

PSOC™ Control C3M6 (KIT_PSC3M6_EVAL) Evaluation Kit user guide

About this document

Scope and purpose

This document provides a comprehensive understanding of the KIT_PSC3M6_EVAL PSOC™ Control C3 Evaluation Kit, which includes kit operation, an out-of-the-box (OOB) example and its operation, and the hardware details of the board.

Intended audience

This document is intended for all embedded developers using the KIT_PSC3M6_EVAL PSOC™ Control C3 Evaluation Kit.

Safety precautions**Safety precautions**

Note: Please note the following warnings regarding the hazards associated with development systems.

Table 1 **Safety precautions**

	Caution: The evaluation or reference board contains parts and assemblies sensitive to electrostatic discharge (ESD). Electrostatic control precautions are required when installing, testing, servicing or repairing the assembly. Component damage may result if ESD control procedures are not followed. If you are not familiar with electrostatic control procedures, refer to the applicable ESD protection handbooks and guidelines.
	Caution: The evaluation or reference board is shipped with packing materials that need to be removed prior to installation. Failure to remove all packing materials that are unnecessary for system installation may result in overheating or abnormal operating conditions.

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1 Introduction

1 Introduction

The PSOC™ Control C3M6 Evaluation Kit enables you to evaluate and develop applications using the PSC3M6 MCU.

PSOC™ Control C3M6 is a high-performance, low-power, 32-bit single-core Arm® Cortex® M33-based MCU running at up to 180 MHz with a digital signal processor (DSP), a floating-point unit (FPU), and state-of-the-art security features.

This device includes the following features:

- **Powerful core and math:**
180 MHz Arm® Cortex® M33 with DSP, FPU, and a hardware CORDIC engine for lightning-fast trigonometric and motor control calculations
- **Advanced safety and security:**
PSA Level 3 certified with TrustZone, secure boot, and a hardware CRYPTO-accelerator for AES, RSA, and high-level signature verification
- **Robust memory:**
Up to 512 KB flash and 128 KB SRAM, both featuring ECC for high reliability and also a built-in bootloader for easy firmware updates
- **Precision motor control:**
Dedicated hall sensor and Quadrature Encoder Interfaces (QEI) with 24 TCPWM channels, featuring sub-90 ps high-resolution PWM
- **High performance analog:**
12-bit 9-Msps SAR ADC with 16 S/H circuits, 4x signal amplifiers (AFE), and 13 fast comparators for real-time hardware protection
- **Ultra-low power:**
Flexible operation (1.71 V – 3.63 V) with six power modes, consuming as little as 11 µA in Deep Sleep and 1000 nA in Hibernate
- **Versatile connectivity:**
6x reconfigurable SCBs (UART/I2C/SPI), CAN FD (8 Mbps), I3C, and a native USB 2.0 Full-Speed host/device PHY
- **Intelligent I/O:**
Up to 84 functional pins, including Smart I/O with 56 LUTs to perform Boolean logic tasks without taxing the CPU

The ModusToolbox™ software is used to develop and debug the PSC3M6 projects. ModusToolbox™ is a set of tools that enable you to integrate these devices into your existing development methodology.

2 Kit details

2 Kit details

The PSOC™ Control C3M6 Evaluation Kit is built around the PSC3M6 MCU. The following section describes the block diagram and peripherals on the board.

For more information on device features, see the device datasheet.

2.1 Kit content

The kit comprises the following components:

- PSOC™ Control C3M6 Evaluation Kit
- USB Type-A to USB Type-C cable
- Jumper wires (10 wires)
- Quick start guide (QR code for web information)



Figure 1 Kit image

2 Kit details

2.2 Board details

The PSOC™ Control C3M6 Evaluation Kit has the following features:

- PSOC™ Control C3 MCU–PSC3M6GES3AHQ1
- USB Type-C connector for the USB device interface
- CAN FD interface
- Two user LEDs
- Headers compatible with MIKROE’s mikroBUS shields
- Headers compatible with Arduino Uno R3
- Two user buttons and a reset button for the PSC3M6 MCU
- Debug LED for XMC4200
- Potentiometer that can be used to simulate analog sensor outputs
- USB2.0 Full-Speed USB device and host
- Two (50-pin) expansion headers

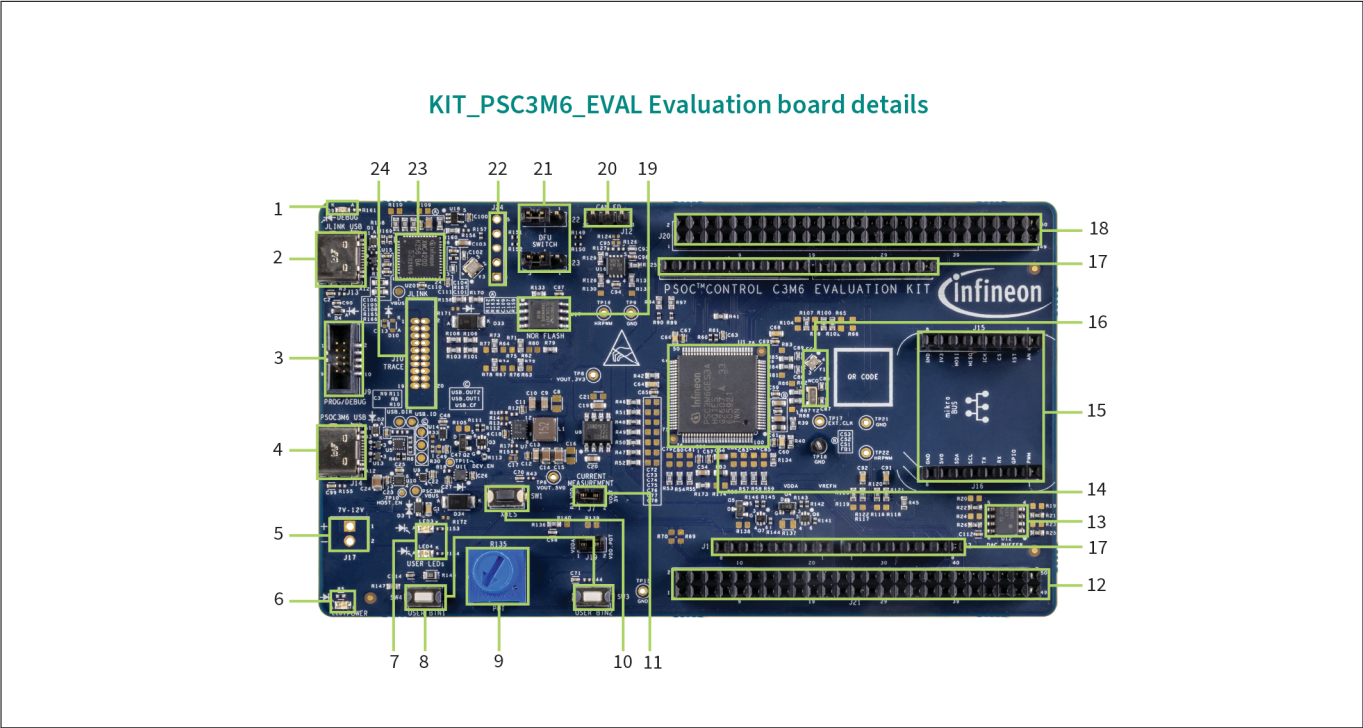


Figure 2 KIT_PSC3M6_EVAL board details

Table 2 Sections

Block number	KIT_PSC3M6_EVAL blocks
1	J-Link debug LED (D9)
2	J-Link USB Type-C connector (J13)
3	10-pin SWD header (J9)
4	PSC3M6 USB Type-C connector (J14)
5	DC jack ¹⁾ (J17)
6	Power LED (LED1)

(table continues...)

2 Kit details

Table 2 (continued) Sections

Block number	KIT_PSC3M6_EVAL blocks
7	User LEDs (LED3, LED4)
8	User button (SW4, SW3)
9	Potentiometer (R135)
10	Reset switch (SW1)
11	Current measurement header(J7)
12	50 pin expansion header(J21)
13	DAC buffer (U12)
14	PSC3M6 MCU (U1)
15	mikroBUS header (J15, J16)
16	ECO (Y1) /WCO (Y2)
17	Arduino header (J1, J2, J3, J4)
18	50 pin expansion header(J20)
19	SPI flash (U17)
20	CAN header(J12)
21	DFU selection header (J22, J23)
22	XMC4200 programming header ¹⁾ (J24)
23	XMC4200 programming device(U20)
24	ETM header ¹⁾ (J10)

1) Footprint only; not populated on the board.

Table 3 Board Pinout

MCU pin	Primary onboard function	Secondary onboard function	Connection details
XRES	Hardware reset	-	-
P0.0	WCO_OUT(Y2)	EXT_CLK	The 32.768-kHz crystal pin can be used as an external clock input. To do so, remove R87 and mount R88
P0.1	WCO IN(Y2)	Expansion header J20.6 as GPIO	The 32.768-kHz crystal pin can be used as an external clock input. To do so, remove R82 and mount R86
P1.0	ECO IN(Y1)	Expansion header J21.24 as GPIO	The 16-MHz crystal pin can also be used as a GPIO. To do so, remove R84 and mount R81
P1.1	ECO OUT(Y1)	Expansion header J20.8 as GPIO	The 16-MHz crystal pin can also be used as a GPIO. To do so, remove R85 and mount R83

(table continues...)

2 Kit details

Table 3 (continued) Board Pinout

MCU pin	Primary onboard function	Secondary onboard function	Connection details
P1.2	SWCLK	-	MCU 10-pin SWD/JTAG interface at J9/20-pin ETM header J10 and XMC4200
P1.3	SWDIO	-	MCU 10-pin SWD/JTAG interface at J9/20-pin ETM header J10 and XMC4200
P2.0	GPIO/Button	TDI	To use the pin as a JTAG pin on the J9 header, remove R100, R102 and mount R98.
P2.1	GPIO	TDO	To use the pin as a JTAG pin on the J9 header, remove R107 and mount R104.
P2.2	DFU_SW1	GPIO	This pin is routed as GPIO on J20.42
P2.3	DFU_SW2	GPIO	This pin is routed as GPIO on J20.44
P3.0	GPIO	-	This pin is routed as GPIO on J20.23
P3.1	GPIO	-	This pin is routed as GPIO on J20.27
P3.2	UART_RX	GPIO	This pin is routed as GPIO on J20.32
P3.3	UART_TX	GPIO	This pin is routed as GPIO on J20.30
P4.0	GPIO	-	This pin is routed as GPIO on J20.36
P4.1	GPIO	-	This pin is routed as GPIO on J20.33
P4.2	GPIO	-	This pin is routed as GPIO on J20.34
P4.3	GPIO	-	This pin is routed as GPIO on J20.31
P4.4	GPIO	-	This pin is routed as GPIO on J20.35
P4.5	GPIO	-	This pin is routed as GPIO on J20.38
P4.6	GPIO	-	This pin is routed as GPIO on J20.9
P4.7	GPIO	-	This pin is routed as GPIO on J20.7
P5.0	GPIO	-	This pin is routed as GPIO on J21.11
P5.1	GPIO	-	This pin is routed as GPIO on J21.13
P5.2	CAN_RX	Expansion header J21.19 as GPIO	To Use this pin as GPIO, remove R131 and mount R132
P5.3	CAN_TX	Expansion header J20.3 as GPIO	To Use this pin as GPIO, remove R128 and mount R130
P6.0	UART_CTS	Expansion header J21.10 as GPIO	-
P6.1	UART_RTS	Expansion header J21.12 as GPIO	-

(table continues...)

2 Kit details

Table 3 (continued) Board Pinout

MCU pin	Primary onboard function	Secondary onboard function	Connection details
P6.2	Primary UART_RX	Expansion header J21.8 as GPIO	-
P6.3	Primary UART_TX	Expansion header J21.6 as GPIO	-
P7.0	SPI_CLK	Expansion header J21.41 as GPIO	-
P7.1	SPI_MOSI	Expansion header J21.45 as GPIO	-
P7.2	SPI_MISO	Expansion header J21.43 as GPIO	-
P7.3	SPI_CS01	Expansion header J21.47 as GPIO	-
P7.4	HRPWM	Trace_CLK	To Use this pin as GPIO, remove R122 and mount R117
P7.5	HRPWM	Expansion header J20.5 as GPIO	To Use this pin as GPIO, remove R120 and mount R116
P7.6	GPIO	Expansion header J21.3 as GPIO	-
P7.7	GPIO	Expansion header J20.50 as GPIO	-
P8.0	GPIO	SPI_CS/ Trace_D0, GPIO as J20.15	To use this pin as a SPI, remove R71 and mount R62
P8.1	GPIO	SPI_MOSI/ Trace_D1, GPIO as J20.13	To use this pin as a SPI, remove R72 and mount R63
P8.2	GPIO	SPI_MISO/ Trace_D2, GPIO as J20.19	To use this pin as a SPI, remove R73 and mount R64
P8.3	GPIO	SPI_CLK/ Trace_D3, GPIO as J20.17	To use this pin as a SPI, remove R74 and mount R67

(table continues...)

2 Kit details

Table 3 (continued) Board Pinout

MCU pin	Primary onboard function	Secondary onboard function	Connection details
P8.4	GPIO	Expansion header J21.5 as GPIO	-
P8.5	GPIO	Expansion header J21.7 as GPIO	-
P8.6	GPIO	Expansion header J20.21 as GPIO	-
P8.7	GPIO	Expansion header J20.11 as GPIO	-
P9.0	SCL	Expansion header J20.46 as GPIO	-
P9.1	GPIO	Expansion header J20.26 as GPIO	-
P9.2	SDA	Expansion header J20.48 as GPIO	-
P9.3	GPIO	Expansion header J21.4 as GPIO	-
P9.4	GPIO	Expansion header J20.12 as GPIO	-
P9.5	GPIO	Expansion header J20.10 as GPIO	-
P9.6	GPIO	Expansion header J20.28 as GPIO	-
P9.7	GPIO	Expansion header J20.20 as GPIO	-
P10.0	GPIO	Expansion header J20.18 as GPIO	-

(table continues...)

