                        | ADC analog 60 input pin                |
|                       | TIOA7_1  | -        |                        | Base timer ch.7 TIOA I/O pin (1)       |
| 103                   | P315     | -        | A                      | General-purpose I/O port               |
|                       | IN5_1    | -        |                        | Input capture ch.5 input pin (1)       |
|                       | AN61     | -        |                        | ADC analog 61 input pin                |
|                       | TIOA8_1  | -        |                        | Base timer ch.8 TIOA output pin (1)    |
| 104                   | P317     | -        | A                      | General-purpose I/O port               |
|                       | AN62     | -        |                        | ADC analog 62 input pin                |
|                       | TIOA9_1  | -        |                        | Base timer ch.9 TIOA I/O pin (1)       |
|                       | INT11_1  | -        |                        | INT11 external interrupt input pin (1) |
| 107                   | P321     | -        | R                      | General-purpose output port            |
|                       | PWUTRG   | -        |                        | Partial wakeup trigger output pin      |
| 110                   | TRST     | N        | J                      | JTAG test reset input pin              |
|                       | P322     | -        |                        | General-purpose output port            |
| 111                   | TDO      | -        | I                      | JTAG test data output pin              |
|                       | P323     | -        |                        | General-purpose output port            |
| 112                   | TDI      | -        | D                      | JTAG test data input pin               |
|                       | P324     | -        |                        | General-purpose output port            |
| 113                   | TMS      | -        | E                      | JTAG test mode state input pin         |
| 114                   | TCK      | -        | E                      | JTAG test clock input pin              |
| 115                   | P327     | -        | P                      | General-purpose I/O port               |
| 116                   | P330     | -        | P                      | General-purpose I/O port               |

| Pin No.<br>S6J311xHAC | Pin Name                                           | Polarity              | I/O<br>Circuit<br>Type | Function                                                                                                                                                                                              |
|-----------------------|----------------------------------------------------|-----------------------|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 117                   | MD                                                 | -                     | C                      | Mode pin                                                                                                                                                                                              |
| 118                   | X0                                                 | -                     | G                      | Main clock oscillation input pin                                                                                                                                                                      |
| 119                   | X1                                                 | -                     | G                      | Main clock oscillation output pin                                                                                                                                                                     |
| 121                   | P331                                               | -                     | P                      | General-purpose I/O port                                                                                                                                                                              |
| 122                   | P400                                               | -                     | P                      | General-purpose I/O port                                                                                                                                                                              |
| 123                   | RSTX                                               | N                     | F                      | External reset input pin                                                                                                                                                                              |
| 127                   | P401<br>IN0_0                                      | -<br>-                | Q                      | General-purpose I/O port<br>Input capture ch.0 input pin (0)                                                                                                                                          |
| 128                   | P402<br>IN1_0<br>INT2_0                            | -<br>-<br>-           | Q                      | General-purpose I/O port<br>Input capture ch.1 input pin (0)<br>INT2 external interrupt input pin (0)                                                                                                 |
| 129                   | P403<br>IN2_0<br>TRACEDATA0                        | -<br>-<br>-           | Q                      | General-purpose I/O port<br>Input capture ch.2 input pin (0)<br>Trace data 0 output pin                                                                                                               |
| 130                   | P404<br>IN3_0<br>TRACEDATA1                        | -<br>-<br>-           | Q                      | General-purpose I/O port<br>Input capture ch.3 input pin (0)<br>Trace data 1 output pin                                                                                                               |
| 131                   | P405<br>IN4_0<br>INT11_0<br>TRACEDATA2             | -<br>-<br>-<br>-      | Q                      | General-purpose I/O port<br>Input capture ch.4 input pin (0)<br>INT11 external interrupt input pin (0)<br>Trace data 2 output pin                                                                     |
| 132                   | P406<br>TRACEDATA3                                 | -<br>-                | Q                      | General-purpose I/O port<br>Trace data 3 output pin                                                                                                                                                   |
| 133                   | P407<br>TRACEDATA4                                 | -<br>-                | Q                      | General-purpose I/O port<br>Trace data 4 output pin                                                                                                                                                   |
| 134                   | P408<br>SIN2_0<br>INT12_0<br>TRACEDATA5            | -<br>-<br>-<br>-      | Q                      | General-purpose I/O port<br>Multi-function serial ch.2 serial data input pin (0)<br>INT12 external interrupt input pin (0)<br>Trace data 5 output pin                                                 |
| 135                   | P409<br>SOT2_0<br>SDA2_0<br>TIOA24_1<br>TRACEDATA6 | -<br>-<br>-<br>-<br>- | Q                      | General-purpose I/O port<br>Multi-function serial ch.2 serial data output pin (0)<br>I <sup>2</sup> C bus ch.2 serial data I/O pin<br>Base timer ch.24 TIOA output pin (1)<br>Trace data 6 output pin |
| 136                   | P411<br>SCK2_0<br>SCL2_0<br>INT13_1<br>TRACEDATA7  | -<br>-<br>-<br>-<br>- | Q                      | General-purpose I/O port<br>Multi-function serial ch.2 clock I/O pin (0)<br>I <sup>2</sup> C bus ch.2 serial clock I/O pin<br>INT13 external interrupt input pin (1)<br>Trace data 7 output pin       |
| 137                   | P413<br>SCS20_0<br>INT14_1                         | -<br>-<br>-           | Q                      | General-purpose I/O port<br>Multi-function serial ch.2 serial chip select 0 I/O pin (0)<br>INT14 external interrupt input pin (1)                                                                     |
| 138                   | P414<br>SCS21_0                                    | -<br>-                | Q                      | General-purpose I/O port<br>Multi-function serial ch.2 serial chip select 1 output pin (0)                                                                                                            |
| 139                   | P416<br>IN5_0<br>TIOA22_1                          | -<br>-<br>-           | Q                      | General-purpose I/O port<br>Input capture ch.5 input pin (0)<br>Base timer ch.22 TIOA output pin (1)                                                                                                  |
| 140                   | P417<br>TIOA23_1<br>INT15_1                        | -<br>-<br>-           | Q                      | General-purpose I/O port<br>Base timer ch.23 TIOA I/O pin (1)<br>INT15 external interrupt input pin (1)                                                                                               |
| 141                   | P418<br>SCS22_0<br>INT14_0                         | -<br>-<br>-           | Q                      | General-purpose I/O port<br>Multi-function serial ch.2 serial chip select 2 output pin (0)<br>INT14 external interrupt input pin (0)                                                                  |

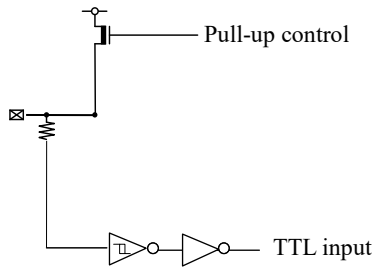
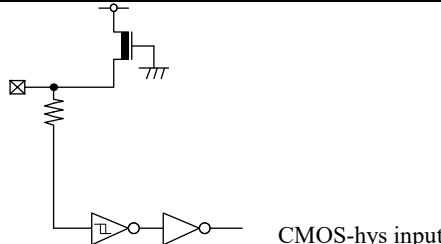
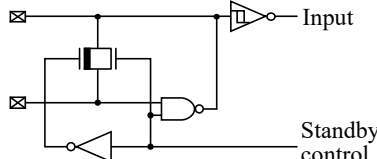
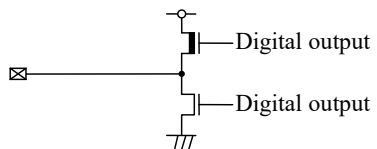
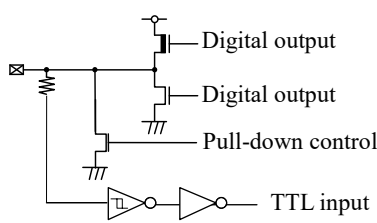
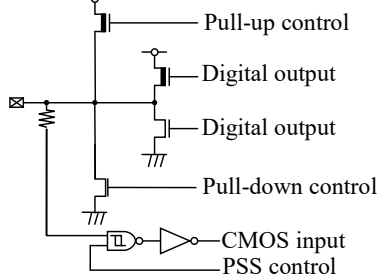
| Pin No.<br>S6J311xHAC                     | Pin Name                   | Polarity    | I/O<br>Circuit<br>Type | Function                                                                                          |
|-------------------------------------------|----------------------------|-------------|------------------------|---------------------------------------------------------------------------------------------------|
| 142                                       | P420<br>SCK2_1<br>TRACECLK | -<br>-<br>- | Q                      | General-purpose I/O port<br>Multi-function serial ch.2 clock I/O pin (1)<br>Trace clock           |
| 143                                       | P421<br>SIN2_1<br>TRACECTL | -<br>-<br>- | Q                      | General-purpose I/O port<br>Multi-function serial ch.2 serial data input pin (1)<br>Trace control |
| 42                                        | AVCC0                      | -           | -                      | Analog power supply pin for AD converter unit 0                                                   |
| 84                                        | AVCC1                      | -           | -                      | Analog power supply pin for AD converter unit 1                                                   |
| 43                                        | AVRH0                      | -           | -                      | Upper-limit reference voltage pin for AD converter unit 0                                         |
| 83                                        | AVRH1                      | -           | -                      | Upper-limit reference voltage pin for AD converter unit 1                                         |
| 44                                        | AVSS0<br>AVRL0             | -<br>-      | -                      | GND pin for AD converter unit 0<br>Lower-limit reference voltage pin for AD converter unit 0      |
| 82                                        | AVSS1<br>AVRL1             | -<br>-      | -                      | GND pin for AD converter unit 1<br>Lower-limit reference voltage pin for AD converter unit 1      |
| 38<br>126                                 | C                          | -           | -                      | External capacity connection output pin                                                           |
| 36<br>72<br>105<br>109<br>124<br>144      | VCC                        | -           | -                      | Power supply pin                                                                                  |
| 1<br>37<br>73<br>106<br>108<br>120<br>125 | VSS                        | -           | -                      | GND                                                                                               |

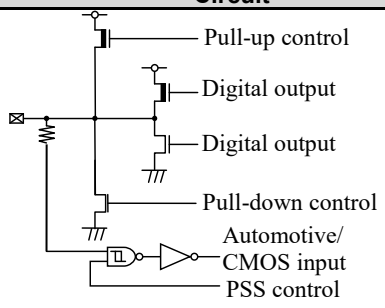
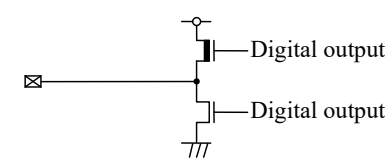
## 4. I/O Circuit Types

This section explains I/O circuit types.

| Type | Circuit                                                                                                                                                                                                                                            | Overview                                                                                                                                                                                                       |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A    |  <p>Pull-up control</p> <p>Digital output</p> <p>Digital output</p> <p>Pull-down control</p> <p>CMOS input</p> <p>PSS control</p> <p>Analog input</p>             | General-purpose I/O port with analog input<br>Output of 1 mA or 2 mA selectable<br>50 kΩ with pull-up resistor control<br>50 kΩ with pull-down resistor control<br>CMOS hysteresis input                       |
| B    |  <p>Pull-up control</p> <p>Digital output</p> <p>Digital output</p> <p>Pull-down control</p> <p>Automotive/CMOS input</p> <p>PSS control</p> <p>Analog input</p> | General-purpose I/O port with analog input<br>Output of 1 mA or 2 mA selectable<br>50 kΩ with pull-up resistor control<br>50 kΩ with pull-down resistor control<br>Automotive/CMOS hysteresis input selectable |
| C    |  <p>Mode input</p>                                                                                                                                              | Mode input<br>CMOS hysteresis input                                                                                                                                                                            |
| D    |  <p>Pull-up control</p> <p>Digital output</p> <p>Digital output</p> <p>TTL input</p>                                                                            | JTAG<br>General-purpose output port<br>Output of 2 mA<br>50 kΩ with pull-up resistor control<br>TTL input                                                                                                      |



| Type | Circuit                                                                             | Overview                                                                                                                                                               |
|------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| E    |    | JTAG<br>50 kΩ with pull-up resistor control<br>TTL input                                                                                                               |
| F    |    | CMOS hysteresis input<br>50 kΩ with pull-up resistor                                                                                                                   |
| G    |   | Main oscillation I/O                                                                                                                                                   |
| I    |  | JTAG<br>Output of 2 mA                                                                                                                                                 |
| J    |  | JTAG<br>General-purpose output port<br>Output of 2 mA<br>50 kΩ with pull-down resistor control<br>TTL input                                                            |
| P    |  | General-purpose I/O port<br>Output of 1 mA or 2 mA selectable<br>50 kΩ with pull-up resistor control<br>50 kΩ with pull-down resistor control<br>CMOS hysteresis input |

| Type | Circuit                                                                           | Overview                                                                                                                                                                                     |
|------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Q    |  | General-purpose I/O port<br>Output of 1 mA or 2 mA selectable<br>50 kΩ with pull-up resistor control<br>50 kΩ with pull-down resistor control<br>Automotive/CMOS hysteresis input selectable |
| R    |  | Output of 2 mA                                                                                                                                                                               |

## 5. Handling Precautions

Any semiconductor devices have inherently a certain rate of failure. The possibility of failure is greatly affected by the conditions in which they are used (circuit conditions, environmental conditions, etc.). This page describes precautions that must be observed to minimize the chance of failure and to obtain higher reliability from your Cypress semiconductor devices.

### 5.1 Precautions for Product Design

This section describes precautions when designing electronic equipment using semiconductor devices.

#### Absolute Maximum Ratings

Semiconductor devices can be permanently damaged by application of stress (voltage, current, temperature, etc.) in excess of certain established limits, called absolute maximum ratings. Do not exceed these ratings.

#### Recommended Operating Conditions

Recommended operating conditions are normal operating ranges for the semiconductor device. All the device's electrical characteristics are warranted when operated within these ranges.

Always use semiconductor devices within the recommended operating conditions. Operation outside these ranges may adversely affect reliability and could result in device failure.

No warranty is made with respect to uses, operating conditions, or combinations not represented on the data sheet. Users considering application outside the listed conditions are advised to contact their sales representative beforehand.

#### Processing and Protection of Pins

These precautions must be followed when handling the pins which connect semiconductor devices to power supply and input/output functions.

##### Preventing Over-Voltage and Over-Current Conditions

Exposure to voltage or current levels in excess of maximum ratings at any pin is likely to cause deterioration within the device, and in extreme cases leads to permanent damage of the device. Try to prevent such overvoltage or over-current conditions at the design stage.

##### Protection of Output Pins

Shorting of output pins to supply pins or other output pins, or connection to large capacitance can cause large current flows. Such conditions if present for extended periods of time can damage the device.

Therefore, avoid this type of connection.

##### Handling of Unused Input Pins

Unconnected input pins with very high impedance levels can adversely affect stability of operation. Such pins should be connected through an appropriate resistance to a power supply pin or ground pin.

**Latch-up**

Semiconductor devices are constructed by the formation of P-type and N-type areas on a substrate. When subjected to abnormally high voltages, internal parasitic PNP junctions (called thyristor structures) may be formed, causing large current levels in excess of several hundred mA to flow continuously at the power supply pin. This condition is called latch-up.

CAUTION: The occurrence of latch-up not only causes loss of reliability in the semiconductor device, but can cause injury or damage from high heat, smoke or flame. To prevent this from happening, do the following:

1. Be sure that voltages applied to pins do not exceed the absolute maximum ratings. This should include attention to abnormal noise, surge levels, etc.

◦ Be sure that abnormal current flows do not occur during the power-on sequence.

**Observance of Safety Regulations and Standards**

Most countries in the world have established standards and regulations regarding safety, protection from electromagnetic interference, etc. Customers are requested to observe applicable regulations and standards in the design of products.

**Fail-Safe Design**

Any semiconductor devices have inherently a certain rate of failure. You must protect against injury, damage or loss from such failures by incorporating safety design measures into your facility and equipment such as redundancy, fire protection, and prevention of over-current levels and other abnormal operating conditions.

**Precautions Related to Usage of Devices**

Cypress semiconductor devices are intended for use in standard applications (computers, office automation and other office equipment, industrial, communications, and measurement equipment, personal or household devices, etc.).

CAUTION: Customers considering the use of our products in special applications where failure or abnormal operation may directly affect human lives or cause physical injury or property damage, or where extremely high levels of reliability are demanded (such as aerospace systems, atomic energy controls, sea floor repeaters, vehicle operating controls, medical devices for life support, etc.) are requested to consult with sales representatives before such use. The company will not be responsible for damages arising from such use without prior approval.

**5.2 Precautions for Package Mounting**

Package mounting may be either lead insertion type or surface mount type. In either case, for heat resistance during soldering, you should only mount under Cypress recommended conditions. For detailed information about mount conditions, contact your sales representative.

**Lead Insertion Type**

Mounting of lead insertion type packages onto printed circuit boards may be done by two methods: direct soldering on the board, or mounting by using a socket.

Direct mounting onto boards normally involves processes for inserting leads into through-holes on the board and using the flow soldering (wave soldering) method of applying liquid solder. In this case, the soldering process usually causes leads to be subjected to thermal stress in excess of the absolute ratings for storage temperature. Mounting processes should conform to Cypress recommended mounting conditions.

If socket mounting is used, differences in surface treatment of the socket contacts and IC lead surfaces can lead to contact deterioration after long periods. For this reason it is recommended that the surface treatment of socket contacts and IC leads be verified before mounting.

**Surface Mount Type**

Surface mount packaging has longer and thinner leads than lead-insertion packaging, and therefore leads are more easily deformed or bent. The use of packages with higher pin counts and narrower pin pitch results in increased susceptibility to open connections caused by deformed pins, or shorting due to solder bridges.

You must use appropriate mounting techniques. Cypress recommends the solder reflow method, and has established a ranking of mounting conditions for each product. Users are advised to mount packages in accordance with Cypress ranking of recommended conditions.

**Lead-Free Packaging**

CAUTION: When ball grid array (BGA) packages with Sn-Ag-Cu balls are mounted using Sn-Pb eutectic soldering, junction strength may be reduced under some conditions of use.

### Storage of Semiconductor Devices

Because plastic chip packages are formed from plastic resins, exposure to natural environmental conditions will cause absorption of moisture. During mounting, the application of heat to a package that has absorbed moisture can cause surfaces to peel, reducing moisture resistance and causing packages to crack. To prevent, do the following:

1. Avoid exposure to rapid temperature changes, which cause moisture to condense inside the product.  
Store products in locations where temperature changes are slight.
2. Use dry boxes for product storage. Products should be stored below 70% relative humidity, and at temperatures between 5 °C and 30 °C.  
When you open Dry Package that recommends humidity 40% to 70% relative humidity.
3. When necessary, Cypress packages semiconductor devices in highly moisture-resistant aluminum laminate bags, with a silica gel desiccant. Devices should be sealed in their aluminum laminate bags for storage.
4. Avoid storing packages where they are exposed to corrosive gases or high levels of dust.

### Baking

Packages that have absorbed moisture may be de-moisturized by baking (heat drying). Follow the Cypress recommended conditions for baking.

Condition: 125 °C/24 h

### Static Electricity

Because semiconductor devices are particularly susceptible to damage by static electricity, you must take the following precautions:

1. Maintain relative humidity in the working environment between 40% and 70%.  
Use of an apparatus for ion generation may be needed to remove electricity.
2. Electrically ground all conveyors, solder vessels, soldering irons and peripheral equipment.
3. Eliminate static body electricity by the use of rings or bracelets connected to ground through high resistance (on the level of 1 MΩ).  
Wearing of conductive clothing and shoes, use of conductive floor mats and other measures to minimize shock loads is recommended.
4. Ground all fixtures and instruments, or protect with anti-static measures.
5. Avoid the use of styrofoam or other highly static-prone materials for storage of completed board assemblies.

### 5.3 Precautions for Use Environment

Reliability of semiconductor devices depends on ambient temperature and other conditions as described above.

For reliable performance, do the following:

1. Humidity  
Prolonged use in high humidity can lead to leakage in devices as well as printed circuit boards. If high humidity levels are anticipated, consider anti-humidity processing.
2. Discharge of Static Electricity  
When high-voltage charges exist close to semiconductor devices, discharges can cause abnormal operation. In such cases, use anti-static measures or processing to prevent discharges.
3. Corrosive Gases, Dust, or Oil  
Exposure to corrosive gases or contact with dust or oil may lead to chemical reactions that will adversely affect the device. If you use devices in such conditions, consider ways to prevent such exposure or to protect the devices.
4. Radiation, Including Cosmic Radiation  
Most devices are not designed for environments involving exposure to radiation or cosmic radiation. Users should provide shielding as appropriate.
5. Smoke, Flame  
CAUTION: Plastic molded devices are flammable, and therefore should not be used near combustible substances. If devices begin to smoke or burn, there is danger of the release of toxic gases.

Customers considering the use of Cypress products in other special environmental conditions should consult with sales representatives.

## 6. Handling Devices

### For Latch-up Prevention

The latch-up phenomenon may occur on a CMOS IC in the following cases: the voltage applied to an input or output pin is higher than  $V_{CC}$  or lower than  $V_{SS}$ ; or the voltage applied between a  $V_{CC}$  pin and a  $V_{SS}$  pin exceeds the rating. A latch-up causes a rapid increase in the power supply current, possibly resulting in thermal damage to an element. When using the device, take sufficient care not to exceed the maximum rating.

Also be careful that analog power supplies ( $AVCC0$ ,  $AVCC1$ ,  $AVRH0$ , and  $AVRH1$ ) and analog inputs do not exceed the digital power supply ( $V_{CC}$ ) at the analog system power-on and power-off times.

The power-on sequence is as follows. Simultaneously turn on the digital supply voltage ( $V_{CC}$ ) and analog supply voltages ( $AVCC0$ ,  $AVCC1$ ,  $AVRH0$ , and  $AVRH1$ ), or turn on the digital supply voltage ( $V_{CC}$ ) and then the analog supply voltages ( $AVCC0$ ,  $AVCC1$ ,  $AVRH0$ , and  $AVRH1$ ).

### About Handling Unused Pins

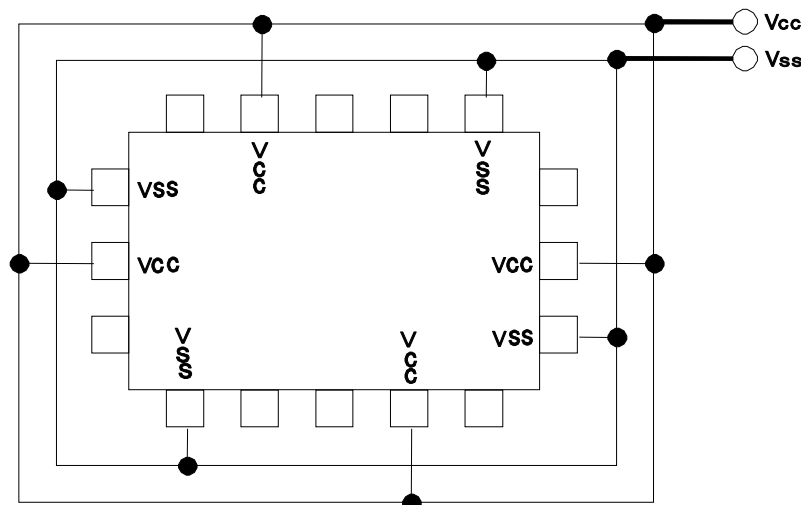
Leaving unused input pins open may cause permanent damage from a malfunction or latch-up. Take measures for unused pins, such as pulling up or pulling down the voltage with resistors of 2 kilohms or higher.

If there are any unused input/output pins, set them to the output state and then open them, or set them to the input state and handle them in the same way as input pins.

### About Power Supply Pins

If the device has multiple  $V_{CC}$  and  $V_{SS}$  pins, the device is designed in such a way that the pins that should be at the same potential are connected to each other inside the device to prevent malfunctions such as latch-up. However, to reduce unwanted emissions, prevent malfunctions of strobe signals caused by an increase of the ground level, and observe standards on total output current, be sure to connect all the  $V_{CC}$  and  $V_{SS}$  pins to the power source and ground externally. Also handle all the  $V_{SS}$  power supply pins in this way as shown in the following diagram. If there are multiple  $V_{CC}$  or  $V_{SS}$  systems, the device does not operate normally even within the guaranteed operating range.

**Figure 6-1. Pin Assignment**



In addition, consider connecting with low impedance from the power supply source to the  $V_{CC}$  and  $V_{SS}$  of this device.

In the area close to this device, a ceramic capacitor having the capacitance larger than the capacitor of C pin is recommended to use as a bypass capacitor between the  $V_{CC}$  pin and the  $V_{SS}$  pin.

### About the Crystal Oscillation Circuit

Noise entering the X0 or X1 pin may cause a malfunction. Design the printed circuit board in such a way that the X0 and X1 pins, the crystal oscillator (or ceramic resonator), and a bypass capacitor to ground are located very close to the device.

We recommend that the printed circuit board artwork have the X0 and X1 pins enclosed by ground.

**About the Mode Pin (MD)**

Use mode pin MD by directly connecting it to a VCC or VSS pin. To prevent noise from causing the device to accidentally enter test mode, reduce the pattern length between each mode pin and a VCC or VSS pin on the printed circuit board, and connect them with low impedance.

**About the Power-on Time**

To prevent a malfunction of the voltage step-down circuit built in the device, the voltage rising must be monotonic during power-on.

**Point to Note during PLL Clock Operation**

While a PLL clock is selected, if the oscillator breaks off or input stops, the PLL clock may continue operating with the free running frequency of the internal self-oscillator circuit. This operation is outside of the guaranteed range.

**Power Supply Pin Processing of an A/D Converter**

Even when no A/D converter is used, establish a connection such that  $AVCC = AVRH = VCC$  and  $AVSS/AVRL = VSS$ .

**Points to Note about Using External Clocks**

External clocks are not supported.

External direct clock input cannot be used.

**Power-on Sequence of the Power Supply Analog Inputs of an A/D Converter**

Be sure to turn on the digital power supply (VCC) before the application of the power supplies (AVCC, AVRH, and AVRL) and analog inputs (AN0 to AN3, AN5, AN6, AN9, AN10, AN12 to AN15, AN17 to AN24, and AN27 to AN62) of an A/D converter. At the power-off time, turn off the power supplies and analog inputs of the A/D converter, and then turn off the digital power supply (VCC). Perform these power-on and power-off operations without AVRH exceeding AVCC. Even when using a pin shared with an analog input as an input port, do not allow the input voltage to exceed AVCC. (Turning on or off the analog supply voltage and digital supply voltage simultaneously is not a problem.)

**About C Pin Processing**

This device has a built-in voltage step-down circuit. Be sure to connect a capacitor to the C pin (pin 126 in S6J311xHAC\* specifications) for internal stabilization of the device. For the standard values, see "Recommended operating conditions" in the latest data sheet.

\*x: A/9

**Precautions on Designing a Mounting Substrate**

Measures against heat generation from the package must be taken for the mounting substrate to observe the absolute maximum rating (operating temperature). Design a mounting substrate with 4 or more layers. Connect the back of the package stage and the substrate pad with solder paste. Arrange thermal via holes on the substrate pad. For detailed information about mount conditions, contact your sales representative.

**Notes on Writing to a Register Containing a Status Flag**

In writing to a register containing a status flag (particularly an interrupt request flag, etc.) to control a function, it is important to take care not to accidentally clear the status flag.

Therefore, before the write operation, configure the status bit such that the flag is not cleared, and then set the control bit to the desired value.

Especially for control bits configured as a set of multiple bits, bit instructions cannot be used (bit instructions have only 1-bit access). In such cases, byte, half-word, or word access is used to write to the control bits and a status flag simultaneously. However, at this time, be careful not to accidentally clear bits other than the intended ones (the status flag bit in this case).

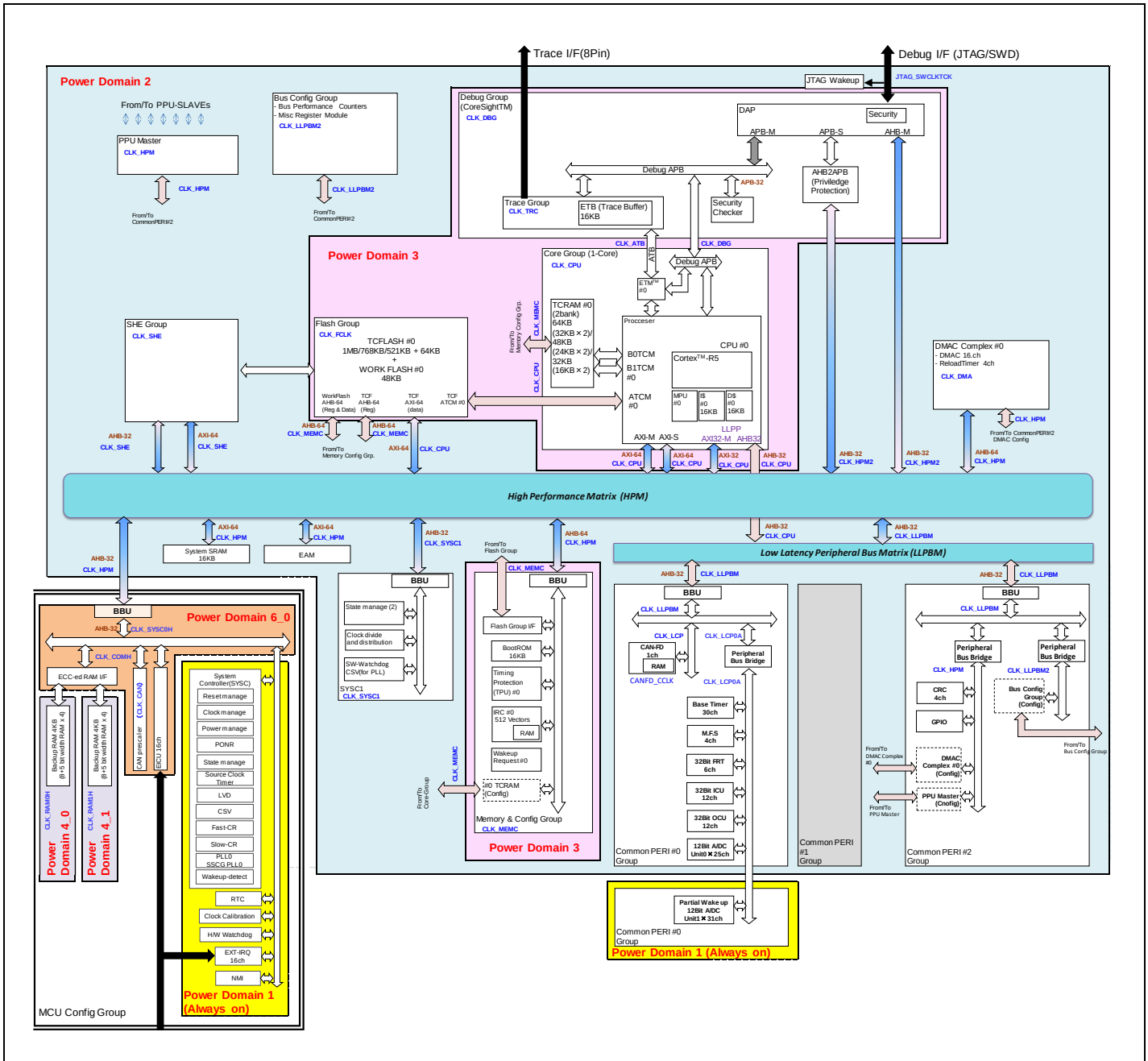
Note: Bit instructions take this point into account for registers that support bit-band units, so it does not need to be a concern. You need to take care when using bit instructions for registers that do not support bit-band units.

## 7. Block Diagram

This section provides block diagrams of the S6J3110 series.

**Figure 7-1. S6J311xHAC\* Block Diagram**

\* x: A/9





## 8. Memory Map

This section explains the memory map.

**Figure 8-1. Memory Map (S6J311AHAC/9HAC)**

\*z:A

| Address     |             | group                         | S6J311AHzC*                                      | S6J3119HzC*                                      |
|-------------|-------------|-------------------------------|--------------------------------------------------|--------------------------------------------------|
| START       | END         |                               | part                                             | part                                             |
| 0x0000_0000 | 0x0000_7FFF | Internal area for CR5 Complex | TCRAM (Main 64KByte)                             | TCRAM (Main 48KByte)                             |
| 0x0000_8000 | 0x0000_BFFF |                               | Reserved                                         | Reserved                                         |
| 0x0000_C000 | 0x0000_FFFF |                               | Reserved                                         | Reserved                                         |
| 0x0001_0000 | 0x007F_FFFF |                               | TCM_FLASH (Small Sector 8KByte×8)                | TCM_FLASH (Small Sector 8KByte×8)                |
| 0x0080_0000 | 0x009E_FFFF |                               | TCM_FLASH (Code 1MByte)                          | TCM_FLASH (Code 768KByte)                        |
| 0x009F_0000 | 0x009F_FFFF |                               | Reserved                                         | Reserved                                         |
| 0x00A0_0000 | 0x00A7_FFFF |                               | Reserved                                         | Reserved                                         |
| 0x00A8_0000 | 0x00AB_FFFF |                               | Reserved                                         | Reserved                                         |
| 0x00AC_0000 | 0x00AF_FFFF |                               | Reserved                                         | Reserved                                         |
| 0x00B0_0000 | 0x00DF_FFFF |                               | Reserved                                         | Reserved                                         |
| 0x00E0_0000 | 0x00FF_FFFF |                               | Reserved                                         | Reserved                                         |
| 0x0100_0000 | 0x019E_FFFF |                               | AXI_FLASH_MEMORY (Small Sector 8KByte×8 *Mirror) | AXI_FLASH_MEMORY (Small Sector 8KByte×8 *Mirror) |
| 0x019F_0000 | 0x019F_FFFF |                               | AXI_FLASH_MEMORY (Code 1MByte *Mirror)           | AXI_FLASH_MEMORY (Code 768KByte *Mirror)         |
| 0x01A0_0000 | 0x01A7_FFFF |                               | Reserved                                         | Reserved                                         |
| 0x01A8_0000 | 0x01AB_FFFF |                               | Reserved                                         | Reserved                                         |
| 0x01AC_0000 | 0x01AF_FFFF |                               | Reserved                                         | Reserved                                         |
| 0x01B0_0000 | 0x01DF_FFFF |                               | Reserved                                         | Reserved                                         |
| 0x01E0_0000 | 0x01FF_FFFF |                               | Reserved                                         | Reserved                                         |
| 0x0200_0000 | 0x0200_3FFF |                               | SYSTEM SRAM (16KByte)                            | SYSTEM SRAM (16KByte)                            |
| 0x0200_4000 | 0x0203_FFFF |                               | Reserved                                         | Reserved                                         |
| 0x0204_0000 | 0x027F_FFFF |                               | Reserved                                         | Reserved                                         |
| 0x0280_0000 | 0x0280_002F | Shared Flash and memory area  | Exclusive Access Memory                          | Exclusive Access Memory                          |
| 0x0280_0030 | 0x03FF_FFFF |                               | Reserved                                         | Reserved                                         |
| 0x0400_0000 | 0x05FF_FFFF |                               | AXI_SLAVE_CORE0                                  | AXI_SLAVE_CORE0                                  |
| 0x0600_0000 | 0x06FF_FFFF |                               | Reserved                                         | Reserved                                         |
| 0x0E00_0000 | 0x0E00_BFFF |                               | WORK_FLASH (48KByte mirror area 1)               | WORK_FLASH (48KByte mirror area 1)               |
| 0x0E00_C000 | 0x0E01_BFFF |                               | Reserved                                         | Reserved                                         |
| 0x0E01_C000 | 0x0E0F_FFFF |                               | Reserved                                         | Reserved                                         |
| 0x0E10_0000 | 0x0E1F_FFFF |                               | Reserved                                         | Reserved                                         |
| 0x0E20_0000 | 0x0E20_BFFF |                               | WORK_FLASH (48KByte mirror area 3)               | WORK_FLASH (48KByte mirror area 3)               |
| 0x0E20_C000 | 0x0E21_BFFF |                               | Reserved                                         | Reserved                                         |
| 0x0E21_C000 | 0x0E2F_FFFF |                               | Reserved                                         | Reserved                                         |
| 0x0E30_0000 | 0x0E30_BFFF |                               | WORK_FLASH (48KByte mirror area 4)               | WORK_FLASH (48KByte mirror area 4)               |
| 0x0E30_C000 | 0x0E31_BFFF |                               | Reserved                                         | Reserved                                         |
| 0x0E31_C000 | 0x0E3F_FFFF |                               | Reserved                                         | Reserved                                         |
| 0x0E40_0000 | 0x0E7F_FFFF |                               | Reserved                                         | Reserved                                         |
| 0x0E80_0000 | 0x0E80_1FFF |                               | Backup RAM 8KByte                                | Backup RAM 8KByte                                |
| 0x0E80_2000 | 0x0E80_FFFF |                               | Reserved                                         | Reserved                                         |
| 0x0E81_0000 | 0x0E87_FFFF |                               | Reserved                                         | Reserved                                         |
| 0x0E88_0000 | 0x0FFF_FFFF |                               | Reserved                                         | Reserved                                         |
| 0x1000_0000 |             | Reserved                      | Reserved                                         | Reserved                                         |
|             |             |                               | Reserved                                         | Reserved                                         |
| 0xB000_0000 | 0xB483_FFFF | Peri area                     | Peri_area                                        | Peri_area                                        |
| 0xB484_0000 | 0xB484_FFFF |                               | Peri_area                                        | Peri_area                                        |
| 0xB485_0000 |             | Reserved                      | Peri_area                                        | Peri_area                                        |
|             |             |                               | Peri_area                                        | Peri_area                                        |
| 0xB7FF_FFFF |             | Reserved                      | Reserved                                         | Reserved                                         |
| 0xB800_0000 |             |                               | Reserved                                         | Reserved                                         |
| 0xFFFE_0000 | 0xFFFE_DFFF | ERRCFG                        | ERRCFG                                           | ERRCFG                                           |
| 0xFFFF_0000 | 0xFFFF_3FFF |                               | ERRCFG                                           | ERRCFG                                           |
| 0xFFFF_4000 | 0xFFFF_FFFF | BootROM                       | BootROM                                          | BootROM                                          |
|             |             |                               | Reserved                                         | Reserved                                         |

Only the CPU core can access 0000\_0000 ~ 01FF\_FFFF. Bus masters other than the CPU core cannot access the region.

