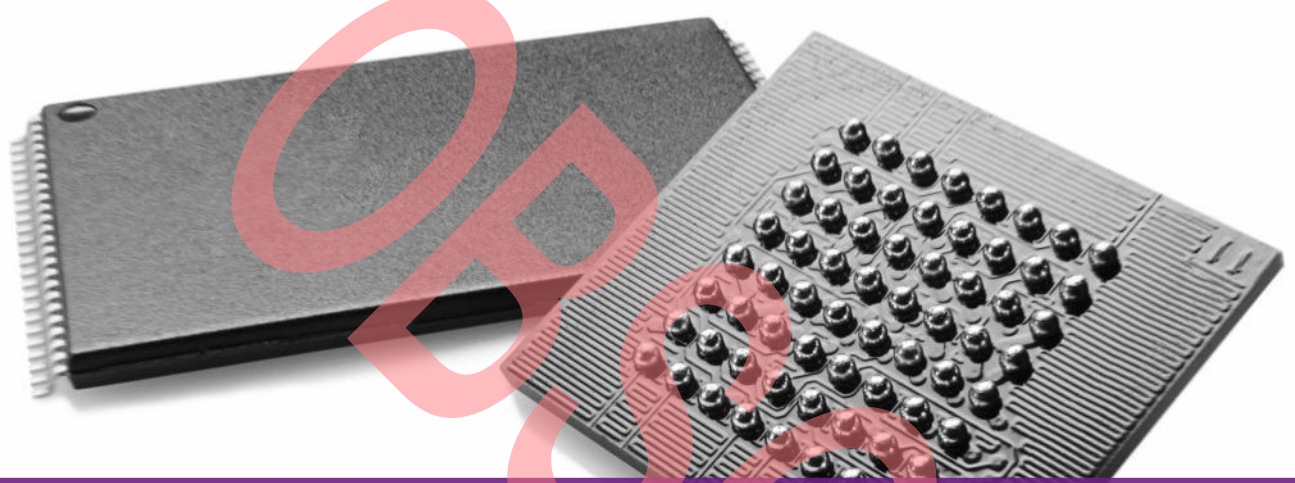


THIS SPEC IS OBSOLETE

Spec No: 002-05539

Spec Title: SK-FM4-U-Peripheral

Replaced by: None



SK-FM4-U-PERIPHERAL

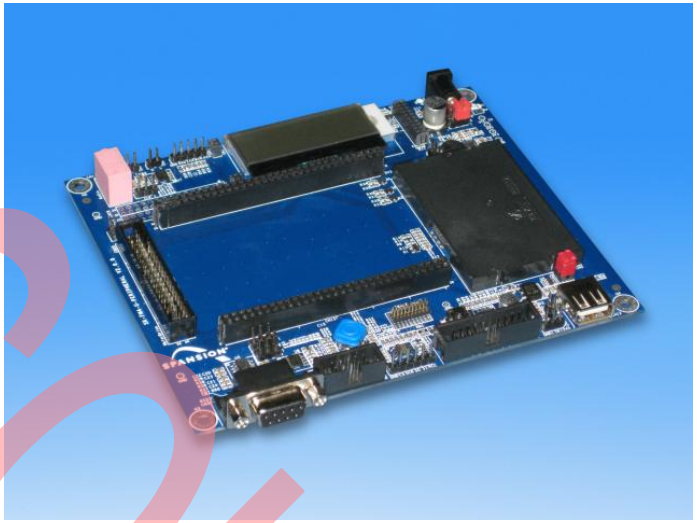
Document Number: 002-05539 Rev. *A

Hardware V2.0.0 / Document 1.0.1

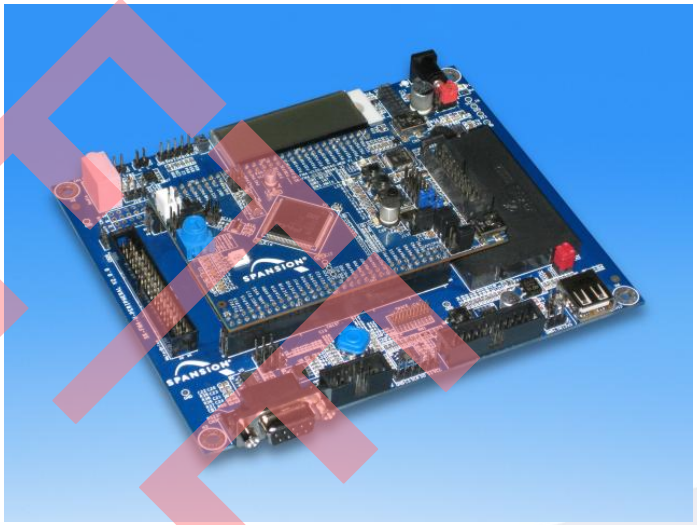
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Content

- Hardware
  - Features
  - Test the board