2 Kit details

Table 3 (continued) Board Pinout

MCU pin	Primary onboard function	Secondary onboard function	Connection details
P10.1	GPIO	Expansion header J20.16 as GPIO	-
P10.2	GPIO	Expansion header J21.17 as GPIO	-
P12.0	GPIO	Expansion header J20.25 as GPIO	-
P12.1	GPIO	Expansion header J21.9 as GPIO	-
P12.2	GPIO	Expansion header J21.32 as GPIO	-
P12.3	GPIO	Expansion header J21.18 as GPIO	-
P12.4	GPIO	Expansion header J21.16 as GPIO	-
P12.5	CAN_STB	Expansion header J21.14 as GPIO	-
P12.6	USB_OUT2	Expansion header J20.49 as GPIO	-
P12.7	USB_OUT1	Expansion header J20.47 as GPIO	-
P13.0	USB_DIR	Expansion header J20.45 as GPIO	-
P13.1	USB_CF	Expansion header J20.43 as GPIO	-
P13.2	USB_ID	Expansion header J20.41 as GPIO	-

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E.T.

FUNCTION PSOC C3 PIN
WCO_IN P0.1
WCO_OUT P0.0

FUNCTION PSOC C3 PIN
ECO_IN P1.0
ECO_OUT P1.1

JLINK (TX)P0.5 UART → P6.2(RX)
(RX)P0.4 UART → P6.3(TX)

121-60808-01-ES Rev 03
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600-60808-01 REV02

3 Kit operation

3.1 Board support package (BSP)

The board support package for the PSOC™ Control C3M6 Evaluation Board (KIT_PSC3M6_EVAL) is available in the ModusToolbox™ ecosystem.

To access the BSP on GitHub, follow the [TARGET_KIT_PSC3M6_EVAL](#) link. The BSP and the supported code examples can also be accessed using the ModusToolbox™ Project Creator.

3.2 J-Link: onboard programmer and debugger

The PSOC™ Control C3M6 Evaluation Kit can be programmed and debugged using the onboard J-Link programmer/debugger(XMC4200).

The PSOC™ Control C3M6 Evaluation Kit integrates an Infineon XMC4200 (Arm® Cortex®-M4-based) microcontroller to serve as the dedicated onboard programmer and debugger. This device is pre-programmed with SEGGER J-Link firmware, providing a professional-grade communication bridge between the host PC and the target PSC3M6 MCU. By utilizing the full-speed USB-to-SWD interface, the XMC4200 enables advanced features such as real-time transfer (RTT), unlimited breakpoints, and seamless integration with industry-standard IDEs. This integrated J-Link solution eliminates the requirement for external debug probes, offering a robust, high-performance debugging environment directly out of the box.

3.3 Creating and running a ModusToolbox™ project for KIT_PSC3M6_EVAL

1. Connect the board to the PC using the provided USB cable through the onboard J-Link USB connector **J1** (PROG/DEBUG USB). It enumerates as a USB composite device.

Note: To use the J-Link debugger, J-Link Software must be installed on the PC

- a. Download and install the latest J-Link Software and Documentation pack from [J-Link/J-Trace Downloads](#) page. PSC3M/P6 devices require J-Link version 9.68 or later
- b. Add the J-Link installation folder to your environment variables using the variable name **MTB_JLINK_DIR**

2. Follow the steps below to import the desired code example (application) into a new workspace of Eclipse IDE for ModusToolbox™

Note: ModusToolbox™ supports a few other IDEs as well. For more details, refer to the application note 'AN243049 - Getting started with PSOC™ Control C3M/P6 MCU on ModusToolbox™ software'

- a. Click on **New Application** from the **Quick Panel**

3 Kit operation

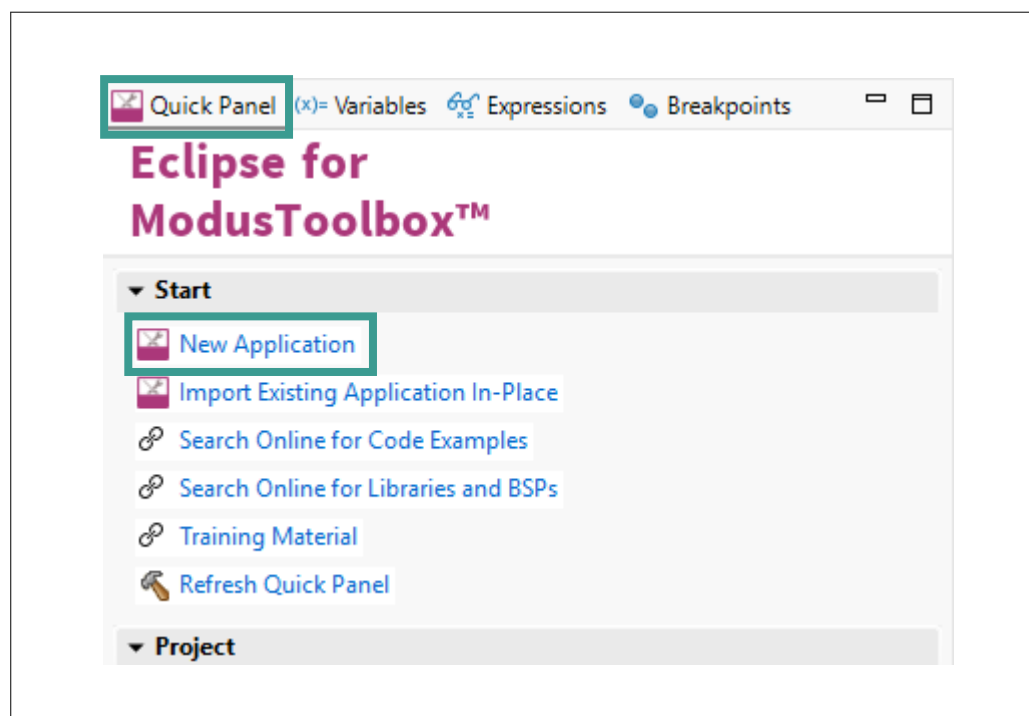


Figure 6 Open Project Creator

- b. Select BSP in the **Choose Board Support Package** window

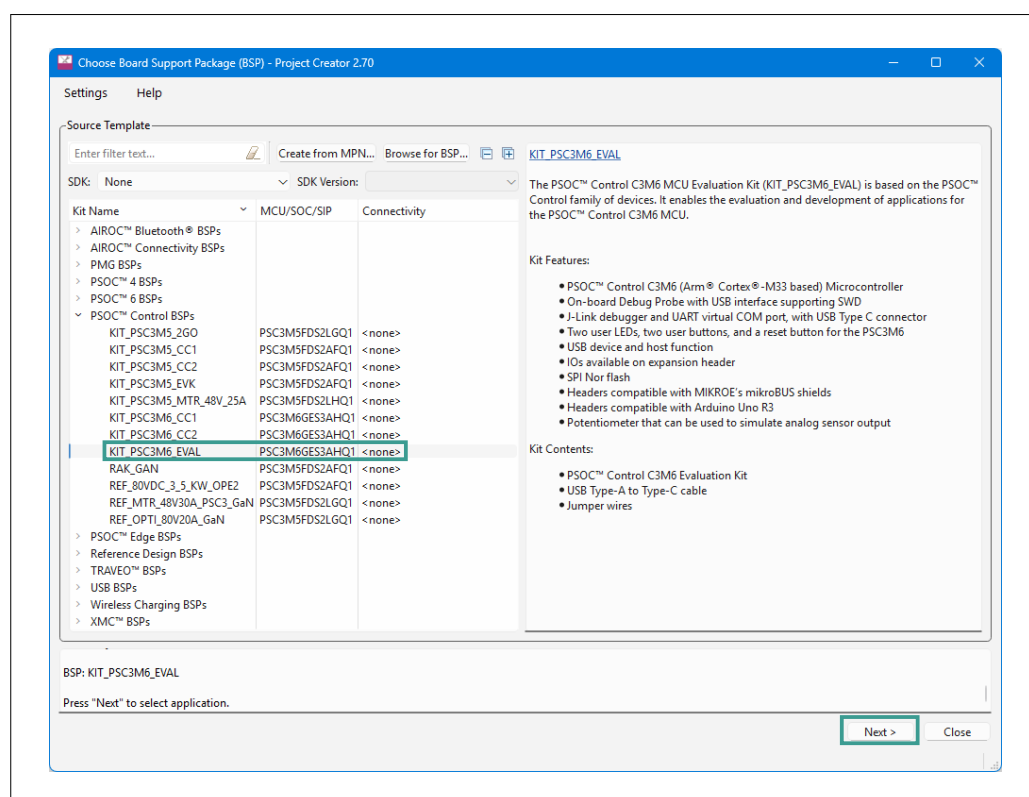


Figure 7 Board support package selection in Project Creator

- c. Click **Next**
- d. Select the application in the **Select Application** window and click **Create**

3 Kit operation

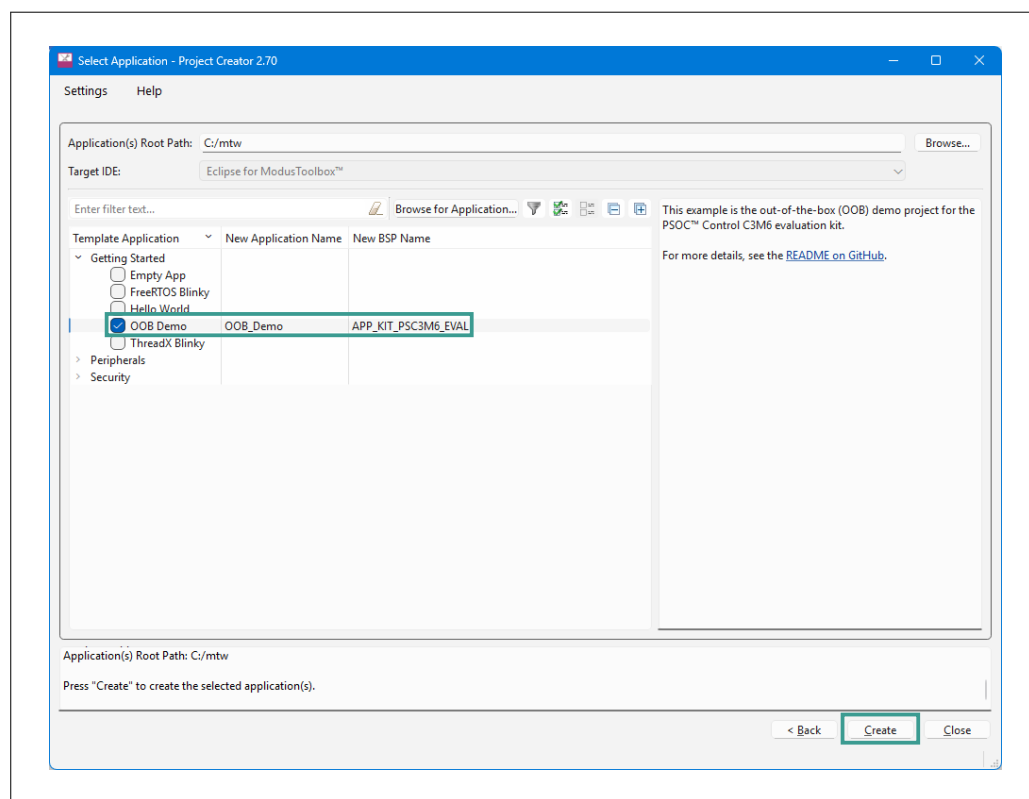


Figure 8 Code Example selection in Project Creator

3. To build and program the application, select the project in the **Project Explorer** of the IDE. Scroll to the **Launches** section and click the **<Application Name> Program** option in the **Quick Panel** tab

3 Kit operation

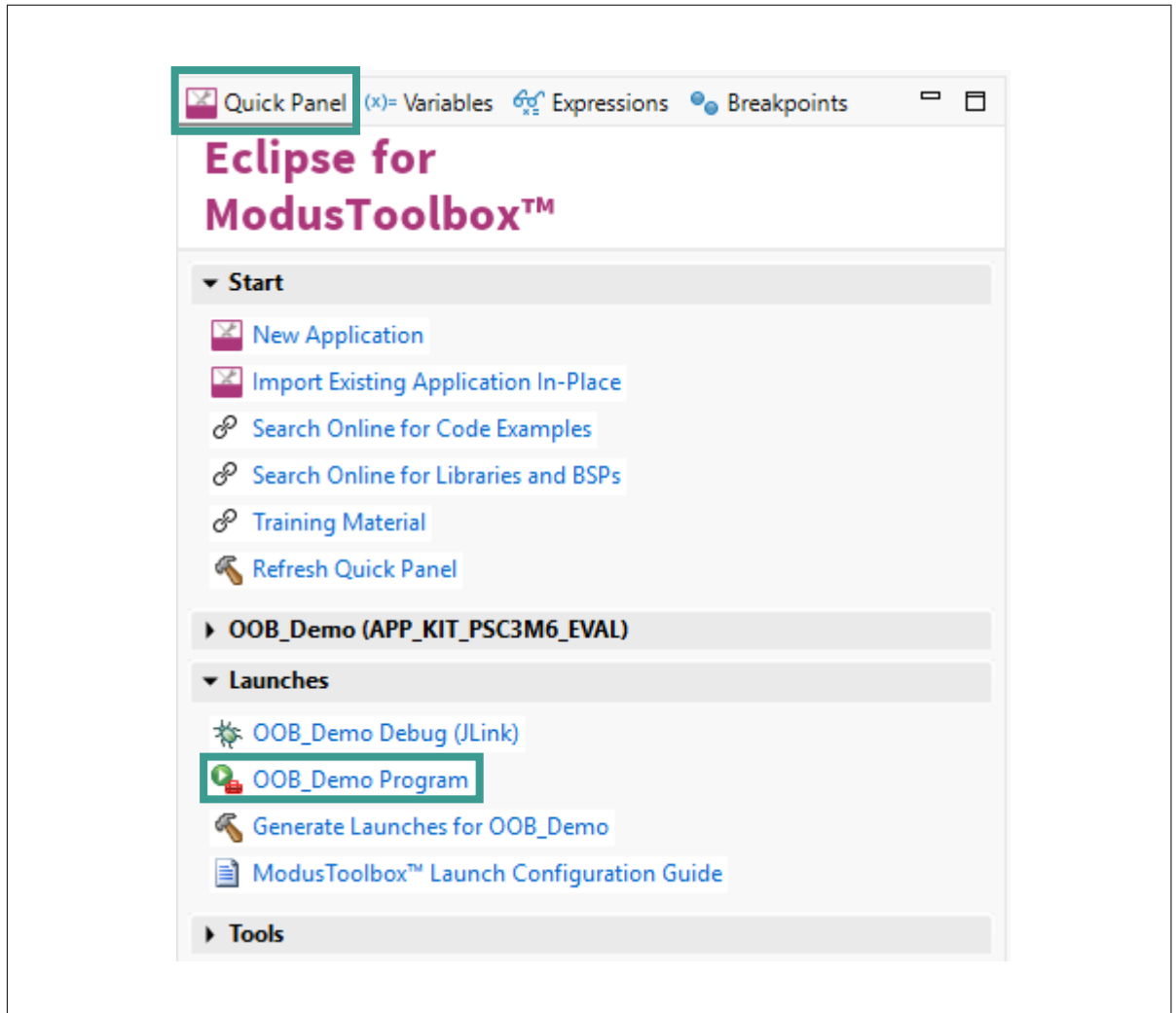


Figure 9 Programming in ModusToolbox™ IDE

4. ModusToolbox™ software has an integrated debugger. To debug an application, select the project in the **Project Explorer**. In the **Quick Panel**, scroll to the **Launches** section and click the **<Application Name> Debug** option