Internal area of CR5 complex (0000\_0000 ~ 01FF\_FFFF) is mapped to AXI\_SLAVE\_CORE0. All bus masters can access to internal area of CR5 complex via AXI\_SLAVE\_CORE0.

In each of the following memory area combinations, the areas are physically the same memory area.

1. TCM FLASH (0x00A0\_0000 -) and AXI FLASH MEMORY (0x01A0\_0000 -)  
 %○ TCM FLASH Small Sector (0x009F\_0000 -) and AXI FLASH MEMORY Small Sector (0x019F\_0000 -)  
 %○ WORKFLASH (0x0E00\_0000 -), WORKFLASH (0x0E20\_0000 -), and WORKFLASH (0x0E30\_0000 -)

The ECC movement in TCM port is based on ECC setting inside the CPU.

■ The differences between the TCM FLASH and AXI FLASH include the following.

| Function                              | TCM FLASH                     | AXI FLASH      |
|---------------------------------------|-------------------------------|----------------|
| High-speed Access Using Dedicated Bus | Applicable                    | Not applicable |
| Write and Erase                       | Not applicable<br>(Read-only) | Applicable     |
| Read                                  | Applicable                    | Applicable     |

■ The differences between WORKFLASH areas include the following.

| Area             | Function                              |
|------------------|---------------------------------------|
| WORKFLASH Area 1 | Used in write operation (with ECC)    |
| WORKFLASH Area 3 | Used in write operation (without ECC) |
| WORKFLASH Area 4 | Used in read operation                |

■ Terms are as follows.

| Term           | Description                                                               |
|----------------|---------------------------------------------------------------------------|
| TCM RAM        | Main RAM                                                                  |
| TCM FLASH      | Program FLASH (TCM area)                                                  |
| AXI FLASH      | Program FLASH (AXI area)<br>This is physically the same as the TCM FLASH. |
| SYSTEM RAM     | System RAM                                                                |
| AXI SLAVE CORE | AXI CPU control area                                                      |
| WORKFLASH      | FLASH for work                                                            |
| BACKUP RAM     | Backup RAM                                                                |
| Peri area      | Entire area for peripheral functions                                      |
| APPS#5         | Part of area for peripheral functions                                     |
| ERRCFG         | Error configuration area                                                  |
| BootROM        | ROM for reset boot                                                        |

**S6J311xHAC\* Peripheral Map**

\* x: A/9

| START Address | END Address | Group               | Function                                                        | PPU No |
|---------------|-------------|---------------------|-----------------------------------------------------------------|--------|
| B000_0000     | B010_7FFF   |                     | Reserved                                                        | -      |
| B010_8000     | B010_80FF   | SystemSRAM          | SystemSRAM registers                                            | -      |
| B010_8100     | B02F_FFFF   |                     | Reserved                                                        | -      |
| B030_0000     | B030_7FFF   | SYSC1               | System Controller #1                                            | -      |
| B030_8000     | B03F_FFFF   | SYSC1               | SWDT                                                            | -      |
| B040_0000     | B040_7FFF   | MEMORY_CONFIG_GROUP | IRC0                                                            | 21     |
| B040_8000     | B040_FFFF   | MEMORY_CONFIG_GROUP | TPU0                                                            | 19     |
| B041_0000     | B041_0FFF   | MEMORY_CONFIG_GROUP | TCRAM Control Status Register                                   | 16     |
| B041_1000     | B041_1FFF   | MEMORY_CONFIG_GROUP | TCFlash Control Status Register                                 | 17     |
| B041_2000     | B041_20FF   | MEMORY_CONFIG_GROUP | WFlash Control Status Register                                  | 18     |
| B041_2100     | B04F_FFFF   |                     | Reserved                                                        | -      |
| B050_0000     | B05F_FFFF   |                     | Reserved                                                        | -      |
| B060_0000     | B060_007F   | MCU_CONFIG_GROUP    | Protection register area                                        | -      |
| B060_0080     | B060_00FF   | MCU_CONFIG_GROUP    | RUN profile register area                                       | -      |
| B060_0100     | B060_017F   | MCU_CONFIG_GROUP    | PSS profile register area                                       | -      |
| B060_0180     | B060_01FF   | MCU_CONFIG_GROUP    | APP profile register area                                       | -      |
| B060_0200     | B060_027F   | MCU_CONFIG_GROUP    | STS profile register area                                       | -      |
| B060_0280     | B060_02FF   | MCU_CONFIG_GROUP    | System register area                                            | -      |
| B060_0300     | B060_037F   | MCU_CONFIG_GROUP    | CSV                                                             | -      |
| B060_0380     | B060_03FF   | MCU_CONFIG_GROUP    | RESET                                                           | -      |
| B060_0400     | B060_047F   | MCU_CONFIG_GROUP    | SCT(Fast CR)                                                    | 34     |
| B060_0480     | B060_04FF   | MCU_CONFIG_GROUP    | SCT(Slow CR)                                                    | 33     |
| B060_0500     | B060_05FF   | MCU_CONFIG_GROUP    | SCT(Main clock)                                                 | 35     |
| B060_0600     | B060_067F   | MCU_CONFIG_GROUP    | Clock System                                                    | -      |
| B060_0680     | B060_06FF   | MCU_CONFIG_GROUP    | Special register area                                           | -      |
| B060_0700     | B060_07FF   | MCU_CONFIG_GROUP    | Debug register area                                             | -      |
| B060_0800     | B060_08FF   | MCU_CONFIG_GROUP    | Mode                                                            | -      |
| B060_C000     | B060_FFFF   | MCU_CONFIG_GROUP    | HWDT                                                            | -      |
| B061_0000     | B061_7FFF   |                     | Reserved                                                        | -      |
| B061_8000     | B061_FFFF   | MCU_CONFIG_GROUP    | RTC                                                             | 32     |
| B062_0000     | B063_FFFF   | MCU_CONFIG_GROUP    | EIC                                                             | -      |
| B064_0000     | B065_FFFF   |                     | Reserved                                                        | -      |
| B066_0000     | B067_FFFF   |                     | Reserved                                                        | -      |
| B068_0000     | B068_7FFF   | MCU_CONFIG_GROUP    | BURAMIF                                                         | -      |
| B068_8000     | B068_83FF   | MCU_CONFIG_GROUP    | EICU                                                            | 37     |
| B068_8400     | B068_87FF   | MCU_CONFIG_GROUP    | CR Calibration                                                  | 38     |
| B068_8800     | B068_8BFF   | MCU_CONFIG_GROUP    | IRQ all                                                         | 42     |
| B068_8C00     | B068_FFFF   | MCU_CONFIG_GROUP    | CAN Prescaler                                                   | 43     |
| B069_0000     | B06F_FFFF   |                     | Reserved                                                        | -      |
| B070_0000     | B07F_FFFF   |                     | Reserved                                                        | -      |
| B080_0000     | B0FF_FFFF   | Bit RMW alias       | Bit RMW alias for MCU config Gr (Covers B060_0000 -- B06F_FFFF) | -      |
| B100_0000     | B10F_FFFF   | Bit RMW alias       | Bit RMW alias for SYSC1 (Covers B030_0000 -- B031_FFFF)         | -      |
| B110_0000     | B11F_FFFF   | Bit RMW alias       | Bit RMW alias for MEMC (Covers B040_0000 -- B041_FFFF)          | -      |
| B120_0000     | B1FF_FFFF   |                     | Reserved                                                        | -      |
| B200_0000     | B20F_FFFF   | SHE                 | SHE configuration registers                                     | 63     |
| B210_0000     | B46F_FFFF   |                     | Reserved                                                        | -      |
| B470_0000     | B470_3FFF   | CommonPERI #2       | DMAC #0 registers                                               | 64     |
| B470_4000     | B470_FFFF   |                     | Reserved                                                        | -      |
| B471_0000     | B471_0FFF   | CommonPERI #2       | MPU for DMAC#0                                                  | 66     |
| B471_1000     | B471_3FFF   |                     | Reserved                                                        | -      |
| B471_4000     | B471_4FFF   | CommonPERI #2       | DMA Complex #0 registers (Additional registers, RLts)           | 68     |
| B471_5000     | B471_7FFF   |                     | Reserved                                                        | -      |
| B471_8000     | B471_83FF   | CommonPERI #2       | CRC#0                                                           | 70     |
| B471_8400     | B471_87FF   | CommonPERI #2       | CRC#1                                                           | 71     |
| B471_8800     | B471_8BFF   | CommonPERI #2       | CRC#2                                                           | 72     |
| B471_8C00     | B471_8FFF   | CommonPERI #2       | CRC#3                                                           | 73     |
| B471_9000     | B473_7FFF   |                     | Reserved                                                        | -      |
| B473_8000     | B473_FFFF   | CommonPERI #2       | GPIO                                                            | 74     |
| B474_0000     | B474_7FFF   | CommonPERI #2       | PPC                                                             | 75     |
| B474_8000     | B474_FFFF   | CommonPERI #2       | RIC                                                             | 76     |
| B475_0000     | B475_7FFF   | CommonPERI #2       | PPU                                                             | -      |
| B475_8000     | B478_FBFF   |                     | Reserved                                                        | -      |
| B478_FC00     | B478_FFFF   |                     | Reserved                                                        | -      |
| B479_0000     | B47F_FFFF   |                     | Reserved                                                        | -      |

| START Address | END Address | Group         | Function                                                 | PPU No |
|---------------|-------------|---------------|----------------------------------------------------------|--------|
| B480_0000     | B480_03FF   | CommonPERI #0 | M.F.Serial ch.0                                          | 176    |
| B480_0400     | B480_07FF   | CommonPERI #0 | M.F.Serial ch.1                                          | 177    |
| B480_0800     | B480_0BFF   | CommonPERI #0 | M.F.Serial ch.2                                          | 178    |
| B480_0C00     | B480_0FFF   | CommonPERI #0 | M.F.Serial ch.3                                          | 179    |
| B480_1000     | B480_7FFF   |               | Reserved                                                 | -      |
| B480_8000     | B480_83FF   | CommonPERI #0 | BaseTimer ch.0                                           | 88     |
| B480_8400     | B480_87FF   | CommonPERI #0 | BaseTimer ch.1                                           | 89     |
| B480_8800     | B480_8BFF   | CommonPERI #0 | BaseTimer ch.2                                           | 90     |
| B480_8C00     | B480_8FFF   | CommonPERI #0 | BaseTimer ch.3                                           | 91     |
| B480_9000     | B480_93FF   | CommonPERI #0 | BaseTimer ch.4                                           | 92     |
| B480_9400     | B480_97FF   | CommonPERI #0 | BaseTimer ch.5                                           | 93     |
| B480_9800     | B480_9BFF   | CommonPERI #0 | BaseTimer ch.6                                           | 94     |
| B480_9C00     | B480_9FFF   | CommonPERI #0 | BaseTimer ch.7                                           | 95     |
| B480_A000     | B480_A3FF   | CommonPERI #0 | BaseTimer ch.8                                           | 96     |
| B480_A400     | B480_A7FF   | CommonPERI #0 | BaseTimer ch.9                                           | 97     |
| B480_A800     | B480_ABFF   | CommonPERI #0 | BaseTimer ch.10                                          | 98     |
| B480_AC00     | B480_AFFF   | CommonPERI #0 | BaseTimer ch.11                                          | 99     |
| B480_B000     | B481_FFFF   |               | Reserved                                                 | -      |
| B482_0000     | B482_03FF   | CommonPERI #0 | FRT ch.0                                                 | 208    |
| B482_0400     | B482_07FF   | CommonPERI #0 | FRT ch.1                                                 | 209    |
| B482_0800     | B482_0BFF   | CommonPERI #0 | FRT ch.2                                                 | 210    |
| B482_0C00     | B482_0FFF   | CommonPERI #0 | FRT ch.3                                                 | 211    |
| B482_1000     | B482_13FF   | CommonPERI #0 | FRT ch.4                                                 | 212    |
| B482_1400     | B482_17FF   | CommonPERI #0 | FRT ch.5                                                 | 213    |
| B482_1800     | B482_7FFF   |               | Reserved                                                 | -      |
| B482_8000     | B482_83FF   | CommonPERI #0 | ICU ch.0 / ch.1                                          | 224    |
| B482_8400     | B482_87FF   | CommonPERI #0 | ICU ch.2 / ch.3                                          | 225    |
| B482_8800     | B482_8BFF   | CommonPERI #0 | ICU ch.4 / ch.5                                          | 226    |
| B482_8C00     | B482_8FFF   | CommonPERI #0 | ICU ch.6 / ch.7                                          | 227    |
| B482_9000     | B482_93FF   | CommonPERI #0 | ICU ch.8 / ch.9                                          | 228    |
| B482_9400     | B482_97FF   | CommonPERI #0 | ICU ch.10 / ch.11                                        | 229    |
| B482_9800     | B482_FFFF   |               | Reserved                                                 | -      |
| B483_0000     | B483_03FF   | CommonPERI #0 | OCU ch.0 / ch.1                                          | 240    |
| B483_0400     | B483_07FF   | CommonPERI #0 | OCU ch.2 / ch.3                                          | 241    |
| B483_0800     | B483_0BFF   | CommonPERI #0 | OCU ch.4 / ch.5                                          | 242    |
| B483_0C00     | B483_0FFF   | CommonPERI #0 | OCU ch.6 / ch.7                                          | 243    |
| B483_1000     | B483_13FF   | CommonPERI #0 | OCU ch.8 / ch.9                                          | 244    |
| B483_1400     | B483_17FF   | CommonPERI #0 | OCU ch.10 / ch.11                                        | 245    |
| B483_1800     | B483_FBFF   |               | Reserved                                                 | -      |
| B483_FC00     | B483_FFFF   |               | Reserved                                                 | -      |
| B484_0000     | B484_FFFF   | APPS #5       | APPS#5 area                                              | -      |
| B485_0000     | B489_FFFF   |               | Reserved                                                 | -      |
| B48A_0000     | B48B_0FFF   |               | Reserved                                                 | -      |
| B48B_1000     | B48B_FBFF   |               | Reserved                                                 | -      |
| B48B_FC00     | B48B_FFFF   |               | Reserved                                                 | -      |
| B48C_0000     | B48F_FFFF   |               | Reserved                                                 | -      |
| B490_0000     | B490_FFFF   | CommonPERI #0 | CAN FD ch.0                                              | 256    |
| B491_0000     | B4BF_FFFF   |               | Reserved                                                 | -      |
| B4C0_0000     | B4FF_FFFF   | Bit RMW alias | Bit RMW alias for CPER#0(Covers B490_0000 -- B497_FFFF)  | -      |
| B500_0000     | B5FF_FFFF   |               | Reserved                                                 | -      |
| B600_0000     | B6FF_FFFF   |               | Reserved                                                 | -      |
| B700_0000     | B77F_FFFF   | Bit RMW alias | Bit RMW alias for CPER#2 (Covers B470_0000 -- B47F_FFFF) | -      |
| B780_0000     | B7BF_FFFF   | Bit RMW alias | Bit RMW alias for CPER#0 (Covers B480_0000 -- B487_FFFF) | -      |
| B7C0_0000     | B7FF_FFFF   |               | Reserved                                                 | -      |
| B800_0000     | FFFE_DFFF   |               | Reserved                                                 | -      |
| FFFE_E000     | FFFE_FBFC   | Error Config  | IRC                                                      | -      |
| FFFE_FC00     | FFFE_FFFF   | Error Config  | BootROM I/F                                              | 20     |

**■ APPS#5 area**

| START Address | END Address | Group   | Function                    | PPU No |
|---------------|-------------|---------|-----------------------------|--------|
| B484_0000     | B484_37FF   |         | Reserved                    | -      |
| B484_3800     | B484_3BFF   | APPS #5 | BaseTimer ch.12             | 278    |
| B484_3C00     | B484_3FFF   | APPS #5 | BaseTimer ch.13             | 279    |
| B484_4000     | B484_43FF   | APPS #5 | BaseTimer ch.14             | 280    |
| B484_4400     | B484_47FF   | APPS #5 | BaseTimer ch.15             | 281    |
| B484_4800     | B484_4BFF   | APPS #5 | BaseTimer ch.16             | 282    |
| B484_4C00     | B484_4FFF   | APPS #5 | BaseTimer ch.17             | 283    |
| B484_5000     | B484_53FF   | APPS #5 | BaseTimer ch.18             | 284    |
| B484_5400     | B484_57FF   | APPS #5 | BaseTimer ch.19             | 285    |
| B484_5800     | B484_5BFF   | APPS #5 | BaseTimer ch.20             | 286    |
| B484_5C00     | B484_5FFF   | APPS #5 | BaseTimer ch.21             | 287    |
| B484_6000     | B484_63FF   | APPS #5 | BaseTimer ch.22             | 288    |
| B484_6400     | B484_67FF   | APPS #5 | BaseTimer ch.23             | 289    |
| B484_6800     | B484_6BFF   | APPS #5 | BaseTimer ch.24             | 290    |
| B484_6C00     | B484_6FFF   | APPS #5 | BaseTimer ch.25             | 291    |
| B484_7000     | B484_73FF   | APPS #5 | BaseTimer ch.26             | 292    |
| B484_7400     | B484_77FF   | APPS #5 | BaseTimer ch.27             | 293    |
| B484_7800     | B484_7BFF   | APPS #5 | BaseTimer ch.28             | 294    |
| B484_7C00     | B484_7FFF   | APPS #5 | BaseTimer ch.29             | 295    |
| B484_8000     | B484_83FF   | APPS #5 | A/D unit0                   | 296    |
| B484_8400     | B484_87FF   | APPS #5 | A/D unit1 , Partial Wake Up | 297    |
| B484_8800     | B484_8BFF   | APPS #5 | A/D analog input control    | 298    |
| B484_8C00     | B484_8FFF   |         | Reserved                    | -      |
| B484_9000     | B484_93FF   | APPS #5 | Global Timer                | 300    |
| B484_9400     | B484_FFFF   |         | Reserved                    | -      |

When MPU attribute of Cortex®-R5 is configured as "Normal", store buffer inside Cortex®-R5 can operate and write data can be merged. To avoid influence of this data merger, MPU attribute "Device" or "Strongly Ordered" should be used.

MPU attribute "Device" or "Strongly Ordered" must be used for areas below, to avoid this influence.

- Backup RAM area (BACKUP\_RAM) [0E80\_0000 ~ 0E87\_FFFF]
- Peripheral area (Peri area) [B000\_0000 ~ B7FF\_FFFF]
- Error Config area (ERRCFG) [FFFE\_E000 ~ FFFE\_FFFF]

MPU attribute "Device" or "Strongly Ordered" is required for accesses to areas below, in particular situation.

- FLASH Memory (when writing commands)

SHE OFF product is prohibited to access SHE area (B200\_0000 to B20F\_FFFF)

## 9. Pin Status in CPU Status

**Table 9-1. Pin State Table (1/2)**

| Pin No. | Pin Name                            | GPORTEN Control | External Reset Factor 1                |                                     |                                     | External Reset Factor 2          |                                     |                                     |                                                      | External Reset Factor 3             |                                                      | Internal Reset Factor *2 | Sleep mode          | Stop mode *4                                           |                                                       | Timer mode *4                                          |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |        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             |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
|---------|-------------------------------------|-----------------|----------------------------------------|-------------------------------------|-------------------------------------|----------------------------------|-------------------------------------|-------------------------------------|------------------------------------------------------|-------------------------------------|------------------------------------------------------|--------------------------|---------------------|--------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------|-------------------------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|--------------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|         |                                     |                 | External factor generation in progress | After external factor releasing     |                                     | While Generating External Factor |                                     | After Releasing External Factor     |                                                      | Internal reset issuance in progress | After internal reset issuance (Before GPORT setting) |                          |                     | High impedance disabled (SYSC0_SPECIFGR, PSSPAUCTRL=0) | High impedance enabled (SYSC0_SPECIFGR, PSSPAUCTRL=1) | High impedance disabled (SYSC0_SPECIFGR, PSSPAUCTRL=0) | High impedance enabled (SYSC0_SPECIFGR, PSSPAUCTRL=1) |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |        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             |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
|         |                                     |                 |                                        | Internal reset issuance in progress | Internal reset issuance in progress | Before internal reset issuance   | Internal reset issuance in progress | Internal reset issuance in progress | After internal reset issuance (Before GPORT setting) |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 2       | P000/SOT2_1                         | With control    | Hi-Z/ Input blocked                    | Hi-Z/ Last status retained          | Hi-Z/ Input blocked                 | Hi-Z/ Input blocked              | Hi-Z/ Input blocked                 | Hi-Z/ Input blocked                 | Status immediately before the shutdown retains       | Last state retained                 | Last state retained (*3)                             | Last state retained (*3) | Hi-Z/ Input blocked | Hi-Z/ Input blocked                                    | Last state retained (*3)                              | Hi-Z/ Input blocked                                    |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 3       | P001/SCS22_1                        |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        | Hi-Z/ Input blocked                                   | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 4       | P003/SCS22_1                        |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 5       | P005/IN6_0/SIN0_0                   |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 6       | P006/SOT3_0/SDA3_0/IN7_0            |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 7       | P007/SCK3_0/SC13_0/IN8_0            |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 8       | P008/IN9_0/SCS30_0/TIOA0_0          |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 9       | P009/IN10_0/TIOA1_0/INT0_1          |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 10      | P010/IN11_0/TIOA2_0                 |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 11      | P012/OUT6_0/TIOA3_0                 |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 12      | P013/OUT6_0/TIOA4_0                 |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 13      | P015/OUT7_0/TIOA5_0                 |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 14      | P016/OUT8_0/TIOA6_0                 |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 15      | P017/OUT9_0/TIOA7_0                 |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 16      | P018/OUT10_0/TIOA8_0                |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 17      | P019/OUT11_0/TIOB0_0/TEXT0_0        |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 18      | P020/SOT0_0/SDA0_0/TEXT1_0/TIOB1_0  |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 19      | P021/SCK0_0/SC10_0/TIOB2_0          |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 20      | P022/SIN0_0/TIOB3_0/INT3_0          |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 21      | P023/SCS0_0/TIOB4_0                 |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 22      | P024/TIOB5_0                        |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 23      | P027/TIOA4_1/TIOB6_0/INT1_1/TEXT0_1 |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 24      | P028/OUT0_1/SIN1_0/TIOB7_0/INT4_0   |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 25      | P029/AN0/SOT1_0/SDA1_0/OUT3_1       |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 26      | P030/OUT2_1                         |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 27      | P031/OUT3_1/SCS1_0/AN1              |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 28      | P100/AN2/SCK1_0/SC11_0/OUT4_1       |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 29      | P101/OUT5_1/AN3                     |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 30      | P103/OUT6_1/AN5                     |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 31      | P105/OUT7_1/TIOA9_0                 |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 32      | P106/OUT8_1                         |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 33      | P107/OUT9_1/TIOA10_0/INT2_1         |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 34      | P108/OUT10_1/AN6/TIOA11_0/INT3_1    |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 35      | P109/OUT11_1/TIOA12_0               |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 39      | P112/AN9/TIOA13_0                   |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 40      | P113/TIOA5_1                        |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 41      | P114/AN10/TIOA6_1                   |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 45      | P115                                |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 46      | P117/AN12/INT4_1                    |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 47      | P118/AN13/INT5_1                    |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 48      | P119/AN14                           |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 49      | P120/AN15                           |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 50      | P122/AN17/TIOA11_1                  |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 51      | P123/AN18/TIOA12_1                  |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 52      | P126/AN19                           |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 53      | P127/AN20/TEXT1_1                   |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 54      | P128/AN21/TEXT2_1                   |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 55      | P129/IN6_1/AN22                     |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 56      | P130/IN7_1/AN23/INT5_0              |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 57      | P131/IN8_1/AN24                     |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 58      | P202/IN9_1/INT6_1                   |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 59      | P203/IN10_1                         |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |
| 60      | P204/IN11_1/AN27                    |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked |
| 61      |                                     |                 |                                        |                                     |                                     |                                  |                                     |                                     |                                                      |                                     |                                                      |                          |                     |                                                        |                                                       |                                                        |                                                       |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |                     |

**Table 9-2. Pin State Table (2/2)**

| Pin No. | Pin Name                                       | GPORTEN Control | External Reset Factor 1                |                                 |                                  | External Reset Factor 2         |                                     |                                                      | External Reset Factor 3                       | Internal Reset Factor 2  | Sleep mode               | Stop mode *4                                     |                                                 | Timer mode *4                                    |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
|---------|------------------------------------------------|-----------------|----------------------------------------|---------------------------------|----------------------------------|---------------------------------|-------------------------------------|------------------------------------------------------|-----------------------------------------------|--------------------------|--------------------------|--------------------------------------------------|-------------------------------------------------|--------------------------------------------------|-------------------------------------------------|---------------------|---------------------|---------------------|-----------------------------------------------|---------------------|--------------------------|---------------------|--------------------------|---------------------|---------------------|----------------------------|---------------------|---------------------|---------------------|-----------------------------------------------|---------------------|--------------------------|---------------------|--------------------------|---------------------|--------------------------|--|--|
|         |                                                |                 | External factor generation in progress | After external factor releasing | While Generating External Factor | After Releasing External Factor | Internal reset issuance in progress | After internal reset issuance (Before GPORT setting) |                                               |                          |                          | High impedance disabled (SYSIO_SPCFG_PSSPACTL=0) | High impedance enabled (SYSIO_SPCFG_PSSPACTL=1) | High impedance disabled (SYSIO_SPCFG_PSSPACTL=0) | High impedance enabled (SYSIO_SPCFG_PSSPACTL=1) |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
|         |                                                |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 74      | P218/AN36/TEXT2_0                              | With control    | Hi-Z/ Input blocked                    | Hi-Z/ Last status retained      | Hi-Z/ Input blocked              | Hi-Z/ Input blocked             | Hi-Z/ Input blocked                 | Status immediately before the shutdown retain        | Last state retained                           | Last state retained (*3) | Hi-Z/ Input blocked      | Hi-Z/ Input blocked (*1)                         | Hi-Z/ Input blocked (*1)                        |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 75      | P219/AN37/TEXT3_0                              |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 76      | P220/IN6_2/AN38                                |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 77      | P222/INT_2/AN39/INT7_0                         |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 78      | P223/IN8_2/AN40/PWU_AN0                        |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 79      | P224/IN9_2/TX0_2/AN41/PWU_AN1                  |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 80      | P225/IN10_2/RX0_2/AN42/INT0_0/PWU_AN2          |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 81      | P226/IN11_2/AN43/TIOA17_1/PWU_AN3              |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 85      | P227/AN44/TIOA23_0/PWU_AN4                     |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 86      | P228/TX0_1/AN45/TIOA24_0/PWU_AN5               |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 87      | P229/OUT0_0/RX0_1/AN46/TIOA25_0/INT8_0/PWU_AN6 |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 88      | P230/OUT1_0/AN47/TIOA26_0/PWU_AN7              |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 89      | P231/OUT2_0/AN48/TIOA27_0                      |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 90      | P300/OUT3_0/AN49/TIOA28_0                      |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 91      | P301/OUT4_0/AN50/TIOA18_1                      |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 92      | P302/AN51/TIOA19_1                             |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 93      | P304/AN52/TIOA20_1/TEXT4_0                     |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 94      | P305/AN53/TIOA29_0/TEXT5_0                     |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 95      | NMIX                                           | -               | Input enabled                          | Input enabled                   | Input enabled                    | Input enabled                   | Input enabled                       | Input enabled                                        | Input enabled                                 | Input enabled            | Input enabled            | Input enabled                                    | Input enabled                                   |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 96      | P306/TX0_0/AN54                                | With control    | Hi-Z/ Input blocked                    | Hi-Z/ Last status retained      | Hi-Z/ Input blocked              | Hi-Z/ Input blocked             | Hi-Z/ Input blocked                 | Status immediately before the shutdown retain        | Last state retained                           | Last state retained (*3) | Hi-Z/ Input blocked      | Hi-Z/ Input blocked (*1)                         | Hi-Z/ Input blocked (*1)                        |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 97      | P307/RX0_0/AN55/INT1_0                         |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 98      | P308/IN0_1/AN56/TIOA28_1                       |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 99      | P309/IN1_1/AN57/TIOA29_1                       |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 100     | P312/IN2_1/AN58                                |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 101     | P313/IN3_1/AN59/INT0_1                         |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 102     | P314/IN4_1/AN60/TIOA7_1                        |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 103     | P315/IN5_1/AN61/TIOA8_1                        |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 104     | P317/AN62/TIOA9_1/INT11_1                      |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 107     | P321/PWUTRG                                    | With control    | Hi-Z/ Input blocked                    | Hi-Z/ Last status retained      | Hi-Z/ Input blocked              | Hi-Z/ Input blocked             | Hi-Z/ Input blocked                 | Status immediately before the shutdown retain        | Last state retained                           | Last state retained (*3) | Hi-Z/ Input blocked      | Hi-Z/ Input blocked (*1)                         | Hi-Z/ Input blocked (*1)                        |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 110     | TRSTP322                                       |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 111     | TDOIP323                                       |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 112     | TDVP324                                        |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 113     | TMS                                            |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 114     | TCK                                            | With control    |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 115     | P327                                           | With control    |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 | Hi-Z/ Input blocked                              | Hi-Z/ Last status retained                      | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Status immediately before the shutdown retain | Last state retained | Last state retained (*3) | Hi-Z/ Input blocked | Last state retained (*3) | Hi-Z/ Input blocked |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 116     | P330                                           |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 117     | MD                                             |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 118     | X0                                             |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 119     | X1                                             |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     | With control        |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 121     | P331                                           | With control    |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     | Hi-Z/ Input blocked | Hi-Z/ Last status retained | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Hi-Z/ Input blocked | Status immediately before the shutdown retain | Last state retained | Last state retained (*3) | Hi-Z/ Input blocked | Last state retained (*3) | Hi-Z/ Input blocked |                          |  |  |
| 122     | P400                                           |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 123     | RSTX                                           |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 127     | P401/IN0_0                                     |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 128     | P402/IN1_0/INT2_0                              |                 | With control                           | Hi-Z/ Input blocked             | Hi-Z/ Last status retained       | Hi-Z/ Input blocked             | Hi-Z/ Input blocked                 | Hi-Z/ Input blocked                                  | Status immediately before the shutdown retain | Last state retained      | Last state retained (*3) | Hi-Z/ Input blocked                              | Hi-Z/ Input blocked (*1)                        |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     | Hi-Z/ Input blocked (*1) |  |  |
| 129     | P403/IN2_0/TRACEDATA0                          |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 130     | P404/IN3_0/TRACEDATA1                          |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 131     | P405/IN4_0/INT11_0/TRACEDATA2                  |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 132     | P406/TRACEDATA3                                |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 133     | P407/TRACEDATA4                                |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 134     | P408/SIN2_0/INT12_0/TRACEDATA5                 |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 135     | P409/SOT2_0/SDA2_0/TIOA24_1/TRACEDATA6         |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 136     | P411/INT13_1/SCK2_0/ISCL2_0/TRACEDATA7         |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 137     | P413/SCS20_0/INT14_1                           |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 138     | P414/SCS21_0                                   |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 139     | P416/IN5_0/TIOA22_1                            |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 140     | P417/TIOA23_1/INT15_1                          |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 141     | P418/SCS22_0/INT14_0                           |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 142     | P420/SCK2_1/TRACECLK                           |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |
| 143     | P422/SIN3_1/TRACECTL                           |                 |                                        |                                 |                                  |                                 |                                     |                                                      |                                               |                          |                          |                                                  |                                                 |                                                  |                                                 |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                     |                            |                     |                     |                     |                                               |                     |                          |                     |                          |                     |                          |  |  |

- \*1: Input disable is not valid when external interrupts are enabled.
- \*2: Recovery from standby (power off) becomes a factor.
- \*3: The pin state from the time that HOLDIO\_PD2 was set (SYSC0\_SPECFGR.HOLDIO\_PD2 = 1) is retained. If power-off has not occurred and HOLDIO\_PD2 has not been set (SYSC0\_SPECFGR.HOLDIO\_PD2 = 0), the last state is retained.
- \*4: To power off power domains 2 and 3, be sure to set HOLDIO\_PD2 (SYSC0\_SPECFGR.HOLDIO\_PD2 = 1).
- \*5: When the PWU function is enabled, a change to output occurs.
- \*6: The pin state when the PORT function is enabled is shown.
- \*7: When PPC\_PCFGRIj:POF[2:0] is set to initial value.