  - Components layout
  - Connectors
  - Jumper table
  - Jumper setting
- Work with FM4 Starterkit
  - Power supply
  - Pin overview
  - Peripheral confiliction
- Finally
  - Contact us



SK-FM4-U-PERIPHERAL with SK-FM4-U120-9B560 mounted



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Hardware

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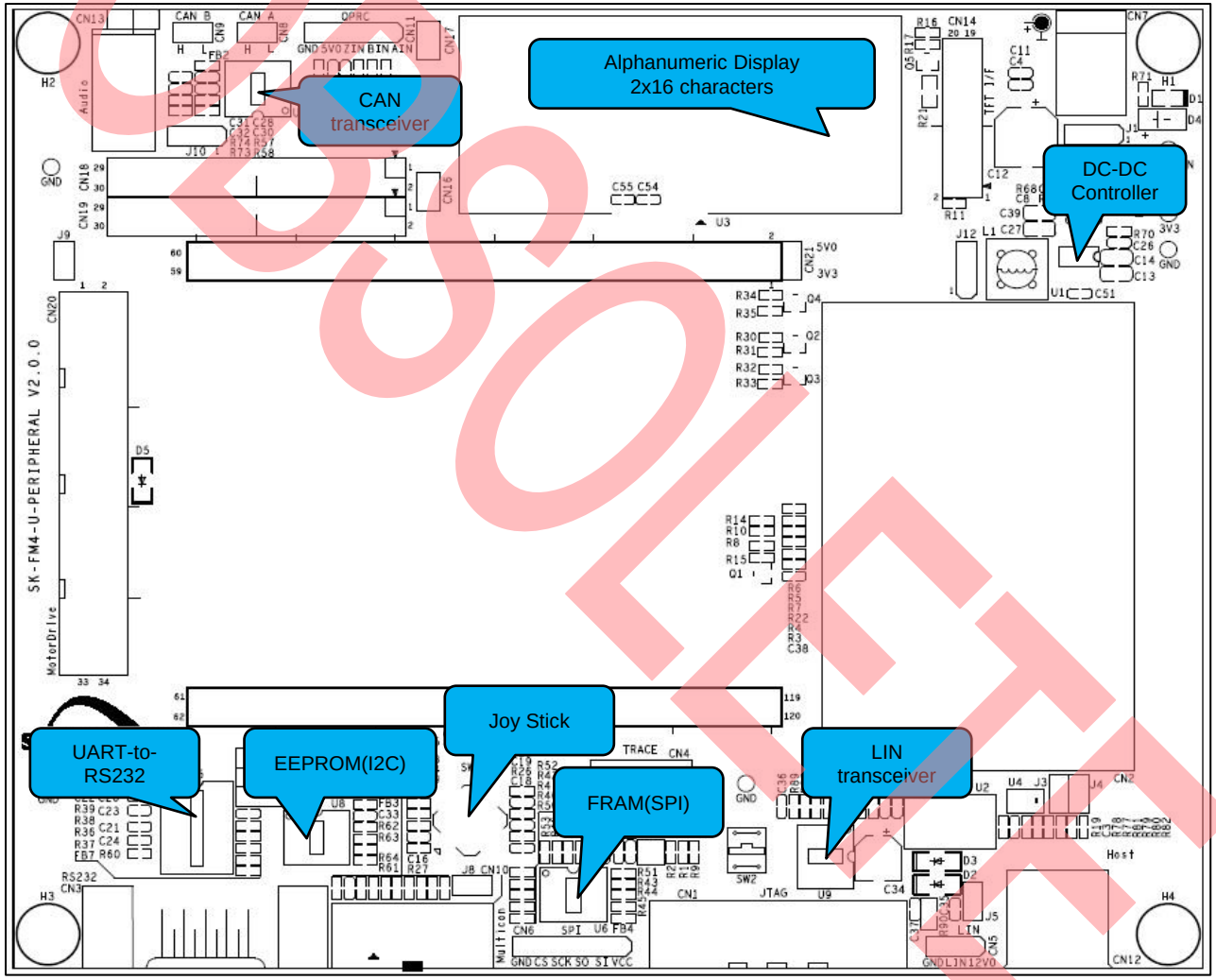
Features