3 Kit operation

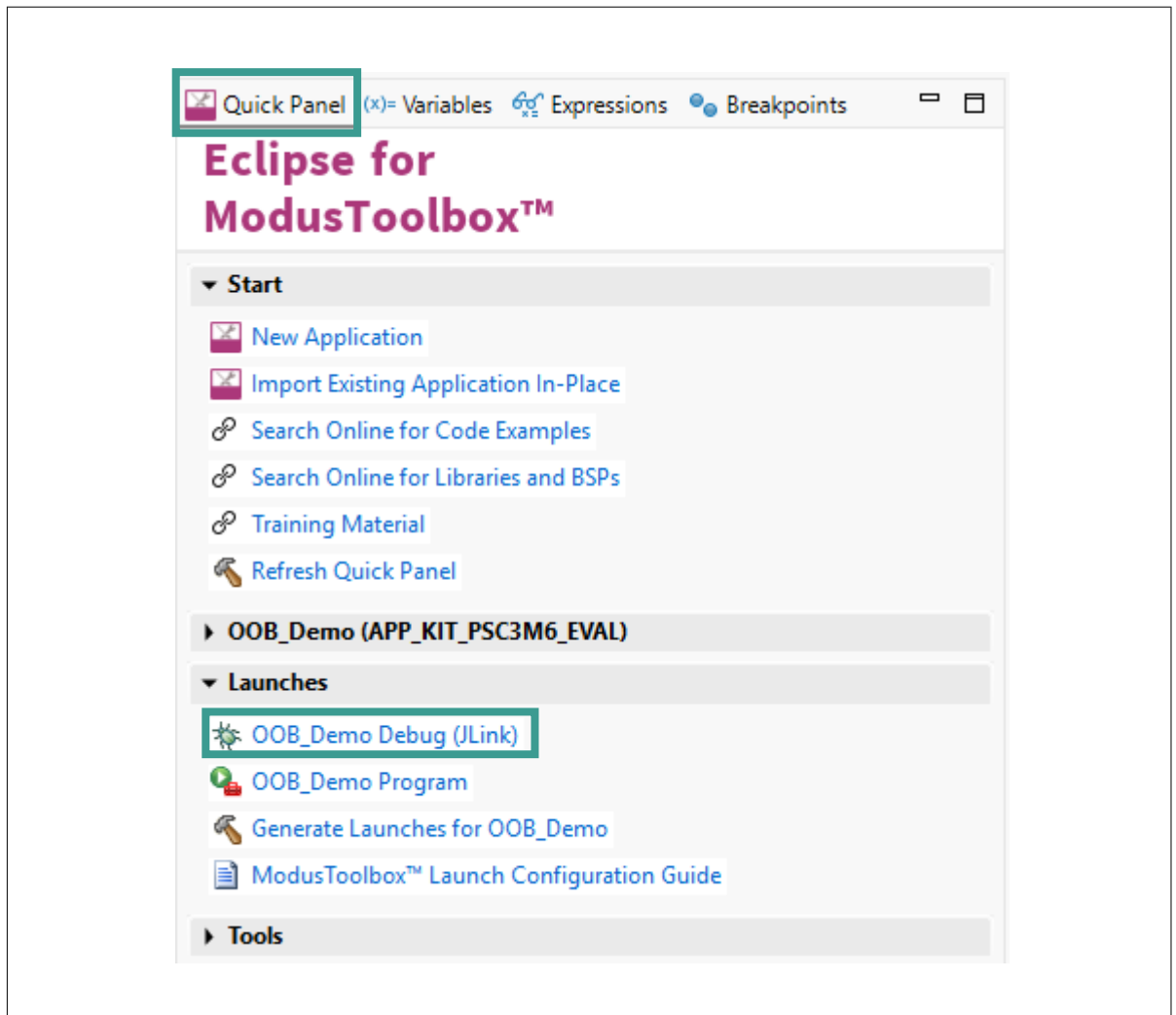


Figure 10 Debugging in ModusToolbox™ IDE

3.4 Using the OOB example – PSC3M6 MCU: OOB demo

By default, the PSOC™ Control C3M6 Evaluation board is pre-programmed with the **PSOC™ Control C3 MCU: Out-of-the-box demo** code example.

For a detailed description of the code example, see the `README.md` file. Follow the [README.md](#) link to view it in the GitHub repository. Alternatively, create a ModusToolbox™ project with the code example and check the application directory for `README.md`.

Note: *At any point in time, if the default code example is overwritten, it can be restored by programming the 'PSOC™ Control C3 MCU: Out-of-the-box demo' available for the PSOC™ Control C3M6 Evaluation board BSP.*

Follow the steps below to use the code example:

1. Connect the board's debug USB connector **J13** (JLink USB) to the PC using the provided USB cable
2. Open a terminal program and select the enumerated COM port. Set the serial port parameters to 8N1 and 115200 baud rate
3. Press the button SW1 (**XRES**) on the board and confirm that terminal application displays the code example title and other text as shown in [Figure 11](#)

4 Hardware

4 Hardware

The following section describes the hardware design.

4.1 Schematics

Schematic files are available in the [KIT-PSC3M6-EVAL](#) kit webpage.

4.2 Hardware functional description

The PSOC™ Control C3M6 Evaluation Kit provides a hardware abstraction for the PSOC™ Control C3M6 (Arm® Cortex®-M33-based) family. It features an onboard J-Link (XMC4200) programmer and debugger, accessible headers for all GPIOs, and power management circuitry to facilitate power-consumption analysis and functional validation.

4.3 PSC3M6 MCU PSC3M6GES3AHQ1 (U1)

PSC3M6GES3AHQ1 is a PSOC™ C3 family of devices with industrial power and motor applications. The PSC3P6xD and PSC3Mx6D devices are based on the Arm® Cortex®-M33 running up to 180 MHz with DSP and FPU capability. In addition to the CPU subsystem, the devices contain advanced real-time control peripherals, such as a high-performance programmable analog subsystem, comparators, advanced timers with high-resolution capability, up to six SCBs, Full-Speed USB2.0, and single CAN FDs for communication. The devices support one active and five low-power modes for managing and reducing power consumption, depending on application requirements.

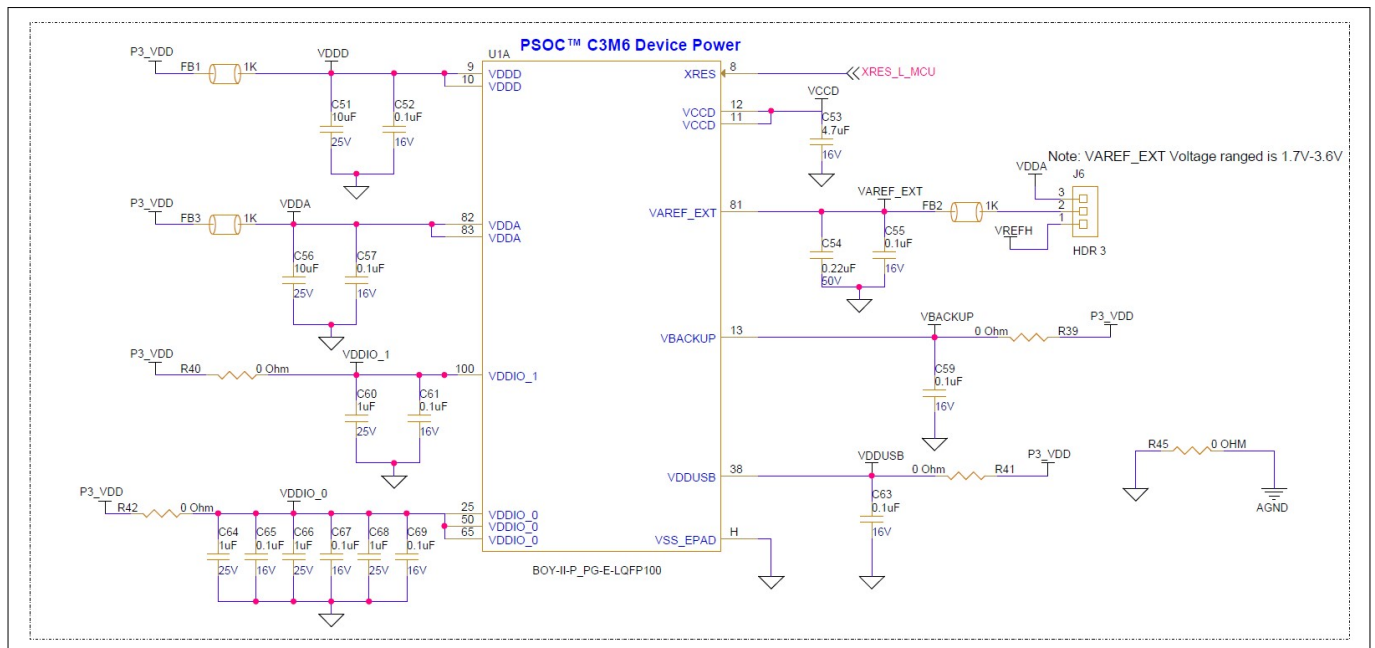


Figure 12 PSOC™ C3M6 device power

4 Hardware

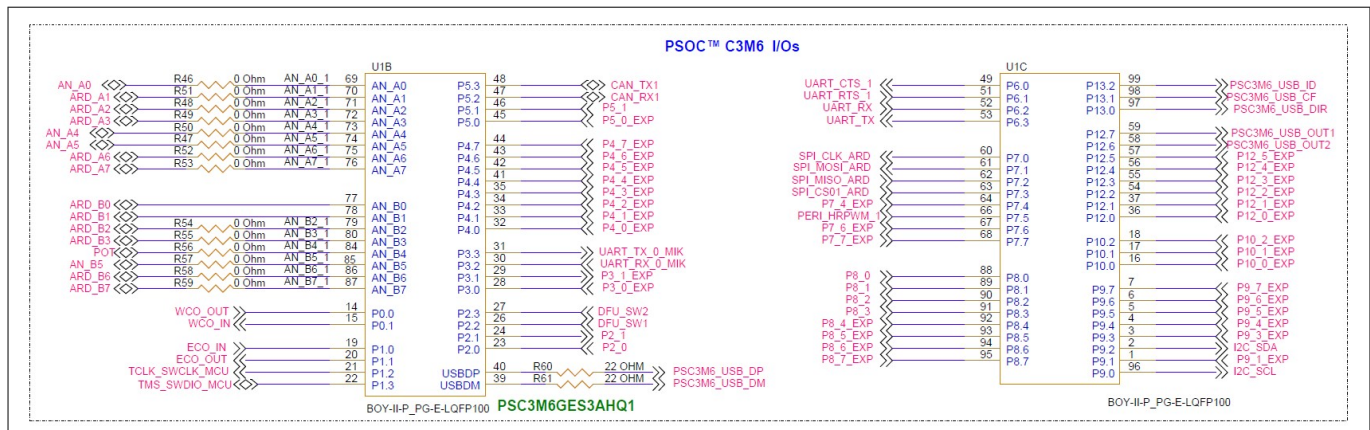


Figure 13 PSOC™ C3M6 device I/O

4.4 XMC4200-based onboard programmer/debugger

XMC4200 is a member of the XMC4000 family, which incorporates a bridge between the USB interface and the PSOC™ Control C3M6 device. XMC4200 is a J-Link programmer and debugger on the board. The USB-SWD and USB-UART interfaces help the user to interact with the hardware by establishing communication between the target device and the test systems while programming and debugging. XMC4200(U20) is preloaded with application-specific firmware to support SWD and UART communications on the kit.

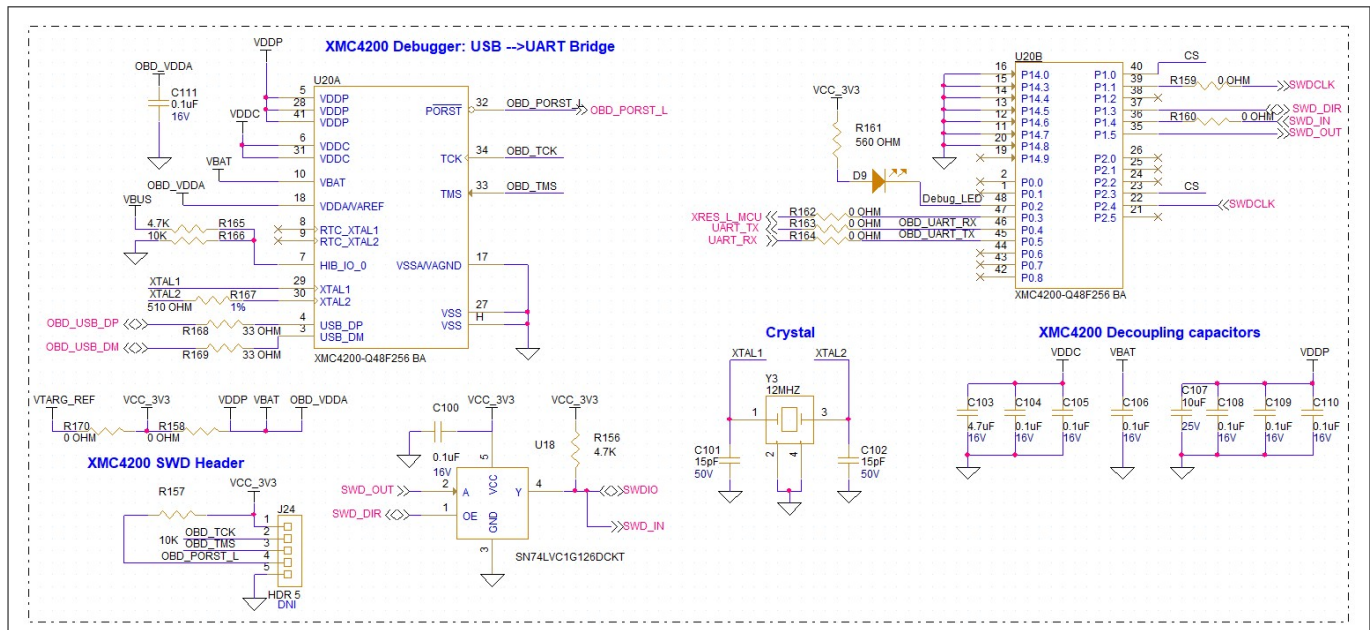


Figure 14 XMC4200 onboard debugger

4.5 Serial interconnection between XMC4200 and PSC3M6

The XMC4200 device works as a USB-UART bridge on the board, providing UART communication between the target MCU and the test PC.