**■ External Reset Factor 1**

- Power-on reset (PONR)
- RAM retention low-voltage detection reset (RVD)
- Internal power supply low-voltage detection reset (LVDL1R)
- RSTX pin + MD pin simultaneous assert reset (INITX)

**■ External Reset Factor 2**

- RSTX pin input reset (RSTX)

**■ External Reset Factor 3**

- Hardware watchdog reset (HWDR)
- Software watchdog reset (SWDR)
- PLL clock supervisor reset (CSVPRn)
- SSCG clock supervisor reset (CSVSRn)
- Profile error reset (PRFERR)
- Software trigger hard reset (SHRST)
- Software reset (SRST)

**■ Internal Reset Factor**

- Standby transition reset/ Power domain reset



## 10. Electrical Characteristics

### 10.1 Absolute Maximum Ratings

| Parameter                                      | Symbol               | Rating               |                      | Unit | Remarks                            |
|------------------------------------------------|----------------------|----------------------|----------------------|------|------------------------------------|
|                                                |                      | Min                  | Max                  |      |                                    |
| Power supply voltage <sup>*1, *2</sup>         | V <sub>CC</sub>      | V <sub>SS</sub> -0.3 | V <sub>SS</sub> +6.0 | V    |                                    |
| Analog supply voltage <sup>*1, *2</sup>        | AV <sub>CC</sub>     | V <sub>SS</sub> -0.3 | V <sub>SS</sub> +6.0 | V    | AV <sub>CC</sub> = V <sub>CC</sub> |
| Analog reference voltage <sup>*1</sup>         | AVRH                 | V <sub>SS</sub> -0.3 | V <sub>SS</sub> +6.0 | V    | AVRH ≤ AV <sub>CC</sub>            |
| Input voltage <sup>*1</sup>                    | V <sub>I</sub>       | V <sub>SS</sub> -0.3 | V <sub>CC</sub> +0.3 | V    |                                    |
| Analog pin input voltage <sup>*1</sup>         | V <sub>IA</sub>      | V <sub>SS</sub> -0.3 | V <sub>CC</sub> +0.3 | V    |                                    |
| Output voltage <sup>*1</sup>                   | V <sub>O</sub>       | V <sub>SS</sub> -0.3 | V <sub>CC</sub> +0.3 | V    |                                    |
| Maximum clamp current                          | I <sub>CLAMP</sub>   | -                    | 4                    | mA   | <sup>*7</sup>                      |
| Total maximum clamp current                    | Σ I <sub>CLAMP</sub> | -                    | 20                   | mA   | <sup>*7</sup>                      |
| "L"-level maximum output current <sup>*3</sup> | I <sub>OL1</sub>     | -                    | 3.5                  | mA   | When setting is 1 mA <sup>*6</sup> |
|                                                | I <sub>OL2</sub>     | -                    | 7                    | mA   | When setting is 2 mA               |
| "L"-level average output current <sup>*4</sup> | I <sub>OLAV1</sub>   | -                    | 1                    | mA   | When setting is 1 mA <sup>*6</sup> |
|                                                | I <sub>OLAV2</sub>   | -                    | 2                    | mA   | When setting is 2 mA               |
| "L"-level total output current <sup>*5</sup>   | ΣI <sub>OL</sub>     | -                    | 40                   | mA   | <sup>*6</sup>                      |
| "H"-level maximum output current <sup>*3</sup> | I <sub>OH1</sub>     | -                    | -3.5                 | mA   | When setting is 1 mA <sup>*6</sup> |
|                                                | I <sub>OH2</sub>     | -                    | -7                   | mA   | When setting is 2 mA               |
| "H"-level average output current <sup>*4</sup> | I <sub>OHAV1</sub>   | -                    | -1                   | mA   | When setting is 1 mA <sup>*6</sup> |
|                                                | I <sub>OHAV2</sub>   | -                    | -2                   | mA   | When setting is 2 mA               |
| "H"-level total output current <sup>*5</sup>   | ΣI <sub>OH</sub>     | -                    | -40                  | mA   | <sup>*6</sup>                      |
| Power consumption                              | P <sub>D</sub>       | -                    | 1300                 | mW   | S6J311xHAC <sup>*8</sup>           |
| Operating temperature                          | T <sub>A</sub>       | -40                  | +125                 | °C   |                                    |
| Storage temperature                            | T <sub>stg</sub>     | -55                  | +150                 | °C   |                                    |

<sup>\*1</sup>: These parameters are based on the condition that V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V.

<sup>\*2</sup>: AV<sub>CC</sub> and V<sub>CC</sub> must be set to the same voltage. It is required that AV<sub>CC</sub> does not exceed V<sub>CC</sub> and that the voltage at the analog inputs does not exceed AV<sub>CC</sub> when the power is switched on.

<sup>\*3</sup>: The maximum output current is defined as the value of the peak current flowing through any one of the corresponding pins.

<sup>\*4</sup>: The average output current is defined as the value of the average current flowing through any one of the corresponding pins for a

10 ms period. The average value is the operation current X the operation ratio.

<sup>\*5</sup>: The total output current is defined as the maximum current value flowing through all of corresponding pins.

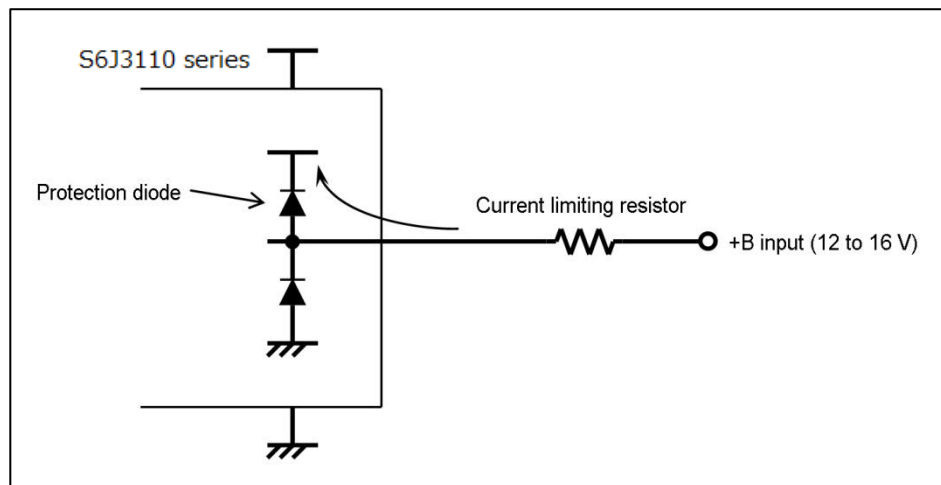
<sup>\*6</sup>: Corresponding pins: general-purpose ports

\*7: Corresponding pins: All general-purpose ports and analog input pins

- Use the device within the recommended operating conditions.
- Use the device with direct voltage (current).
- The + B signal should always be applied by connecting a limiting resistor between the + B signal and the microcontroller.
- The value of the limiting resistor should be set so that the current input to the microcontroller pin does not exceed rated values at any time regardless of instantaneously or constantly when the + B signal is input.
- Note that when the microcontroller drive current is low, such as in the low-power consumption modes, the + B input potential can increase the potential at the VCC pin via a protective diode, possibly affecting other devices.
- Note that if the + B signal is input when the microcontroller is off (not fixed at 0 V), since the power is supplied through the pin, the microcontroller may operate incompletely.
- Note that if the +B signal is input at power-on, since the power is supplied through the pin, the power-on reset may not function in the power supply voltage.
- Do not leave + B input pins open.

\*8: It is standard when four-layer substrate is used. x : A/9

Example of a recommended circuit



#### WARNING:

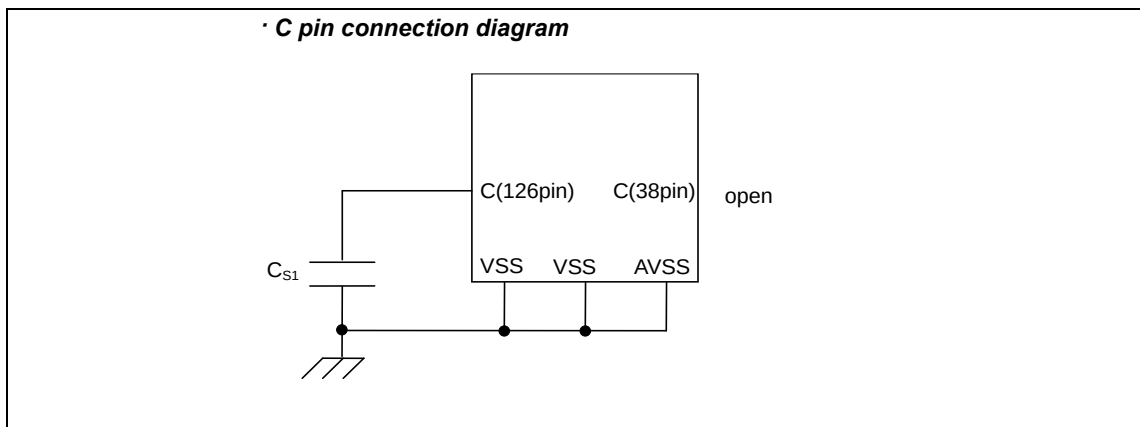
- Semiconductor devices may be permanently damaged by application of stress (including, without limitation, voltage, current or temperature) in excess of absolute maximum ratings. Do not exceed any of these ratings.

## 10.2 Recommended Operating Conditions

(V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter             | Symbol           | Value |      | Unit | Remarks                                                                                                                                                                                                                     |
|-----------------------|------------------|-------|------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                       |                  | Min   | Max  |      |                                                                                                                                                                                                                             |
| Supply voltage        | V <sub>CC</sub>  | 4.5   | 5.25 | V    | Recommended operation assurance range                                                                                                                                                                                       |
|                       | AV <sub>CC</sub> | 4.5   | 5.25 | V    |                                                                                                                                                                                                                             |
|                       | V <sub>CC</sub>  | 3.5   | 5.25 | V    | Operation assurance range                                                                                                                                                                                                   |
|                       | AV <sub>CC</sub> | 3.5   | 5.25 | V    |                                                                                                                                                                                                                             |
| Smoothing capacitor*  | C <sub>S1</sub>  | 4.7   |      | μF   | Tolerance of up to ±40%, 126-pin<br>Use a ceramic capacitor or a capacitor that has the similar frequency characteristics.<br>Use a capacitor with a capacitance greater than CS as the smoothing capacitor on the VCC pin. |
| Operating temperature | T <sub>A</sub>   | -40   | +125 | °C   | S6J311xHAC*<br>* x:A/9                                                                                                                                                                                                      |

\* For the connections of smoothing capacitor C<sub>S1</sub>, see the following diagram.



### WARNING:

1. The recommended operating conditions are required in order to ensure the normal operation of the semiconductor device. All of the device's electrical characteristics are warranted when the device is operated under these conditions.
2. Any use of semiconductor devices will be under their recommended operating condition.
3. Operation under any conditions other than these conditions may adversely affect reliability of device and could result in device failure.
4. No warranty is made with respect to any use, operating conditions or combinations not represented on this data sheet. If you are considering application under any conditions other than listed herein, please contact sales representatives beforehand.

**Notes:**

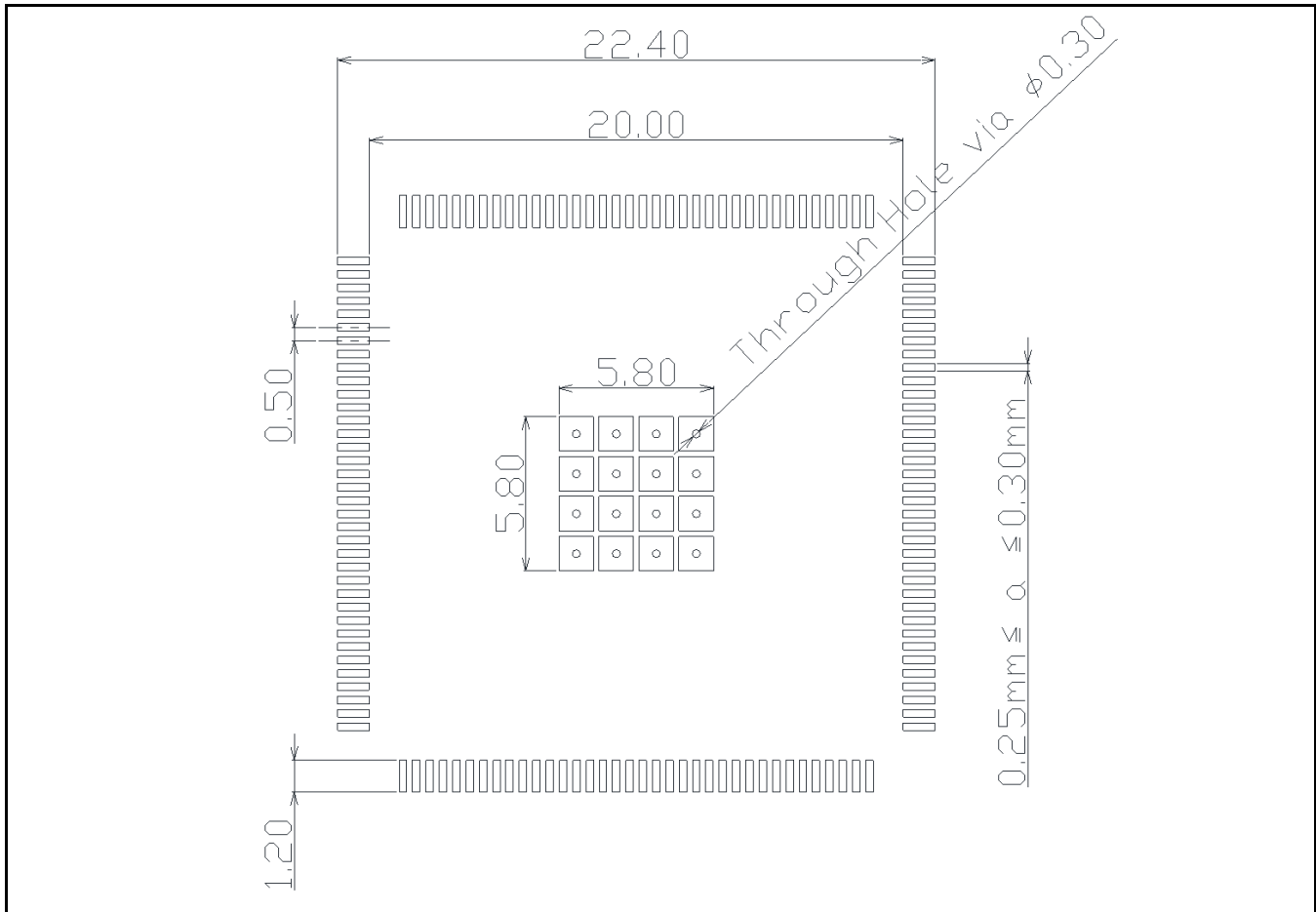
- The following condition should be satisfied in order to facilitate heat dissipation.
  1. 4 or more layers PCB should be used.
  2. The area of PCB should be 114.3 mm x 76.2 mm or more, and the thickness should be 1.6 mm or more. (JEDEC standard)
  3. 1 layer of middle layers at least should be used for dedicated layer to radiate heat with residual copper rate 90% or more. The layer can be used for system ground.
  4. 35~50% of the die stage area which is exposed at back surface of package should be soldered to a part of 1<sup>st</sup> layer.
  5. The part of 1<sup>st</sup> layer should be connected to the dedicated heat radiation layer with more than 10 thermal via holes.

**Figure10.2-1: Example thermal via holes on PCB.**


**Notes:**

- Figure 10.2-1 is a schematic diagram showing PCB in section.
- Figure 10.2-2 in the following pages are recommended land patterns for each package series. Thermal via holes should closely be placed and aligned with lands.
- If you are considering application under any conditions other than listed herein, please contact sales representatives beforehand.

**Figure 10.2-2: Land Pattern and Thermal Via LEU144**



### 10.3 DC Characteristics

(T<sub>A</sub>: Recommended operating conditions, V<sub>CC</sub> = 5.0 V +5%/-10%, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter               | Symbol           | Pin Name                                                                                                                                                                                                                                                                                                                                         | Conditions                        | Value                |     |                      | Unit | Remarks |
|-------------------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|----------------------|-----|----------------------|------|---------|
|                         |                  |                                                                                                                                                                                                                                                                                                                                                  |                                   | Min                  | Typ | Max                  |      |         |
| "H" level input voltage | V <sub>IH1</sub> | P000 to P001, P003, P005 to P010, P012 to P013, P015 to P024, P027 to P031, P100 to P101, P103, P105 to P109, P112 to P115, P117 to P120, P122 to P123, P126 to P131, P202 to P215, P218 to P220, P222 to P231, P300 to P302, P304 to P309, P312 to P315, P317, P327, P330 to P331, P400 to P409, P411, P413 to P414, P416 to P418, P420 to P421 | CMOS Schmitt input level selected | 0.7×V <sub>CC</sub>  | -   | V <sub>CC</sub> +0.3 | V    |         |
|                         | V <sub>IH2</sub> | P401 to P409, P411, P413 to P414, P416 to P418, P420 to P421                                                                                                                                                                                                                                                                                     | Automotive input level selected   | 0.8×V <sub>CC</sub>  | -   | V <sub>CC</sub> +0.3 | V    |         |
|                         | V <sub>IH4</sub> | RSTX, NMIX                                                                                                                                                                                                                                                                                                                                       | -                                 | 0.7×V <sub>CC</sub>  | -   | V <sub>CC</sub> +0.3 | V    |         |
|                         | V <sub>IH5</sub> | MD                                                                                                                                                                                                                                                                                                                                               | -                                 | 0.7×V <sub>CC</sub>  | -   | V <sub>CC</sub> +0.3 | V    |         |
|                         | V <sub>IH6</sub> | TRST, TCK, TDI, TMS                                                                                                                                                                                                                                                                                                                              | TTL input level                   | 2.3                  | -   | V <sub>CC</sub> +0.3 | V    |         |
| "L" level input voltage | V <sub>IL1</sub> | P000 to P001, P003, P005 to P010, P012 to P013, P015 to P024, P027 to P031, P100 to P101, P103, P105 to P109, P112 to P115, P117 to P120, P122 to P123, P126 to P131, P202 to P215, P218 to P220, P222 to P231, P300 to P302, P304 to P309, P312 to P315, P317, P327, P330 to P331, P400 to P409, P411, P413 to P414, P416 to P418, P420 to P421 | CMOS Schmitt input level selected | V <sub>SS</sub> -0.3 | -   | 0.3×V <sub>CC</sub>  | V    |         |
|                         | V <sub>IL2</sub> | P401 to P409, P411, P413 to P414, P416 to P418, P420 to P421                                                                                                                                                                                                                                                                                     | Automotive input level selected   | V <sub>SS</sub> -0.3 | -   | 0.5×V <sub>CC</sub>  | V    |         |
|                         | V <sub>IL4</sub> | RSTX, NMIX                                                                                                                                                                                                                                                                                                                                       | -                                 | V <sub>SS</sub> -0.3 | -   | 0.3×V <sub>CC</sub>  | V    |         |
|                         | V <sub>IL5</sub> | MD                                                                                                                                                                                                                                                                                                                                               | -                                 | V <sub>SS</sub> -0.3 | -   | 0.3×V <sub>CC</sub>  | V    |         |
|                         | V <sub>IL6</sub> | TRST, TCK, TDI, TMS                                                                                                                                                                                                                                                                                                                              | TTL input level                   | V <sub>SS</sub> -0.3 | -   | 0.8                  | V    |         |

(TA: Recommended operating conditions, V<sub>CC</sub> = 5.0 V +5%/-10%, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter                | Symbol           | Pin Name                                                                                                                                                                                                                                                                                                                                                       | Conditions                                           | Value                |     |                 | Unit | Remarks |
|--------------------------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|----------------------|-----|-----------------|------|---------|
|                          |                  |                                                                                                                                                                                                                                                                                                                                                                |                                                      | Min                  | Typ | Max             |      |         |
| "H" level output voltage | V <sub>OH1</sub> | P000 to P001, P003, P005 to P010, P012 to P013, P015 to P024, P027 to P031, P100 to P101, P103, P105 to P109, P112 to P115, P117 to P120, P122 to P123, P126 to P131, P202 to P215, P218 to P220, P222 to P231, P300 to P302, P304 to P309, P312 to P315, P317, P321 to P324, P327, P330 to P331, P400 to P409, P411, P413 to P414, P416 to P418, P420 to P421 | V <sub>CC</sub> = 4.5 V<br>I <sub>OH</sub> = -2.0 mA | V <sub>CC</sub> -0.5 | -   | V <sub>CC</sub> | V    |         |
| "H" level output voltage | V <sub>OH2</sub> | P000 to P001, P003, P005 to P010, P012 to P013, P015 to P024, P027 to P031, P100 to P101, P103, P105 to P109, P112 to P115, P117 to P120, P122 to P123, P126 to P131, P202 to P215, P218 to P220, P222 to P231, P300 to P302, P304 to P309, P312 to P315, P317, P321 to P324, P327, P330 to P331, P400 to P409, P411, P413 to P414, P416 to P418, P420 to P421 | V <sub>CC</sub> = 4.5 V<br>I <sub>OH</sub> = -1.0 mA | V <sub>CC</sub> -0.5 | -   | V <sub>CC</sub> | V    |         |
| "L" level output voltage | V <sub>OL1</sub> | P000 to P001, P003, P005 to P010, P012 to P013, P015 to P024, P027 to P031, P100 to P101, P103, P105 to P109, P112 to P115, P117 to P120, P122 to P123, P126 to P131, P202 to P215, P218 to P220, P222 to P231, P300 to P302, P304 to P309, P312 to P315, P317, P321 to P324, P327, P330 to P331, P400 to P409, P411, P413 to P414, P416 to P418, P420 to P421 | V <sub>CC</sub> = 4.5 V<br>I <sub>OL</sub> = 2.0 mA  | 0                    | -   | 0.4             | V    |         |
| "L" level output voltage | V <sub>OL2</sub> | P000 to P001, P003, P005 to P010, P012 to P013, P015 to P024, P027 to P031, P100 to P101, P103, P105 to P109, P112 to P115, P117 to P120, P122 to P123, P126 to P131, P202 to P215, P218 to P220, P222 to P231, P300 to P302, P304 to P309, P312 to P315, P317, P321 to P324, P327, P330 to P331, P400 to P409, P411, P413 to P414, P416 to P418, P420 to P421 | V <sub>CC</sub> = 4.5 V<br>I <sub>OL</sub> = 1.0 mA  | 0                    | -   | 0.4             | V    |         |

(TA: Recommended operating conditions, V<sub>CC</sub> = 5.0 V +5%/-10%, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter             | Symbol             | Pin Name                                                                                                                                                                                                                                                                                                                                        | Conditions                                                                                        | Value |     |     | Unit | Remarks |
|-----------------------|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------|-----|-----|------|---------|
|                       |                    |                                                                                                                                                                                                                                                                                                                                                 |                                                                                                   | Min   | Typ | Max |      |         |
| Input leakage current | I <sub>IL</sub>    | All input pins                                                                                                                                                                                                                                                                                                                                  | V <sub>CC</sub> = AV <sub>CC</sub> = 5.25 V<br>V <sub>SS</sub> < V <sub>I</sub> < V <sub>CC</sub> | -5    | -   | +5  | μA   |         |
| Pull-up resistor      | R <sub>UP1</sub>   | RSTX, NMIX                                                                                                                                                                                                                                                                                                                                      | -                                                                                                 | 25    | -   | 100 | kΩ   |         |
|                       | R <sub>UP2</sub>   | P000 to P001, P003, P005 to P010, P012 to P013, P015 to P024, P027 to P031, P100 to P101, P103, P105 to P109, P112 to P115, P117 to P120, P122 to P123, P126 to P131, P202 to P215, P218 to P220, P222 to P231, P300 to P302, P304 to P309, P312 to P315, P317 P327, P330 to P331, P400 to P409, P411, P413 to P414, P416 to P418, P420 to P421 | Pull-up resistor selected                                                                         | 25    | -   | 100 | kΩ   |         |
|                       | R <sub>UP3</sub>   | TDI(P324), TMS, TCK                                                                                                                                                                                                                                                                                                                             | -                                                                                                 | 25    | -   | 100 | kΩ   |         |
| Pull-down resistor    | R <sub>DOWN1</sub> | P000 to P001, P003, P005 to P010, P012 to P013, P015 to P024, P027 to P031, P100 to P101, P103, P105 to P109, P112 to P115, P117 to P120, P122 to P123, P126 to P131, P202 to P215, P218 to P220, P222 to P231, P300 to P302, P304 to P309, P312 to P315, P317 P327, P330 to P331, P400 to P409, P411, P413 to P414, P416 to P418, P420 to P421 | Pull-down resistor selected                                                                       | 25    | -   | 100 | kΩ   |         |
|                       | R <sub>DOWN2</sub> | TRST(P322)                                                                                                                                                                                                                                                                                                                                      | -                                                                                                 | 25    | -   | 100 | kΩ   |         |
| Input capacitance     | C <sub>IN</sub>    | Pins other than V <sub>CC</sub> , V <sub>SS</sub> , AV <sub>CC0</sub> , AV <sub>CC1</sub> , AV <sub>SS0</sub> , AV <sub>SS1</sub>                                                                                                                                                                                                               | -                                                                                                 | -     | 5   | 15  | pF   |         |



(T<sub>A</sub>: Recommended operating conditions, V<sub>CC</sub> = 5.0 V +5%/-10%, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter                                              | Symbol             | Pin Name | Conditions            | Value |      |       | Unit | Remarks                                               |
|--------------------------------------------------------|--------------------|----------|-----------------------|-------|------|-------|------|-------------------------------------------------------|
|                                                        |                    |          |                       | Min   | Typ  | Max   |      |                                                       |
| Power supply current<br><br>S6J311xHA<br>C*<br>*X: A/9 | I <sub>CC5</sub>   | VCC      | Normal operation      | -     | 80   | 175   | mA   | Operating at 96 MHz                                   |
|                                                        |                    |          | Flash write/erase     | -     | 100  | 200   | mA   | Operating at 96 MHz                                   |
|                                                        | I <sub>CCS5</sub>  |          | CPU Sleep             | -     | 65   | 150   | mA   | Operating at 96 MHz                                   |
|                                                        | I <sub>CCT5</sub>  |          | Timer mode            | -     | 480  | 1450  | μA   | T <sub>A</sub> = 25 °C<br>Slow-CR source Oscillation  |
|                                                        | I <sub>CCH5</sub>  |          | Stop mode             | -     | 480  | 1450  | μA   | T <sub>A</sub> = 25 °C                                |
|                                                        | I <sub>CCP</sub>   |          | PWU mode (Shutdown)   | -     | 52.5 | 129.7 | μA   | T <sub>A</sub> = 25 °C<br>(PWU operation cycle 16 ms) |
|                                                        |                    |          |                       | -     | 46.2 | 115.5 | μA   | T <sub>A</sub> = 25 °C<br>(PWU operation cycle 32 ms) |
|                                                        | I <sub>CCT52</sub> |          | Timer mode (Shutdown) | -     | 40   | 100   | μA   | T <sub>A</sub> = 25 °C<br>Slow-CR source Oscillation  |
|                                                        | I <sub>CCH52</sub> |          | Stop mode (Shutdown)  | -     | 40   | 100   | μA   | T <sub>A</sub> = 25 °C                                |

Refer to Hardware manual "APPENDIX State transition" for Internal clock frequency setting / Setting of the power domain / Regulator setting.

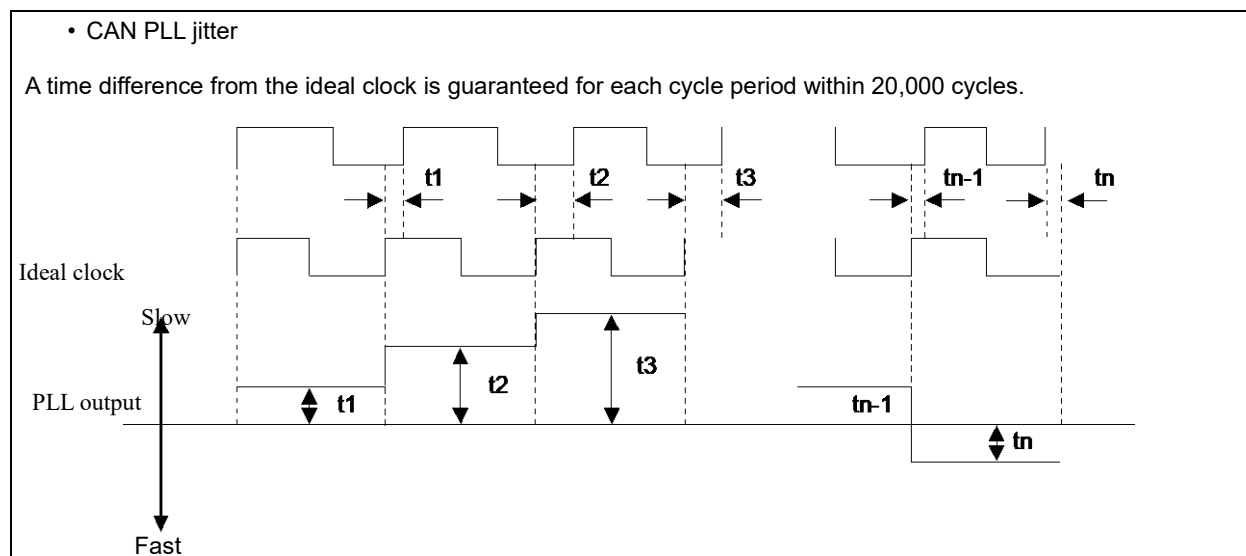
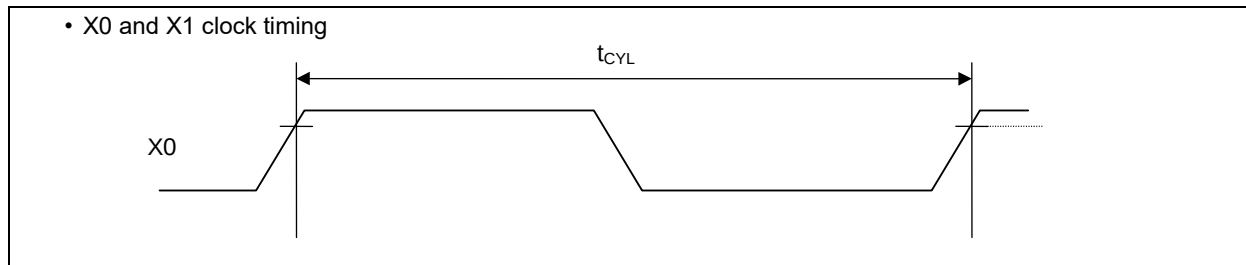
## 10.4 AC Characteristics

### 10.4.1 Source Clock Timing

(T<sub>A</sub>: Recommended operating conditions, V<sub>CC</sub> = 5.0 V +5%/-10%, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter                                  | Symbol                | Pin Name | Conditions | Value |     |     | Unit | Remarks |
|--------------------------------------------|-----------------------|----------|------------|-------|-----|-----|------|---------|
|                                            |                       |          |            | Min   | Typ | Max |      |         |
| Source oscillation clock frequency         | F <sub>C</sub>        | X0, X1   | -          | -     | 4   | -   | MHz  |         |
| Source oscillation clock cycle time        | t <sub>CYL</sub>      | X0, X1   | -          | -     | 250 | -   | ns   |         |
| CAN PLL jitter (during lock)               | t <sub>PJ</sub>       | -        | -          | -10   | -   | +10 | ns   | *       |
| Built-in slow-CR oscillation frequency     | F <sub>CRS</sub>      | -        | -          | 50    | 100 | 150 | kHz  |         |
| Built-in fast-CR oscillation frequency     | F <sub>CRF</sub>      | -        | -          | 2.4   | 4   | 6.0 | MHz  |         |
| PLL input clock frequency                  | F <sub>PLLI</sub>     | -        | -          | -     | 4   | -   | MHz  |         |
| PLL macro oscillation clock frequency      | F <sub>PLLO</sub>     | -        | -          | 400   | -   | 576 | MHz  |         |
| SSCG-PLL input clock frequency             | F <sub>SSCGPLLI</sub> | -        | -          | -     | 4   | -   | MHz  |         |
| SSCG-PLL macro oscillation clock frequency | F <sub>SSCGPLLO</sub> | -        | -          | 400   | -   | 576 | MHz  |         |

\*: The maximum/minimum values have been standardized with the main clock and PLL clock in use.