- The SK-FM4-U-PERIPHERAL board includes following features:
  - DC power input, external 15V or 5V, including power LED
  - LC-Display (2x16 characters, serial I2C connection)
  - Miniature joystick usable for HMI
  - External memory: EEPROM (2Kbit) via I2C, FRAM (64Kbit) via SPI
  - High-Speed CAN and LIN interface (master or slave)
  - RS232 I/F, D-Sub9 female connector
  - Multicon connector (SPI, I2C) and SPI interface
  - USB Host interface
  - Smart Card socket
  - Ear-phone jack
  - Connector for motor power stages e.g.: SK-Power-3P-LV2-MC
  - Connector (20pin) for optional external JTAG adapter
  - Connector (20pin) for optional external Trace adapter

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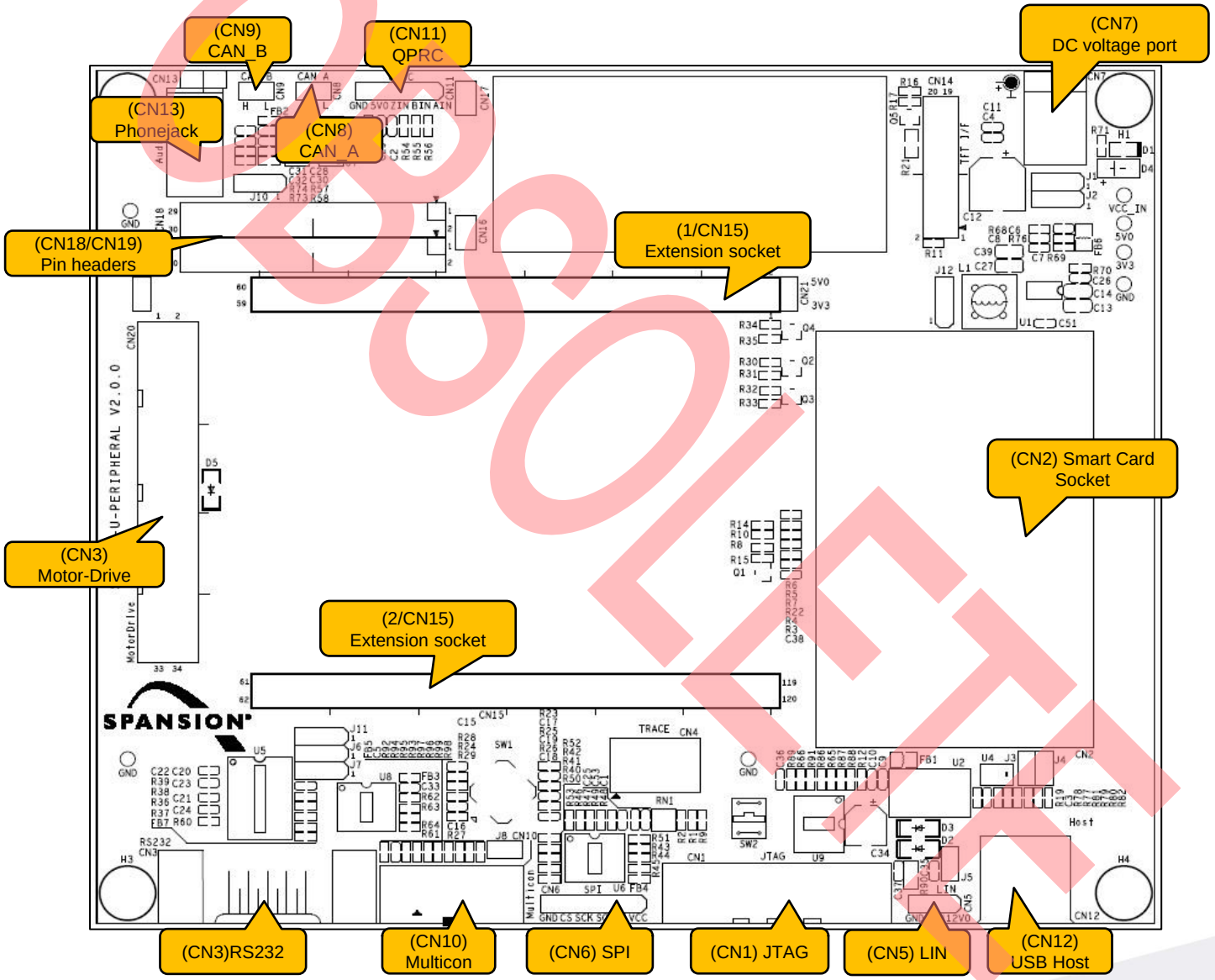
Components Layout