4 Hardware

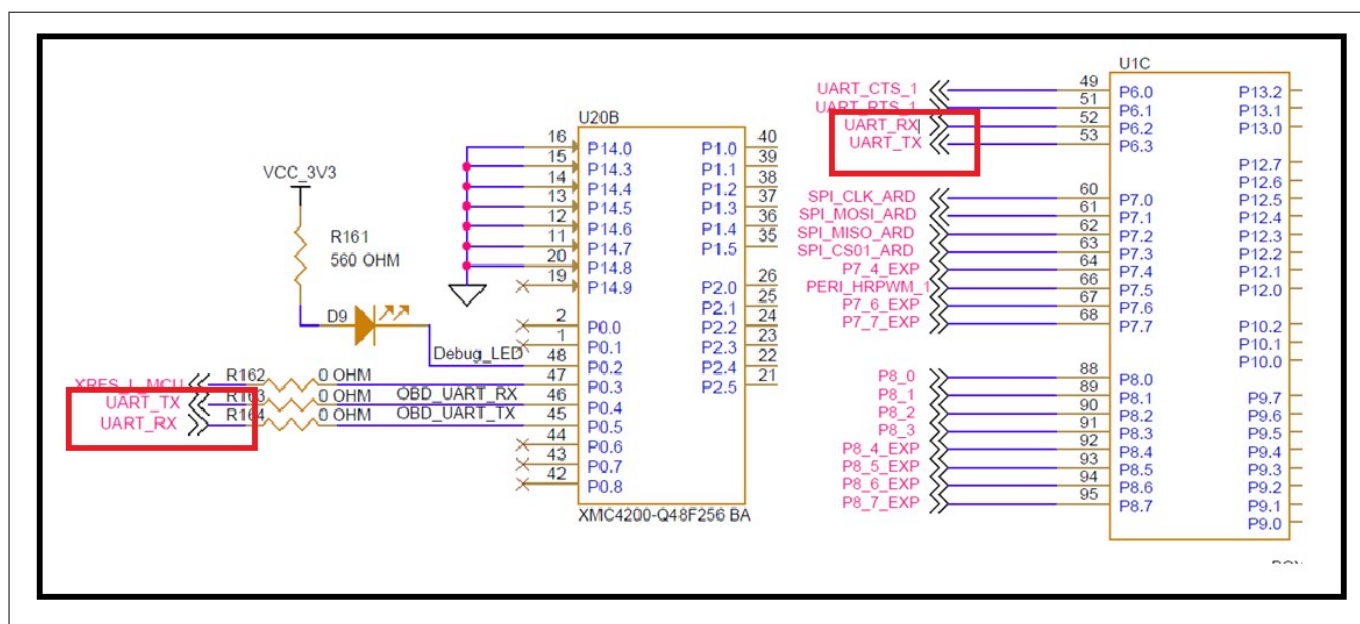


Figure 15 XMC4200 UART connection with MCU

4.6 Programming/debugging headers

The PSOC™ Control C3M6 Evaluation Kit is designed with dedicated headers for programming the PSC3M6 device.

A 10-pin SWD/JTAG header (J9) allows you to program the target device using the SWD or JTAG interface. A 20-pin ETM standard header (J10) is provided for trace debugging. Trace output from the PSC3M6 device can be used for debugging purposes.

This 20-pin header is also connected to the SWD and JTAG signals, and this helps a create a single programming header concept for the programming and debugging of the PSC3M6 device.

By default, JTAG debug over the J9 is not enabled. See [Table 4](#) to rework.

Table 4 JTAG program enable rework

Reference designator	Assembly
R98	Stuff
R104	Stuff
R100	Remove
R102	Remove
R107	Remove

By default, trace debug over J10 is not enabled. See [Table 5](#) to rework.

Table 5 ETM trace rework J10

Reference designator	Assembly
R75	Stuff
R76	Stuff
R77	Stuff

(table continues...)

4 Hardware

Table 5 (continued) ETM trace rework J10

Reference designator	Assembly
R78	Stuff
R80	Stuff
R79	Remove
R71	Remove
R72	Remove
R73	Remove
R74	Remove

4.7 Power supply system

The power supply system on this board is versatile, allowing the input supply to come from the following sources:

- 5V from the onboard USB Type-C connector J13
- 5V from the J14 connector only in Device mode of operation
- 7V to 12V from the external power supply through the Vin barrel jack J17 or from a J1 header compatible with Arduino

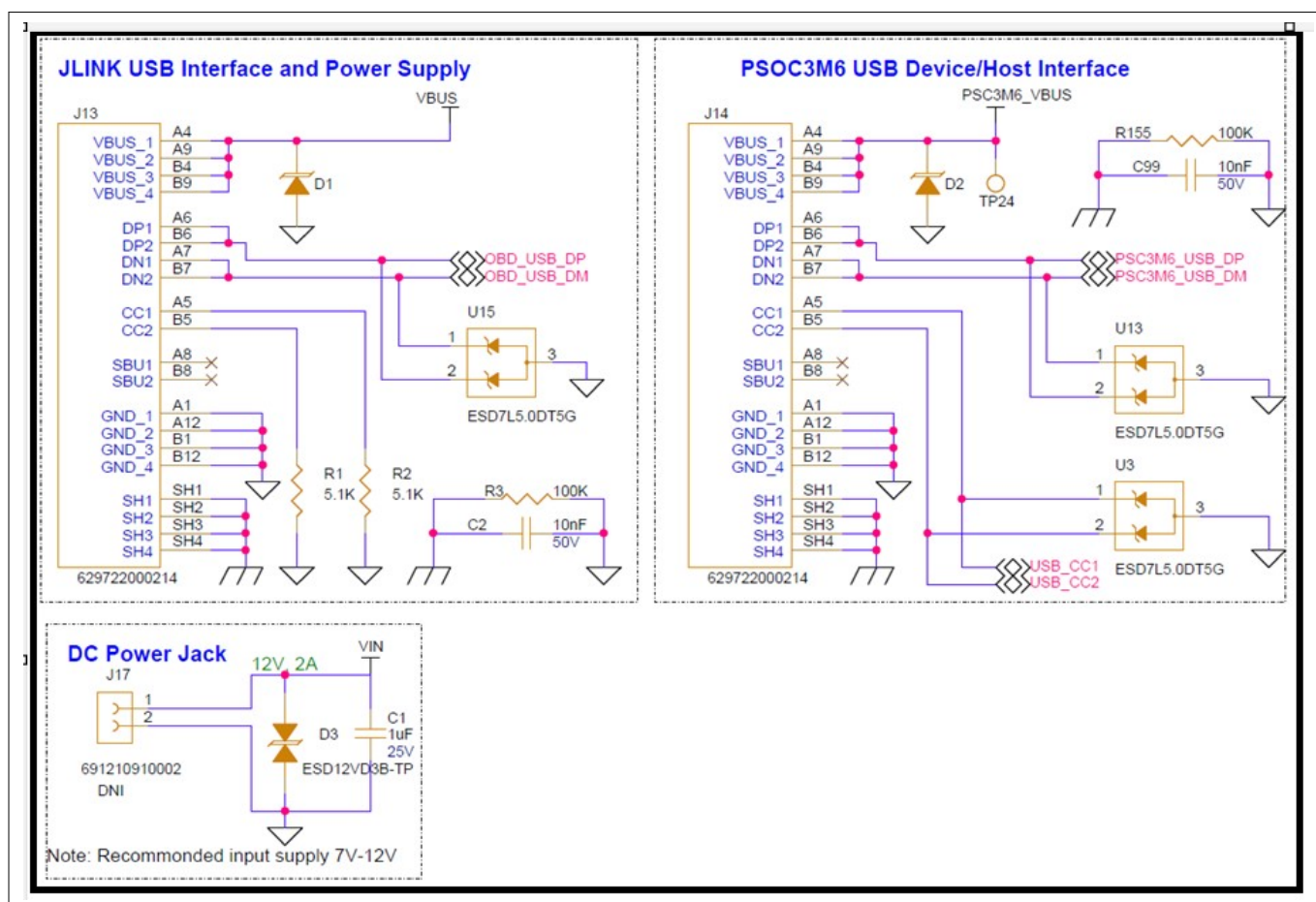


Figure 16 Power supply input

4 Hardware

4.8 Voltage regulators

The power supply system is designed for the following voltage configurations. The evaluation kit includes two switching regulators:

- 3.3 V LDO regulator (U8):
This regulator output provides the supply to overall peripherals, including the MCU
- 5 V buck-boost regulator (U7):
It is used to power the CAN transceiver and the Arduino headers

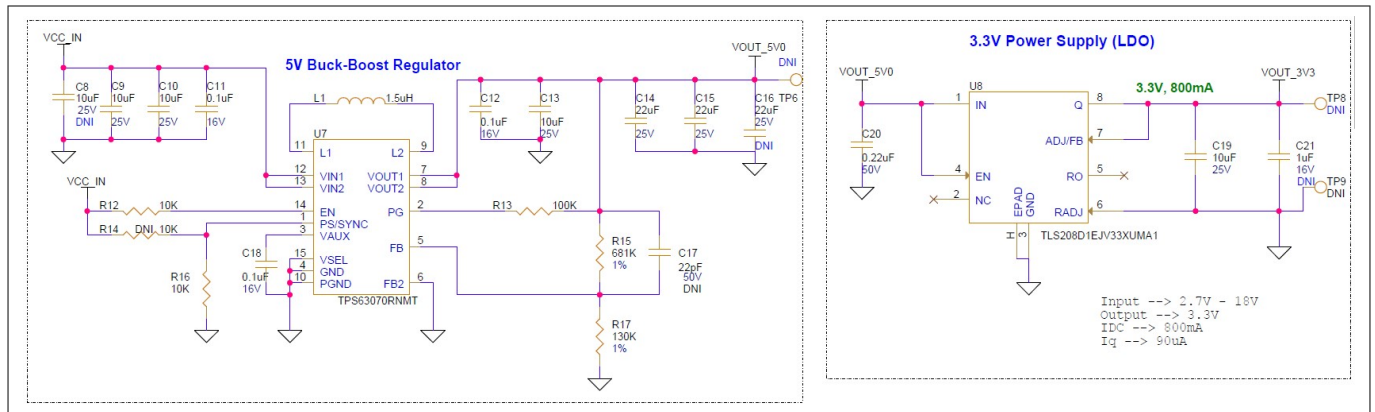


Figure 17 Voltage regulators

4.9 Current measurement header

The current of the following domains have dedicated 2-pin header to facilitate easy current measurement using an ammeter across the pins.

The 2-pin header (J7) is used for checking the MCU current consumption.

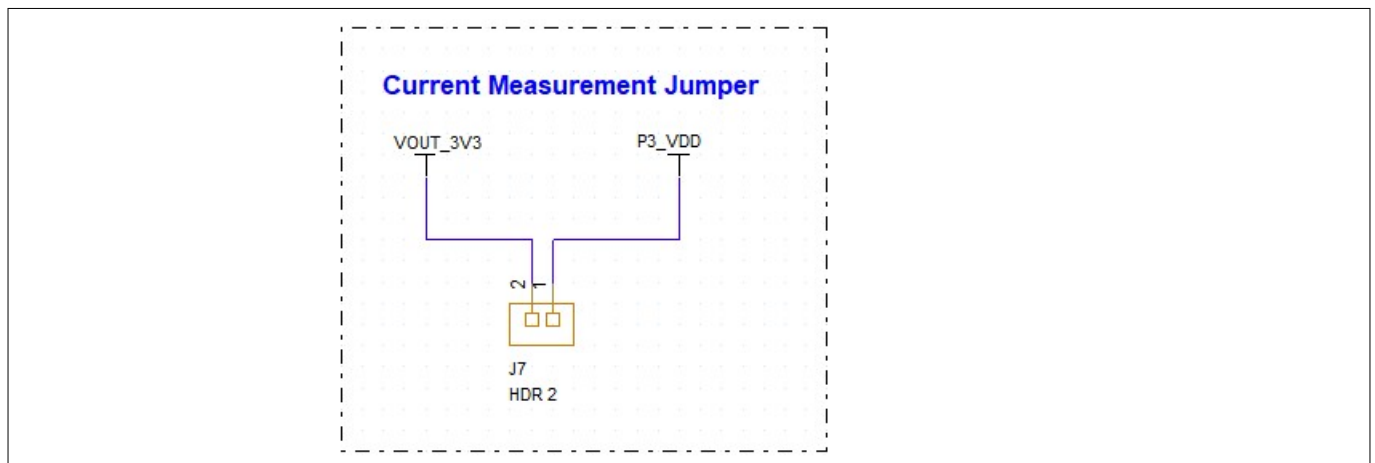


Figure 18 Current measurement header

5 I/O headers

5 I/O headers

The evaluation kit (EVK) is provided with header interfaces to evaluate sensors and shields with different form factors, such as Arduino, mikroBUS from MIKROE, which are supported on the EVK.

A few of the I/O signals from the PSC3M6 device are multiplexed by sharing between Arduino and mikroBUS.