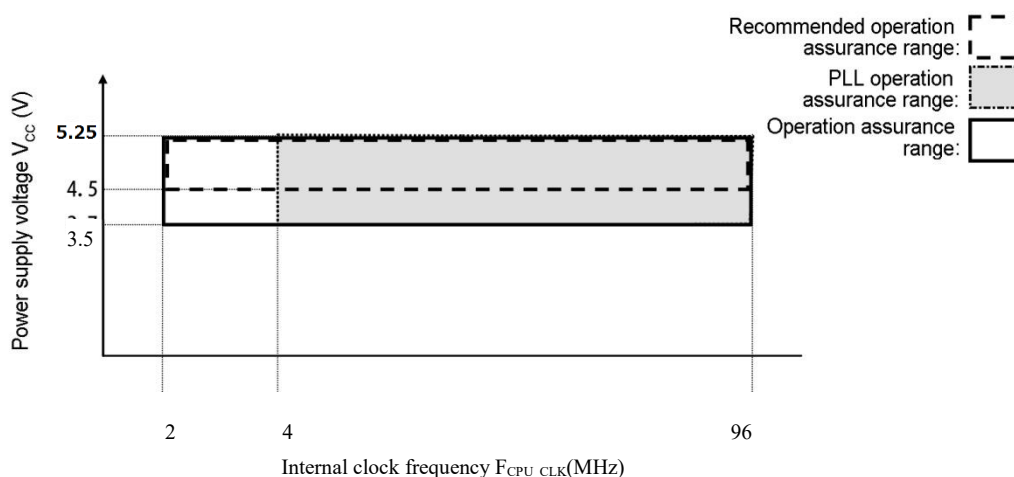
### 10.4.2 Internal Clock Timing

(T<sub>A</sub>: Recommended operating conditions, V<sub>CC</sub> = 5.0 V +5%/-10%, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter                       | Symbol                   | Pin Name | Conditions | S6J311xHAC* Value<br>* x:A/9 |     |     | Unit | Remarks     |
|---------------------------------|--------------------------|----------|------------|------------------------------|-----|-----|------|-------------|
|                                 |                          |          |            | Min                          | Typ | Max |      |             |
| Internal<br>Clock<br>Frequency  | F <sub>CLK</sub> CPU     | -        | -          | -                            | -   | 96  | MHz  | CLK_CPU     |
|                                 | F <sub>CLK</sub> FCLK    | -        | -          | -                            | -   | 48  | MHz  | CLK_FCLK    |
|                                 | F <sub>CLK</sub> ATB     | -        | -          | -                            | -   | 48  | MHz  | CLK_ATB     |
|                                 | F <sub>CLK</sub> DBG     | -        | -          | -                            | -   | 48  | MHz  | CLK_DBG     |
|                                 | F <sub>CLK</sub> HPM     | -        | -          | -                            | -   | 24  | MHz  | CLK_HPM     |
|                                 | F <sub>CLK</sub> HPM2    | -        | -          | -                            | -   | 12  | MHz  | CLK_HPM2    |
|                                 | F <sub>CLK</sub> DMA     | -        | -          | -                            | -   | 24  | MHz  | CLK_DMA     |
|                                 | F <sub>CLK</sub> MEMC    | -        | -          | -                            | -   | 24  | MHz  | CLK_MEMC    |
|                                 | F <sub>CLK</sub> EXTBUS  | -        | -          | -                            | -   | 24  | MHz  | CLK_EXTBUS  |
|                                 | F <sub>CLK</sub> SYSC1   | -        | -          | -                            | -   | 24  | MHz  | CLK_SYSC1   |
|                                 | F <sub>CLK</sub> HAPPOA0 | -        | -          | -                            | -   | 24  | MHz  | CLK_HAPPOA0 |
|                                 | F <sub>CLK</sub> HAPPOA1 | -        | -          | -                            | -   | 24  | MHz  | CLK_HAPPOA1 |
|                                 | F <sub>CLK</sub> HAPPB0  | -        | -          | -                            | -   | 24  | MHz  | CLK_HAPPB0  |
|                                 | F <sub>CLK</sub> HAPPB1  | -        | -          | -                            | -   | 24  | MHz  | CLK_HAPPB1  |
|                                 | F <sub>CLK</sub> LLPBM   | -        | -          | -                            | -   | 96  | MHz  | CLK_LLPBM   |
|                                 | F <sub>CLK</sub> LLPBM2  | -        | -          | -                            | -   | 48  | MHz  | CLK_LLPBM2  |
|                                 | F <sub>CLK</sub> LCP     | -        | -          | -                            | -   | 48  | MHz  | CLK_LCP     |
|                                 | F <sub>CLK</sub> LCP0    | -        | -          | -                            | -   | 24  | MHz  | CLK_LCP0    |
|                                 | F <sub>CLK</sub> LCP0A   | -        | -          | -                            | -   | 24  | MHz  | CLK_LCP0A   |
|                                 | F <sub>CLK</sub> LCP1    | -        | -          | -                            | -   | 24  | MHz  | CLK_LCP1    |
|                                 | F <sub>CLK</sub> LCP1A   | -        | -          | -                            | -   | 24  | MHz  | CLK_LCP1A   |
|                                 | F <sub>CLK</sub> LAPP0   | -        | -          | -                            | -   | 24  | MHz  | CLK_LAPP0   |
|                                 | F <sub>CLK</sub> LAPP0A  | -        | -          | -                            | -   | 24  | MHz  | CLK_LAPP0A  |
|                                 | F <sub>CLK</sub> LAPP1   | -        | -          | -                            | -   | 24  | MHz  | CLK_LAPP1   |
|                                 | F <sub>CLK</sub> LAPP1A  | -        | -          | -                            | -   | 24  | MHz  | CLK_LAPP1A  |
|                                 | F <sub>CLK</sub> TRC     | -        | -          | -                            | -   | 48  | MHz  | CLK_TRC     |
|                                 | F <sub>CLK</sub> HSSPI   | -        | -          | -                            | -   | 24  | MHz  | CLK_HSSPI   |
|                                 | F <sub>CLK</sub> SYSC0H  | -        | -          | -                            | -   | 24  | MHz  | CLK_SYSC0H  |
|                                 | F <sub>CLK</sub> COMH    | -        | -          | -                            | -   | 24  | MHz  | CLK_COMH    |
|                                 | F <sub>CLK</sub> RAM0H   | -        | -          | -                            | -   | 24  | MHz  | CLK_RAM0H   |
|                                 | F <sub>CLK</sub> RAM1H   | -        | -          | -                            | -   | 24  | MHz  | CLK_RAM1H   |
|                                 | F <sub>CLK</sub> SYSC0P  | -        | -          | -                            | -   | 24  | MHz  | CLK_SYSC0P  |
|                                 | F <sub>CLK</sub> COMP    | -        | -          | -                            | -   | 24  | MHz  | CLK_COMP    |
|                                 | F <sub>CANFD</sub> CCLK  | -        | -          | -                            | -   | 40  | MHz  | CANFD_CCLK  |
| Internal<br>Clock<br>Cycle Time | t <sub>CLK</sub> CPU     | -        | -          | 10.4                         | -   | -   | ns   | CLK_CPU     |
|                                 | t <sub>CLK</sub> FLASH   | -        | -          | 20.8                         | -   | -   | ns   | CLK_FCLK    |
|                                 | t <sub>CLK</sub> ATB     | -        | -          | 20.8                         | -   | -   | ns   | CLK_ATB     |
|                                 | t <sub>CLK</sub> DBG     | -        | -          | 20.8                         | -   | -   | ns   | CLK_DBG     |
|                                 | t <sub>CLK</sub> HPM     | -        | -          | 41.6                         | -   | -   | ns   | CLK_HPM     |
|                                 | t <sub>CLK</sub> HPM2    | -        | -          | 83.3                         | -   | -   | ns   | CLK_HPM2    |
|                                 | t <sub>CLK</sub> DMA     | -        | -          | 41.6                         | -   | -   | ns   | CLK_DMA     |

| Parameter                       | Symbol       | Pin Name | Conditions | S6J311xHAC* Value<br>* x:A/9 |     |     | Unit | Remarks     |
|---------------------------------|--------------|----------|------------|------------------------------|-----|-----|------|-------------|
|                                 |              |          |            | Min                          | Typ | Max |      |             |
| Internal<br>Clock<br>Cycle Time | tCLK_MEMC    | -        | -          | 41.6                         | -   | -   | ns   | CLK_MEMC    |
|                                 | tCLK_EXTBUS  | -        | -          | 41.6                         | -   | -   | ns   | CLK_EXTBUS  |
|                                 | tCLK_SYSC1   | -        | -          | 41.6                         | -   | -   | ns   | CLK_SYSC1   |
|                                 | tCLK_HAPP0A0 | -        | -          | 41.6                         | -   | -   | ns   | CLK_HAPP0A0 |
|                                 | tCLK_HAPP0A1 | -        | -          | 41.6                         | -   | -   | ns   | CLK_HAPP0A1 |
|                                 | tCLK_HAPP1B0 | -        | -          | 41.6                         | -   | -   | ns   | CLK_HAPP1B0 |
|                                 | tCLK_HAPP1B1 | -        | -          | 41.6                         | -   | -   | ns   | CLK_HAPP1B1 |
|                                 | tCLK_LLPCM   | -        | -          | 10.4                         | -   | -   | ns   | CLK_LLPCM   |
|                                 | tCLK_LLPCM2  | -        | -          | 20.8                         | -   | -   | ns   | CLK_LLPCM2  |
|                                 | tCLK_LCP     | -        | -          | 20.8                         | -   | -   | ns   | CLK_LCP     |
|                                 | tCLK_LCP0    | -        | -          | 41.6                         | -   | -   | ns   | CLK_LCP0    |
|                                 | tCLK_LCP0A   | -        | -          | 41.6                         | -   | -   | ns   | CLK_LCP0A   |
|                                 | tCLK_LCP1    | -        | -          | 41.6                         | -   | -   | ns   | CLK_LCP1    |
|                                 | tCLK_LCP1A   | -        | -          | 41.6                         | -   | -   | ns   | CLK_LCP1A   |
|                                 | tCLK_LAPP0   | -        | -          | 41.6                         | -   | -   | ns   | CLK_LAPP0   |
|                                 | tCLK_LAPP0A  | -        | -          | 41.6                         | -   | -   | ns   | CLK_LAPP0A  |
|                                 | tCLK_LAPP1   | -        | -          | 41.6                         | -   | -   | ns   | CLK_LAPP1   |
|                                 | tCLK_LAPP1A  | -        | -          | 41.6                         | -   | -   | ns   | CLK_LAPP1A  |
|                                 | tCLK_TRC     | -        | -          | 20.8                         | -   | -   | ns   | CLK_TRC     |
|                                 | tCLK_HSSPI   | -        | -          | 41.6                         | -   | -   | ns   | CLK_HSSPI   |
|                                 | tCLK_SYSC0H  | -        | -          | 41.6                         | -   | -   | ns   | CLK_SYSC0H  |
|                                 | tCLK_COMH    | -        | -          | 41.6                         | -   | -   | ns   | CLK_COMH    |
|                                 | tCLK_RAM0H   | -        | -          | 41.6                         | -   | -   | ns   | CLK_RAM0H   |
|                                 | tCLK_RAM1H   | -        | -          | 41.6                         | -   | -   | ns   | CLK_RAM1H   |
|                                 | tCLK_SYSC0P  | -        | -          | 41.6                         | -   | -   | ns   | CLK_SYSC0P  |
|                                 | tCLK_COMP    | -        | -          | 41.6                         | -   | -   | ns   | CLK_COMP    |
|                                 | tCANFD_CCLK  | -        | -          | 25.0                         | -   | -   | ns   | CANFD_CCLK  |

• Guaranteed operation range  
Internal operation clock frequency vs. Power supply voltage

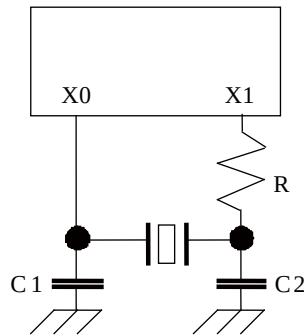


Note: A supply voltage that is equal to or less than the set voltage for low-voltage detection causes a reset.

Relationship between the oscillation clock frequency and internal clock frequency

| Oscillation Clock Frequency | Main Clock | PLL Multiplier Setting | PLL Output Division Setting | PLL Clock |
|-----------------------------|------------|------------------------|-----------------------------|-----------|
| 4 MHz                       | 4 MHz      | 144                    | 6                           | 96 MHz    |
| 4 MHz                       | 4 MHz      | 120                    | 6                           | 80 MHz    |

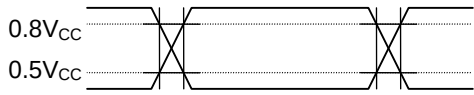
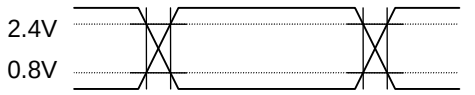
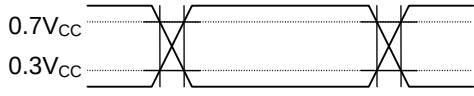
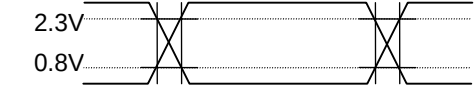
– Oscillation circuit example



Notes:

- When configuring the oscillator circuit, it is recommended to ask matching evaluation of the circuit to oscillator manufacturers for the design.
- The maximum PLL clock frequency must be 96 MHz.  
 Output division configuration can be set by the following.
  - PLLDIVM bit in SYSC0\_RUNPLL0CNTR register
  - PLLDIVM bit in SYSC0\_PSSPLL0CNTR register
  - SSCGDIVM bit in SYSC0\_RUNSSCG0CNTR0 register
  - SSCGDIVM bit in SYSC0\_PSSSSCG0CNTR0 register
 (e.g. If PLLout is 576 MHz, these settings must be configured as "multiply by 6" and over multiplication setting)

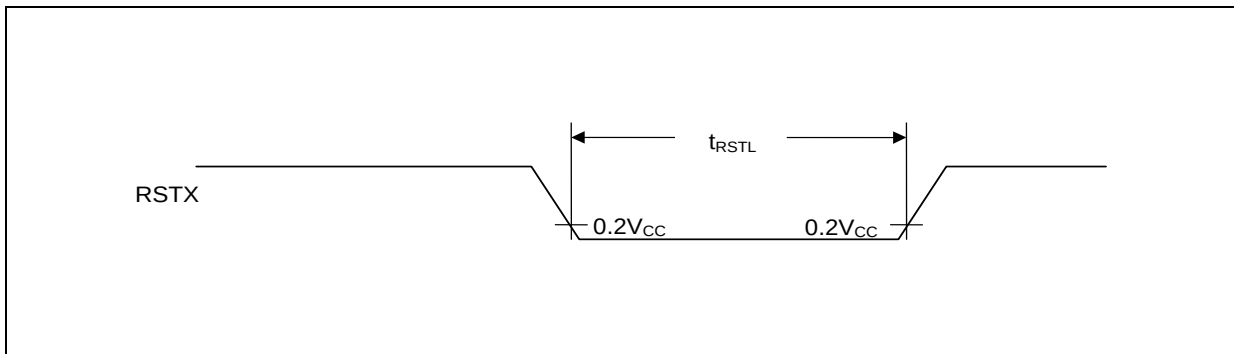
AC characteristics are specified by the following measurement reference voltage values.

| – Input signal waveform                                                                                                        | – Output signal waveform                                                                               |
|--------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| <p>Hysteresis input pin (Automotive)</p>    | <p>Output pin</p>  |
| <p>Hysteresis input pin (CMOS Schmitt)</p>  |                                                                                                        |
| <p>Hysteresis input pin (TTL)</p>           |                                                                                                        |

### 10.4.3 Reset Input

(T<sub>A</sub>: Recommended operating conditions, V<sub>CC</sub> = 5.0 V +5%/-10%, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter                     | Symbol            | Pin Name | Conditions | Value |     | Unit | Remarks |
|-------------------------------|-------------------|----------|------------|-------|-----|------|---------|
|                               |                   |          |            | Min   | Max |      |         |
| Reset input time              | t <sub>RSTL</sub> | RSTX     | -          | 10    | -   | μs   |         |
| Width for reset input removal |                   |          |            | 1     | -   | μs   |         |



#### 10.4.4 Power-on Conditions

(T<sub>A</sub>: Recommended operating conditions, V<sub>SS</sub> = 0.0 V)

| Parameter                                                   | Symbol           | Pin Name | Conditions                      | Value |      |      | Unit  | Remarks |
|-------------------------------------------------------------|------------------|----------|---------------------------------|-------|------|------|-------|---------|
|                                                             |                  |          |                                 | Min   | Typ  | Max  |       |         |
| Level detection voltage                                     | -                | VCC      | -                               | 2.15  | 2.35 | 2.55 | V     |         |
| Level release voltage                                       | -                | VCC      | -                               | 2.25  | 2.45 | 2.65 | V     |         |
| Level detection hysteresis width                            | -                | VCC      | -                               | -     | 100  | -    | mV    |         |
| Level detection time                                        | -                | -        | -                               | -     | -    | 540  | μs    | *1      |
| Power off time                                              | t <sub>OFF</sub> | VCC      | -                               | 1     | -    | -    | ms    | *2      |
| Power ramp rate                                             | dV/dt            | VCC      | VCC:<br>0.2 V to 2.55 V         | -     | -    | 6    | mV/μs | *3      |
| Maximum ramp rate guaranteed to not generate power-on reset | dV/dt            | VCC      | VCC:<br>Between 2.6 V and 4.5 V | -     | -    | 50   | mV/μs | *4      |

\*1: If a power fluctuation precedes the low-voltage detection time, the detection may occur or be canceled after the supply voltage passes the detection voltage range.

\*2: If VCC is held below 0.2 V for a minimum period of t<sub>OFF</sub>, power-on reset will occur. If t<sub>OFF</sub> is not satisfied, power-on reset will still occur if the power ramp rate is kept below 6 mV/μs.

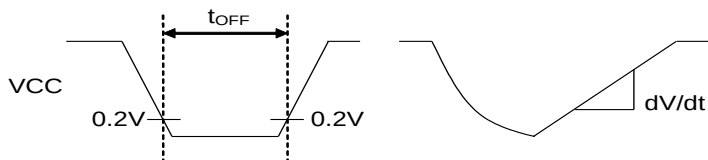
\*3: This is the power ramp rate with which power-on reset will always occur regardless of power-off time, as mentioned in \*2.

\*4: When VCC is within 2.6 V - 4.5 V, and VCC fluctuation is below 50 mV/μs, the power-on reset is suppressed. Between 4.5 V - 5.5 V, the power-on reset does not occur with any VCC fluctuation.

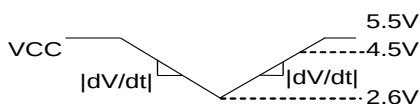
#### Note:

When neither \*2 nor \*3 can be satisfied, assert external reset (RSTX) at power-up and at any brownout event.

##### • Power off time, Power ramp rate at Power-on



##### • Maximum ramp rate guaranteed to not generate power-on reset



#### 10.4.5 Multi-function Serial

##### 10.4.5.1 CSIO Timing (SMR:MD[2:0] = 010<sub>B</sub>)

##### (5-1-1) Normal Synchronous Transfer (SCR:SPI = 0) and Serial Clock Output Signal Detect Level "H" (SMR:SCINV = 0)

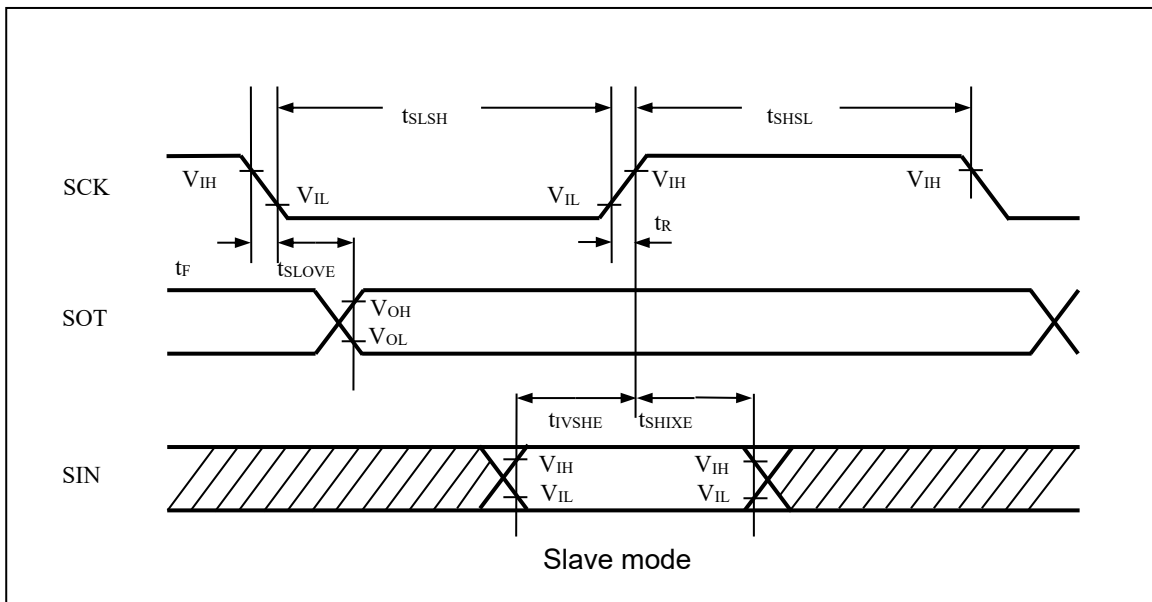
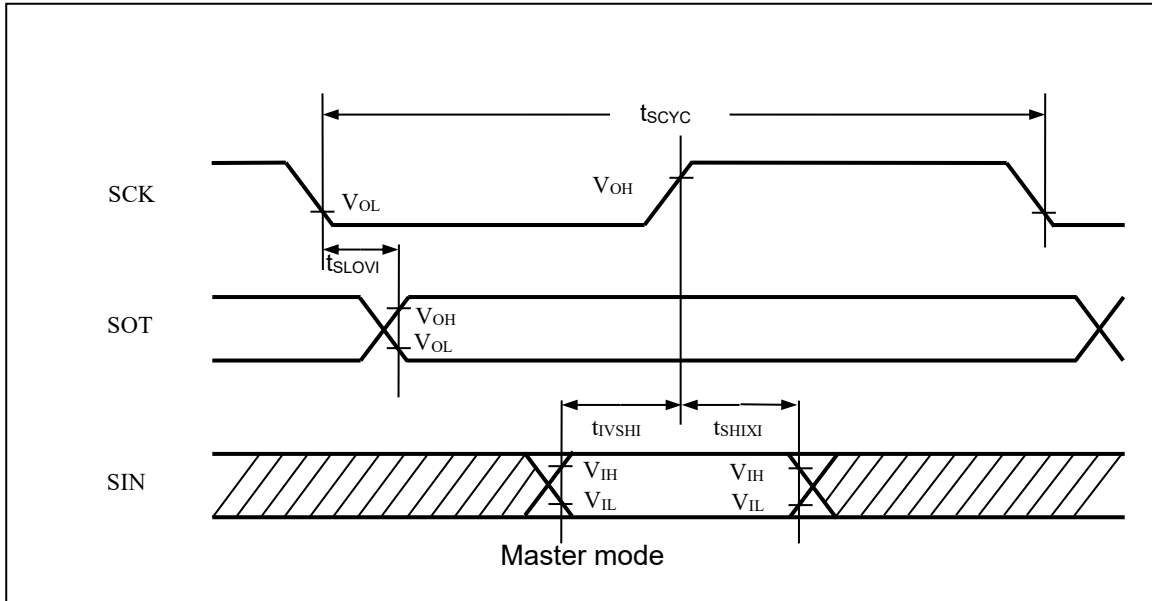
(T<sub>A</sub>: Recommended operating conditions, V<sub>CC</sub> = 5.0 V +5%/-10%, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter                    | Symbol             | Pin Name                   | Conditions                                                                                                                                                             | Value                       |     | Unit | Remarks |
|------------------------------|--------------------|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-----|------|---------|
|                              |                    |                            |                                                                                                                                                                        | Min                         | Max |      |         |
| Serial clock cycle time      | t <sub>SCYC</sub>  | SCK0 to SCK3               | Master mode<br>(C <sub>L</sub> = 50 pF, I <sub>OL</sub> = -2 mA, I <sub>OH</sub> = 2 mA),<br>(C <sub>L</sub> = 20 pF, I <sub>OL</sub> = -1 mA, I <sub>OH</sub> = 1 mA) | 4t <sub>CLK_LCP0A</sub>     | -   | ns   |         |
| SCK ↓ → SOT delay time       | t <sub>SLOVI</sub> | SCK0 to SCK3, SOT0 to SOT3 |                                                                                                                                                                        | -30                         | +30 | ns   |         |
| Valid SIN → SCK ↑ setup time | t <sub>IVSHI</sub> | SCK0 to SCK3, SIN0 to SIN3 |                                                                                                                                                                        | 30                          | -   | ns   |         |
| SCK ↑→ Valid SIN hold time   | t <sub>SHIXI</sub> |                            |                                                                                                                                                                        | 0                           | -   | ns   |         |
| Serial clock "H" pulse width | t <sub>SHSL</sub>  | SCK0 to SCK3               | Slave mode<br>(C <sub>L</sub> = 50 pF, I <sub>OL</sub> = -2 mA, I <sub>OH</sub> = 2 mA),<br>(C <sub>L</sub> = 20 pF, I <sub>OL</sub> = -1 mA, I <sub>OH</sub> = 1 mA)  | t <sub>CLK_LCP0A</sub> +10  | -   | ns   |         |
| Serial clock "L" pulse width | t <sub>SLSH</sub>  |                            |                                                                                                                                                                        | 2t <sub>CLK_LCP0A</sub> -10 | -   | ns   |         |
| SCK ↓→ SOT delay time        | t <sub>SLOVE</sub> | SCK0 to SCK3, SOT0 to SOT3 |                                                                                                                                                                        | -                           | 45  | ns   |         |
| Valid SIN → SCK ↑ setup time | t <sub>IVSHE</sub> | SCK0 to SCK3, SIN0 to SIN3 |                                                                                                                                                                        | 10                          | -   | ns   |         |
| SCK ↑ → Valid SIN hold time  | t <sub>SHIXE</sub> |                            |                                                                                                                                                                        | 20                          | -   | ns   |         |
| SCK fall time                | t <sub>F</sub>     | SCK0 to SCK3               |                                                                                                                                                                        | -                           | 5   | ns   |         |
| SCK rise time                | t <sub>R</sub>     | SCK0 to SCK3               |                                                                                                                                                                        | -                           | 5   | ns   |         |

**Notes:**

- This is the AC characteristic in CLK synchronized mode.
- C<sub>L</sub> is the load capacitance applied to pins during testing.
- The maximum baud rate is limited by the internal operating clock used and other parameters.  
For details, see the hardware manual.





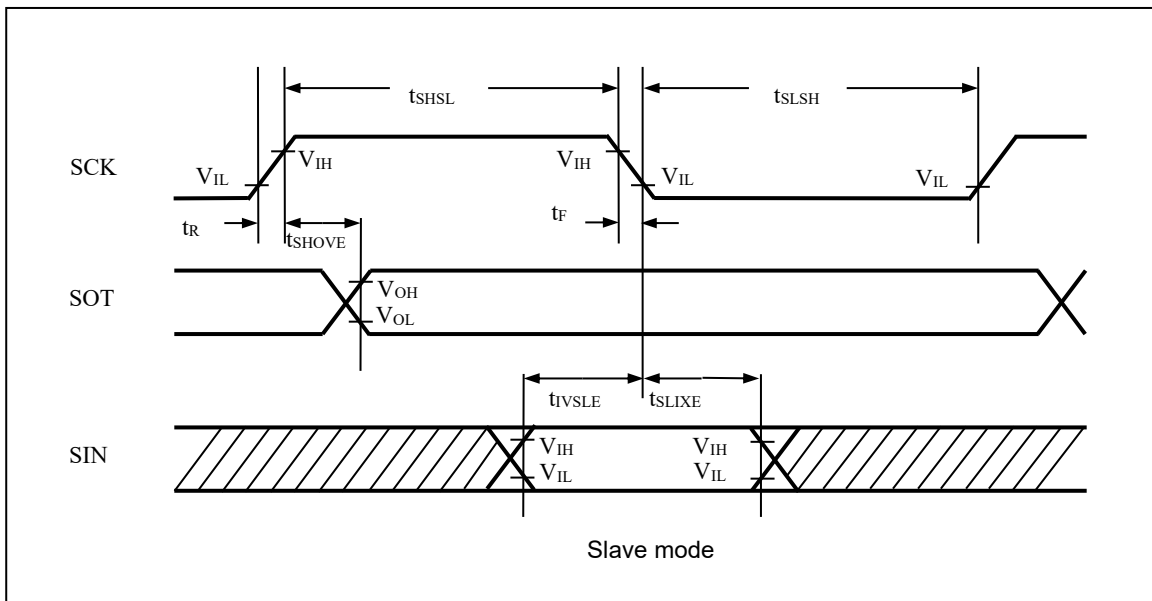
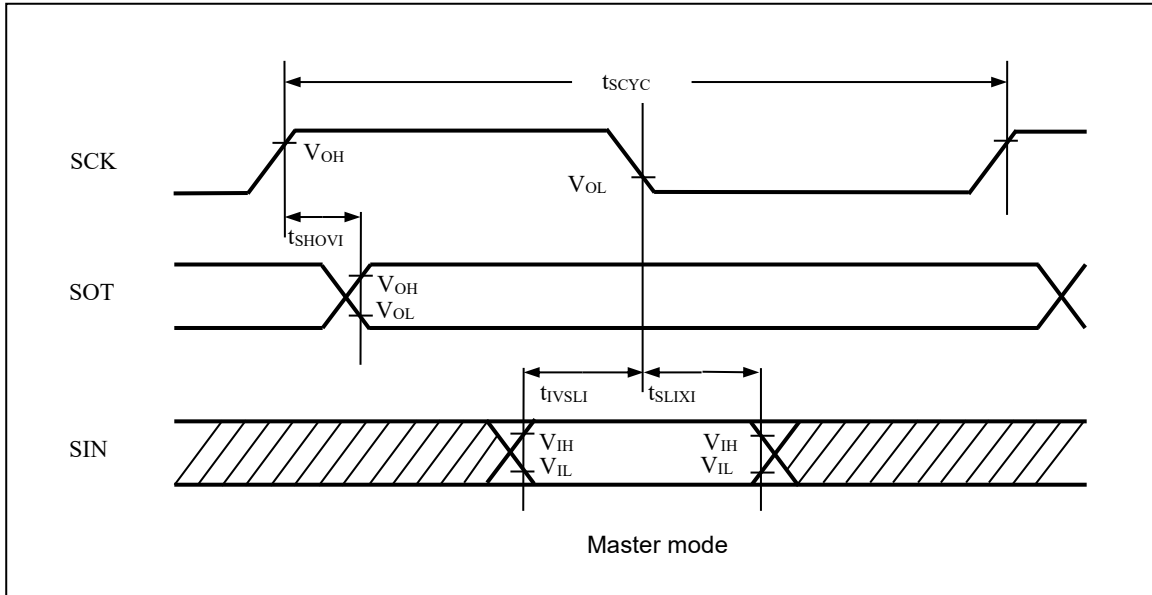
**(5-1-2) Normal Synchronous Transfer (SCR:SPI = 0) and Serial Clock Output Signal Detect Level "L"  
 (SMR:SCINV = 1)**

 (T<sub>A</sub>: Recommended operating conditions, V<sub>CC</sub> = 5.0 V +5%/-10%, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter                    | Symbol             | Pin Name                      | Conditions                                                                                                                                                                         | Value                       |     | Unit | Remarks |
|------------------------------|--------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-----|------|---------|
|                              |                    |                               |                                                                                                                                                                                    | Min                         | Max |      |         |
| Serial clock cycle time      | t <sub>SCYC</sub>  | SCK0 to SCK3                  | Master mode<br>(C <sub>L</sub> = 50 pF,<br>I <sub>OL</sub> = -2 mA,<br>I <sub>OH</sub> = 2 mA),<br>(C <sub>L</sub> = 20 pF,<br>I <sub>OL</sub> = -1 mA,<br>I <sub>OH</sub> = 1 mA) | 4t <sub>CLK_LCP0A</sub>     | -   | ns   |         |
| SCK ↑ → SOT delay time       | t <sub>SHOVI</sub> | SCK0 to SCK3,<br>SOT0 to SOT3 |                                                                                                                                                                                    | -30                         | +30 | ns   |         |
| Valid SIN → SCK ↓ setup time | t <sub>IVSLI</sub> | SCK0 to SCK3,<br>SIN0 to SIN3 |                                                                                                                                                                                    | 30                          | -   | ns   |         |
| SCK ↓ → Valid SIN hold time  | t <sub>SLIXI</sub> |                               |                                                                                                                                                                                    | 0                           | -   | ns   |         |
| Serial clock "H" pulse width | t <sub>SHSL</sub>  | SCK0 to SCK3                  | Slave mode<br>(C <sub>L</sub> = 50 pF,<br>I <sub>OL</sub> = -2 mA,<br>I <sub>OH</sub> = 2 mA),<br>(C <sub>L</sub> = 20 pF,<br>I <sub>OL</sub> = -1 mA,<br>I <sub>OH</sub> = 1 mA)  | t <sub>CLK_LCP0A</sub> +10  | -   | ns   |         |
| Serial clock "L" pulse width | t <sub>SLSH</sub>  |                               |                                                                                                                                                                                    | 2t <sub>CLK_LCP0A</sub> -10 | -   | ns   |         |
| SCK ↑ → SOT delay time       | t <sub>SHOVE</sub> | SCK0 to SCK3,<br>SOT0 to SOT3 |                                                                                                                                                                                    | -                           | 45  | ns   |         |
| Valid SIN → SCK ↓ setup time | t <sub>IVSLE</sub> | SCK0 to SCK3,<br>SIN0 to SIN3 |                                                                                                                                                                                    | 10                          | -   | ns   |         |
| SCK ↓ → Valid SIN hold time  | t <sub>SLIXE</sub> |                               |                                                                                                                                                                                    | 20                          | -   | ns   |         |
| SCK fall time                | t <sub>F</sub>     | SCK0 to SCK3                  |                                                                                                                                                                                    | -                           | 5   | ns   |         |
| SCK rise time                | t <sub>R</sub>     | SCK0 to SCK3                  |                                                                                                                                                                                    | -                           | 5   | ns   |         |

**Notes:**

- This is the AC characteristic in CLK synchronized mode.
- C<sub>L</sub> is the load capacitance applied to pins during testing.
- The maximum baud rate is limited by the internal operating clock used and other parameters.  
For details, see the hardware manual.



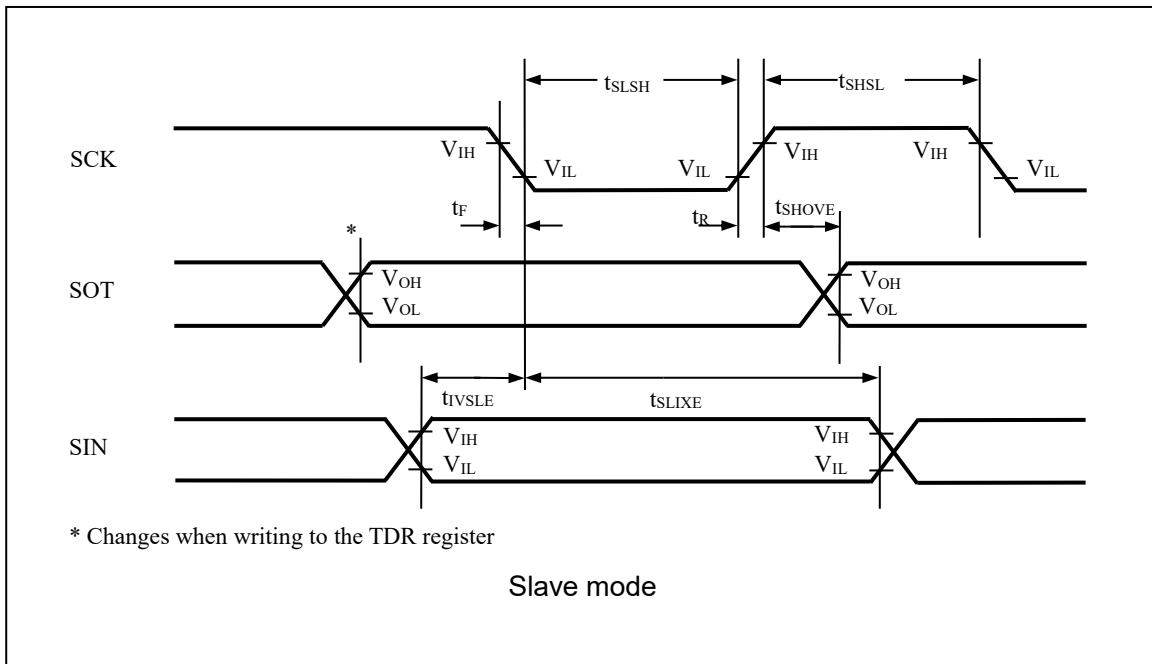
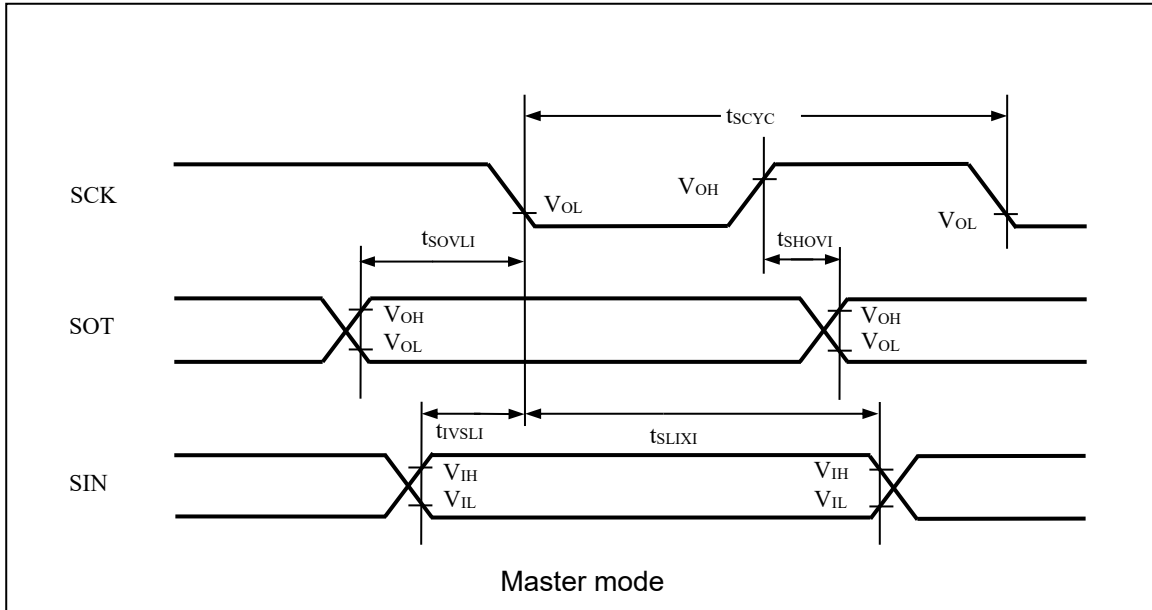
**(5-1-3) SPI Supported (SCR:SPI = 1), and Serial Clock Output Signal Detect Level "H" (SMR:SCINV = 0)**

 (TA: Recommended operating conditions, V<sub>CC</sub> = 5.0 V +5%/-10%, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter                    | Symbol             | Pin Name                   | Conditions                                                                                                                                                             | Value                       |     | Unit | Remarks |
|------------------------------|--------------------|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-----|------|---------|
|                              |                    |                            |                                                                                                                                                                        | Min                         | Max |      |         |
| Serial clock cycle time      | t <sub>SCYC</sub>  | SCK0 to SCK3               | Master mode<br>(C <sub>L</sub> = 50 pF, I <sub>OL</sub> = -2 mA, I <sub>OH</sub> = 2 mA),<br>(C <sub>L</sub> = 20 pF, I <sub>OL</sub> = -1 mA, I <sub>OH</sub> = 1 mA) | 4t <sub>CLK_LCP0A</sub>     | -   | ns   |         |
| SCK ↑ → SOT delay time       | t <sub>SHOVI</sub> | SCK0 to SCK3, SOT0 to SOT3 |                                                                                                                                                                        | -30                         | +30 | ns   |         |
| Valid SIN → SCK ↓ setup time | t <sub>IVSLI</sub> | SCK0 to SCK3, SIN0 to SIN3 |                                                                                                                                                                        | 30                          | -   | ns   |         |
| SCK ↓ → Valid SIN hold time  | t <sub>SLIXI</sub> |                            |                                                                                                                                                                        | 0                           | -   | ns   |         |
| SOT → SCK ↓ delay time       | t <sub>SOVLI</sub> | SCK0 to SCK3, SOT0 to SOT3 |                                                                                                                                                                        | 2t <sub>CLK_LCP0A</sub> -30 | -   | ns   |         |
| Serial clock "H" pulse width | t <sub>SHSL</sub>  | SCK0 to SCK3               | Slave mode<br>(C <sub>L</sub> = 50 pF, I <sub>OL</sub> = -2 mA, I <sub>OH</sub> = 2 mA),<br>(C <sub>L</sub> = 20 pF, I <sub>OL</sub> = -1 mA, I <sub>OH</sub> = 1 mA)  | t <sub>CLK_LCP0A</sub> +10  | -   | ns   |         |
| Serial clock "L" pulse width | t <sub>SLSH</sub>  |                            |                                                                                                                                                                        | 2t <sub>CLK_LCP0A</sub> -10 | -   | ns   |         |
| SCK ↑ → SOT delay time       | t <sub>SHOVE</sub> | SCK0 to SCK3, SOT0 to SOT3 |                                                                                                                                                                        | -                           | 45  | ns   |         |
| Valid SIN → SCK ↓ setup time | t <sub>IVSLE</sub> | SCK0 to SCK3, SIN0 to SIN3 |                                                                                                                                                                        | 10                          | -   | ns   |         |
| SCK ↓ → Valid SIN hold time  | t <sub>SLIXE</sub> |                            |                                                                                                                                                                        | 20                          | -   | ns   |         |
| SCK fall time                | t <sub>F</sub>     | SCK0 to SCK3               |                                                                                                                                                                        | -                           | 5   | ns   |         |
| SCK rise time                | t <sub>R</sub>     | SCK0 to SCK3               |                                                                                                                                                                        | -                           | 5   | ns   |         |

**Notes:**

- This is the AC characteristic in CLK synchronized mode.
- C<sub>L</sub> is the load capacitance applied to pins during testing.
- The maximum baud rate is limited by the internal operating clock used and other parameters.  
For details, see the hardware manual.