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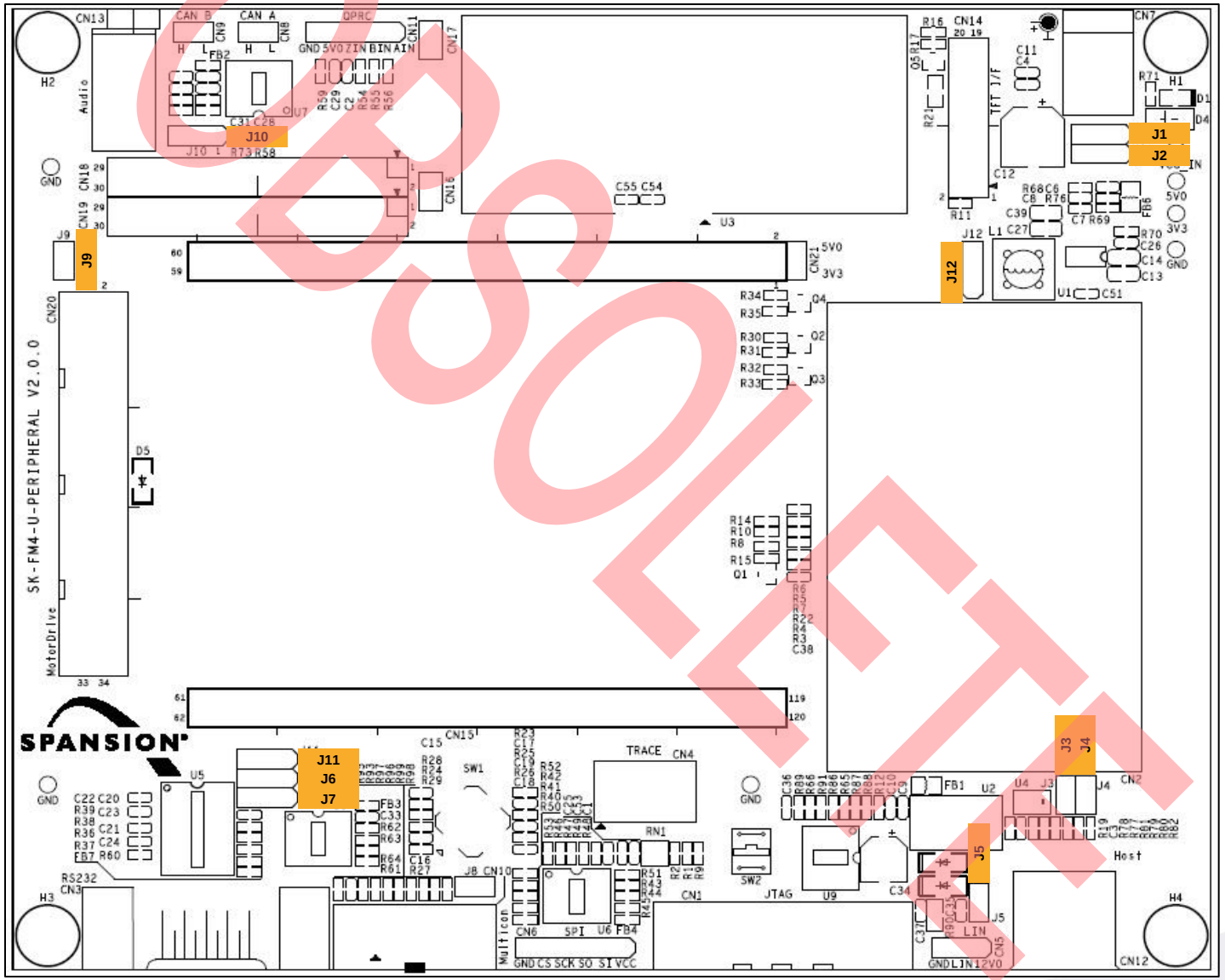
Connectors