5.1 Headers compatible with Arduino Uno R3 (J1, J2, J3, J4)

The board has four headers (J1, J2, J3, and J4) compatible with Arduino Uno R3. Connect 3.3 V shields compatible with Arduino Uno R3 to develop applications based on the shield's hardware.

Note that the kit does not support 5 V and 1.8 V shields.

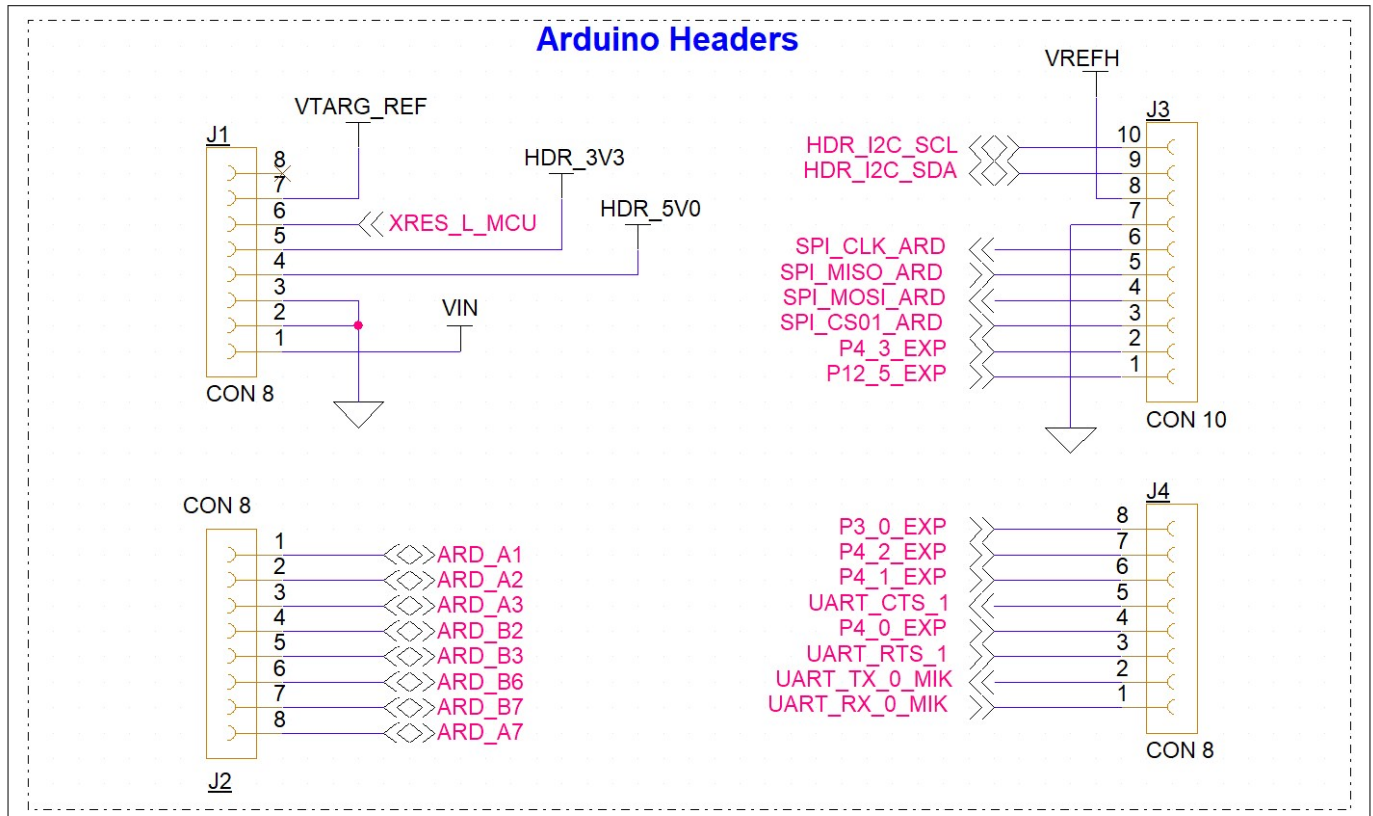


Figure 19 Arduino headers

5.2 mikroBUS shield compatible headers

Evaluation kit consists headers populated to interface the MIKROE standard mikroBUS sensor shields.

You can directly mount the respective mikroBUS sensor shields to evaluate the functionality. The mikroBUS shields are available with different working voltage levels, such as 3.3 V and 5 V. Based on the operating voltage, a shield needs to be selected, and in this kit, only 3.3 V is supported.

5 I/O headers

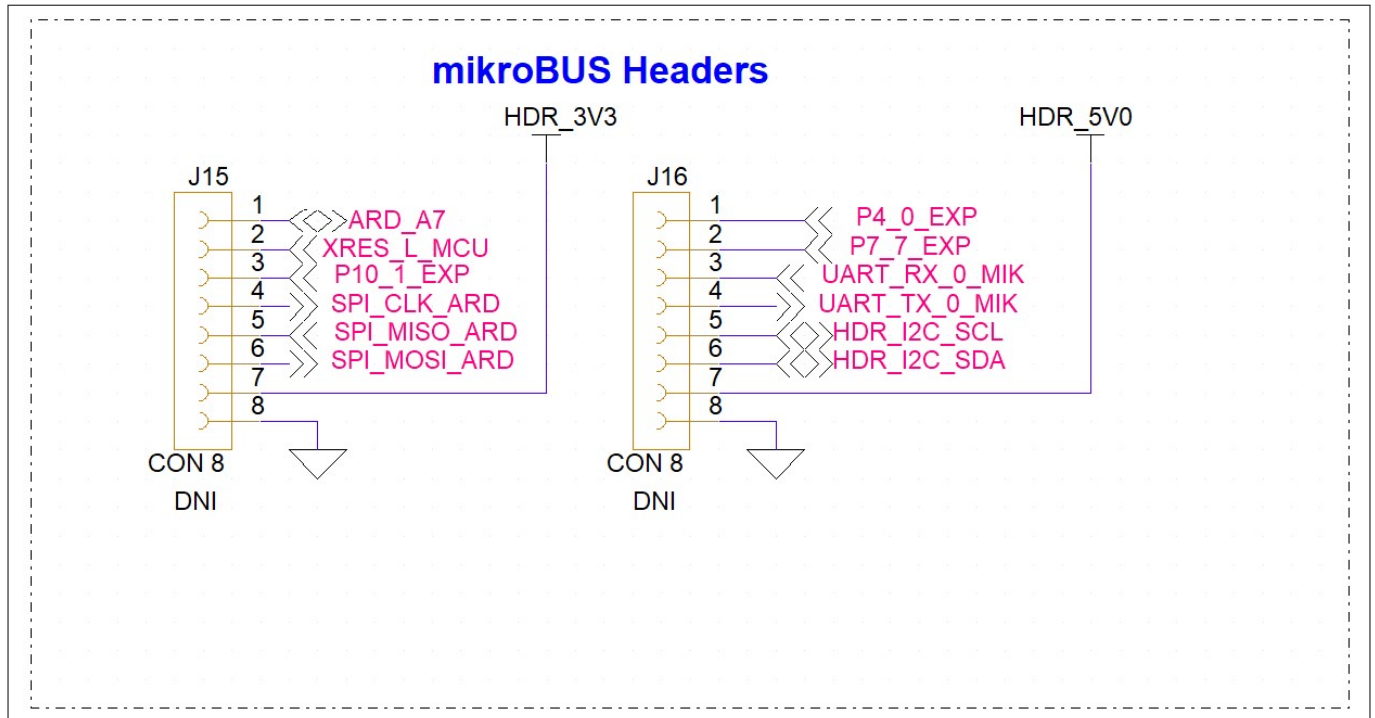


Figure 20 **mikroBUS header**

5.3 I/O Expansion headers (J20, J21)

PSOC™ Control C3M6 Evaluation Kit has two expansion header with 50-pins each that are J20 and J21.

These connectors will expose all the IOs (some by kit rework) from the PSC3M6 device except SWD pins, this will be compatible for infineon upcoming motor shield.

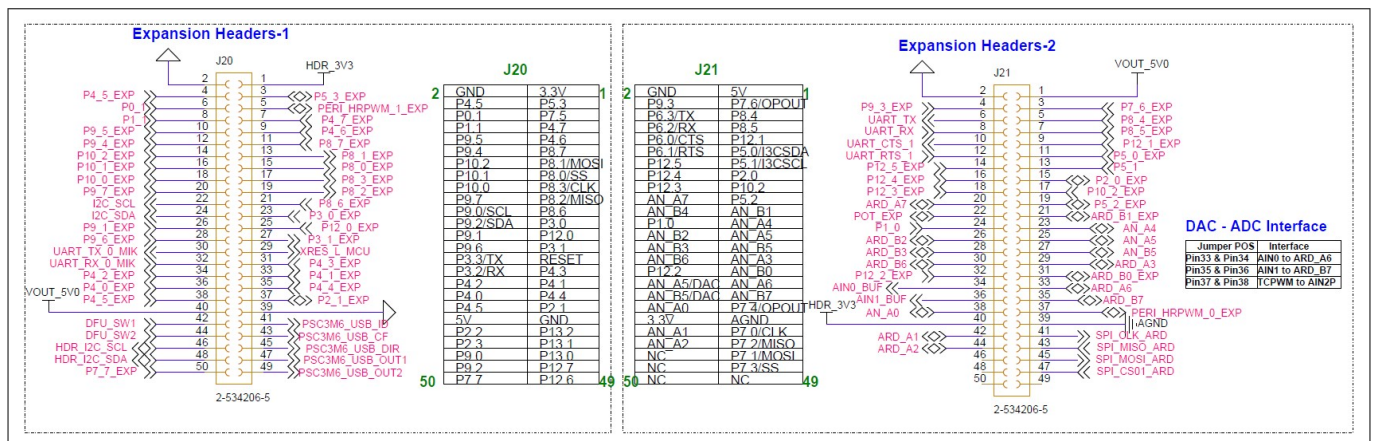


Figure 21 **I/O expansion headers**

6 CAN FD transceiver

6 CAN FD transceiver

The TLE9251V is a high-speed CAN transceiver, operating as an interface between the CAN controller and the physical bus medium

A high-speed CAN network is a two-wire, differential network that allows data transmission rates up to 5 Mbps. The CANH and CANL pins are the interfaces to the CAN bus; both pins operate as an input and an output. The RxD and TxD pins are the interfaces to the MCU. The TxD pin is the serial data input from the CAN controller(U16) and the RxD pin is the serial data output from the CAN controller. The voltage level on the digital input TxD and the digital output RxD is determined by the power supply level at the VIO pin. The signal levels on the logic pins (STB, TxD, and RxD) are compatible with MCUs having a 3.3 V I/O supply. The CAN transceiver will operate accordingly (3.3 V or 5 V).

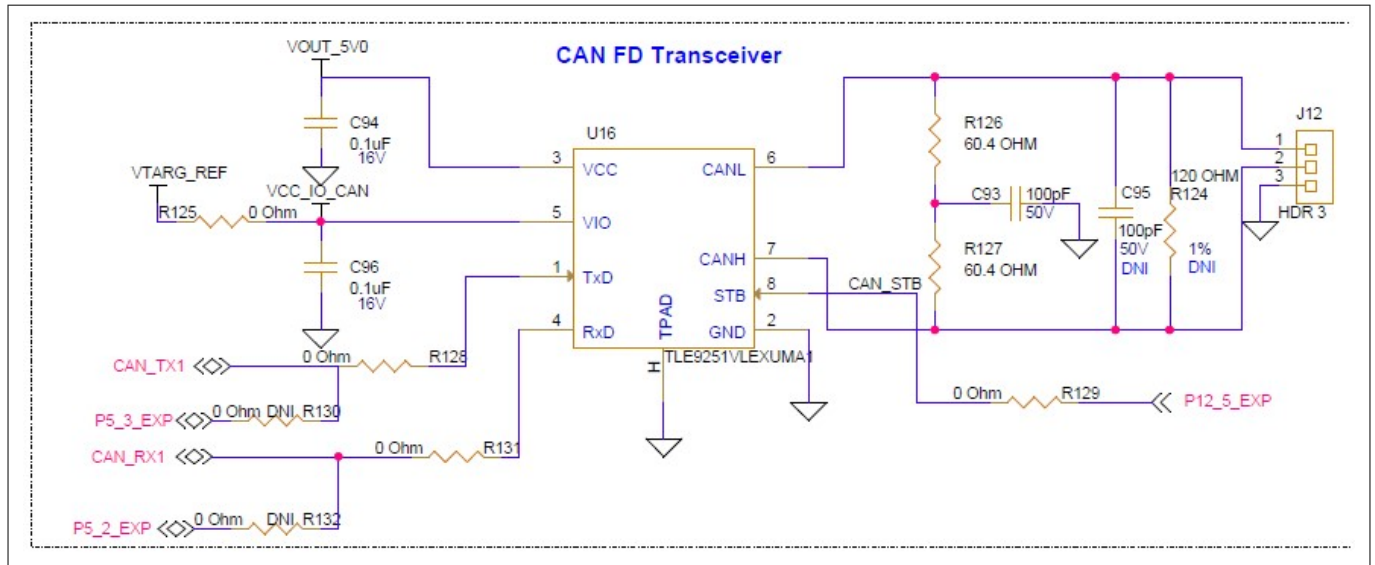


Figure 22 CAN transceiver

7 USB2.0 Full-Speed host and device

7 USB2.0 Full-Speed host and device

PSOC™ Control C3M6 Evaluation Kit features a dedicated USB 2.0 Full-Speed (12 Mbps) interface via a USB Type-C connector, which is connected directly to the internal USB PHY of PSC3M6 MCU. This direct hardware connection allows the MCU to operate in both USB device and USB host modes, enabling the development of diverse applications.

The TUSB321RWBR controller manages the switching between USB device and host modes. This chip handles the configuration channel (CC) logic required for USB Type-C to negotiate roles automatically or through manual hardware selection.