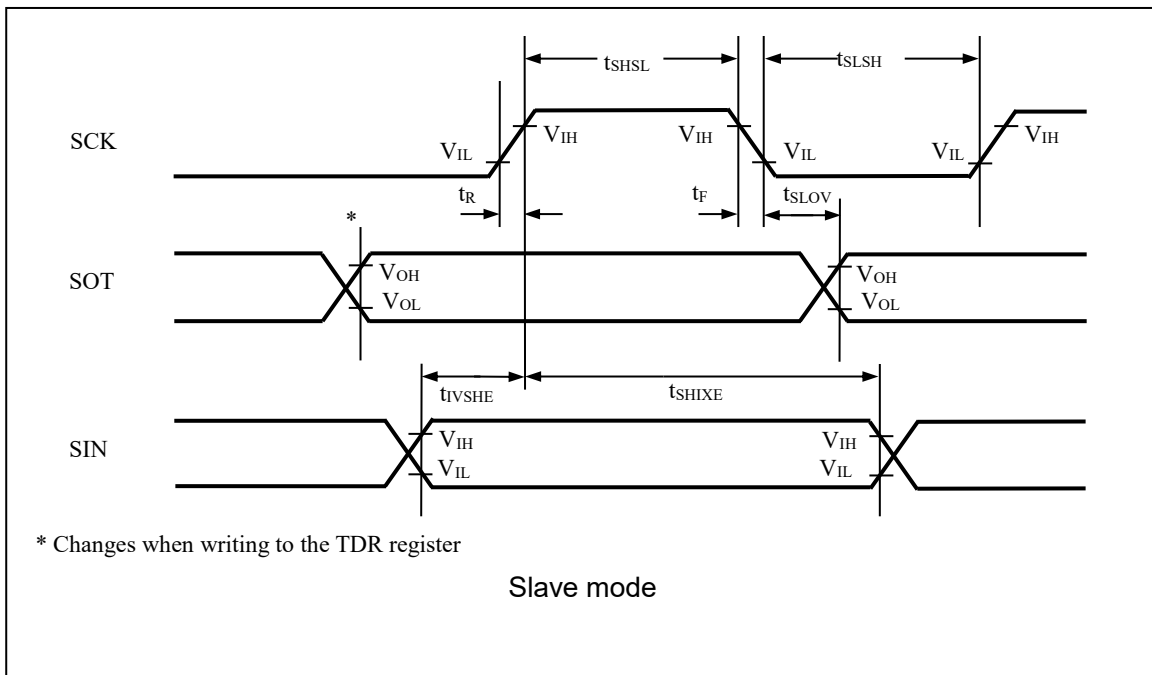
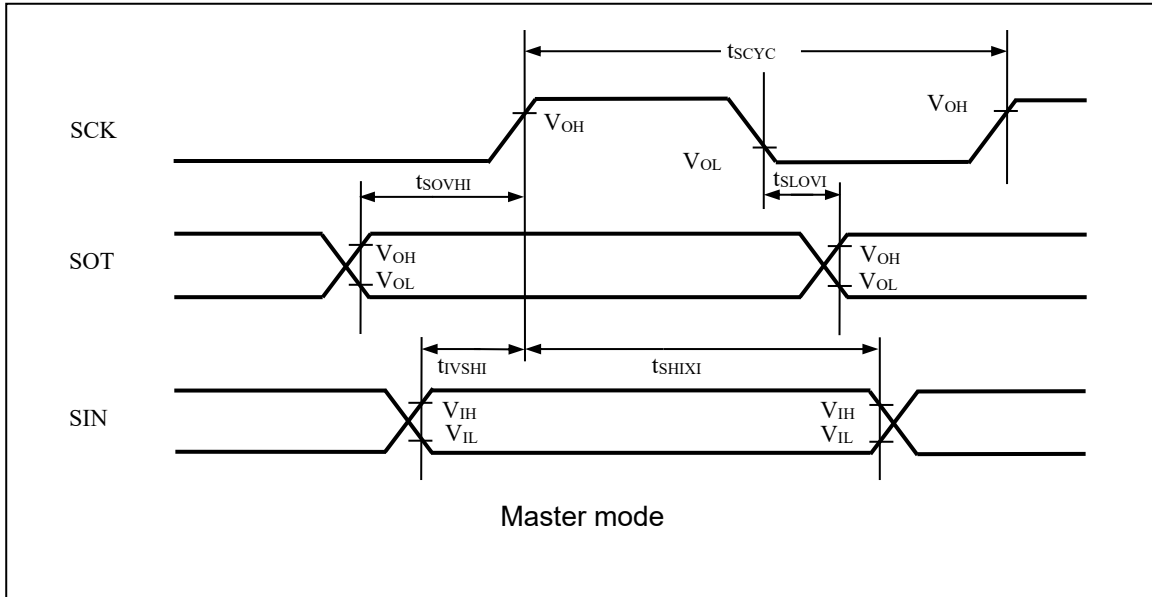
**(5-1-4) SPI Supported (SCR:SPI = 1), and Serial Clock Output Signal Detect Level "L" (SMR:SCINV = 1)**

 (T<sub>A</sub>: Recommended operating conditions, V<sub>CC</sub> = 5.0 V +5%/-10%, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter                    | Symbol             | Pin Name                   | Conditions                                                                                                                                                             | Value                       |     | Unit | Remarks |
|------------------------------|--------------------|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-----|------|---------|
|                              |                    |                            |                                                                                                                                                                        | Min                         | Max |      |         |
| Serial clock cycle time      | t <sub>SCYC</sub>  | SCK0 to SCK3               | Master mode<br>(C <sub>L</sub> = 50 pF, I <sub>OL</sub> = -2 mA, I <sub>OH</sub> = 2 mA),<br>(C <sub>L</sub> = 20 pF, I <sub>OL</sub> = -1 mA, I <sub>OH</sub> = 1 mA) | 4t <sub>CLK_LCP0A</sub>     | -   | ns   |         |
| SCK ↓ → SOT delay time       | t <sub>SLOVI</sub> | SCK0 to SCK3, SOT0 to SOT3 |                                                                                                                                                                        | -30                         | +30 | ns   |         |
| Valid SIN → SCK ↑ setup time | t <sub>IVSHI</sub> | SCK0 to SCK3, SIN0 to SIN3 |                                                                                                                                                                        | 30                          | -   | ns   |         |
| SCK ↑ → Valid SIN hold time  | t <sub>SHIXI</sub> |                            |                                                                                                                                                                        | 0                           | -   | ns   |         |
| SOT → SCK ↑ delay time       | t <sub>SOVHI</sub> | SCK0 to SCK3, SOT0 to SOT3 |                                                                                                                                                                        | 2t <sub>CLK_LCP0A</sub> -30 | -   | ns   |         |
| Serial clock "H" pulse width | t <sub>SHSL</sub>  | SCK0 to SCK3               | Slave mode<br>(C <sub>L</sub> = 50 pF, I <sub>OL</sub> = -2 mA, I <sub>OH</sub> = 2 mA),<br>(C <sub>L</sub> = 20 pF, I <sub>OL</sub> = -1 mA, I <sub>OH</sub> = 1 mA)  | t <sub>CLK_LCP0A</sub> +10  | -   | ns   |         |
| Serial clock "L" pulse width | t <sub>SLSH</sub>  |                            |                                                                                                                                                                        | 2t <sub>CLK_LCP0A</sub> -10 | -   | ns   |         |
| SCK ↓ → SOT delay time       | t <sub>SLOVE</sub> | SCK0 to SCK3, SOT0 to SOT3 |                                                                                                                                                                        | -                           | 45  | ns   |         |
| Valid SIN → SCK ↑ setup time | t <sub>IVSHE</sub> | SCK0 to SCK3, SIN0 to SIN3 |                                                                                                                                                                        | 10                          | -   | ns   |         |
| SCK ↑ → Valid SIN hold time  | t <sub>SHIXE</sub> |                            |                                                                                                                                                                        | 20                          | -   | ns   |         |
| SCK fall time                | t <sub>F</sub>     | SCK0 to SCK3               |                                                                                                                                                                        | -                           | 5   | ns   |         |
| SCK rise time                | t <sub>R</sub>     | SCK0 to SCK3               |                                                                                                                                                                        | -                           | 5   | ns   |         |

**Notes:**

- This is the AC characteristic in CLK synchronized mode.
- C<sub>L</sub> is the load capacitance applied to pins during testing.
- The maximum baud rate is limited by the internal operating clock used and other parameters.  
For details, see the hardware manual.



**(5-1-5) Serial Chip Select Used (SCSCR:CSEN = 1)**

- Mark level "H" of serial clock output (SMR, SCSFR:SCINV = 0)
- Inactive level "H" of serial chip select (SCSCR, SCSFR:CSLVL = 1)

(T<sub>A</sub>: Recommended operating conditions, V<sub>CC</sub> = 5.0 V +5%/-10%, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter                          | Symbol            | Pin Name                     | Conditions                                                                                                                                                             | Value                                                                                                                                                                                  |                                                                 | Unit                        | Remarks |
|------------------------------------|-------------------|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|-----------------------------|---------|
|                                    |                   |                              |                                                                                                                                                                        | Min                                                                                                                                                                                    | Max                                                             |                             |         |
| SCS ↓ → SCK ↓ setup time           | t <sub>CSSU</sub> | SCK0 to SCK3, SCS0x to SCS3x | Master mode<br>(C <sub>L</sub> = 50 pF, I <sub>OL</sub> = -2 mA, I <sub>OH</sub> = 2 mA),<br>(C <sub>L</sub> = 20 pF, I <sub>OL</sub> = -1 mA, I <sub>OH</sub> = 1 mA) | t <sub>CSSU</sub> <sup>*1</sup> -50                                                                                                                                                    | -                                                               | ns                          |         |
| SCK ↑ → SCS ↑ hold time            | t <sub>CSDH</sub> |                              |                                                                                                                                                                        | t <sub>CSDH</sub> <sup>*2</sup> +0                                                                                                                                                     | -                                                               | ns                          |         |
| SCS deselect time                  | t <sub>CSDI</sub> |                              |                                                                                                                                                                        | SCS0x to SCS3x                                                                                                                                                                         | t <sub>CSDS</sub> <sup>*3</sup> -50<br>+5t <sub>CLK_LCP0A</sub> | -                           |         |
| SCS ↓ → SCK ↓ setup time           | t <sub>CSSE</sub> | SCK0 to SCK3, SCS0x to SCS3x | Slave mode<br>(C <sub>L</sub> = 50 pF, I <sub>OL</sub> = -2 mA, I <sub>OH</sub> = 2 mA),<br>(C <sub>L</sub> = 20 pF, I <sub>OL</sub> = -1 mA, I <sub>OH</sub> = 1 mA)  | 3t <sub>CLK_LCP0A</sub> +30                                                                                                                                                            | -                                                               | ns                          |         |
| SCK ↑ → SCS ↑ hold time            | t <sub>CSHE</sub> |                              |                                                                                                                                                                        | 0                                                                                                                                                                                      | -                                                               | ns                          |         |
| SCS deselect time                  | t <sub>CSDE</sub> | SCS0x to SCS3x               |                                                                                                                                                                        | 3t <sub>CLK_LCP0A</sub> +30                                                                                                                                                            | -                                                               | ns                          |         |
| SCS ↓ → SOT delay time             | t <sub>DSE</sub>  | SCS0x to SCS3x, SOT0 to SOT3 |                                                                                                                                                                        | -                                                                                                                                                                                      | 50                                                              | ns                          |         |
| SCS ↑ → SOT delay time             | t <sub>DEE</sub>  |                              |                                                                                                                                                                        | 0                                                                                                                                                                                      | -                                                               | ns                          |         |
| SCK ↓ → SCS ↓ clock switching time | t <sub>SCC</sub>  | SCK0 to SCK3, SCS0x to SCS3x |                                                                                                                                                                        | Master mode round operation<br>(C <sub>L</sub> = 50 pF, I <sub>OL</sub> = -2 mA, I <sub>OH</sub> = 2 mA),<br>(C <sub>L</sub> = 20 pF, I <sub>OL</sub> = -1 mA, I <sub>OH</sub> = 1 mA) | 3t <sub>CLK_LCP0A</sub> +0                                      | 3t <sub>CLK_LCP0A</sub> +50 |         |

\*1: t<sub>CSSU</sub> = SCSTR:CSSU[7:0] x serial chip select timing operating clock

\*2: t<sub>CSDH</sub> = SCSTR:CSHD[7:0] x serial chip select timing operating clock

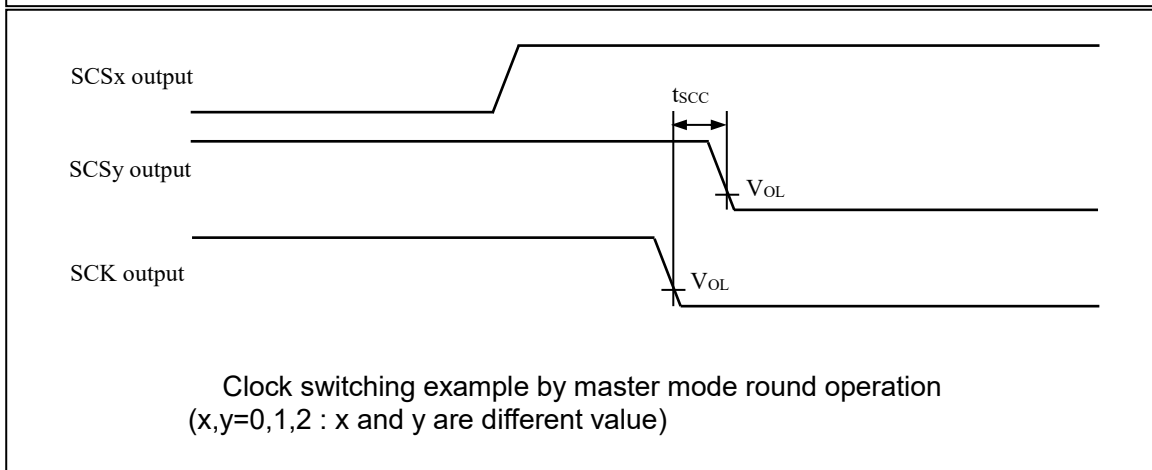
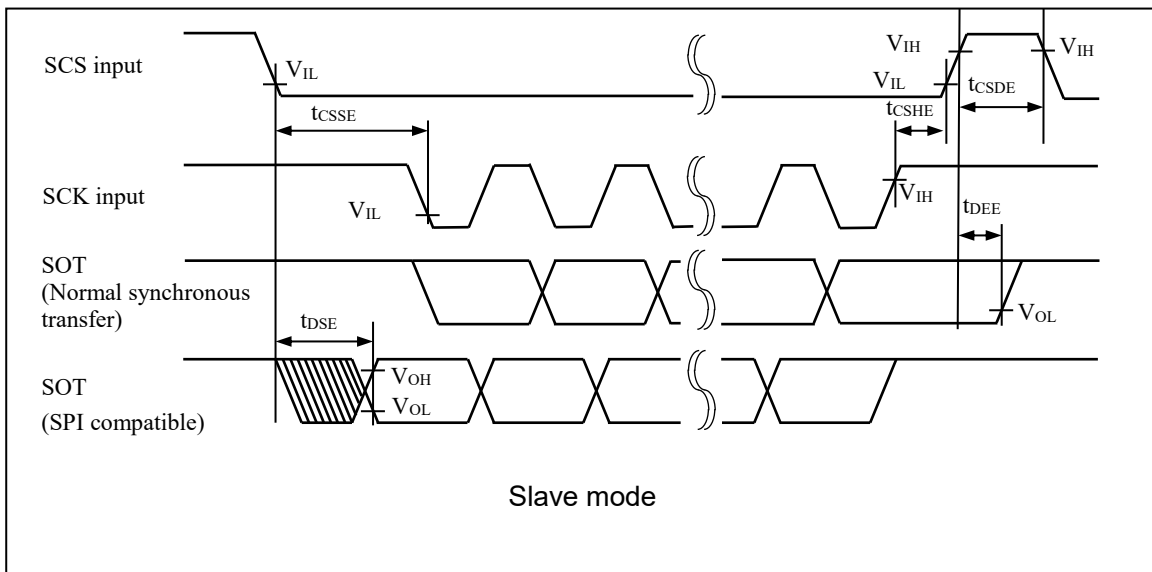
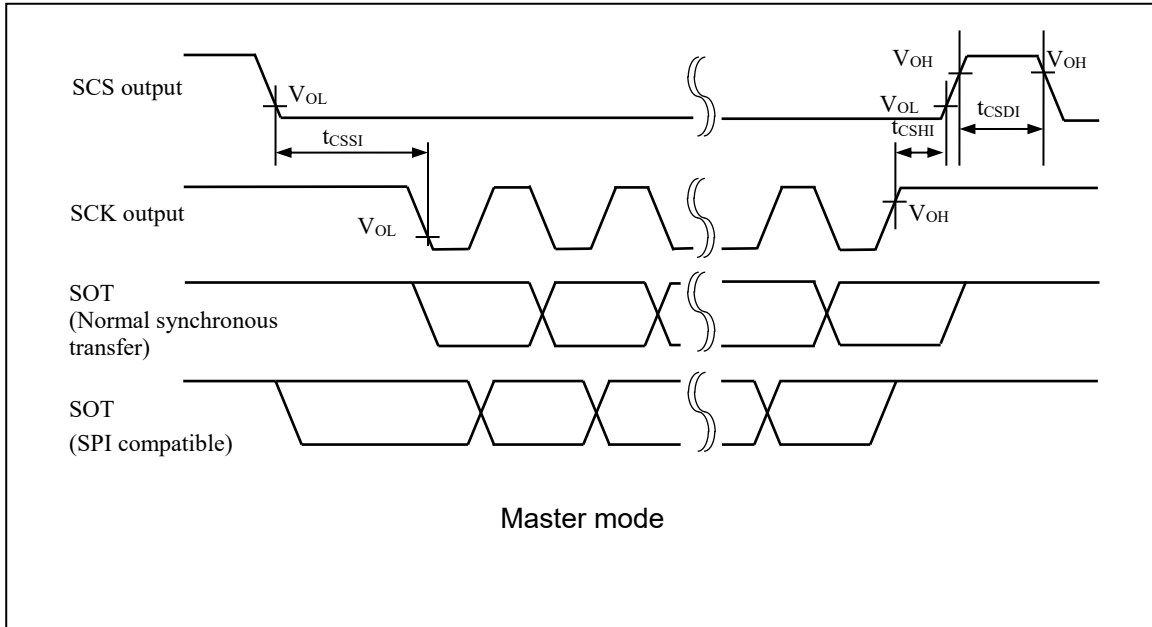
\*3: t<sub>CSDS</sub> = SCSTR:CSDS[15:0] x serial chip select timing operating clock

For details on \*1, \*2, and \*3 above, see the hardware manual.

**Notes:**

- This is the AC characteristic in CLK synchronized mode.
- C<sub>L</sub> is the load capacitance applied to pins during testing.
- The maximum baud rate is limited by the internal operating clock used and other parameters.  
For details, see the hardware manual.





**(5-1-6) Serial Chip Select Used (SCSCR:CSEN = 1)**

■ Serial clock output signal detect level "L" (SMR, SCSE:SCINV = 1)

■ Serial chip select inactive level "H" (SCSCR, SCSE:CSLVL = 1)

(T<sub>A</sub>: Recommended operating conditions, V<sub>CC</sub> = 5.0 V +5%/-10%, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter                          | Symbol            | Pin Name                           | Conditions                                                                                                                                                                                         | Value                               |                                                                  | Unit | Remarks |
|------------------------------------|-------------------|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|------------------------------------------------------------------|------|---------|
|                                    |                   |                                    |                                                                                                                                                                                                    | Min                                 | Max                                                              |      |         |
| SCS ↓ → SCK ↑ setup time           | t <sub>CSSU</sub> | SCK0 to SCK3,<br>SCS0x to SCS3x    | Master mode<br>(C <sub>L</sub> = 50 pF,<br>I <sub>OL</sub> = -2 mA,<br>I <sub>OH</sub> = 2 mA),<br>(C <sub>L</sub> = 20 pF,<br>I <sub>OL</sub> = -1 mA,<br>I <sub>OH</sub> = 1 mA)                 | t <sub>CSSU</sub> <sup>*1</sup> -50 | -                                                                | ns   |         |
| SCK ↓ → SCS ↑ hold time            | t <sub>CSHI</sub> |                                    |                                                                                                                                                                                                    | t <sub>CSHD</sub> <sup>*2</sup> +0  | -                                                                | ns   |         |
| SCS deselect time                  | t <sub>CSDI</sub> |                                    |                                                                                                                                                                                                    | SCS0x to SCS3x                      | t <sub>CSDS</sub> <sup>*3</sup> -50+<br>5 t <sub>CLK_LCP0A</sub> | -    |         |
| SCS ↓ → SCK ↑ setup time           | t <sub>CSSE</sub> | SCK0 to SCK3,<br>SCS0x to SCS3x    | Slave mode<br>(C <sub>L</sub> = 50 pF,<br>I <sub>OL</sub> = -2 mA,<br>I <sub>OH</sub> = 2 mA),<br>(C <sub>L</sub> = 20 pF,<br>I <sub>OL</sub> = -1 mA,<br>I <sub>OH</sub> = 1 mA)                  | 3t <sub>CLK_LCP0A</sub> +30         | -                                                                | ns   |         |
| SCK ↓ → SCS ↑ hold time            | t <sub>CSHE</sub> |                                    |                                                                                                                                                                                                    | 0                                   | -                                                                | ns   |         |
| SCS deselect time                  | t <sub>CSDE</sub> | SCS0x to SCS3x                     |                                                                                                                                                                                                    | 3t <sub>CLK_LCP0A</sub> +30         | -                                                                | ns   |         |
| SCS ↓ → SOT delay time             | t <sub>DSE</sub>  | SCS0x to<br>SCS3x,<br>SOT0 to SOT3 |                                                                                                                                                                                                    | -                                   | 50                                                               | ns   |         |
| SCS ↑ → SOT delay time             | t <sub>DEE</sub>  |                                    |                                                                                                                                                                                                    | 0                                   | -                                                                | ns   |         |
| SCK ↑ → SCS ↓ clock switching time | t <sub>SCC</sub>  | SCK0 to SCK3,<br>SCS0x to SCS3x    | Master mode round operation<br>(C <sub>L</sub> = 50 pF,<br>I <sub>OL</sub> = -2 mA,<br>I <sub>OH</sub> = 2 mA),<br>(C <sub>L</sub> = 20 pF,<br>I <sub>OL</sub> = -1 mA,<br>I <sub>OH</sub> = 1 mA) | 3t <sub>CLK_LCP0A</sub> +0          | 3t <sub>CLK_LCP0A</sub> +50                                      | ns   |         |

\*1: t<sub>CSSU</sub> = SCSTR:CSSU[7:0] x serial chip select timing operating clock

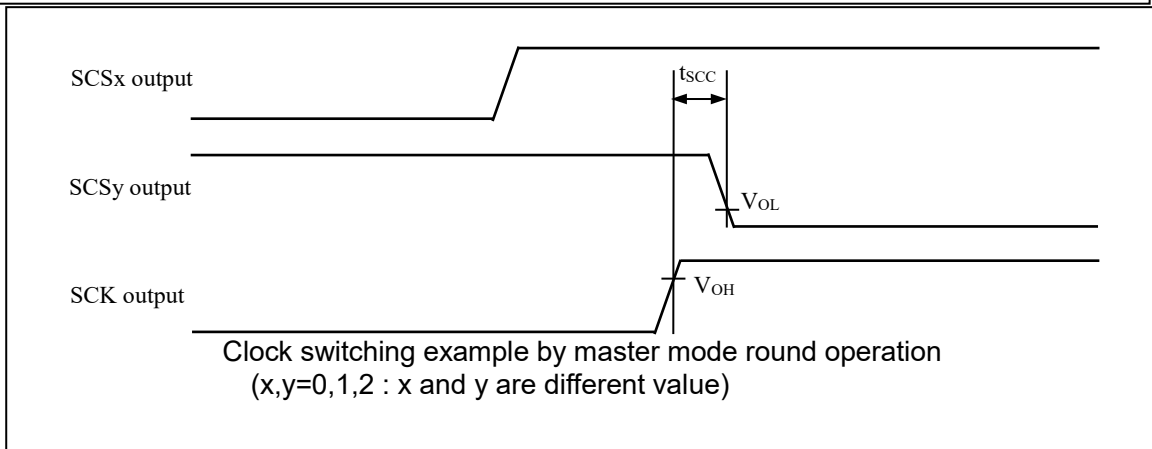
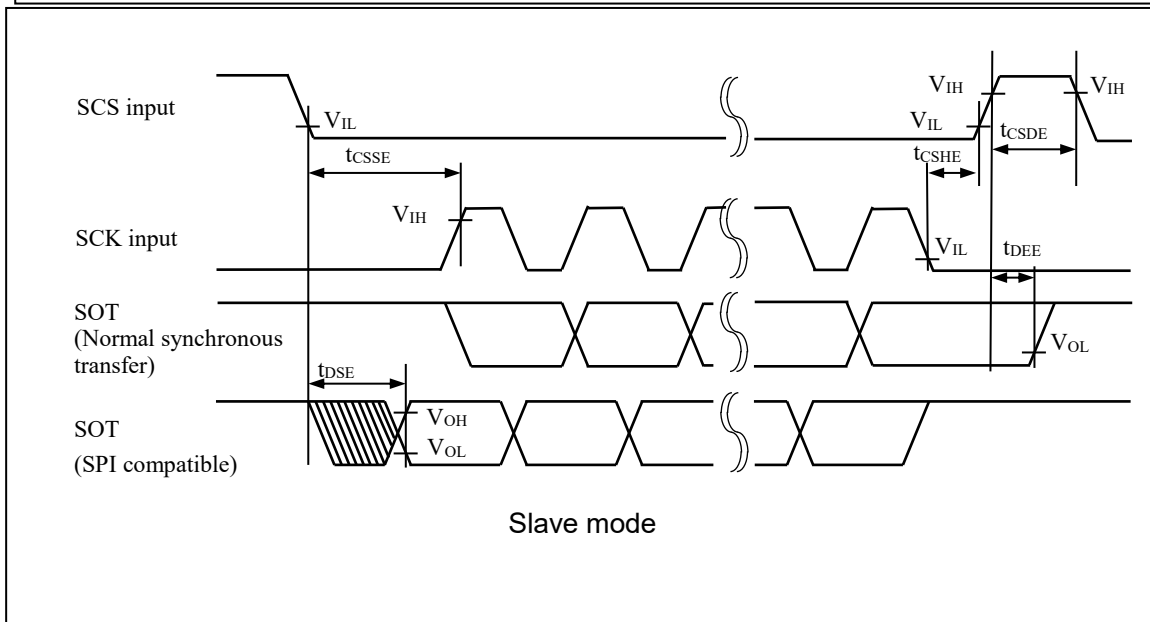
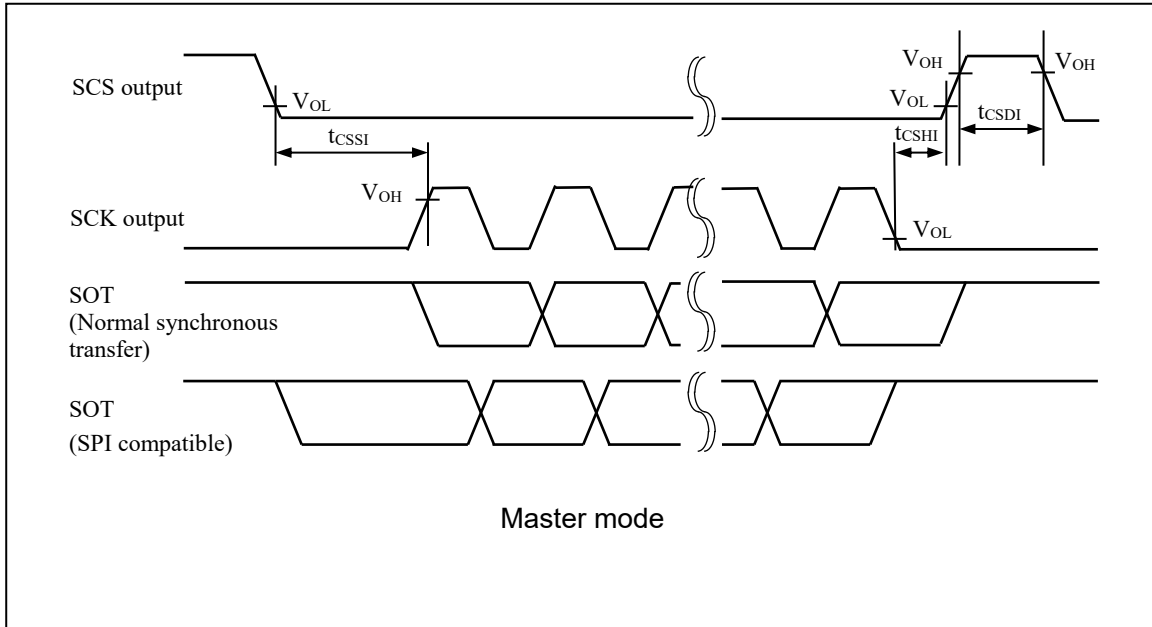
\*2: t<sub>CSHD</sub> = SCSTR:CSHD[7:0] x serial chip select timing operating clock

\*3: t<sub>CSDS</sub> = SCSTR:CSDS[15:0] x serial chip select timing operating clock

For details on \*1, \*2, and \*3 above, see the hardware manual.

**Notes:**

- This is the AC characteristic in CLK synchronized mode.
- C<sub>L</sub> is the load capacitance applied to pins during testing.
- The maximum baud rate is limited by the internal operating clock used and other parameters.  
For details, see the hardware manual.