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Jumpers



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Jumper table

Jumper	Function	Settings
J1	Bypass the DC-DC Depending on the voltage input from CN7	1~2 : power from 15V0, use the DC-DC 2~3 : power from 5V0, bypass the DC-DC
J2	5V0 source selection Set the J2 according the configuration of J1	1~2 : 5V0 is from DC-DC 2~3 : 5V0 is from CN7
J3	USB D- If close J3, open the J12 on SK-FM4-U120-9B560	Close : USB host is connected Open : USB host is disconnected
J4	USB D+ If close J4, open the J11 on SK-FM4-U120-9B560	Close : USB is connected (Host) Open : USB is disconnected (Host)
J5	Mode selection of LIN	Close : Support master mode Open : Not support master mode
J6	UART TX channel selection	1~2 : select SOT0 connected with RS232 2~3 : select SOT4 connected with RS232
J7	UART RX channel selection	1~2 : select SIN0 connected with RS232 2~3 : select SIN4 connected with RS232
J9	15V0 in MotorDrive connector When board is power from 15V0	Close : connect 15V to MotorDrvie connector Open : disconnect 15V to MotorDrive connector
J10	Multi-function selection for PIN37	1~2 : pulse input for TIOB0_0 2~3 : DAC channel 1 output (DA1)
J11	Multi-function selection for PIN78	1~2 : connect PIN78 with the R1OUT of RS232 IC (U5) 2~3 : connect PIN78 with the gate of transistor Q5 (Dot LCD backlight control)