The TUSB321RWBR controller provides the following ID output that reflects the negotiation role:

- ID = 3.3 V (High) device mode by default
- ID = 0 V (Low) host mode

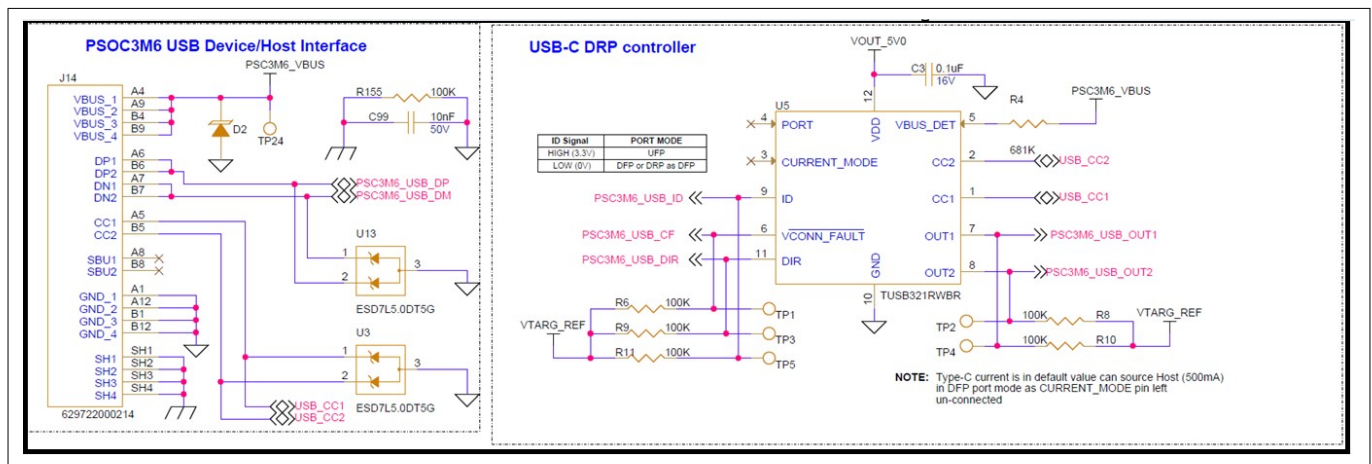


Figure 23 USB2.0 Full-Speed connector and DRP

8 LEDs

8 LEDs

The evaluation kit (EVK) includes the following four LEDs:

- LED1(Red) indicates the power status of evaluation kit
- LED3 (Yellow) connected to user application
- LED4 (Blue) connected to user application
- D9 (Green) indicates the status of the XMC4200

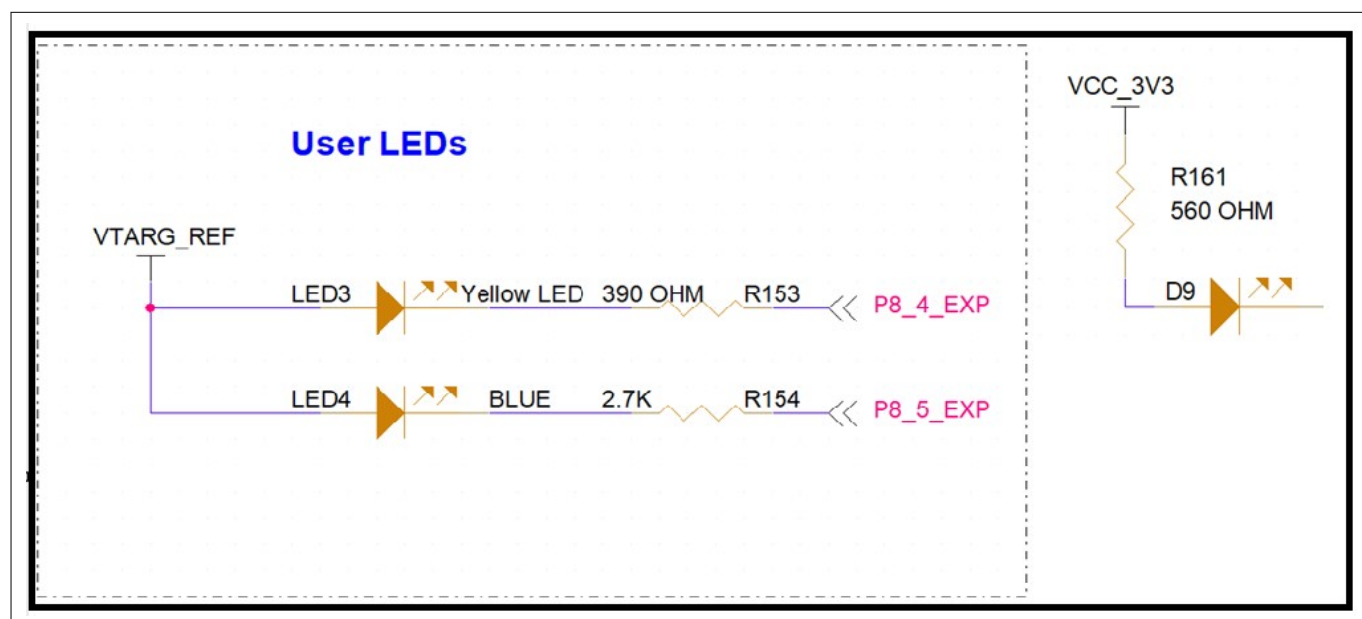


Figure 24 User LEDs

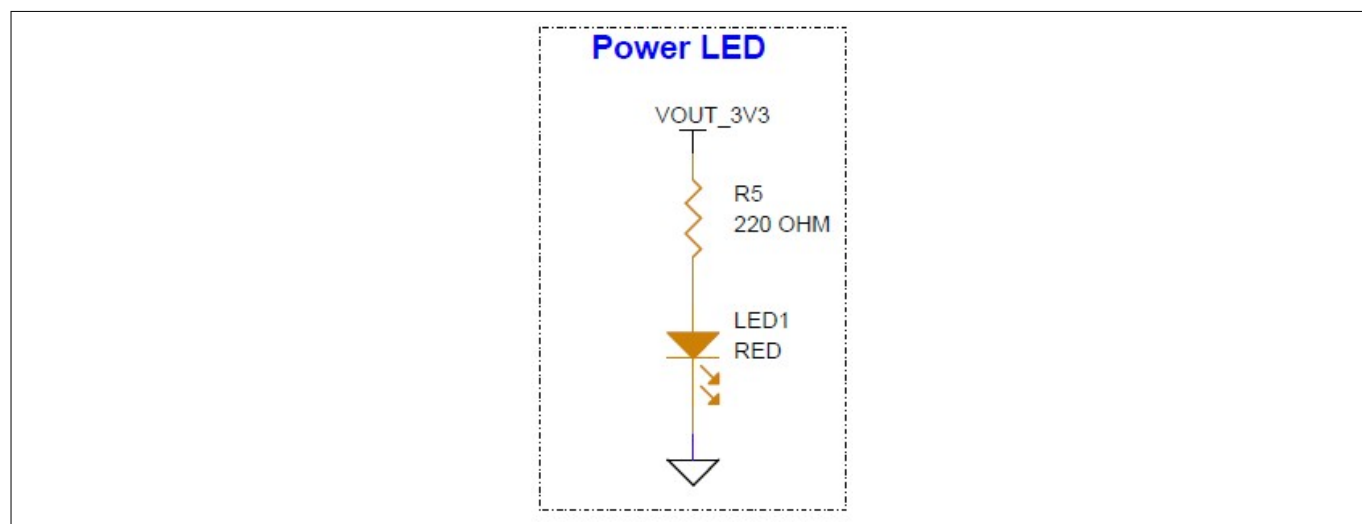


Figure 25 Power LED

9 Push buttons

9 Push buttons

The board includes the following buttons:

- Reset button (SW1) is connected to the XRES pin of PSC3M6 device and used to reset the device
- User button2 (SW3) connected to pin P2.0 of the MCU
- User button1 (SW4) connected to pin P10.2 of the MCU

All buttons are in the ACTIVE LOW configuration and short to GND when pressed.

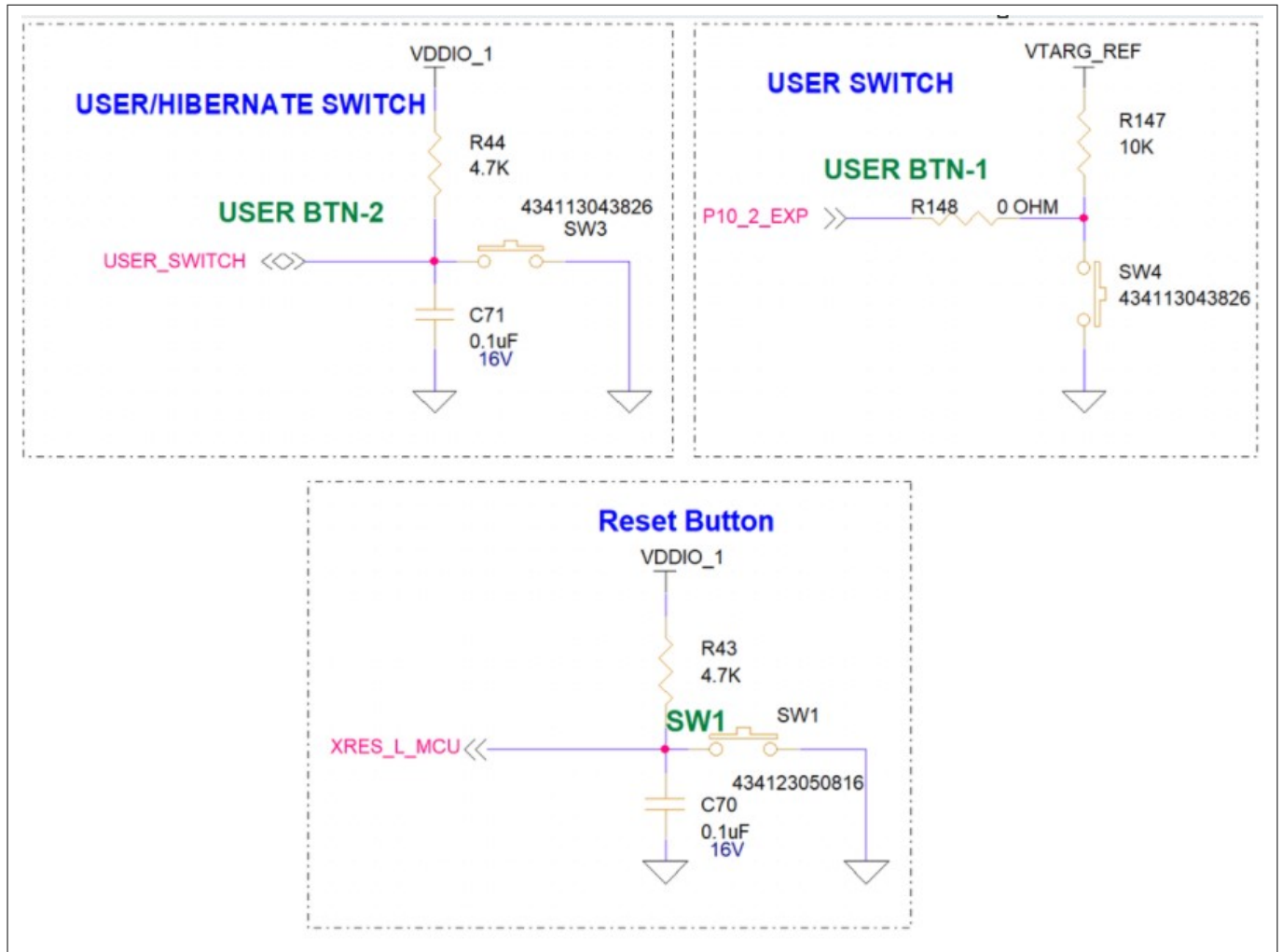


Figure 26 Push buttons

10 Crystals and oscillators

10 Crystals and oscillators

The evaluation kit provides the following two crystal as clock source:

- 16-MHz crystal is connected to P1.0 and P1.1 as external crystal oscillator (ECO)
- 32.768-kHz crystal connected to P0.0 and P0.1 as watch crystal oscillator (WCO)

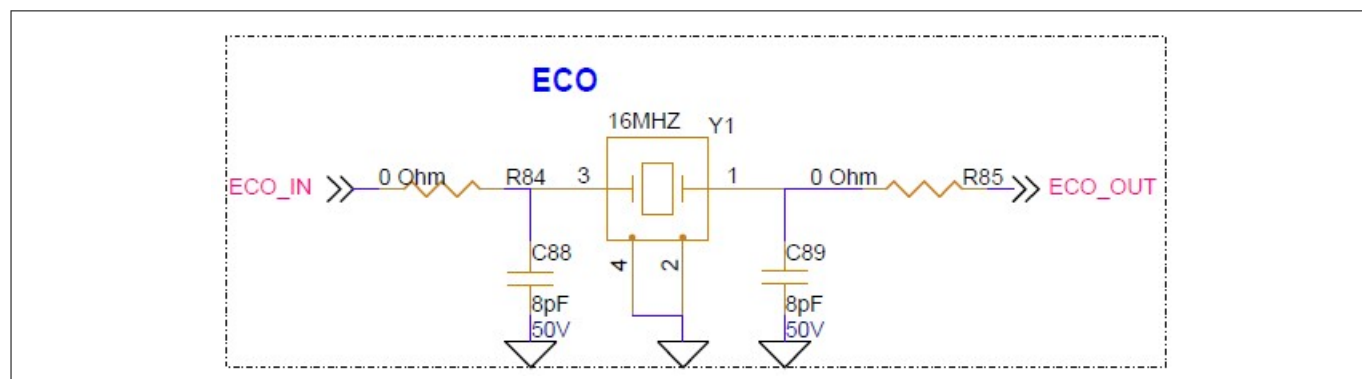


Figure 27 ECO

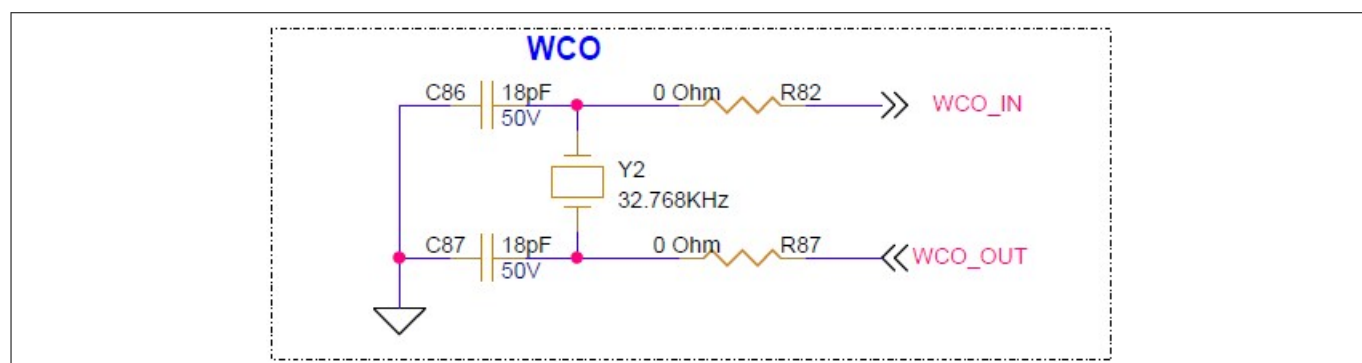


Figure 28 WCO

11 Potentiometer

11 Potentiometer

The board contains a 10K potentiometer connected to AN_B4 pin of MCU.