**(5-1-7) Serial Chip Select Used (SCSCR:CSSEN = 1)**

■ Serial clock output signal detect level "H" (SMR, SCSFR:SCINV = 0)

■ Serial Chip select inactive level "L" (SCSCR, SCSFR:CSLVL = 0

(TA: Recommended operating conditions,  $V_{CC} = 5.0\text{ V} +5\%/ -10\%$ ,  $V_{SS} = AV_{SS} = 0.0\text{ V}$ )

| Parameter                                                        | Symbol     | Pin Name                        | Conditions                                                                                                                                                                             | Value                                                                                                                                                                                                  |                      | Unit                  | Remarks |
|------------------------------------------------------------------|------------|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-----------------------|---------|
|                                                                  |            |                                 |                                                                                                                                                                                        | Min                                                                                                                                                                                                    | Max                  |                       |         |
| SCS $\uparrow \rightarrow$ SCK $\downarrow$ setup time           | $t_{CSSI}$ | SCK0 to SCK3,<br>SCS0x to SCS3x | Master mode<br>( $C_L = 50\text{ pF}$ ,<br>$I_{OL} = -2\text{ mA}$ ,<br>$I_{OH} = 2\text{ mA}$ ),<br>( $C_L = 20\text{ pF}$ ,<br>$I_{OL} = -1\text{ mA}$ ,<br>$I_{OH} = 1\text{ mA}$ ) | $t_{CSSU}^{*1}-50$                                                                                                                                                                                     | -                    | ns                    |         |
| SCK $\uparrow \rightarrow$ SCS $\downarrow$ hold time            | $t_{CSHI}$ |                                 |                                                                                                                                                                                        | $t_{CSHD}^{*2}+0$                                                                                                                                                                                      | -                    | ns                    |         |
| SCS deselect time                                                | $t_{CSDI}$ | SCS0x to SCS3x                  |                                                                                                                                                                                        | $t_{CSDS}^{*3}-50+5\ t_{CLK\_LCP0A}$                                                                                                                                                                   | -                    | ns                    |         |
| SCS $\uparrow \rightarrow$ SCK $\downarrow$ setup time           | $t_{CSSE}$ | SCK0 to SCK3,<br>SCS0x to SCS3x | Slave mode<br>( $C_L = 50\text{ pF}$ ,<br>$I_{OL} = -2\text{ mA}$ ,<br>$I_{OH} = 2\text{ mA}$ ),<br>( $C_L = 20\text{ pF}$ ,<br>$I_{OL} = -1\text{ mA}$ ,<br>$I_{OH} = 1\text{ mA}$ )  | $3t_{CLK\_LCP0A} +30$                                                                                                                                                                                  | -                    | ns                    |         |
| SCK $\uparrow \rightarrow$ SCS $\downarrow$ hold time            | $t_{CSHE}$ |                                 |                                                                                                                                                                                        | 0                                                                                                                                                                                                      | -                    | ns                    |         |
| SCS deselect time                                                | $t_{CSDE}$ | SCS0x to SCS3x                  |                                                                                                                                                                                        | $3t_{CLK\_LCP0A} +30$                                                                                                                                                                                  | -                    | ns                    |         |
| SCS $\uparrow \rightarrow$ SOT delay time                        | $t_{DSE}$  | SCS0x to SCS3x,<br>SOT0 to SOT3 |                                                                                                                                                                                        | -                                                                                                                                                                                                      | 50                   | ns                    |         |
| SCS $\downarrow \rightarrow$ SOT delay time                      | $t_{DEE}$  |                                 |                                                                                                                                                                                        | 0                                                                                                                                                                                                      | -                    | ns                    |         |
| SCK $\downarrow \rightarrow$ SCS $\uparrow$ clock switching time | $t_{SCC}$  | SCK0 to SCK3,<br>SCS0x to SCS3x |                                                                                                                                                                                        | Master mode round operation<br>( $C_L = 50\text{ pF}$ ,<br>$I_{OL} = -2\text{ mA}$ ,<br>$I_{OH} = 2\text{ mA}$ ),<br>( $C_L = 20\text{ pF}$ ,<br>$I_{OL} = -1\text{ mA}$ ,<br>$I_{OH} = 1\text{ mA}$ ) | $3t_{CLK\_LCP0A} +0$ | $3t_{CLK\_LCP0A} +50$ |         |

\*1:  $t_{CSSU} = \text{SCSTR:CSSU}[7:0] \times \text{serial chip select timing operating clock}$

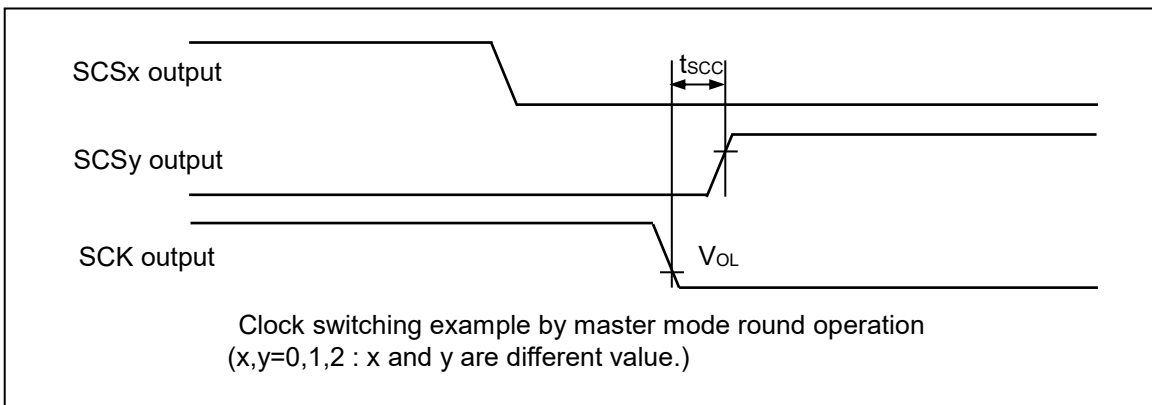
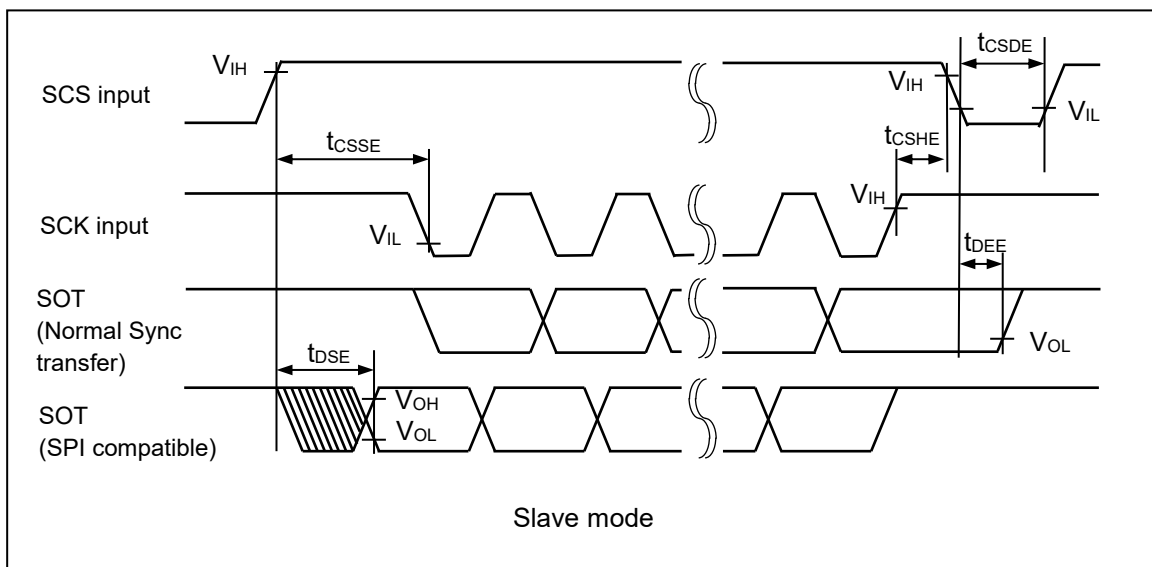
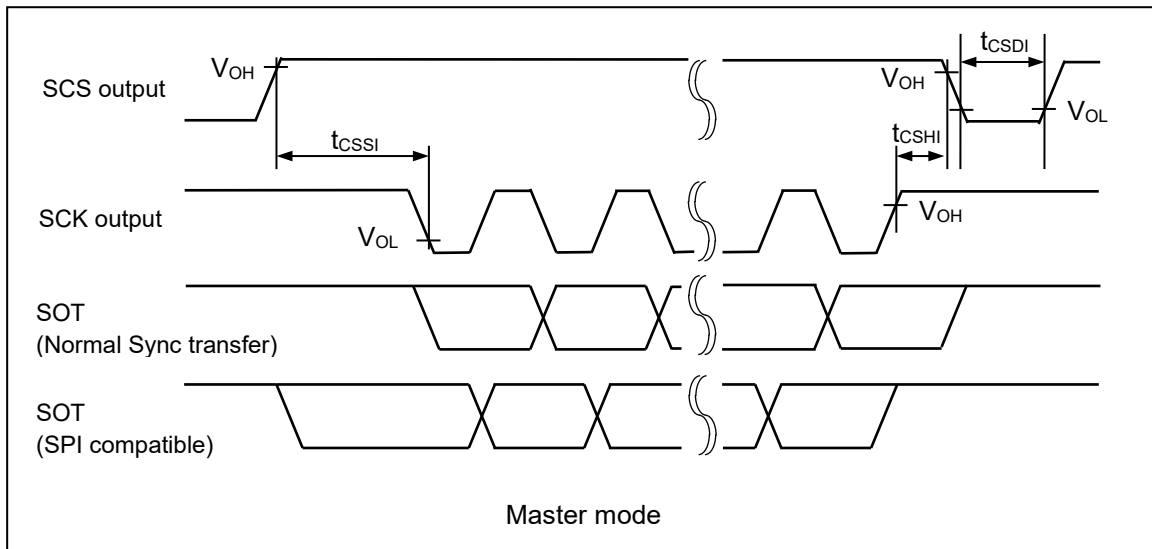
\*2:  $t_{CSHD} = \text{SCSTR:CSHD}[7:0] \times \text{serial chip select timing operating clock}$

\*3:  $t_{CSDS} = \text{SCSTR:CSDS}[15:0] \times \text{serial chip select timing operating clock}$

For details on \*1, \*2, and \*3 above, see the hardware manual.

**Notes:**

- This is the AC characteristic in CLK synchronized mode.
- $C_L$  is the load capacitance applied to pins during testing.
- The maximum baud rate is limited by the internal operating clock used and other parameters.  
For details, see the hardware manual



**(5-1-8) Serial Chip Select Used (SCSCR:CSEN = 1)**

■ Serial clock output signal detect level "L" (SMR, SCSTR:SCINV = 1)

■ Serial Chip select inactive level "L" (SCSCR, SCSTR:CSLVL = 0)

(T<sub>A</sub>: Recommended operating conditions, V<sub>CC</sub> = 5.0 V +5%/-10%, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter                          | Symbol            | Pin Name                        | Conditions                                                                                                                                                                                         | Value                               |                                                                   | Unit | Remarks |
|------------------------------------|-------------------|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------------------------------------|------|---------|
|                                    |                   |                                 |                                                                                                                                                                                                    | Min                                 | Max                                                               |      |         |
| SCS ↑ → SCK ↑ setup time           | t <sub>CSSU</sub> | SCK0 to SCK3,<br>SCS0x to SCS3x | Master mode<br>(C <sub>L</sub> = 50 pF,<br>I <sub>OL</sub> = -2 mA,<br>I <sub>OH</sub> = 2 mA),<br>(C <sub>L</sub> = 20 pF,<br>I <sub>OL</sub> = -1 mA,<br>I <sub>OH</sub> = 1 mA)                 | t <sub>CSSU</sub> <sup>*1</sup> -50 | -                                                                 | ns   |         |
| SCK ↓ → SCS ↓ hold time            | t <sub>CSHI</sub> |                                 |                                                                                                                                                                                                    | t <sub>CSHD</sub> <sup>*2</sup> +0  | -                                                                 | ns   |         |
| SCS deselect time                  | t <sub>CSDI</sub> |                                 |                                                                                                                                                                                                    | SCS0x to SCS3x                      | t <sub>CSDS</sub> <sup>*3</sup> -50<br>+ 5 t <sub>CLK_LCP0A</sub> | -    |         |
| SCS ↑ → SCK ↑ setup time           | t <sub>CSSE</sub> | SCK0 to SCK3,<br>SCS0x to SCS3x | Slave mode<br>(C <sub>L</sub> = 50 pF,<br>I <sub>OL</sub> = -2 mA,<br>I <sub>OH</sub> = 2 mA),<br>(C <sub>L</sub> = 20 pF,<br>I <sub>OL</sub> = -1 mA,<br>I <sub>OH</sub> = 1 mA)                  | 3t <sub>CLK_LCP0A</sub> + 30        | -                                                                 | ns   |         |
| SCK ↓ → SCS ↓ hold time            | t <sub>CSHE</sub> |                                 |                                                                                                                                                                                                    | 0                                   | -                                                                 | ns   |         |
| SCS deselect time                  | t <sub>CSDE</sub> | SCS0x to SCS3x                  |                                                                                                                                                                                                    | 3t <sub>CLK_LCP0A</sub> + 30        | -                                                                 | ns   |         |
| SCS ↑ → SOT delay time             | t <sub>DSE</sub>  | SCS0x to SCS3x,<br>SOT0 to SOT3 |                                                                                                                                                                                                    | -                                   | 50                                                                | ns   |         |
| SCS ↓ → SOT delay time             | t <sub>DEE</sub>  |                                 |                                                                                                                                                                                                    | 0                                   | -                                                                 | ns   |         |
| SCK ↑ → SCS ↑ clock switching time | t <sub>SCC</sub>  | SCK0 to SCK3,<br>SCS0x to SCS3x | Master mode round operation<br>(C <sub>L</sub> = 50 pF,<br>I <sub>OL</sub> = -2 mA,<br>I <sub>OH</sub> = 2 mA),<br>(C <sub>L</sub> = 20 pF,<br>I <sub>OL</sub> = -1 mA,<br>I <sub>OH</sub> = 1 mA) | 3t <sub>CLK_LCP0A</sub> + 0         | 3t <sub>CLK_LCP0A</sub> + 50                                      | ns   |         |

\*1: t<sub>CSSU</sub> = SCSTR:CSSU[7:0] x serial chip select timing operating clock

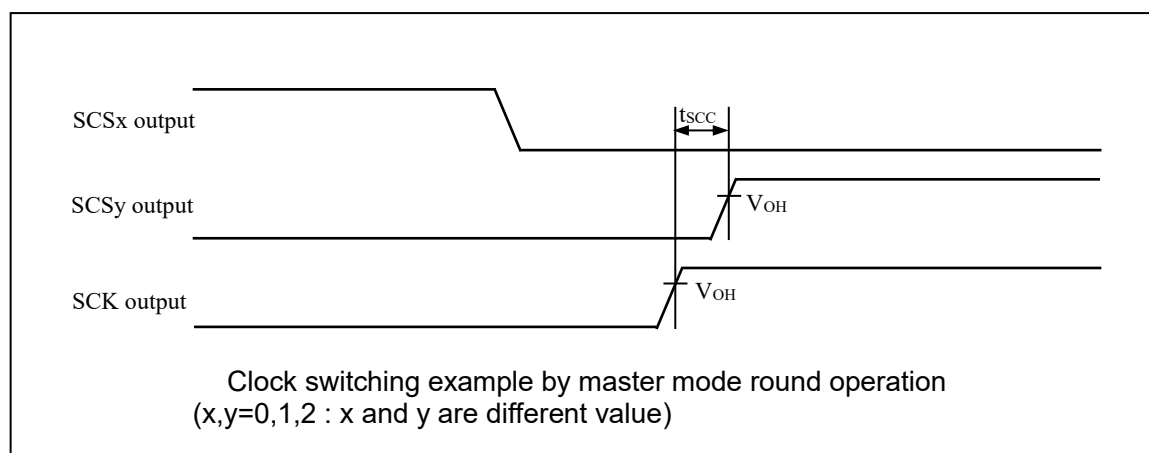
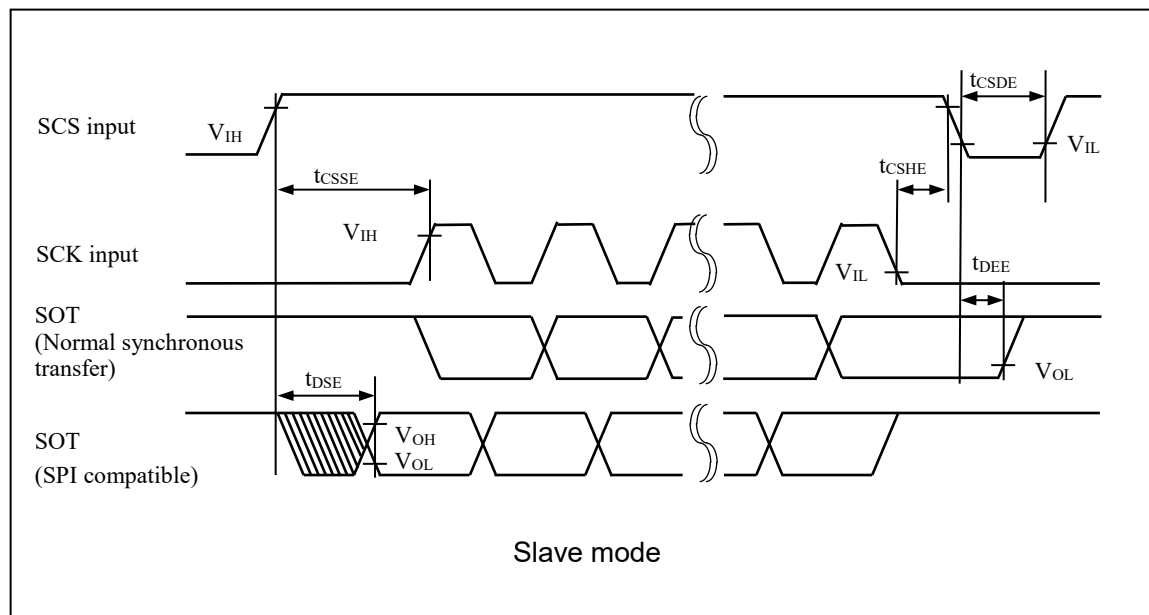
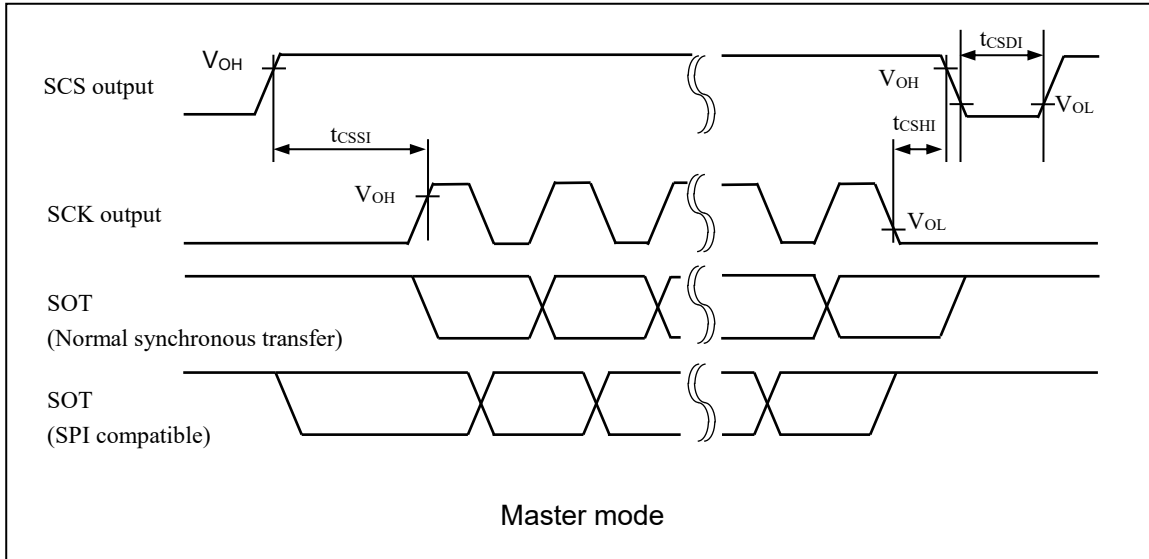
\*2: t<sub>CSHD</sub> = SCSTR:CSHD[7:0] x serial chip select timing operating clock

\*3: t<sub>CSDS</sub> = SCSTR:CSDS[15:0] x serial chip select timing operating clock

For details on \*1, \*2, and \*3 above, see the hardware manual.

**Notes:**

- This is the AC characteristic in CLK synchronized mode.
- C<sub>L</sub> is the load capacitance applied to pins during testing.
- The maximum baud rate is limited by the internal operating clock used and other parameters.  
For details, see the hardware manual.

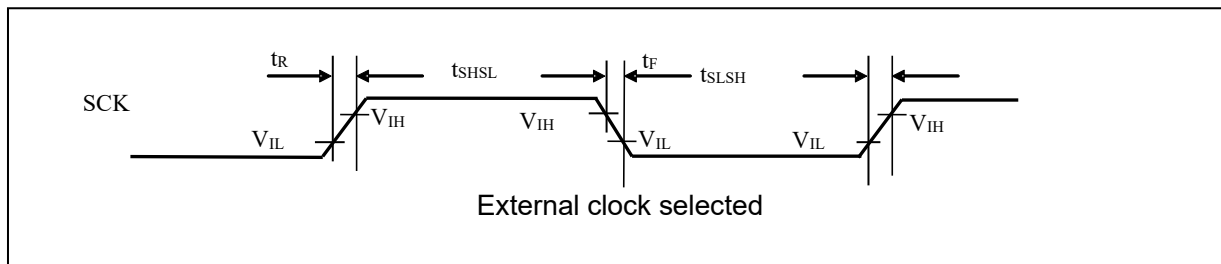


#### 10.4.5.2 UART (Async Serial Interface) Timing (SMR:MD[2:0] = 000<sub>B</sub>, 001<sub>B</sub>)

##### (5-2-1) External clock selected (BGR:EXT = 1)

(T<sub>A</sub>: Recommended operating conditions, V<sub>CC</sub> = 5.0 V +5%/-10%, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter                    | Symbol            | Pin Name     | Conditions                                                                                                                                                          | Value                      |     | Unit | Remarks |
|------------------------------|-------------------|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-----|------|---------|
|                              |                   |              |                                                                                                                                                                     | Min                        | Max |      |         |
| Serial clock "L" pulse width | t <sub>SLSH</sub> | SCK0 to SCK3 | (C <sub>L</sub> = 50 pF,<br>I <sub>OL</sub> = -2 mA,<br>I <sub>OH</sub> = 2 mA),<br>(C <sub>L</sub> = 20 pF,<br>I <sub>OL</sub> = -1 mA,<br>I <sub>OH</sub> = 1 mA) | t <sub>CLK_LCP0A</sub> +10 | -   | ns   |         |
| Serial clock "H" pulse width | t <sub>SHSL</sub> |              |                                                                                                                                                                     | t <sub>CLK_LCP0A</sub> +10 | -   | ns   |         |
| SCK fall time                | t <sub>F</sub>    |              |                                                                                                                                                                     | -                          | 5   | ns   |         |
| SCK rise time                | t <sub>R</sub>    |              |                                                                                                                                                                     | -                          | 5   | ns   |         |



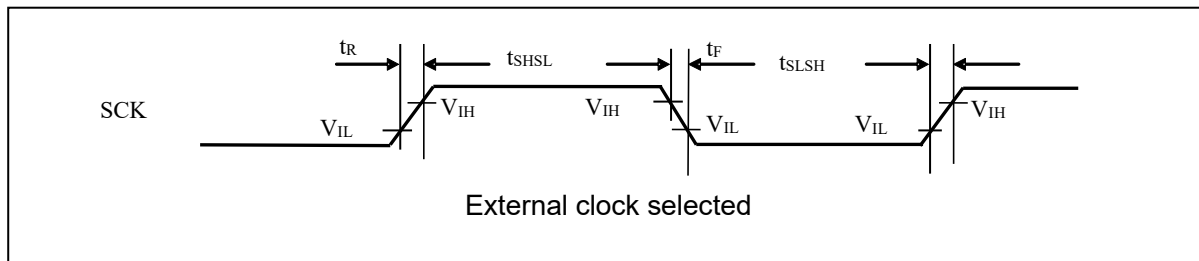


#### 10.4.5.3 LIN Interface (v2.1) (LIN Communication Control Interface (v2.1)) Timing (SMR:MD[2:0] = 011<sub>B</sub>)

##### (5-3-1) External Clock Selected (BGR:EXT = 1)

(T<sub>A</sub>: Recommended operating conditions, V<sub>CC</sub> = 5.0 V +5%/-10%, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter                    | Symbol            | Pin Name     | Conditions                                                                                                                                                          | Value                      |     | Unit | Remarks |
|------------------------------|-------------------|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-----|------|---------|
|                              |                   |              |                                                                                                                                                                     | Min                        | Max |      |         |
| Serial clock "L" pulse width | t <sub>SLSH</sub> | SCK0 to SCK3 | (C <sub>L</sub> = 50 pF,<br>I <sub>OL</sub> = -2 mA,<br>I <sub>OH</sub> = 2 mA),<br>(C <sub>L</sub> = 20 pF,<br>I <sub>OL</sub> = -1 mA,<br>I <sub>OH</sub> = 1 mA) | t <sub>CLK_LCP0A</sub> +10 | -   | ns   |         |
| Serial clock "H" pulse width | t <sub>SHSL</sub> |              |                                                                                                                                                                     | t <sub>CLK_LCP0A</sub> +10 | -   | ns   |         |
| SCK fall time                | t <sub>F</sub>    |              |                                                                                                                                                                     | -                          | 5   | ns   |         |
| SCK rise time                | t <sub>R</sub>    |              |                                                                                                                                                                     | -                          | 5   | ns   |         |



#### 10.4.5.4 I<sup>2</sup>C timing (SMR:MD[2:0] = 100B)

(TA: Recommended operating conditions, V<sub>CC</sub> = 5.0 V +5%/-10%, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter                                                    | Symbol             | Pin Name                     | Conditions                                                                      | Standard Mode                  |                    | Unit | Remarks |
|--------------------------------------------------------------|--------------------|------------------------------|---------------------------------------------------------------------------------|--------------------------------|--------------------|------|---------|
|                                                              |                    |                              |                                                                                 | Min                            | Max                |      |         |
| SCL clock frequency                                          | f <sub>SCL</sub>   | SCL0 to SCL3                 | C <sub>L</sub> = 50 pF,<br>R = (V <sub>p</sub> /I <sub>OL</sub> ) <sup>*1</sup> | 0                              | 100                | kHz  |         |
| Repeat "start" condition hold time<br>SDA ↓ → SCL ↓          | t <sub>HDSTA</sub> | SDA0 to SDA3<br>SCL0 to SCL3 |                                                                                 | 4.0                            | -                  | μs   |         |
| Period of "L" for SCL clock                                  | t <sub>LOW</sub>   | SCL0 to SCL3                 |                                                                                 | 4.7                            | -                  | μs   |         |
| Period of "H" for SCL clock                                  | t <sub>HIGH</sub>  |                              |                                                                                 | 4.0                            | -                  | μs   |         |
| Repeat "start" condition setup time<br>SCL ↑ → SDA ↓         | t <sub>SUSTA</sub> | SDA0 to SDA3<br>SCL0 to SCL3 |                                                                                 | 4.7                            | -                  | μs   |         |
| Data hold time<br>SCL ↓ → SDA ↓ ↑                            | t <sub>HDDAT</sub> |                              |                                                                                 | 0                              | 3.45 <sup>*2</sup> | μs   |         |
| Data setup time<br>SDA ↓ ↑ → SCL ↑                           | t <sub>SUDAT</sub> |                              |                                                                                 | 250                            | -                  | ns   |         |
| "Stop" condition setup time<br>SCL ↑ → SDA ↑                 | t <sub>SUSTO</sub> |                              |                                                                                 | 4.0                            | -                  | μs   |         |
| Bus-free time between "stop" condition and "start" condition | t <sub>BUF</sub>   | -                            |                                                                                 | 4.7                            | -                  | μs   |         |
| Noise filter                                                 | t <sub>SP</sub>    | -                            |                                                                                 | t <sub>NFT</sub> <sup>*3</sup> | -                  | ns   |         |

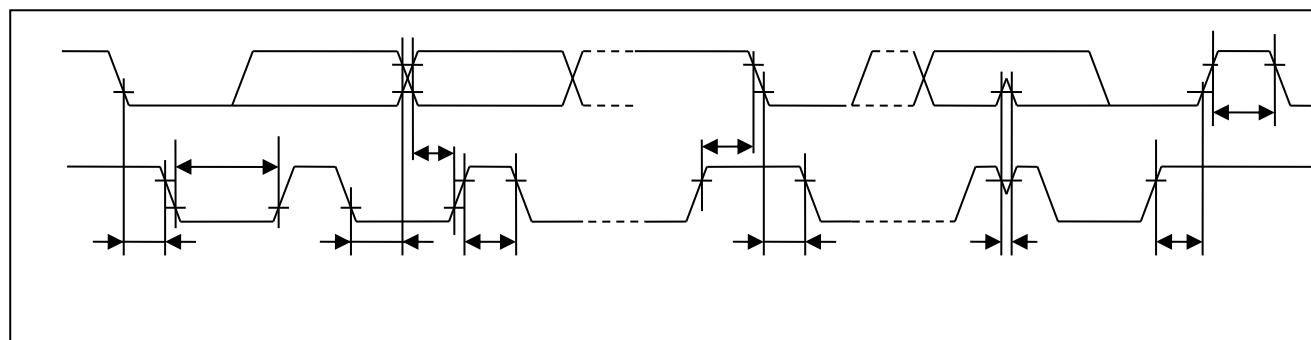
<sup>\*1</sup>: R and C<sub>L</sub> represent the pull-up resistance and load capacitance of the SCL and SDA output lines, respectively V<sub>p</sub> shows that the power-supply voltage of the pull-up resistor and I<sub>OL</sub> shows the VOL guarantee current.

<sup>\*2</sup>: The maximum t<sub>HDDAT</sub> only has to be met if the device does not extend the "L" width (t<sub>LOW</sub>) of the SCL signal.

<sup>\*3</sup>: t<sub>NFT</sub> = (NFCR:NFT[4:0]+1) x 2 x tCLK\_LCP0A

#### Notes:

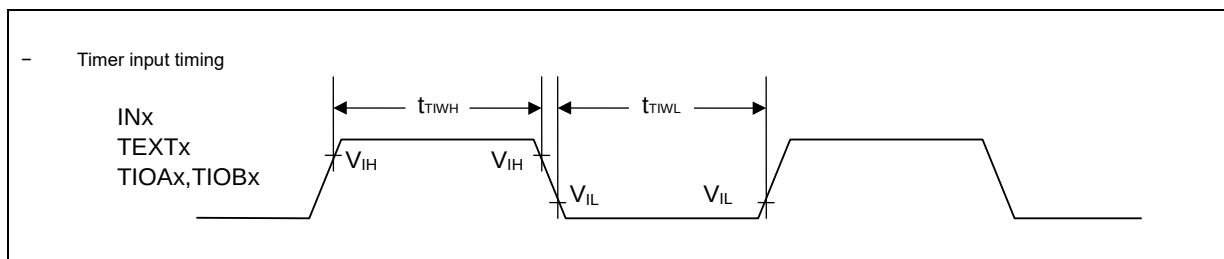
- In this device, Standard mode ( Max. 100 kbps ) is supported only.
- This model does not support high-speed mode. ( Max. 400 kbps ).
- This model does not support Min. I<sub>OL</sub> = 3 mA with V<sub>OL</sub> = 0.4 V.



## 10.5 Timer Input Timing

(TA: Recommended operating conditions, V<sub>CC</sub> = 5.0 V +5%/-10%, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

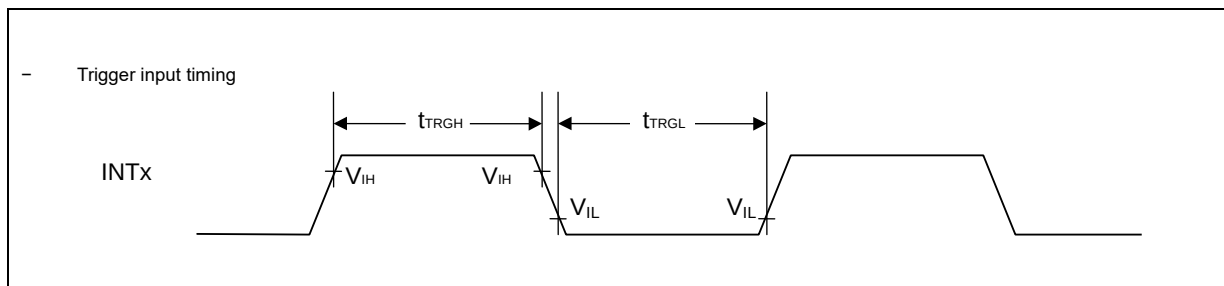
| Parameter         | Symbol                   | Pin Name                          | Conditions | Value             |     | Unit | Remarks                       |
|-------------------|--------------------------|-----------------------------------|------------|-------------------|-----|------|-------------------------------|
|                   |                          |                                   |            | Min               | Max |      |                               |
| Input pulse width | $t_{TWH}$ ,<br>$t_{TWL}$ | IN0 to IN11                       | -          | $4t_{CLK\_LCP0A}$ | -   | ns   | $4t_{CLK\_LCP0A} \geq 100$ ns |
|                   |                          |                                   |            | 100               |     |      | $4t_{CLK\_LCP0A} < 100$ ns    |
|                   |                          | TEXT0 to 5                        | -          | $4t_{CLK\_LCP0A}$ | -   | ns   | $4t_{CLK\_LCP0A} \geq 100$ ns |
|                   |                          |                                   |            | 100               |     |      | $4t_{CLK\_LCP0A} < 100$ ns    |
|                   |                          | TIOA0 to TIOA29<br>TIOB0 to TIOB7 | -          | $4t_{CLK\_LCP0A}$ | -   | ns   | $4t_{CLK\_LCP0A} \geq 100$ ns |
|                   |                          |                                   |            | 100               |     |      | $4t_{CLK\_LCP0A} < 100$ ns    |



## 10.6 Trigger Input Timing

(TA: Recommended operating conditions, V<sub>CC</sub> = 5.0 V +5%/-10%, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

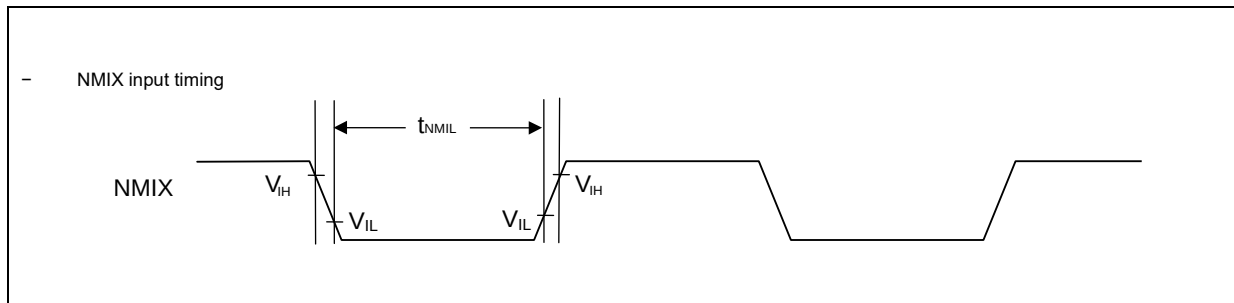
| Parameter         | Symbol                     | Pin Name      | Conditions | Value |     | Unit | Remarks   |
|-------------------|----------------------------|---------------|------------|-------|-----|------|-----------|
|                   |                            |               |            | Min   | Max |      |           |
| Input pulse width | $t_{TRGH}$ ,<br>$t_{TRGL}$ | INT0 to INT15 | -          | 100   | -   | ns   |           |
|                   |                            | INT0 to INT15 | -          | 1     | -   | μs   | Stop mode |



## 10.7 NMI Input Timing

(T<sub>A</sub>: Recommended operating conditions, V<sub>CC</sub> = 5.0 V +5%/-10%, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter         | Symbol            | Pin Name | Conditions | Value |     | Unit | Remarks |
|-------------------|-------------------|----------|------------|-------|-----|------|---------|
|                   |                   |          |            | Min   | Max |      |         |
| Input pulse width | t <sub>NMIL</sub> | NMIX     | -          | 300   | -   | ns   |         |



## 10.8 Low-Voltage Detection (External Low-Voltage Detection)

(T<sub>A</sub>: Recommended operating conditions, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter                       | Symbol           | Pin Name | Conditions | Value |     |      | Unit | Remarks                                                              |
|---------------------------------|------------------|----------|------------|-------|-----|------|------|----------------------------------------------------------------------|
|                                 |                  |          |            | Min   | Typ | Max  |      |                                                                      |
| Power supply voltage range      | V <sub>DP5</sub> | VCC      | -          | 3.5   | -   | 5.25 | V    |                                                                      |
| Detection voltage               | V <sub>DL0</sub> | VCC      | *1<br>*3   | 3.6   | 3.8 | 4.0  | V    | When power-supply voltage falls and detection level is set initially |
|                                 | V <sub>DL1</sub> | VCC      | *1<br>*4   | 3.8   | 4.0 | 4.2  | V    |                                                                      |
|                                 | V <sub>DL2</sub> | VCC      | *1<br>*5   | 4     | 4.2 | 4.4  | V    |                                                                      |
| Hysteresis width                | V <sub>HYS</sub> | VCC      | -          | -     | 100 | -    | mV   | When power-supply voltage rises                                      |
| Low-voltage detection time      | T <sub>d</sub>   | -        | -          | -     | -   | 30   | μs   |                                                                      |
| Power supply voltage regulation | -                | VCC      | -          | -2    | -   | 2    | V/ms | *2                                                                   |

\*1: If the fluctuation of the power supply has exceeded the detection voltage range within the time less than the low-voltage detection

time (T<sub>d</sub>), there is the possibility to generate or release after the power supply voltage has exceeded the detection voltage range.

\*2: Please suppress the change of the power supply within the range of the power-supply voltage regulation to do low-voltage detection by detecting voltage (V<sub>DL</sub>)

\*3: SYSC0\_RUNLVDCFG.LVDH1V = 0100<sub>B</sub> or SYSC0\_PSSLVDCFG.LVDH1V = 0100<sub>B</sub>

\*4: SYSC0\_RUNLVDCFG.LVDH1V = 0101<sub>B</sub> or SYSC0\_PSSLVDCFG.LVDH1V = 0101<sub>B</sub>

\*5: SYSC0\_RUNLVDCFG.LVDH1V = 0110<sub>B</sub> or SYSC0\_PSSLVDCFG.LVDH1V = 0110<sub>B</sub>

## 10.9 Low-Voltage Detection (RAM Retention Low-Voltage Detection)

(T<sub>A</sub>: Recommended operating conditions, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter                  | Symbol            | Pin Name | Conditions | Value |      |     | Unit | Remarks                         |
|----------------------------|-------------------|----------|------------|-------|------|-----|------|---------------------------------|
|                            |                   |          |            | Min   | Typ  | Max |      |                                 |
| Power supply voltage range | V <sub>RDP5</sub> | -        | -          | 0.6   | -    | 1.4 | V    |                                 |
| Detection voltage*         | V <sub>RDL</sub>  | -        | *1         | 0.9   | 0.95 | 1.0 | V    | When power-supply voltage falls |
| Hysteresis width           | V <sub>RHYS</sub> | -        | -          | -     | 75   | -   | mV   | When power-supply voltage rises |
| Low-voltage detection time | T <sub>Rd</sub>   | -        | -          | -     | -    | 30  | μs   |                                 |

\*: This LVD cannot be used to reliably generate a reset before voltage dips below minimum guaranteed MCU operation voltage, as this detection level is below the minimum guaranteed MCU operation voltage.