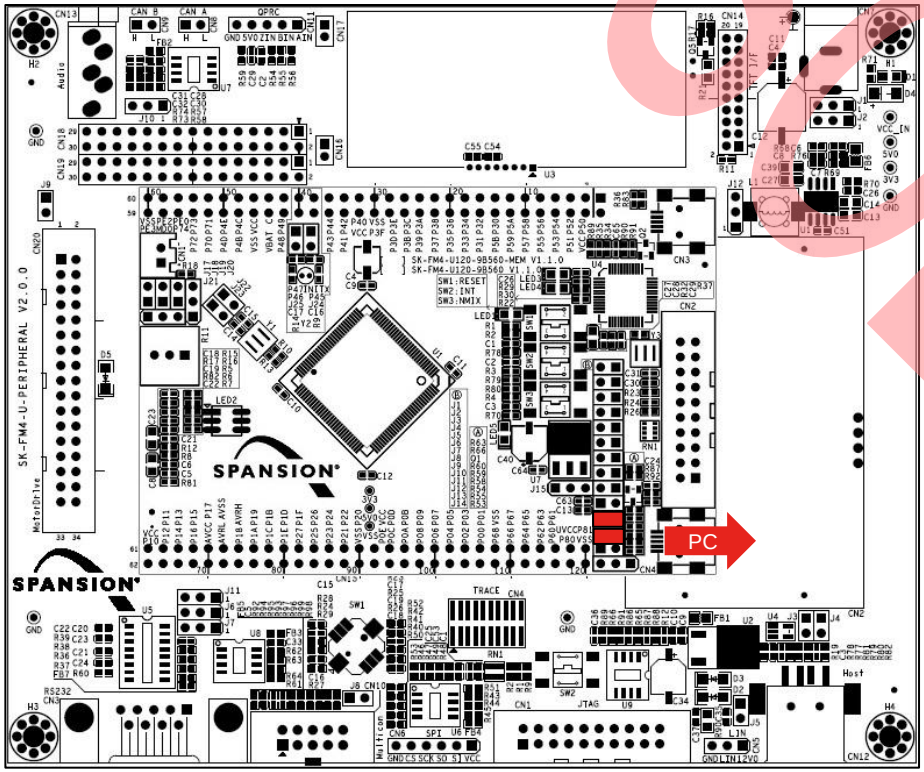
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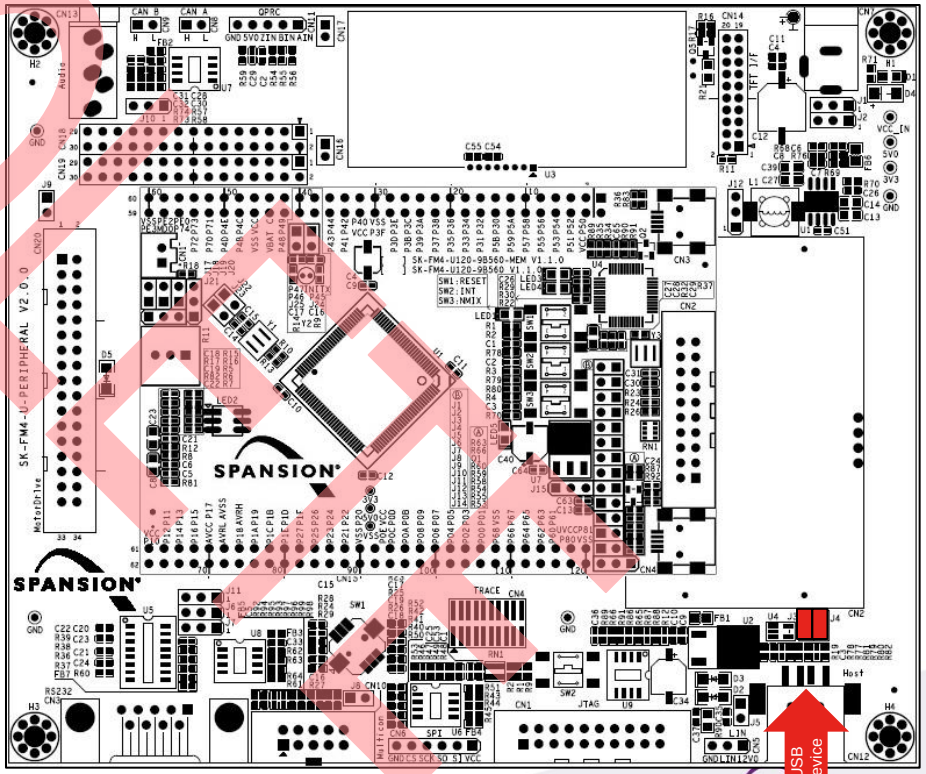
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Jumper Setting (1/3)