The same signal is connected to a 50-pin expansion header (J21.22). Remove R136 and mount R140 resistor to isolate the signal from the potentiometer. The fixed ends are connected to VDDA (VDD_POT through J19) and GND that may contribute to leakage current on the P3_VDD supply. Remove the jumper J19 to disconnect power from the potentiometer when measuring the P3_VDD current.

ADC output readings must increase when the potentiometer is rotated in a clockwise direction and conversely.

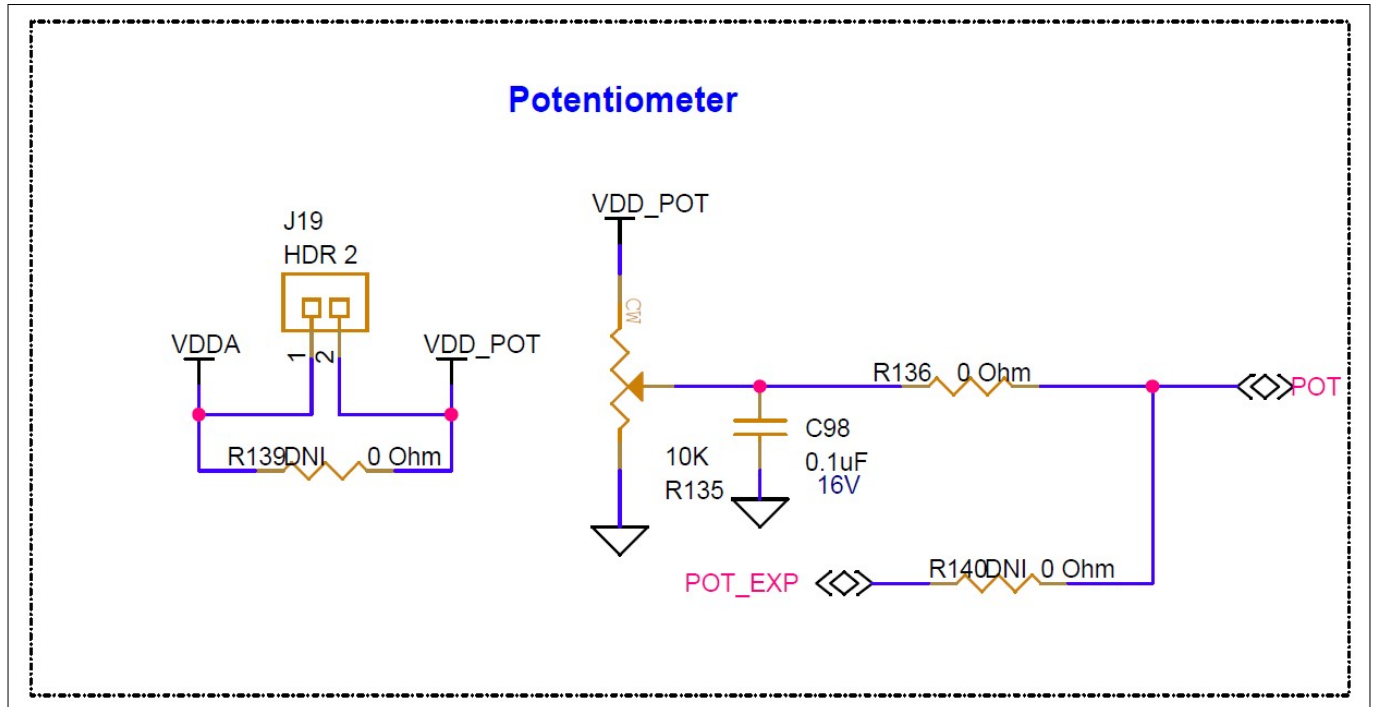


Figure 29 Potentiometer

12 Reverse voltage protection

12 Reverse voltage protection

The following circuit is used to protect the device from reverse supply.

The kit includes a necessary reverse voltage protection circuit to prevent damage from the reverse supply to the board. The circuit protecting the PSC3M6 device will prevent any accidental supply from coming in as input to the board. The board uses a FET-based diode circuit for reverse voltage protection.

The corresponding reverse voltage protection circuit protects the power supply pins from all the headers, such as Arduino, mikroBUS, and expansion headers. Programming headers are restricted to powering the PSOC™ Control C3 Evaluation Kit. To protect the target device from accidental power fluctuations from the external world, a reverse voltage protection circuit is added to the design.

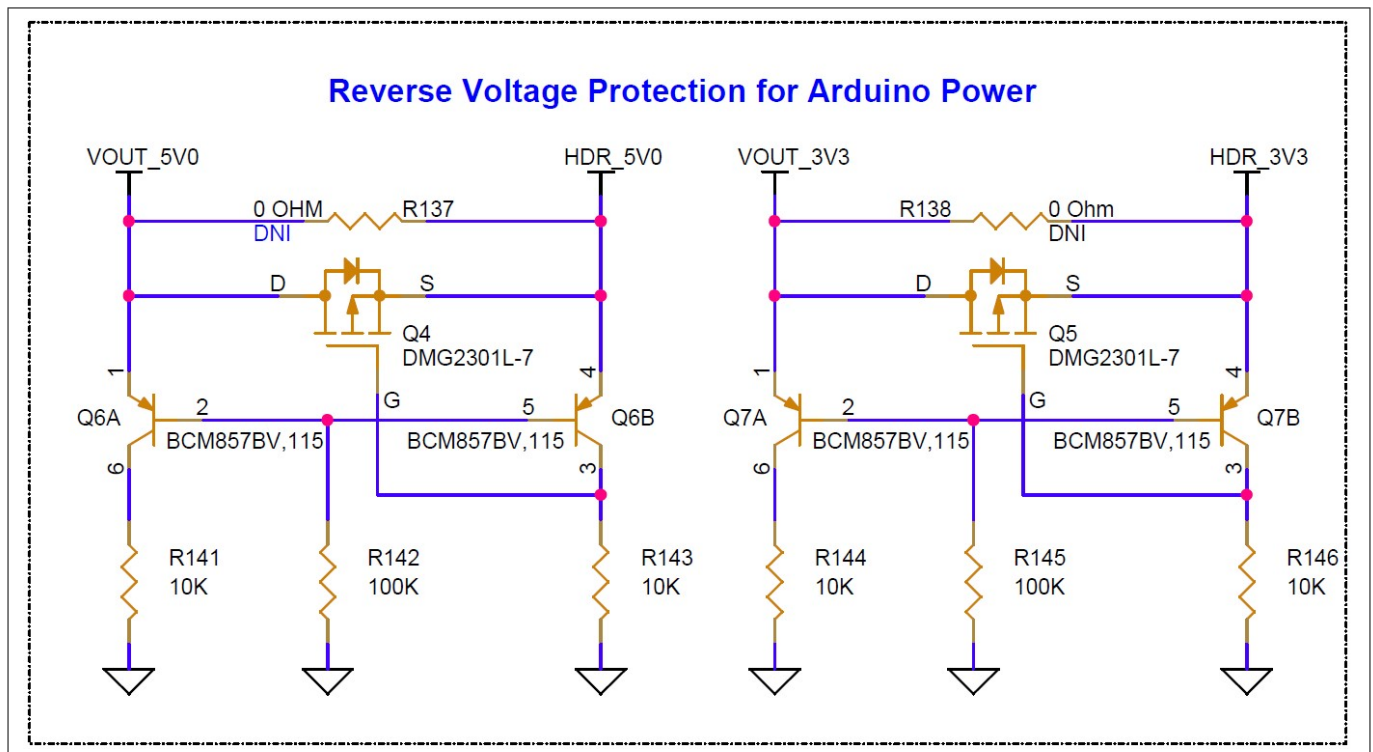


Figure 30 Reverse voltage protection

13 Kit rework

13 Kit rework

The PSOC™ Control C3M6 Evaluation Kit requires the following rework to access the peripherals, which are not supported by default

See board pinouts for more details.

13.1 SPI NOR flash

The NOR flash U17 (S25FL128LAGMFV013) is accessible through SCB5 by performing the following rework:

By default, SCB5 pins are used as GPIO pins, which are routed to the 50-pin expansion headers. To test this memory device (50 MHz), perform the following rework

Table 6 Rework instruction

Reference designator	Assembly
R71	DNI
R72	DNI
R73	DNI
R74	DNI
R62	Stuff
R63	Stuff
R64	Stuff
R67	Stuff

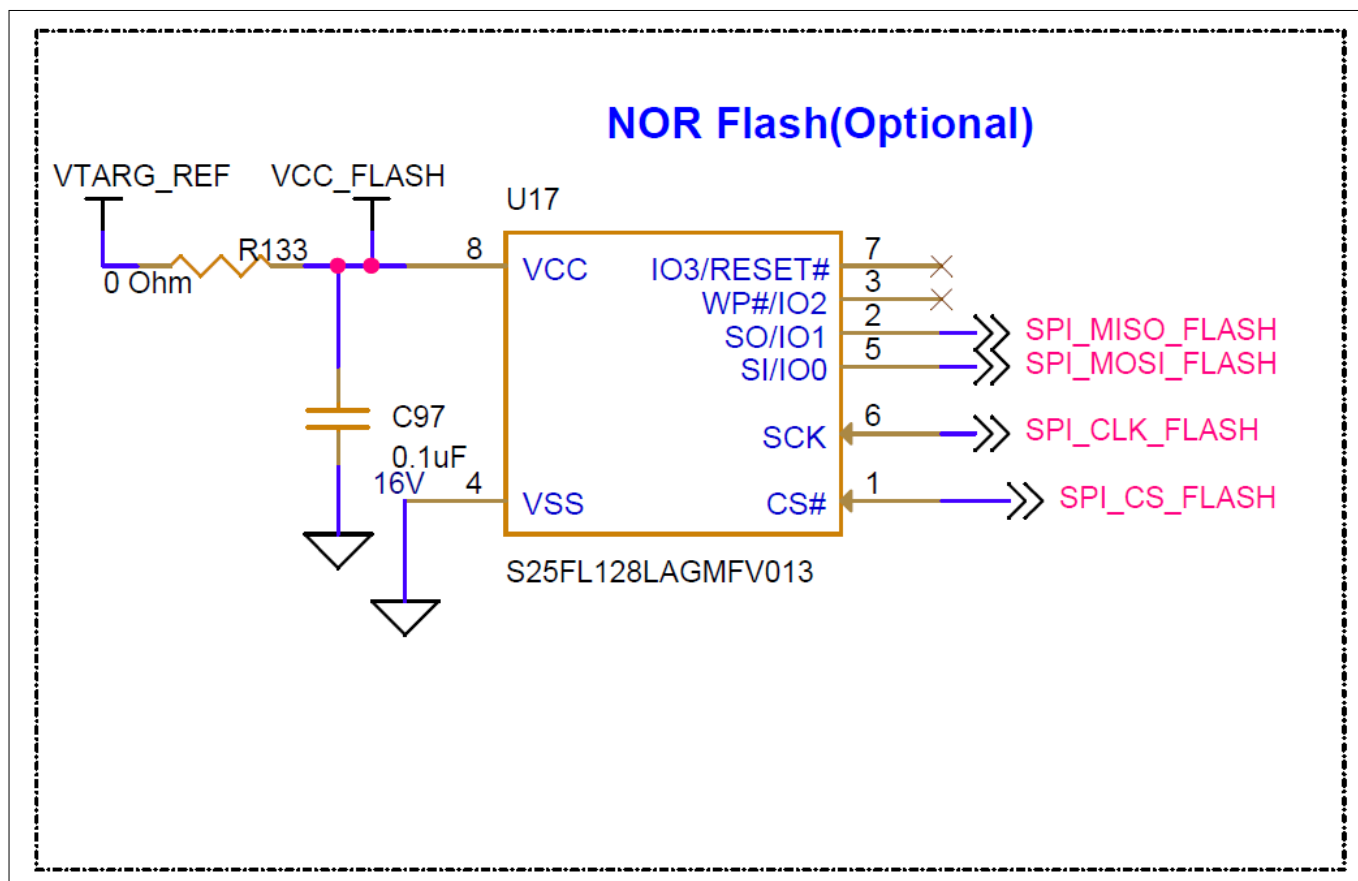


Figure 31 NOR flash

13 Kit rework

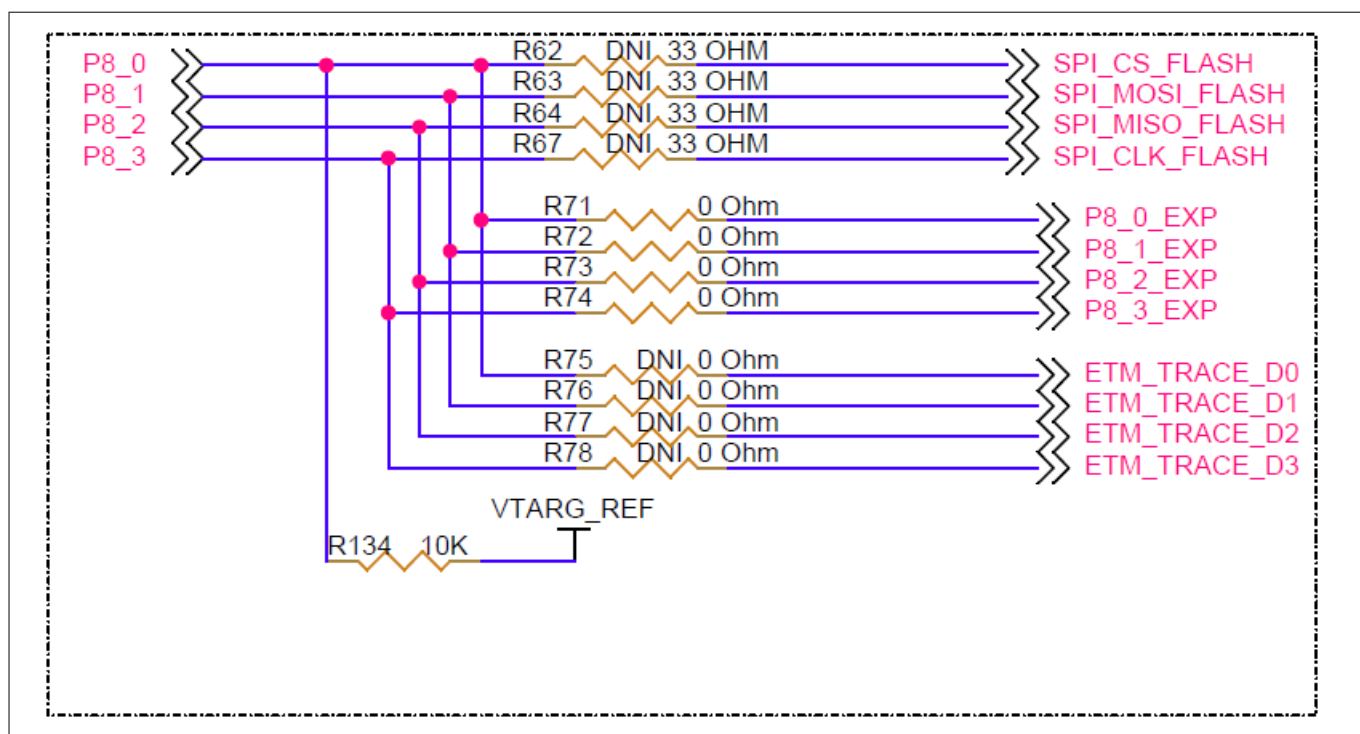


Figure 32 Rework connections

13.2 ETM trace and debug header

By default, the ETM trace and debug headers are not populated on the kit. Populate the 20-pin ETM standard connector before using a third-party programmer for trace programming.