\*1: If the fluctuation of the power supply has exceeded the detection voltage range within the time less than the low-voltage detection time (T<sub>Rd</sub>), there is the possibility to generate or release after the power supply voltage has exceeded the detection voltage range.

## 10.10 Low-Voltage Detection (1.2 V Power Supply Low-Voltage Detection)

(T<sub>A</sub>: Recommended operating conditions, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter                  | Symbol            | Pin Name | Conditions     | Value |      |      | Unit | Remarks                         | Guaranteed MCU operation range |
|----------------------------|-------------------|----------|----------------|-------|------|------|------|---------------------------------|--------------------------------|
|                            |                   |          |                | Min   | Typ  | Max  |      |                                 |                                |
| Power supply voltage range | V <sub>RDP5</sub> | -        | -              | 0.6   | -    | 1.4  | V    |                                 | No                             |
| Detection voltage*         | V <sub>RDL0</sub> | -        | *1<br>*2<br>*4 | 0.92  | 0.97 | 1.02 | V    | When power-supply voltage falls |                                |
|                            | V <sub>RDL1</sub> | -        | *1<br>*3<br>*4 | 1.02  | 1.07 | 1.12 | V    |                                 |                                |
| Hysteresis width           | V <sub>RHYS</sub> | -        | -              | -     | 75   | -    | mV   | When power-supply voltage rises |                                |
| Low-voltage detection time | T <sub>Rd</sub>   | -        | -              | -     | -    | 30   | μs   |                                 |                                |

\*: This LVD cannot be used to reliably generate a reset before voltage dips below minimum guaranteed MCU operation voltage, as these detection levels are below the minimum guaranteed MCU operation voltage.

\*1: If the fluctuation of the power supply has exceeded the detection voltage range within the time less than the low-voltage detection time (T<sub>Rd</sub>), there is the possibility to generate or release after the power supply voltage has exceeded the detection voltage range.

\*2: SYSC0\_RUNLVDCFG.RLVDL1V = 10<sub>B</sub> or SYSC0\_PSSLVDCFG.RLVDL1V = 10<sub>B</sub>

\*3: SYSC0\_RUNLVDCFG.RLVDL1V = 11<sub>B</sub> or SYSC0\_PSSLVDCFG.RLVDL1V = 11<sub>B</sub>

\*4: These detection voltage level settings are below the minimum operation voltage.

Between these detection voltages and the minimum operation voltage, MCU functions are not guaranteed except for the low voltage detector.

Note that although the detection level is below the minimum operation voltage, the LVD reset factor flag is set as the voltage drops below the detection level.

## 10.11 A/D Converter

### 10.11.1 Electrical Characteristics

(T<sub>A</sub>: Recommended operating conditions, V<sub>CC</sub> = 5.0 V +5%/-10%, V<sub>SS</sub> = AV<sub>SS</sub> = 0.0 V)

| Parameter                     | Symbol           | Pin Name                            | Value            |     |                  | Unit | Remarks                                                  |
|-------------------------------|------------------|-------------------------------------|------------------|-----|------------------|------|----------------------------------------------------------|
|                               |                  |                                     | Min              | Typ | Max              |      |                                                          |
| Resolution                    | -                | -                                   | -                | -   | 12               | bit  |                                                          |
| Total Error                   | -                | -                                   | -                | -   | ±12              | LSB  | *3                                                       |
| Integral Nonlinearity         | -                | -                                   | -                | -   | ±4.0             | LSB  | *4                                                       |
| Differential Nonlinearity     | -                | -                                   | -                | -   | ±1.9             | LSB  | *4                                                       |
| Zero transition voltage       | V <sub>ZT</sub>  | *6                                  | AVRL<br>-11.5LSB | -   | AVRL<br>+12.5LSB | V    | *5                                                       |
| Full-scale transition voltage | V <sub>FST</sub> | *6                                  | AVRH<br>-13.5LSB | -   | AVRH<br>+10.5LSB | V    |                                                          |
| Sampling time                 | t <sub>SMP</sub> | -                                   | 0.3              | -   | 12               | μs   | *1                                                       |
| Compare time                  | t <sub>CMP</sub> | -                                   | 0.7              | -   | 28               | μs   | *1                                                       |
| A/D conversion time           | t <sub>CNV</sub> | -                                   | 1.0              | -   | 40               | μs   | *1                                                       |
| Analog port input current     | I <sub>AIN</sub> | *7                                  | -1.0             | -   | 1.0              | μA   | V <sub>AVSS</sub> ≤ V <sub>AIN</sub> ≤ V <sub>AVCC</sub> |
|                               |                  | *8                                  | -2.0             | -   | 2.0              |      |                                                          |
|                               |                  | *9                                  | -3.0             | -   | 3.0              |      |                                                          |
| Analog input voltage          | V <sub>AIN</sub> | *6                                  | AVSS             | -   | AVRH             | V    |                                                          |
| Reference voltage             | AVRH             | AVRH0,<br>AVRH1                     | 4.5              | -   | 5.25             | V    | AV <sub>CC</sub> ≥ AVRH                                  |
|                               | AVRL             | AVRL0/AVSS<br>0,<br>AVRL1/AVSS<br>1 | -                | 0.0 | -                | V    |                                                          |
| Power supply current          | I <sub>A</sub>   | AVCC                                | -                | 500 | 900              | μA   | per one unit                                             |
|                               | I <sub>AH</sub>  |                                     | -                | 1.0 | 100              | μA   | *2                                                       |
|                               | I <sub>R</sub>   | AVRH                                | -                | 1   | 2                | mA   | per one unit                                             |
|                               | I <sub>RH</sub>  |                                     | -                | -   | 5.0              | μA   | *2                                                       |
| Variation between channels    | -                | *10                                 | -                | -   | 4                | LSB  |                                                          |
|                               |                  | AN32 to AN62                        | -                | -   | 4                | LSB  |                                                          |

\*1: Time for each channel

\*2: The power supply current (V<sub>CC</sub> = AV<sub>CC</sub> = 5.0 V) is specified if the A/D converter is not operating and CPU is stopped.

\*3: Total Error is a comprehensive static error that includes the linearity. 1LSB = (AVRH-AVRL)/4096

\*4: 1LSB = (V<sub>FST</sub>-V<sub>ZT</sub>)/4094

\*5: 1LSB = (AVRH-AVRL)/4096

\*6: AN0 to AN3, AN5, AN6, AN9, AN10, AN12 to AN15, AN17 to AN24, and AN27 to AN62

\*7: AN3, AN5, AN6, AN9, AN10, AN12 to AN15, AN17 to AN24, and AN27 to AN42

\*8: AN0 to AN2, and AN43

\*9: AN44 to AN62

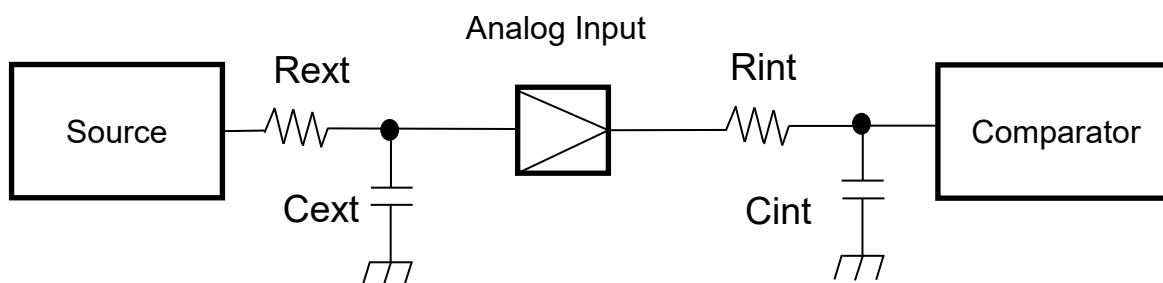
\*10: AN0 to AN3, AN5, AN6, AN9, AN10, AN12 to AN15, AN17 to AN24, and AN27 to AN31

### 10.11.2 Notes on Using A/D Converters

#### About the output impedance of an external circuit for analog input

When the external impedance is too high, the analog voltage sampling time may become insufficient. In this case, we recommend attaching a capacitor (about 0.1  $\mu$ F) to an analog input pin.

Analog Input Circuit Model



$R_{int}$  : Analog input impedance  
 3.9 kilo ohms (max) ( $4.5V \leq AV_{CC} \leq 5.25V$ )  
 $C_{int}$  : Capacitance of MCU input pin  
 11.0pF (max) ( $4.5V \leq AV_{CC} \leq 5.25V$ )  
 $R_{ext}$  : External driving impedance  
 $C_{ext}$  : Capacitance of PCB at A/D converter input

The following approximation formula for the replacement model above can be used:  
 sampling time (minimum) =  $9 \times ((R_{int} + R_{ext}) \times C_{int} + R_{ext} \times C_{ext})$

Note: Listed values must be considered as reference values.

### 10.11.3 Definition of terms

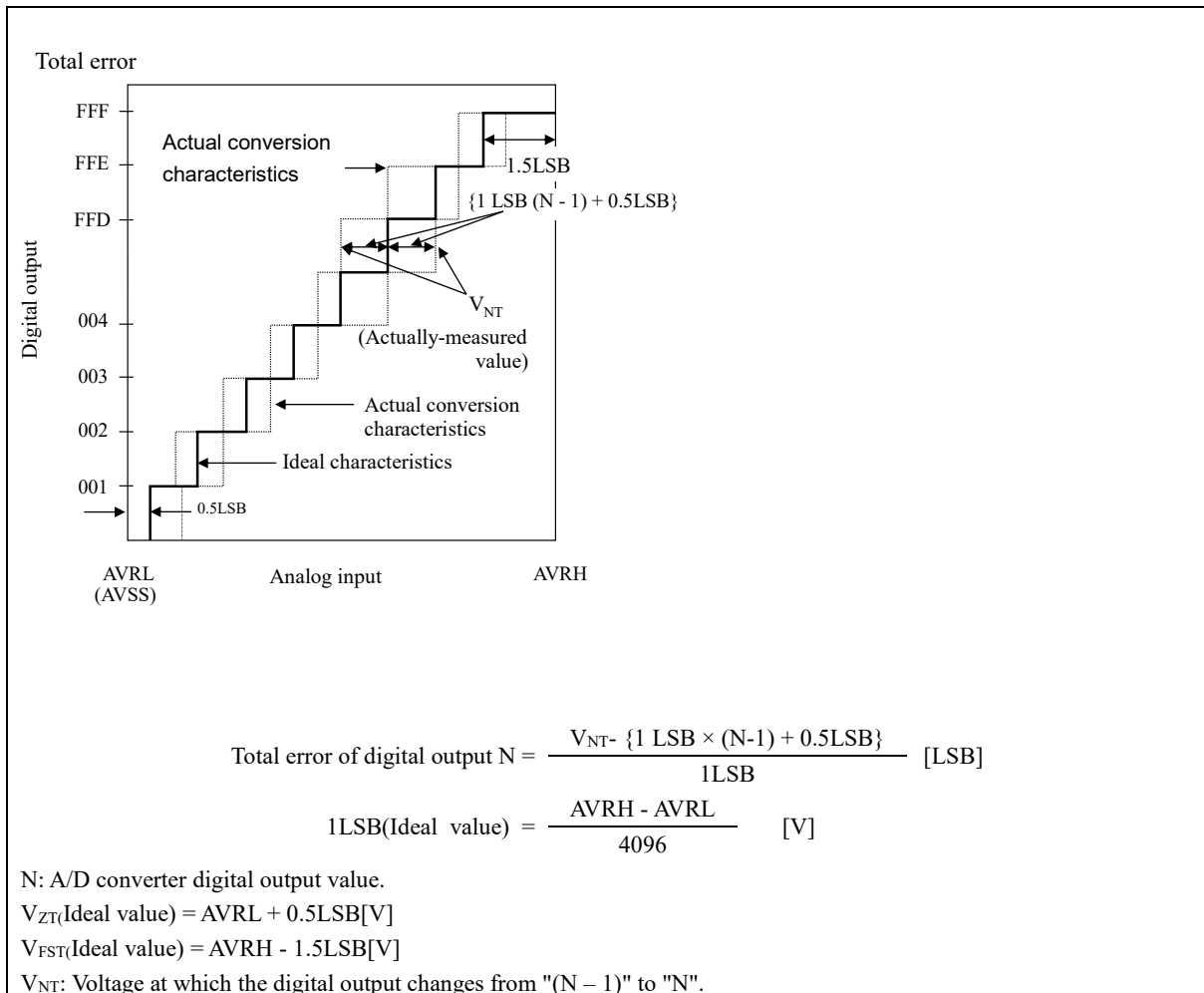
Resolution: Analog variation that is recognized by an A/D converter

Integral Nonlinearity error \*: Deviation of the straight line connecting the zero transition point ("0000 0000 0000" <--> "0000 0000 0001") and full-scale transition point ("1111 1111 1110" <--> "1111 1111 1111") from actual conversion characteristics includes zero transition error, full-scale transition error, and non-linearity error.

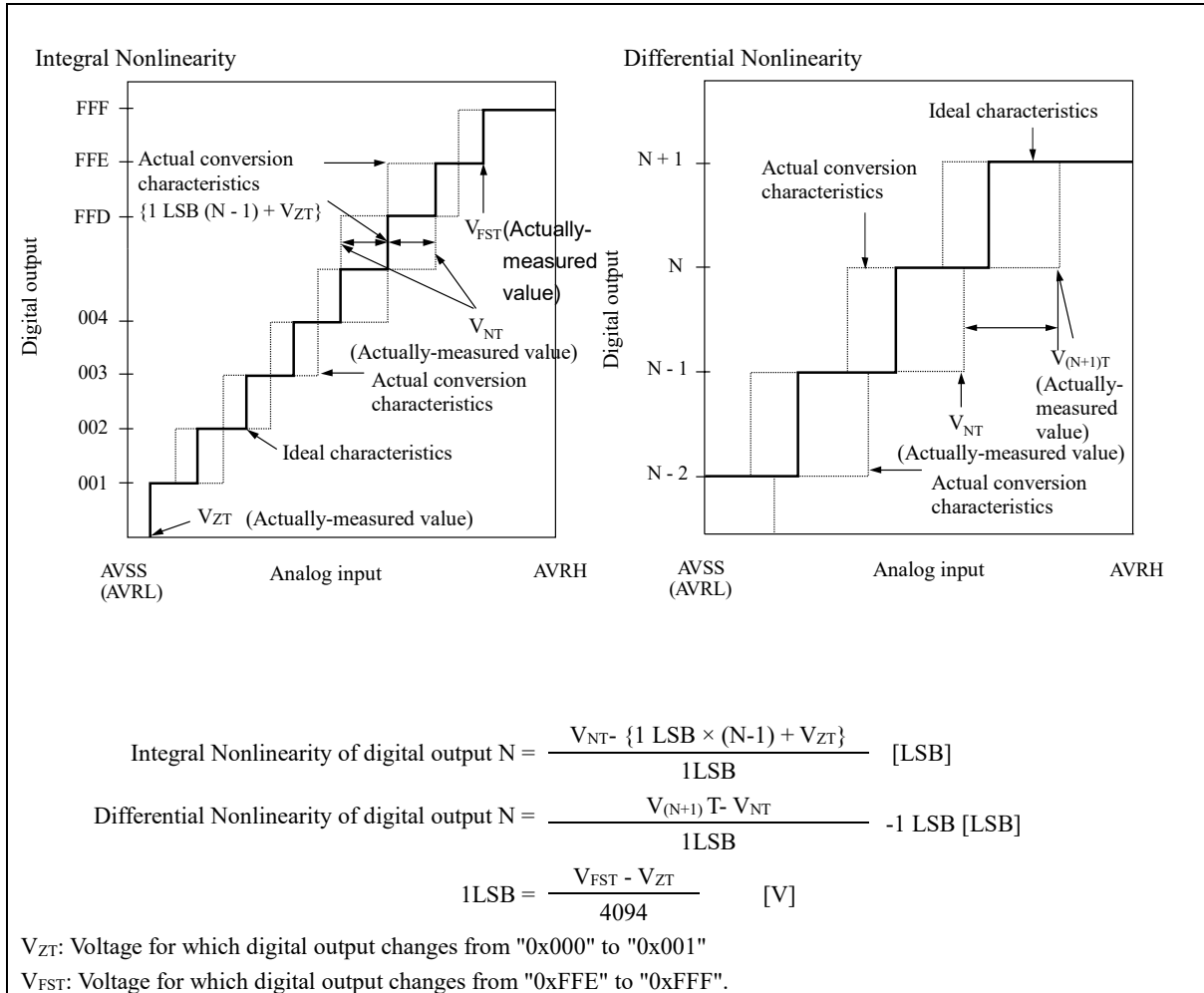
Differential Nonlinearity error: Deviation from the ideal value of the input voltage required for changing the output code by 1 LSB

Total error: Difference between the actual value and the theoretical value. The total error includes zero transition error, full-scale transition error, and non linearity error.

\*: Represented as "Linearity error" in the former product series.







## 10.12 Flash Memory

| Parameter                                          | Value                                                  |     |      | Unit | Remarks                                                                                        |
|----------------------------------------------------|--------------------------------------------------------|-----|------|------|------------------------------------------------------------------------------------------------|
|                                                    | Min                                                    | Typ | Max  |      |                                                                                                |
| Sector erase time                                  | -                                                      | 300 | 1100 | ms   | 8-KB sector* <sup>1</sup><br>Internal preprogramming time included                             |
|                                                    | -                                                      | 800 | 3700 | ms   | 64-KB sector* <sup>1</sup><br>Internal preprogramming time included                            |
| 8-bit write time                                   | -                                                      | 15  | 288  | μs   | System-level overhead time excluded* <sup>1</sup>                                              |
| 16-bit write time                                  | -                                                      | 19  | 384  | μs   | System-level overhead time excluded* <sup>1</sup>                                              |
| 32-bit write time                                  | -                                                      | 27  | 567  | μs   | System-level overhead time excluded* <sup>1</sup>                                              |
| 64-bit write time                                  | -                                                      | 45  | 945  | μs   | System-level overhead time excluded* <sup>1</sup>                                              |
| 8-bit (with ECC) write time                        | -                                                      | 19  | 384  | μs   | System-level overhead time excluded* <sup>1</sup>                                              |
| 16-bit (with ECC) write time                       | -                                                      | 23  | 483  | μs   | System-level overhead time excluded* <sup>1</sup>                                              |
| 32-bit (with ECC) write time                       | -                                                      | 31  | 651  | μs   | System-level overhead time excluded* <sup>1</sup>                                              |
| 64-bit (with ECC) write time                       | -                                                      | 49  | 1029 | μs   | System-level overhead time excluded* <sup>1</sup>                                              |
| Erase count* <sup>2</sup> /<br>Data retention time | 1,000/20 years,<br>10,000/10 years,<br>100,000/5 years | -   | -    | -    | Temperature at write/erase time<br>Average temperature T <sub>A</sub> = +85<br>degrees Celsius |

\*<sup>1</sup>: Guaranteed value for up to 100,000 erases

\*<sup>2</sup>: Number of erases for each sector

### Notes:

- While the Flash memory is written or erased, shutdown of the external power (V<sub>CC</sub>) is prohibited.
- In the application system where V<sub>CC</sub> might be shut down while writing or erasing, be sure to turn the power off by using an external low-voltage detection function.
- To put it concretely, after the external power supply voltage falls below the detection voltage (V<sub>DL</sub>), hold V<sub>CC</sub> at 2.7 V or more within the duration calculated by the following expression:

$$T_d^{*1} [\mu s] + (1 / F_{CRF}^{*2} [MHz]) \times 1029 + 25 [\mu s]$$

\*<sup>1</sup>: See "10.8 Low-voltage detection (external low-voltage detection)"

\*<sup>2</sup>: See "10.4.1 Source clock timing"

## 11. Ordering Information

| Part Number       | Package                        |
|-------------------|--------------------------------|
| S6J311xHzCSEy0000 | 144-pin Plastic TEQFP (LEU144) |

### Note:

- "x"/"y" is a part number option. For the part number option, see the following table.  
For details on each package, see "PACKAGE DIMENSIONS."

\* z: A

## 12. Part Number Option

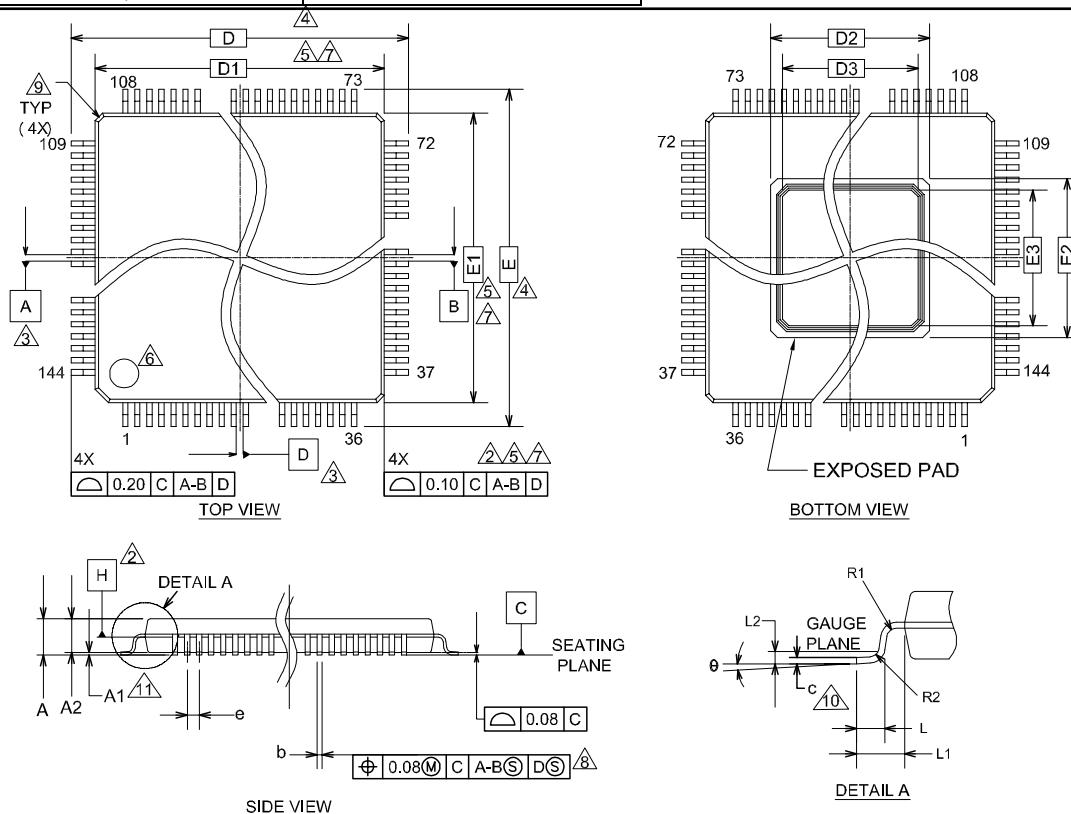
| Part Number Option<br>"x" | FLASH Memory |
|---------------------------|--------------|
| A                         | 1 MByte      |
| 9                         | 768 KByte    |

| Part Number Option<br>"y" |                       |
|---------------------------|-----------------------|
| 2                         | PureSn & Halogen Free |

| Part Number Option<br>"z" | SHE    |
|---------------------------|--------|
| A                         | SHE ON |

### 13. Package Dimensions

| Package Type | Package Code |
|--------------|--------------|
| Ex-LQFP 144  | LEU144       |



| SYMBOL | DIMENSIONS |      |      |
|--------|------------|------|------|
|        | MIN.       | NOM. | MAX. |
| A      | —          | —    | 1.70 |
| A1     | 0.05       | —    | 0.15 |
| A2     | 1.35       | 1.40 | 1.45 |
| D      | 22.00 BSC. |      |      |
| D1     | 20.00 BSC. |      |      |
| D2     | 7.05 BSC.  |      |      |
| D3     | 5.85 BSC.  |      |      |
| E      | 22.00 BSC. |      |      |
| E1     | 20.00 BSC. |      |      |
| E2     | 7.05 BSC.  |      |      |
| E3     | 5.85 BSC.  |      |      |

| SYMBOL | DIMENSIONS |      |      |
|--------|------------|------|------|
|        | MIN.       | NOM. | MAX. |
| b      | 0.17       | 0.22 | 0.27 |
| e      | 0.50 BSC.  |      |      |
| R 1    | 0.08       | —    | —    |
| R 2    | 0.08       | —    | 0.20 |
| θ      | 0°         | 4°   | 8°   |
| c      | 0.12       | —    | 0.20 |
| L      | 0.45       | 0.60 | 0.75 |
| L 1    | 1.00 REF.  |      |      |
| L 2    | 0.25       |      |      |

## NOTES :

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DATUM PLANE H IS LOCATED AT THE BOTTOM OF THE MOLD PARTING LINE COINCIDENT WITH WHERE THE LEAD EXITS THE BODY.
3. DATUMS A-B AND D TO BE DETERMINED AT DATUM PLANE H.
4. TO BE DETERMINED AT SEATING PLANE C.
5. DIMENSIONS D1 AND E1 DO NOT INCLUDE MOLD PROTRUSION. ALLOWABLE PROTRUSION IS 0.25mm PRE SIDE. DIMENSIONS D1 AND E1 INCLUDE MOLD MISMATCH AND ARE DETERMINED AT DATUM PLANE H.
6. DETAILS OF PIN 1 IDENTIFIER ARE OPTIONAL BUT MUST BE LOCATED WITHIN THE ZONE INDICATED.
7. REGARDLESS OF THE RELATIVE SIZE OF THE UPPER AND LOWER BODY SECTIONS, DIMENSIONS D1 AND E1 ARE DETERMINED AT THE LARGEST FEATURE OF THE BODY EXCLUSIVE OF MOLD FLASH AND GATE BURRS, BUT INCLUDING ANY MISMATCH BETWEEN THE UPPER AND LOWER SECTIONS OF THE MOLDER BODY.
8. DIMENSION b DOES NOT INCLUDE DAMBAR PROTRUSION. THE DAMBAR PROTRUSION(S) SHALL NOT CAUSE THE LEAD WIDTH TO EXCEED b MAXIMUM BY MORE THAN 0.08mm. DAMBAR CANNOT BE LOCATED ON THE LOWER RADIUS OR THE LEAD FOOT.
9. EXACT SHAPE AND SIZE OF THIS FEATURE IS OPTIONAL.
10. THESE DIMENSIONS APPLY TO THE FLAT SECTION OF THE LEAD BETWEEN 0.10mm AND 0.25mm FROM THE LEAD TIP.
11. A1 IS DEFINED AS THE DISTANCE FROM THE SEATING PLANE TO THE LOWEST POINT OF THE PACKAGE BODY.

002-10858 \*A

PACKAGE OUTLINE, 144 LEAD TEQFP  
20,0X20,0X1,7 MM LEU144

## 14. Errata

This section describes the errata for the S6J3110 Series. Details include errata trigger conditions, scope of impact, available workarounds, and silicon revision applicability. Contact your local Cypress Sales Representative if you have questions.

### Part Numbers Affected

| Part Number       |
|-------------------|
| S6J311AHACSE20000 |
| S6J3119HACSE20000 |

### S6J3110 Qualification Status

Product Status: Production

### Errata Summary

The following table defines the errata applicability to available S6J3110 Series devices.

| Items                                                                                                                                                    | Part Number                            | Fix Status             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------|
| 1. MCAN Wrong Message Transmission                                                                                                                       | S6J311AHACSE20000<br>S6J3119HACSE20000 | No silicon fix planned |
| 2. CAN FD controller message order inversion when transmitting from dedicated Tx Buffers configured with same Message ID                                 |                                        |                        |
| 3. CAN FD: Incomplete description of Dedicated Tx Buffers and Tx Queue related to transmission from multiple buffers configured with the same Message ID |                                        |                        |

#### 1. MCAN Wrong Message Transmission

##### ■ Problem Definition

There is a possibility a message with an ID (arbitration field) and a format and DLC (control field) is transmitted which was not configured by the application. The message itself is syntactically correct and can be received by other nodes.

The occurrence of the limitation requires a certain relationship in time between a transmission request for sending a message and the coincidence of noise in the 3rd bit of intermission field which is treated as the start of new message transmission (SoF).

##### ■ Trigger Condition

Under the following conditions a message with wrong ID, format and DLC is transmitted:

- M\_CAN is in state "Receiver" (PSR.ACT = "10"), no pending transmission.
- A new transmission is requested after sample point of 2nd bit of intermission but before the 3rd bit of Intermission is reached.
- The CAN bus is sampled dominant at the third bit of Intermission which is treated as SoF (see ISO11898-1:2015 Section 10.4.2.2).

##### ■ Scope of Impact

Under the conditions listed above it may happen, that:

- The shift register is not loaded with ID, format, and DLC of the requested message.
- The M\_CAN will start arbitration with wrong ID, format, and DLC.
- In case the ID won arbitration, a CAN message with valid CRC is transmitted.

- In case this message is acknowledged, the ID stored in the Tx Event FIFO is the ID of the requested Tx message and not the ID of the message transmitted on the CAN bus
- Neither an error is detected by the transmitting node nor at the receiving node.

#### ■ Workaround

##### Workaround 1:

This workaround avoids submitting a transmission request in the critical time window of about one bit time before the sample point of the 3<sup>rd</sup> bit of intermission field when on other pending transmission request exists:

- Request a new transmission if another transmission is already pending or when the M\_CAN / M\_TTCAN is not in state "Receiver" (when PSR.ACT ≠ "10").
- If no pending transmission request exists, the application software needs to evaluate the Rx Interrupt flags IR.DRX, IR.RF0N, IR.RF1N which are set at the last bit of EoF when a received and accepted message gets valid.
- A new transmission may be requested by writing to TXBAR once the Rx interrupt occurred and the application waited another 3 bit times before submitting its Tx request. Note the Rx interrupt is generated at the last bit of EoF which is followed by three bits of Intermission.
- The application has to take care that the transmission request for the CAN Protocol Controller is activated before the critical window of the following reception is reached.

A supplemental action can be applied in order to detect messages which contain wrong ID and control field information:

- A checksum covering arbitration and control fields can be added to the data field of the message to be transmitted, to detect frames transmitted with wrong arbitration and control fields.

##### Workaround 2:

This workaround ensures that always at least one pending Tx request exists. If that is the case, the application may launch its Tx requests at any time without suffering from the limitation.

- Define a low priority message with DLC = 0 that can be sent without harm. E.g. loses arbitration against all other application messages, does not pass any acceptance filter of nodes in the same network. DLC = 0 shall reduce latency for other application messages.
- Configure sufficient Tx buffers – at least two - for this message type thus that there is always another one waiting to be sent. E.g. an application that cannot react quickly enough with the time a single message of this type is sent, more than 2 Tx buffer may become necessary.
- The application uses the standard interfaces of the CAN / CAN FD stack to feed these messages.
- Whenever Tx confirmation is indicated for the second but last message of this type with pending Tx request, the application needs to submit at least one new Tx request. Note Tx confirmation is a standard feature in the AUTOSAR SW architecture.
- Before initially leaving INIT state of the M\_CAN IP by clearing CCCR.INIT bit, make sure to activate a Tx request after having cleared CCCR.CCE. This will ensure that the conditions for the occurrence of the limitation when synchronizing to the CAN bus the first time after RESET are prevented.

#### ■ Fix Status

No silicon fix planned

## **2. CAN FD controller message order inversion when transmitting from dedicated Tx Buffers configured with same Message ID**

### **■ Problem Definition**

CAN FD controller message order inversion when multiple Tx Buffers that are configured with the same Message ID have pending Tx requests.

### **■ Configuration**

Several Tx Buffers are configured with the same Message ID. Transmission of these Tx Buffers is requested sequentially with a delay between the individual Tx requests.

### **■ Expected behavior**

When multiple Tx Buffers that are configured with the same Message ID have pending Tx requests, they shall be transmitted in ascending order of their Tx Buffer numbers. The Tx Buffer with lowest buffer number and pending Tx request is transmitted first.

### **■ Observed behavior**

It may happen, depending on the delay between the individual Tx requests, that where multiple Tx Buffers are configured with the same Message ID the Tx Buffers are not transmitted in order of the Tx Buffer number (lowest number first).

### **■ Workaround**

First, write the group of Tx messages with the same Message ID to the Message RAM and then request transmission of all these messages concurrently by a single write access to TXBAR. Before requesting a group of Tx messages with this Message ID, ensure that no message with this Message ID has a pending Tx request.

Applications not able to use the above workaround can implement a counter within the data section of their messages sent with same ID in order to allow the recipients to determine the correct sending sequence.

### **■ Fix Status**

No silicon fix planned

## **3. CAN FD: Incomplete description of Dedicated Tx Buffers and Tx Queue related to transmission from multiple buffers configured with the same Message ID**

### **■ Problem Definition**

There was an incomplete description related to transmission from multiple buffers configured with the same Message ID in Section 3.5.2 Dedicated Tx Buffers and Section 3.5.4 Tx Queue of the Hardware Manual..

### **■ Detailed explanation**

The following is the updated description in Section 3.5.2 Dedicated Tx Buffers and Section 3.5.4 Tx Queue of the Hardware Manual.

#### **Section 3.5.2 Dedicated Tx Buffers:**

- Original content in the hardware manual:

In case that multiple Tx Buffers are configured with the same Message ID, the Tx Buffer with the lowest buffer number is transmitted first.

- Enhancement:

These Tx buffers shall be requested in ascending order with the lowest buffer number first. Alternatively, all Tx buffers configured with the same Message ID can be requested simultaneously by a single write access to TXBAR.

#### **Section 3.5.4 Tx Queue:**

- Original content in the Hardware Manual:

In case that multiple Queue Buffers are configured with the same Message ID, the Queue Buffer with the lowest buffer number is transmitted first.

- Replacement:

In case that multiple Tx Queue buffers are configured with the same Message ID, the transmission order depends on numbers of the buffers where the messages were stored for transmission. As these buffer numbers depend on the then current states of the PUT index, a prediction of the transmission order is not possible.

- Original content in the Hardware Manual:

An Add Request cyclically increments the Put Index to the next free Tx Buffer.

- Replacement:

The Put Index always points to that free buffer of the Tx Queue with the lowest buffer number.

■ **Workaround**

In case a defined order of transmission is required the Tx FIFO shall be used for transmission of messages with the same Message ID. Alternatively dedicated Tx buffers with same Message ID shall be requested in ascending order with lowest buffer number first or by a single write access to TXBAR. Alternatively, a single Tx Buffer can be used to transmit those messages one after the other.

■ **Fix Status**

No silicon fix planned. Use workaround.