- USB Host vs. USB Device

USB function	Jumper Setting	Remark
USB Host	Open J11, J12 on FM4 SK Close J3, J4 on FM4 PB	Connect with USB device via CN12 on FM4 PB
USB Device	Close J11, J12 on FM4 SK Open J3, J4 on FM4 PB	Connect with PC via CN4 on FM4 SK





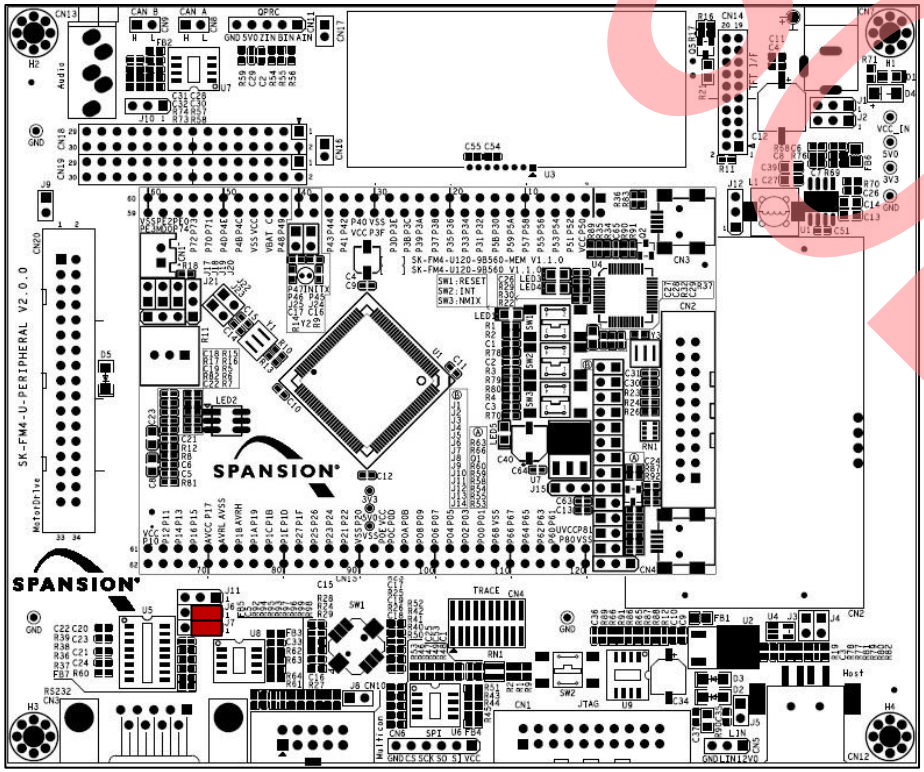
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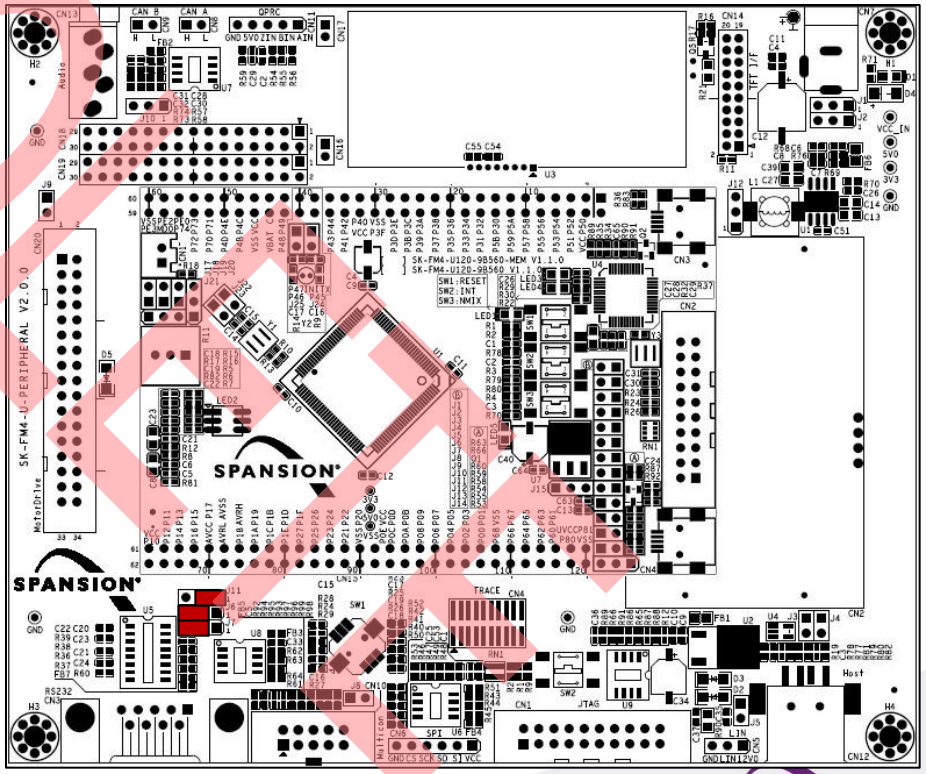
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Jumper Setting (2/3)