Rework the following components in EVK to enable the ETM interface.

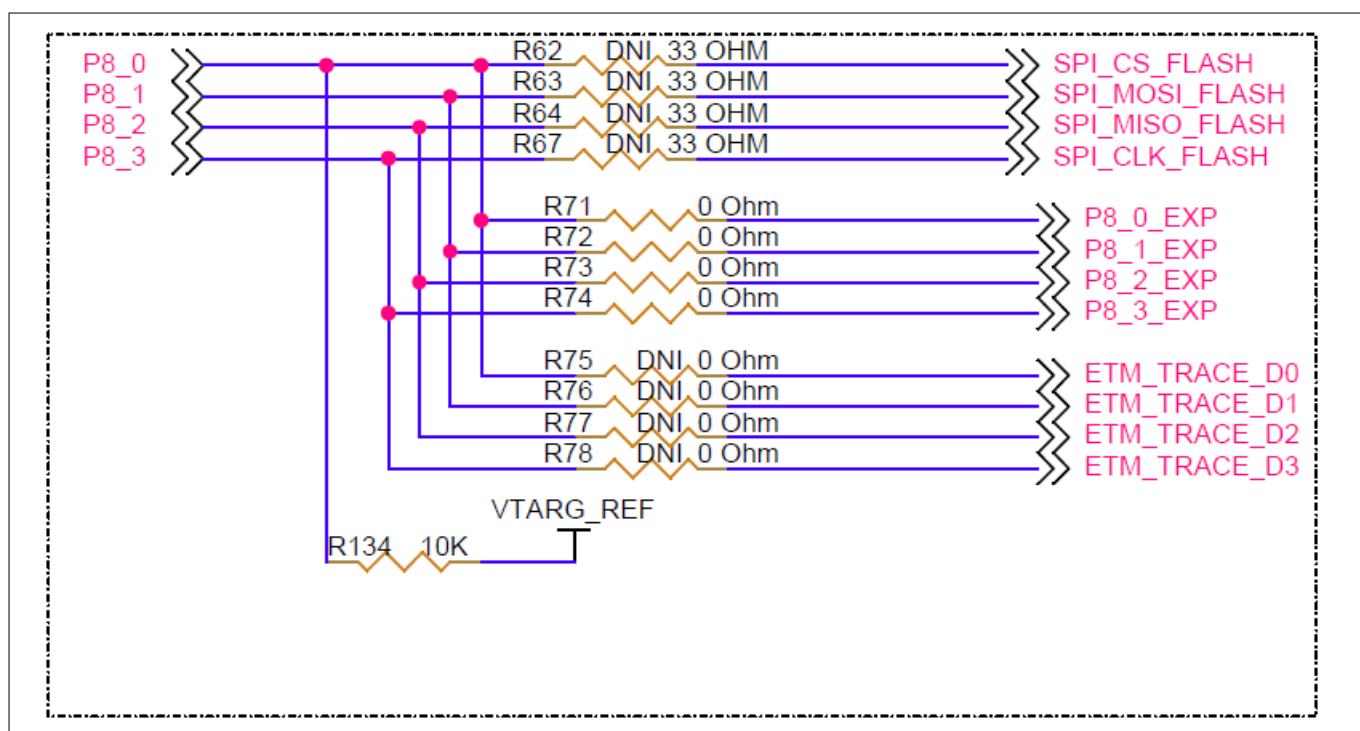


Figure 33 Rework connections

13 Kit rework

Table 7 Rework instruction

Reference designator	Assembly
R71	Remove
R72	Remove
R73	Remove
R74	Remove
R79	Remove
R134	Remove
R75	Stuff
R76	Stuff
R77	Stuff
R78	Stuff
R80	Stuff

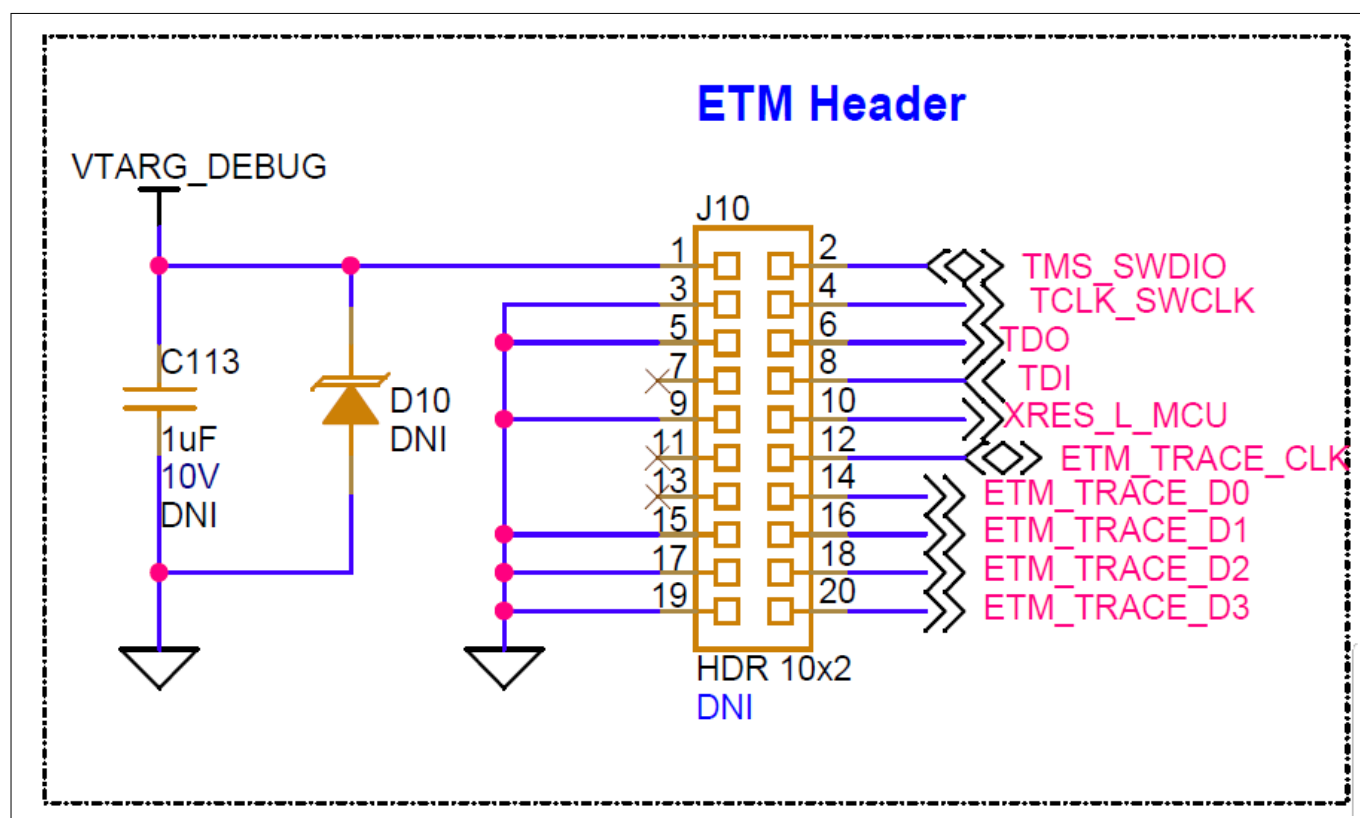


Figure 34 ETM header

13 Kit rework

13.3 Antialiasing filter

To evaluate the ADC pin functionality on the PSOC™ Control C3M6 Evaluation Kit, an antialiasing filter provision is provided for analog signals that are connected to J2 of the Arduino-compatible header, J15 of the mikroBUS header, and 50-pin expansion header J21.

By default, the PSC3M6 includes only default function as an analog series resistor ($0\ \Omega$) and an optional capacitor acting as an antialiasing filter. Assemble the necessary capacitors for this operation. To optimize the filtering option, modify the respective resistor value ($0\ \Omega$) to a suitable value specific to the user application.

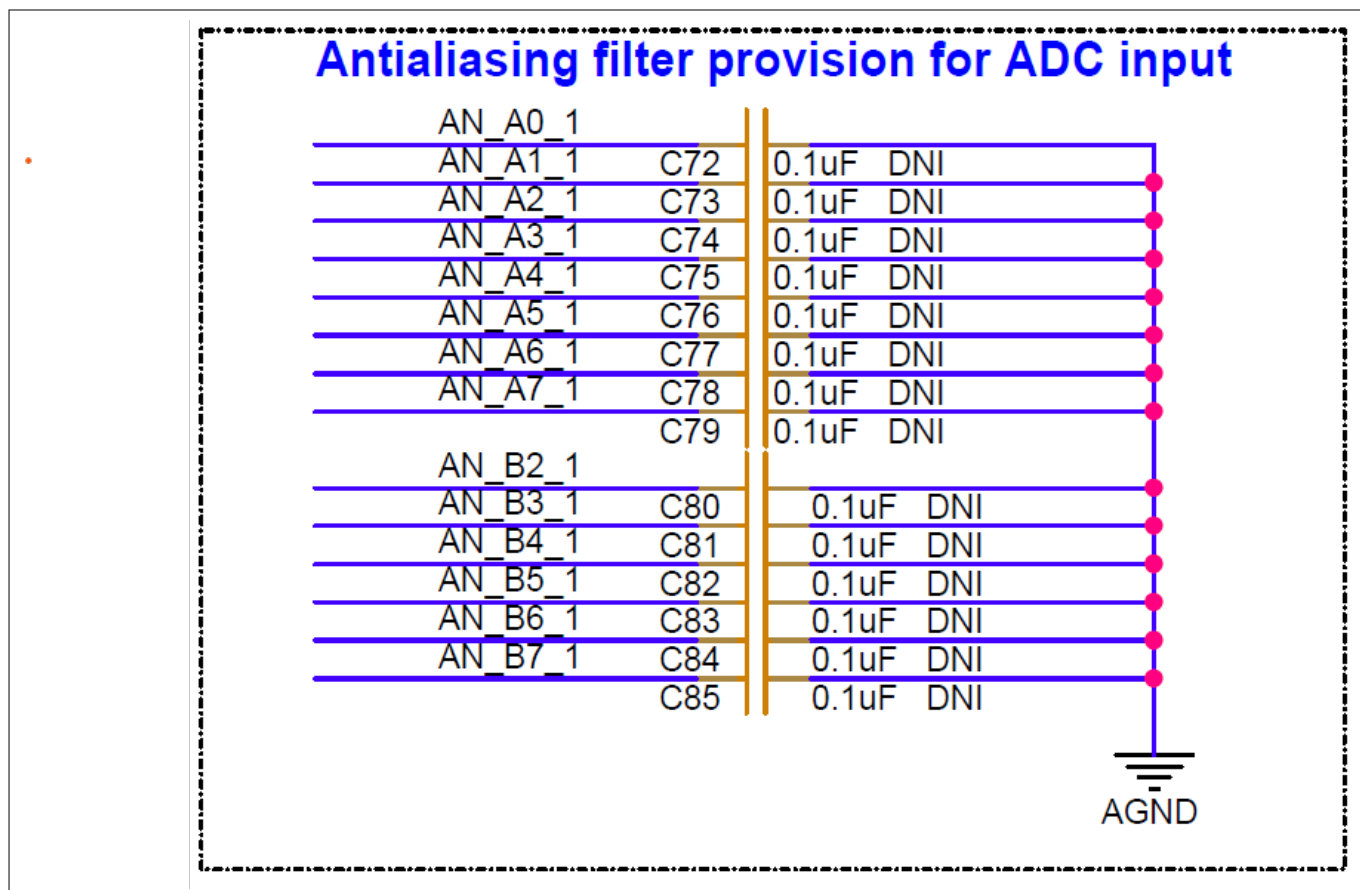


Figure 35 Antialiasing filter

Revision history**Revision history**

Document revision	Date	Description of changes
**	2026-05-04	Initial release
*A	2026-08-28	Updated Table 2 Updated Board support package (BSP) Updated Creating and running a ModusToolbox™ project for KIT_PSC3M6_EVAL Updated Using the OOB example – PSC3M6 MCU: OOB demo Updated Headers compatible with Arduino Uno R3 (J1, J2, J3, J4) Updated Potentiometer Updated SPI NOR flash Updated ETM trace and debug header Added Safety precautions

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The electrical installation must be completed in accordance with the appropriate safety requirements.