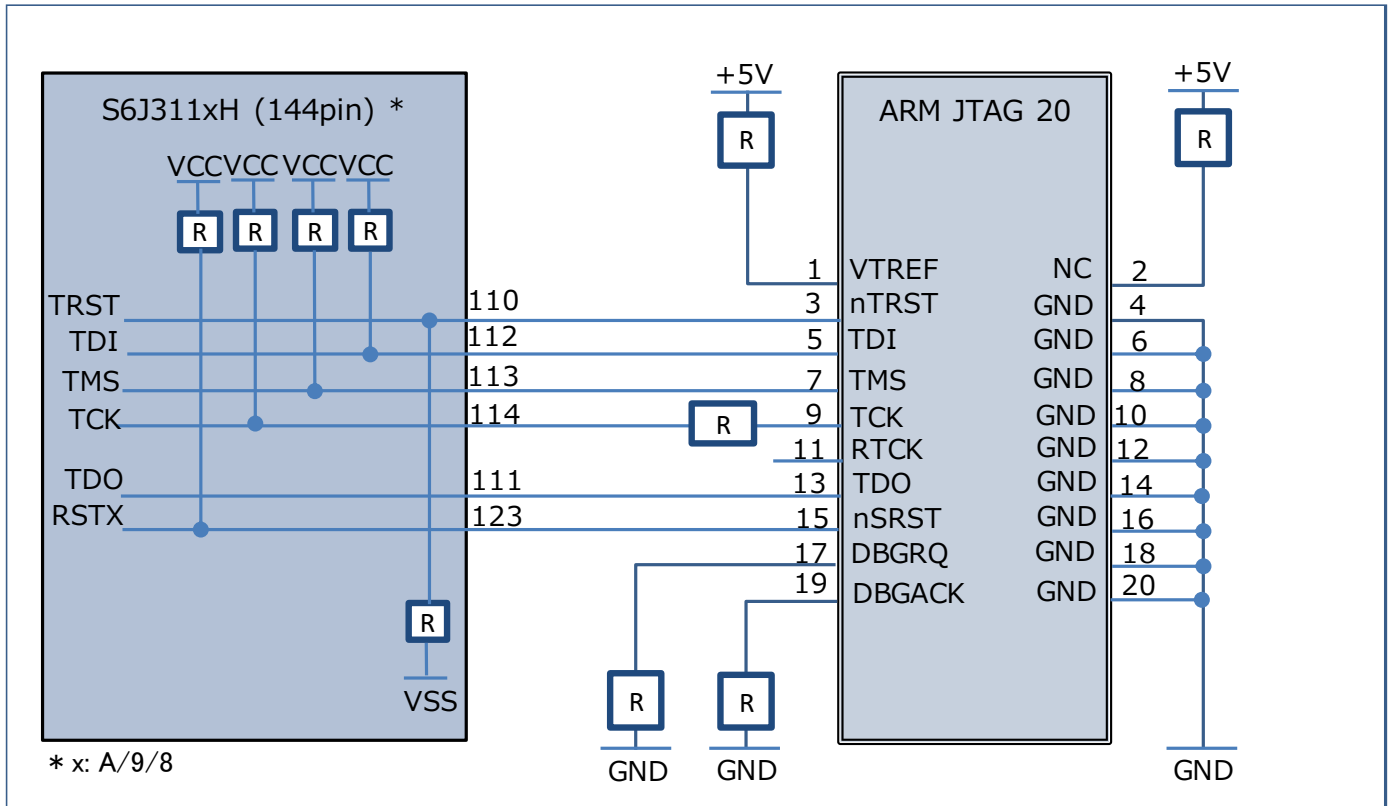
Hardware Manual will be updated accordingly.



## 15. Appendix

### 15.1 Application 1: JTAG tool connection

This is an application example of JTAG tool connection. See the relevant application note AN203911 in detail.



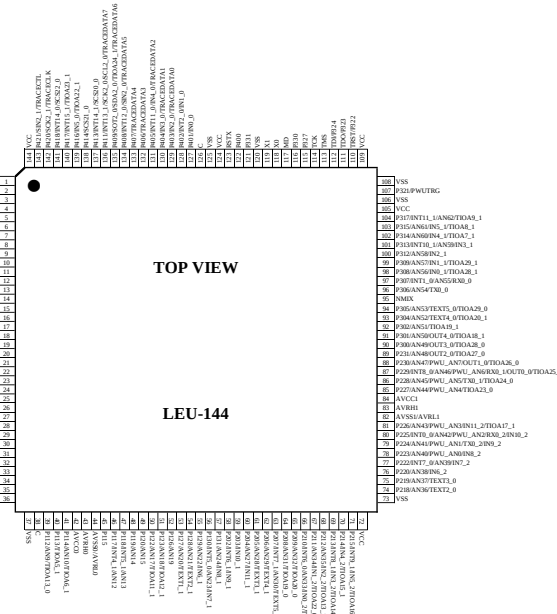
## 16. Major Changes

Spanision Publication Number: S6J311A\_DS708-00004

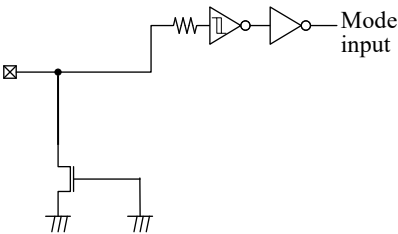
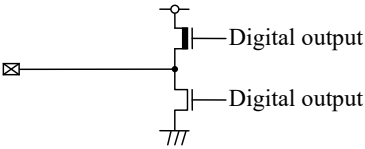
| Page         | Section                                                                 | Change Results                                                                                                             |
|--------------|-------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| Revision 0.1 |                                                                         |                                                                                                                            |
| -            | -                                                                       | Initial release                                                                                                            |
| Revision 1.0 |                                                                         |                                                                                                                            |
| 1,3          | Cover                                                                   | Added the family product names(S6J3119HAA / S6J3118HAA)                                                                    |
| 1,3          | Cover                                                                   | Revised the level of this data sheet as full production                                                                    |
| 6            | 2. Features<br>2.2 Peripheral Functions                                 | Added the information about the memory capacity expansion                                                                  |
| 7            | 2. Features<br>2.2 Peripheral Functions                                 | Revised the CAN transfer speed to 5Mbps                                                                                    |
| 9            | 3. Product Lineup                                                       | Added the specifications as full production                                                                                |
| 11           | 4. Pin Assignment                                                       | Revised the product names of title S6J311AHAA-> S6J311xHAA                                                                 |
| 12           | 5. Pin Description                                                      | Revised the product names of title S6J311AHAA-> S6J311xHAA                                                                 |
| 12~21        | 5. Pin Description                                                      | Revised the product names of Pin No. S6J311AHAA-> S6J311xHAA                                                               |
| 30           | 8. Handling Devices                                                     | Revised the note of "About power supply pins"                                                                              |
| 32           | 8. Handling Devices                                                     | Revised the note of "About C pin processing"(Delete "and pin 38")                                                          |
| 33           | 9. Block Diagram                                                        | Revised the block diagram of S6J311xHAA as full production                                                                 |
| 34           | 10. Memory Map                                                          | Revised the memory map of S6J311xHAA<br>(added information of S6J3119HAA / S6J3118HAA)                                     |
| 36           | 10.Memory Map                                                           | Revised the product names of title S6J311AHAA-> S6J311xHAA                                                                 |
| 42,44,52,55  | 12. Electrical Characteristics                                          | Added the product names S6J311AHAA-> S6J311xHAA                                                                            |
| 42           | 12. Electrical Characteristics<br>12.1 Absolute Maximum Ratings         | Revised "Remarks" of Analog supply voltage to "AV <sub>CC</sub> =V <sub>CC</sub> "                                         |
| 42           | 12. Electrical Characteristics<br>12.1 Absolute Maximum Ratings         | Revised the note of *2                                                                                                     |
| 42           | 12. Electrical Characteristics<br>12.1 Absolute Maximum Ratings         | Revised the symbol of Maximum clamp current                                                                                |
| 43           | 12. Electrical Characteristics<br>12.1 Absolute Maximum Ratings         | Moved the note of *8 to the bottom of note                                                                                 |
| 44           | 12. Electrical Characteristics<br>12.2 Recommended Operating Conditions | Delete the information about CS2                                                                                           |
| 44           | 12. Electrical Characteristics<br>12.2 Recommended Operating Conditions | Revised C pin connection diagram                                                                                           |
| 44           | 12. Electrical Characteristics<br>12.2 Recommended Operating Conditions | Added "Remarks" of Smoothing capacitor                                                                                     |
| 45           | 12. Electrical Characteristics<br>12.3 DC Characteristics               | Revised the minimum value of VIH6<br>2.0 -> 2.3                                                                            |
| 52           | 12. Electrical Characteristics<br>12.3 DC Characteristics               | Revised the following DC characteristics<br>I <sub>CC5</sub> , I <sub>CCS5</sub> , I <sub>CCT52</sub> , I <sub>CCH52</sub> |
| 55           | 12. Electrical Characteristics<br>12.4.2 Internal Clock Timing          | Revised the product names in the table S6J311AHAA-> S6J311xHAA                                                             |
| 55           | 12. Electrical Characteristics<br>12.4.2 Internal Clock Timing          | Delete the line of FCD0_CLK and tCD0_CLK                                                                                   |
| 57           | 12. Electrical Characteristics<br>12.4.2 Internal Clock Timing          | Revised the note as follow<br>FCD0_CLK->FCPU_CLK                                                                           |
| 58           | 12. Electrical Characteristics<br>12.4.2 Internal Clock Timing          | Revised the voltage value of Hysteresis input pin (TTL).<br>2.0V -> 2.3V                                                   |
| 60           | 12. Electrical Characteristics<br>12.4.4 Power-on Conditions            | Revised the value of Level detection voltage                                                                               |
| 60           | 12. Electrical Characteristics<br>12.4.4 Power-on Conditions            | Added the line of Level release voltage                                                                                    |

| Page        | Section                                                                      | Change Results                                                                                                                                                                                                                                                                                                                                                      |
|-------------|------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 75          | 12. Electrical Characteristics<br>12.4.5.1 CSIO Timing<br>(SMR:MD[2:0]=010B) | Added the Figure of 5-1-7(1st, 2nd, 3rd)                                                                                                                                                                                                                                                                                                                            |
| 82          | 12. Electrical Characteristics<br>12.6 Trigger Input Timing                  | Deleted the following pin names in the table of "Input pulse width" and figure of "Trigger input timing"<br>"RX0", "RXx"                                                                                                                                                                                                                                            |
| 86          | 12. Electrical Characteristics<br>12.11.1 Electrical Characteristics         | Revised the value of "Analog port input current" in the table, and revised the pin name note *7 to *9                                                                                                                                                                                                                                                               |
| 86          | 12. Electrical Characteristics<br>12.11.1 Electrical Characteristics         | Revised the pin name note of "Variation between channels"<br>*7 -> *10                                                                                                                                                                                                                                                                                              |
| 89          | 12. Electrical Characteristics<br>12.11.3 Definition of Terms                | Revised the note of "Total error"                                                                                                                                                                                                                                                                                                                                   |
| 91          | 12. Electrical Characteristics<br>12.12 Definition of Terms                  | Deleted the note *3                                                                                                                                                                                                                                                                                                                                                 |
| 92          | 13. Ordering Information                                                     | Revised the note of "Package"                                                                                                                                                                                                                                                                                                                                       |
| 92          | 14. Part Number Option                                                       | Added the part number options as full production                                                                                                                                                                                                                                                                                                                    |
| Revision *A |                                                                              |                                                                                                                                                                                                                                                                                                                                                                     |
| 1           | Features<br>Cortex-R5 Core                                                   | Revised the following note<br>(Error)<br>ECC support for the TCM ports<br>(Correct)<br>ECC support for the TCM ports for RAM                                                                                                                                                                                                                                        |
| 1           | Features<br>Peripheral Functions                                             | Revised the full production and SHE-OFF series as follows:<br>(Correct)<br>Built-in flash memory size<br>-Program: 1024 K + 64 KB (S6J311AHzB*) / 768 K + 64 KB (S6J3119HzB*) / 512 K + 64 KB (S6J3118HzB*)<br>-Work: 48 KB (S6J311AHzB*) / 48 KB (S6J3119HzB*) / 48 KB (S6J3118HzB*)<br>*z: A/B                                                                    |
| 1           | Features<br>Peripheral Functions                                             | Revised the full production and SHE-OFF series as follows:<br>(Correct)<br>Built-in RAM size<br>-TCRAM 64 KB (S6J311AHzB*) / 48 KB (S6J3119HzB*) / 32 KB (S6J3118HzB*)<br>-System SRAM 16 KB (S6J311AHzB*) / 16 KB (S6J3119HzB*) / 16 KB (S6J3118HzB*)<br>-Backup RAM 8 KB (S6J311AHzB*) / Backup RAM 8 KB (S6J3119HzB*) / Backup RAM 8 KB (S6J3118HzB*)<br>*z: A/B |
| 1           | Features<br>Peripheral Functions                                             | Revised the full production and SHE-OFF series as follows:<br>(Correct)<br>General-purpose ports: 116 channels (S6J311AHzB*) / 116 channels (S6J3119HzB*) / 116 channels (S6J3118HzB*)<br>*z: A/B                                                                                                                                                                   |
| 1           | Features<br>Peripheral Functions                                             | Revised the full production and SHE-OFF series as follows:<br>(Correct)<br>A/D converter (successive approximation type)<br>12-bit resolution, 2 units mounted: Max 56 channels (25 channels + 31 channels) (S6J311AHzB*) / Max 56 channels (25 channels + 31 channels) (S6J3119HzB*) / Max 56 channels (25 channels + 31 channels) (S6J3118HzB*)<br>*z: A/B        |
| 1           | Features<br>Peripheral Functions                                             | Revised the full production and SHE-OFF series as follows:<br>(Correct)<br>Multi-function serial (transmission and reception FIFOs mounted) :Max 4 channels (S6J311AHzB*) / Max 4 channels (S6J3119HzB*) / Max 4 channels (S6J3118HzB*)<br>*z: A/B                                                                                                                  |

| Page           | Section                                                                  | Change Results                                                                                                                                                                                                                                                              |  |             |             |                |    |     |
|----------------|--------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------|-------------|----------------|----|-----|
| 1              | FEATURES<br>Peripheral Functions                                         | Added the following function lists:<br><I <sup>2</sup> C><br>- Full-duplex double buffering system, 64-byte transmission FIFO, 64-byte reception FIFO.<br>-Standard mode ( Max. 100kbps ) is supported only.<br>-DMA transfer is supported                                  |  |             |             |                |    |     |
| 2              | FEATURES<br>Peripheral Functions<br>CAN controller: CAN-FD Max 1 channel | Added the following function list:<br>-32 message buffer/channel (transmission message buffer size)                                                                                                                                                                         |  |             |             |                |    |     |
| 2              | Features<br>Peripheral Functions                                         | Revised the full production and SHE-OFF series as follows:<br>(Correct)<br>-Package: LEU144 (S6J311xHzB*)<br>*z: A/B                                                                                                                                                        |  |             |             |                |    |     |
| 2              | Features<br>Peripheral Functions                                         | Added "-Partial wakeup function"                                                                                                                                                                                                                                            |  |             |             |                |    |     |
| 4              | 1. Product Lineup                                                        | Revised the full production and SHE-OFF series of "Table 3-1 Memory Size"<br>(Error)<br>S6J311AHAA                      S6J3119HAA                      S6J3118HAA<br>(Correct)<br>S6J311AHzB*                      S6J3119HzB*                      S6J3118HzB*<br>*z: A/B |  |             |             |                |    |     |
| 4              | 1. Product Lineup                                                        | Added Table 3-2. SHE option as follows:<br>Table 1-2. SHE option<br><table border="1"> <tr> <td></td><td>S6J311xHAB*</td><td>S6J311xHBB*</td></tr> <tr> <td>Security (SHE)</td><td>ON</td><td>OFF</td></tr> </table> * x: A/9/8                                             |  | S6J311xHAB* | S6J311xHBB* | Security (SHE) | ON | OFF |
|                | S6J311xHAB*                                                              | S6J311xHBB*                                                                                                                                                                                                                                                                 |  |             |             |                |    |     |
| Security (SHE) | ON                                                                       | OFF                                                                                                                                                                                                                                                                         |  |             |             |                |    |     |
| 4              | 1. Product Lineup                                                        | Revised the full production and SHE-OFF series of "Table 1-3: Product Lineup"<br>(Error)<br>S6J311xHAA<br>(Correct)<br>S6J311xHzB*<br>* x: A/9/8, z: A/B                                                                                                                    |  |             |             |                |    |     |
| 5              | 1.Product Lineup                                                         | Added "Partial wakeup function"                                                                                                                                                                                                                                             |  |             |             |                |    |     |

| Page    | Section            | Change Results                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |        |                                               |       |        |                                                |        |        |                                               |        |        |                                                |        |        |                                               |        |        |                                                |         |        |                                               |         |        |                                                |
|---------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|-----------------------------------------------|-------|--------|------------------------------------------------|--------|--------|-----------------------------------------------|--------|--------|------------------------------------------------|--------|--------|-----------------------------------------------|--------|--------|------------------------------------------------|---------|--------|-----------------------------------------------|---------|--------|------------------------------------------------|
| 6       | 2. Pin Assignment  | <p>Revised "Figure 2-1 Pin Assignment for S6J311xHzB*" as follows.<br/>(Correct)<br/>* x: A/9/8, z: A/B</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |        |                                               |       |        |                                                |        |        |                                               |        |        |                                                |        |        |                                               |        |        |                                                |         |        |                                               |         |        |                                                |
| 7       | 3. Pin Description | <p>Revised the tables as follows for full production.<br/>(Correct)<br/>Table 3-1 S6J311xHzB* Pin Functions<br/>* x: A/9/8, z: A/B</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |       |        |                                               |       |        |                                                |        |        |                                               |        |        |                                                |        |        |                                               |        |        |                                                |         |        |                                               |         |        |                                                |
| 7 to 13 | 3. Pin Description | <p>Added the I2C function to Pin 6,7,18,19,25,28,135,136.</p> <table> <tr> <td>Pin 6</td><td>SDA3_0</td><td>I<sup>2</sup>C bus ch.3 serial data I/O pin</td></tr> <tr> <td>Pin 7</td><td>SCL3_0</td><td>I<sup>2</sup>C bus ch.3 serial clock I/O pin</td></tr> <tr> <td>Pin 18</td><td>SDA0_0</td><td>I<sup>2</sup>C bus ch.0 serial data I/O pin</td></tr> <tr> <td>Pin 19</td><td>SCL0_0</td><td>I<sup>2</sup>C bus ch.0 serial clock I/O pin</td></tr> <tr> <td>Pin 25</td><td>SDA1_0</td><td>I<sup>2</sup>C bus ch.1 serial data I/O pin</td></tr> <tr> <td>Pin 28</td><td>SCL1_0</td><td>I<sup>2</sup>C bus ch.1 serial clock I/O pin</td></tr> <tr> <td>Pin 135</td><td>SDA2_0</td><td>I<sup>2</sup>C bus ch.2 serial data I/O pin</td></tr> <tr> <td>Pin 136</td><td>SCL2_0</td><td>I<sup>2</sup>C bus ch.2 serial clock I/O pin</td></tr> </table> | Pin 6 | SDA3_0 | I <sup>2</sup> C bus ch.3 serial data I/O pin | Pin 7 | SCL3_0 | I <sup>2</sup> C bus ch.3 serial clock I/O pin | Pin 18 | SDA0_0 | I <sup>2</sup> C bus ch.0 serial data I/O pin | Pin 19 | SCL0_0 | I <sup>2</sup> C bus ch.0 serial clock I/O pin | Pin 25 | SDA1_0 | I <sup>2</sup> C bus ch.1 serial data I/O pin | Pin 28 | SCL1_0 | I <sup>2</sup> C bus ch.1 serial clock I/O pin | Pin 135 | SDA2_0 | I <sup>2</sup> C bus ch.2 serial data I/O pin | Pin 136 | SCL2_0 | I <sup>2</sup> C bus ch.2 serial clock I/O pin |
| Pin 6   | SDA3_0             | I <sup>2</sup> C bus ch.3 serial data I/O pin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |        |                                               |       |        |                                                |        |        |                                               |        |        |                                                |        |        |                                               |        |        |                                                |         |        |                                               |         |        |                                                |
| Pin 7   | SCL3_0             | I <sup>2</sup> C bus ch.3 serial clock I/O pin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |        |                                               |       |        |                                                |        |        |                                               |        |        |                                                |        |        |                                               |        |        |                                                |         |        |                                               |         |        |                                                |
| Pin 18  | SDA0_0             | I <sup>2</sup> C bus ch.0 serial data I/O pin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |        |                                               |       |        |                                                |        |        |                                               |        |        |                                                |        |        |                                               |        |        |                                                |         |        |                                               |         |        |                                                |
| Pin 19  | SCL0_0             | I <sup>2</sup> C bus ch.0 serial clock I/O pin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |        |                                               |       |        |                                                |        |        |                                               |        |        |                                                |        |        |                                               |        |        |                                                |         |        |                                               |         |        |                                                |
| Pin 25  | SDA1_0             | I <sup>2</sup> C bus ch.1 serial data I/O pin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |        |                                               |       |        |                                                |        |        |                                               |        |        |                                                |        |        |                                               |        |        |                                                |         |        |                                               |         |        |                                                |
| Pin 28  | SCL1_0             | I <sup>2</sup> C bus ch.1 serial clock I/O pin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |        |                                               |       |        |                                                |        |        |                                               |        |        |                                                |        |        |                                               |        |        |                                                |         |        |                                               |         |        |                                                |
| Pin 135 | SDA2_0             | I <sup>2</sup> C bus ch.2 serial data I/O pin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |        |                                               |       |        |                                                |        |        |                                               |        |        |                                                |        |        |                                               |        |        |                                                |         |        |                                               |         |        |                                                |
| Pin 136 | SCL2_0             | I <sup>2</sup> C bus ch.2 serial clock I/O pin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |        |                                               |       |        |                                                |        |        |                                               |        |        |                                                |        |        |                                               |        |        |                                                |         |        |                                               |         |        |                                                |

| Page | Section            | Change Results                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
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| 11   | 3. Pin Description | <p>Added the Partial wakeup function from Pin 78to Pin 81, and from Pin 85 to Pin88.</p> <p>78<br/>AN40                      ADC analog 40 input pin<br/>PWU_AN0                Partial wakeup ADC analog 0 input pin</p> <p>79<br/>AN41                      ADC analog 41 input pin<br/>PWU_AN1                Partial wakeup ADC analog 1 input pin</p> <p>80<br/>AN42                      ADC analog 42 input pin<br/>PWU_AN2                Partial wakeup ADC analog 2 input pin</p> <p>81<br/>AN43                      ADC analog 43 input pin<br/>PWU_AN3                Partial wakeup ADC analog 3 input pin</p> <p>85<br/>AN44                      ADC analog 44 input pin<br/>PWU_AN4                Partial wakeup ADC analog 4 input pin</p> <p>86<br/>AN45                      ADC analog 45 input pin<br/>PWU_AN5                Partial wakeup ADC analog 5 input pin</p> <p>87<br/>AN46                      ADC analog 46 input pin<br/>PWU_AN6                Partial wakeup ADC analog 6 input pin</p> <p>88<br/>AN47                      ADC analog 47 input pin<br/>PWU_AN7                Partial wakeup ADC analog 7 input pin</p> |
| 12   | 3.Pin Description  | <p>Revised the "I/O Circuit Type "and add PWUTRG to Pin 107 (Correct)</p> <p>107 P321                -    R    General-purpose output port<br/>PWUTRG                -            Partial wakeup trigger output pin</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

| Page | Section              | Change Results                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
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| 15   | 4. I/O Circuit Types | <p>Revised Type C of “I/O Circuit Type” as follows:<br/>(Correct)</p>                                                                                                                                                                                                                                                                                                            |
| 17   | 4. I/O Circuit Types | <p>Added Type R to “11. I/O Circuit Type”<br/>R</p>  <p>Output of 2 mA</p>                                                                                                                                                                                                                                                                                                       |
| 22   | 5.Handling Devices   | <p>Revised the following notice.<br/>(Error)<br/>About the Power-on Time<br/>To prevent the internal built-in voltage step-down circuit from malfunctioning, secure a voltage rising time of 50 <math>\mu</math>s (between 0.2 V and 2.7 V) or longer at the power-on time.<br/>(Correct)<br/>About the Power-on Time<br/>To prevent a malfunction of the voltage step-down circuit built in the device, the voltage rising must be monotonic during power-on.</p> |
| 22   | 5.Handling Devices   | <p>Revised the item as follows:<br/>(Error)<br/>This device has a built-in voltage step-down circuit. Be sure to connect a capacitor to the C pin (pin 126 in S6J311xHAA specifications)<br/>(Correct)<br/>This device has a built-in voltage step-down circuit. Be sure to connect a capacitor to the C pin (pin 126 in S6J311xHzB* specifications)<br/>*x: A/9/8, z: A/B</p>                                                                                     |
| 23   | 7.Block Diagram      | <p>Revised the title as follows:<br/>(Error)<br/>Figure 7-1 S6J311xHAA Block Diagram<br/>(Correct)<br/>Figure 7-1 S6J311xHzB* Block Diagram<br/>* x: A/9/8, z: A/B</p>                                                                                                                                                                                                                                                                                             |
| 23   | 7.Block Diagram      | Added “Partial Wake up” to “Block Diagram”                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 24   | 8.Memory Map         | <p>Revised Figure 8-1 as follows<br/>(Correct)<br/>Figure 8-1 Memory Map (S6J311AHzB/9HzB/8HzB*) * z: A/B</p>                                                                                                                                                                                                                                                                                                                                                      |
| 25   | 8.Memory Map         | <p>Added item as follows:<br/>“The ECC movement in TCM port is based on ECC setting inside the CPU.”</p>                                                                                                                                                                                                                                                                                                                                                           |

| Page      | Section                                                                 | Change Results                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                             |           |         |                             |     |           |           |         |              |     |           |           |  |          |   |
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| 26        | 8.Memory Map                                                            | Revised " S6J311xHAA Peripheral Map" as follows<br>(Correct)<br>S6J311xHzB* Peripheral Map<br>* x:A/9/8, z:A/B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                             |           |         |                             |     |           |           |         |              |     |           |           |  |          |   |
| 28        | 8.Memory Map                                                            | Added "Partial Wake Up" to address of "B484_8400 to B484_87FF". <table><tr><td>B484_8400</td><td>B484_87FF</td><td>APPS #5</td><td>A/D unit1 , Partial Wake Up</td><td>297</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | B484_8400                   | B484_87FF | APPS #5 | A/D unit1 , Partial Wake Up | 297 |           |           |         |              |     |           |           |  |          |   |
| B484_8400 | B484_87FF                                                               | APPS #5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | A/D unit1 , Partial Wake Up | 297       |         |                             |     |           |           |         |              |     |           |           |  |          |   |
| 28        | 8.Memory Map                                                            | Revised the memory map of APPS#5 as follows.<br>(Correct) <table><tr><td>B484_8C00</td><td>B484_8FFF</td><td></td><td>Reserved</td><td>-</td></tr><tr><td>B484_9000</td><td>B484_93FF</td><td>APPS #5</td><td>Global Timer</td><td>300</td></tr><tr><td>B484_9400</td><td>B484_FFFF</td><td></td><td>Reserved</td><td>-</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | B484_8C00                   | B484_8FFF |         | Reserved                    | -   | B484_9000 | B484_93FF | APPS #5 | Global Timer | 300 | B484_9400 | B484_FFFF |  | Reserved | - |
| B484_8C00 | B484_8FFF                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Reserved                    | -         |         |                             |     |           |           |         |              |     |           |           |  |          |   |
| B484_9000 | B484_93FF                                                               | APPS #5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Global Timer                | 300       |         |                             |     |           |           |         |              |     |           |           |  |          |   |
| B484_9400 | B484_FFFF                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Reserved                    | -         |         |                             |     |           |           |         |              |     |           |           |  |          |   |
| 28        | 8. Memory Map                                                           | Added the following comments and restriction under the table of "APPS#5 area"<br><br>When MPU attribute of Cortex-R5 is configured as "Normal", store buffer inside Cortex-R5 can operate and write data can be merged. To avoid influence of this data merger, MPU attribute "Device" or "Strongly Ordered" should be used.<br>MPU attribute "Device" or "Strongly Ordered" must be used for areas below, to avoid this influence.<br>– Backup RAM area (BACKUP_RAM) [0E80_0000 ~ 0E87_FFFF]<br>– Peripheral area (Peri area) [B000_0000 ~ B7FF_FFFF]<br>– Error Config area (ERRCFG) [FFFE_E000 ~ FFFE_FFFF]<br>MPU attribute "Device" or "Strongly Ordered" is required for accesses to areas below, in particular situation.<br>– FLASH Memory (when writing commands)<br>SHE OFF product is prohibited to access SHE area (B200_0000 to B20F_FFFF) |                             |           |         |                             |     |           |           |         |              |     |           |           |  |          |   |
| 29,30     | 9. Pin Status in CPU Status                                             | Added Pin name about I <sup>2</sup> C and PWU to Table 9-1 Pin State Table (1/2) and Table 9-2 Pin State Table (2/2).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                             |           |         |                             |     |           |           |         |              |     |           |           |  |          |   |
| 31        | 9. Pin Status in CPU Status                                             | Added the item as follows<br>*5: When the PWU function is enabled, a change to output occurs.<br>*7: When PPC_PCFGRIj:POF[2:0] is set to initial value.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                             |           |         |                             |     |           |           |         |              |     |           |           |  |          |   |
| 32,33     | 10. Electrical Characteristics<br>10.1 Absolute Maximum Ratings         | Revised "S6J311xHAA" to "S6J311xHzB"<br>Added "* x:A/9/8, z:A/B" to "*8".                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                             |           |         |                             |     |           |           |         |              |     |           |           |  |          |   |
| 34        | 10. Electrical Characteristics<br>10.2 Recommended Operating Conditions | Revised "S6J311xHAA" to "S6J311xHzB"<br>Added "* x: A/9/8, z: A/B".                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                             |           |         |                             |     |           |           |         |              |     |           |           |  |          |   |



| Page        | Section                                                                                                  | Change Results                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
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| 35          | 10. Electrical Characteristics<br>10.2 Recommended operating conditions                                  | <p>Added the following notes</p> <p>-The following condition should be satisfied in order to facilitate heat dissipation.</p> <p>1.4 or more layers PCB should be used.</p> <p>2.The area of PCB should be 114.3 mm x 76.2 mm or more, and the thickness should be 1.6 mm or more. (JEDEC standard)</p> <p>3.1 layer of middle layers at least should be used for dedicated layer to radiate heat with residual copper rate 90% or more. The layer can be used for system ground.</p> <p>4.35~50% of the die stage area which is exposed at back surface of package should be soldered to a part of 1st layer.</p> <p>5.The part of 1st layer should be connected to the dedicated heat radiation layer with more than 10 thermal via holes.</p> |
| 35          | 10. Electrical Characteristics<br>10.2 Recommended operating conditions                                  | <p>Added the following notes</p> <p>-Figure10.2-1 is a schematic diagram showing PCB in section.</p> <p>-Figure10.2-2 in the following pages are recommended land patterns for each package series. Thermal via holes should closely be placed and aligned with lands.</p> <p>-If you are considering application under any conditions other than listed herein, please contact sales representatives beforehand.</p>                                                                                                                                                                                                                                                                                                                            |
| 35,36       | 10. Electrical Characteristics<br>10.2 Recommended operating conditions                                  | <p>Added the following figures</p> <p>Figure 10.2-1: Example thermal via holes on PCB.</p> <p>Figure 10.2-2: Land Pattern and Thermal Via LEU144</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 41          | 10. Electrical Characteristics<br>10.3 DC Characteristics                                                | Deleted the pin name "P321" in Rup3 of Pull-up register.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 43          | 10. Electrical Characteristics<br>10.3 DC Characteristics                                                | Revised "S6J311xHAA" to "S6J311xHzB"<br>Added"* x: A/9/8, z: A/B".                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 43          | 10. Electrical Characteristics<br>10.3 DC Characteristics                                                | Added the following symbol and value<br>I <sub>CCP</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 45          | 10. Electrical Characteristics<br>10.4.2 Internal Clock Timing                                           | Revised "S6J311xHAA" to "S6J311xHzB"<br>Added"* x: A/9/8, z: A/B".                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 49          | 10. Electrical Characteristics<br>10.4.4 Power-on Conditions                                             | <p>Deleted the Slope detection undetected specification.</p> <p>Added the Power ramp rate and Maximum ramp rate guaranteed to not generate power-on reset.</p> <p>*1, *2: Changed the sentence.</p> <p>Added *3, *4, Note, Figure at the Power off time, Power ramp rate, Maximum ramp rate guaranteed to not generate power-on reset.</p>                                                                                                                                                                                                                                                                                                                                                                                                       |
| 69,70       | 10. Electrical Characteristics<br>10.4.5.4 I2C timing (SMR:MD[2:0]=100B)                                 | Added"10.4.5.4 I2C timing (SMR:MD[2:0]=100B)" as a new item.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 75          | 10. Electrical Characteristics<br>10.9 Low-Voltage Detection (RAM Retention Low-Voltage Detection)       | Revised the title in 10.9 "Internal Low-Voltage Detection" to "RAM Retention Low-Voltage Detection".                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 75          | 10. Electrical Characteristics<br>10.10 Low-Voltage Detection (1.2 V Power Supply Low-Voltage Detection) | Added the notice *4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 81          | 11. Ordering Information                                                                                 | Added SHE option to the part number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 81          | 11. Ordering Information                                                                                 | Revised Package Code "LES144" to "LEU144"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 81          | 12. Part Number Option                                                                                   | Added Part Number Option "z" as SHE option                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Revision *I |                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 77, 79, 80  | 14. Errata                                                                                               | Added about CAN FD controller message order inversion when transmitting from dedicated Tx Buffers configured with same Message ID                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| Revision *J |            |                                                                                                                                                            |
|-------------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 77, 79, 80  | 14. Errata | Added CAN FD incomplete description of Dedicated Tx Buffers and Tx Queue related to transmission from multiple buffers configured with the same Message ID |

**NOTE: Please see “Document History” for later revised information.**

## Document History

**Document Title: S6J311A, S6J3119 32-Bit TRAVEO™ T1G Family S6J3110 Series Microcontroller Datasheet**

**Document Number: 002-04632**

| Revision | ECN     | Submission Date | Description of Change                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------|---------|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| **       | -       | 01/16/2015      | Migrated to Cypress and assigned document number 002-04632.<br>No change to document contents or format.                                                                                                                                                                                                                                                                                                                                                        |
| *A       | 5272677 | 05/16/2016      | Updated to Cypress format.<br>Adapted to full-production.<br>Added some characteristics.<br><br>For detail, see “Major Changes”.                                                                                                                                                                                                                                                                                                                                |
| *B       | 5311072 | 06/20/2016      | Page 1,<br>Revised the title as follows<br>(error)<br>S6J3110 Series<br>32-Bit Traveo™ Family<br>Microcontroller Datasheet<br>(correct)<br>S6J311A, S6J3119, S6J3118<br>32-Bit Traveo™ Family<br>S6J3110 Series Microcontroller Datasheet<br><br>Page 2, Features<br>Added “CAN-FD (V3.2.0)” under “CAN controller: CAN-FD Max 1 channel”.<br><br>In page of 1,2,4 to 14,22 to 24,26,32,34,43,45,46,49,81<br>Revised part number from S6J311xxxB to S6J311xxxC. |
| *C       | 5375461 | 07/27/2016      | Page49,<br>10.4.4 Power-on Conditions<br>Revised Level detection time from 30 to 540,<br>Revised *1 to *4 and Note.<br><br>Page75,<br>10.9 Low-Voltage Detection (RAM Retention Low-Voltage Detection)                                                                                                                                                                                                                                                          |

| Revision | ECN     | Submission Date | Description of Change                                                                                                                                                      |
|----------|---------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          |         |                 | Added * and Note to Detection voltage.<br><br>Page 75,<br>10.10 Low-Voltage Detection (1.2 V Power Supply Low-Voltage Detection)<br>Added * and Note to Detection voltage. |
| *D       | 5554882 | 12/15/2016      | Page 82,<br>Replaced 13. Package Dimensions<br><br>Page 83,<br>Added 14. Appendix                                                                                          |
| *E       | 5782586 | 06/22/2017      | Updated Cypress logo.<br>Updated Copyright.                                                                                                                                |
| *F       | 5998871 | 12/19/2017      | Sunset update.<br>Updated Figure (spec 002-10858 ** to *A) in Package Diagram.                                                                                             |
| *G       | 6231567 | 07/06/2018      | Part Number Option is updated.                                                                                                                                             |
| *H       | 6294152 | 08/29/2018      | Page 77<br>Added 14. Errata                                                                                                                                                |
| *I       | 7100292 | 03/08/2021      | Updated 14. Errata.<br>For details, see 16. Major Changes.                                                                                                                 |
| *J       | 7388124 | 10/25/2021      | Updated 14. Errata.<br>For details, see 16. Major Changes.                                                                                                                 |

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