- UART0 vs. UART4 to RS232

UART No.	Jumper Setting	Remark
UART0	Close 1~2 of J6 (SOT0_0) Close 1~2 of J7 (SIN0_0)	N/A
UART4	Close 2~3 of J6 (SOT4_0) Close 2~3 of J7 (SIN4_0)	Close 1~2 of J11





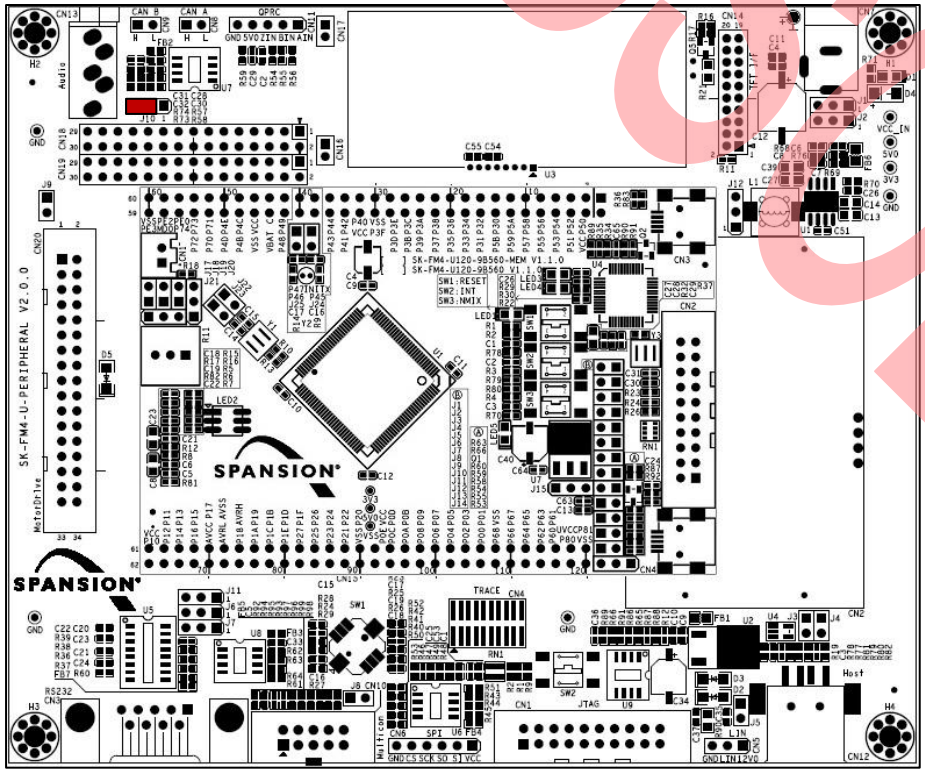
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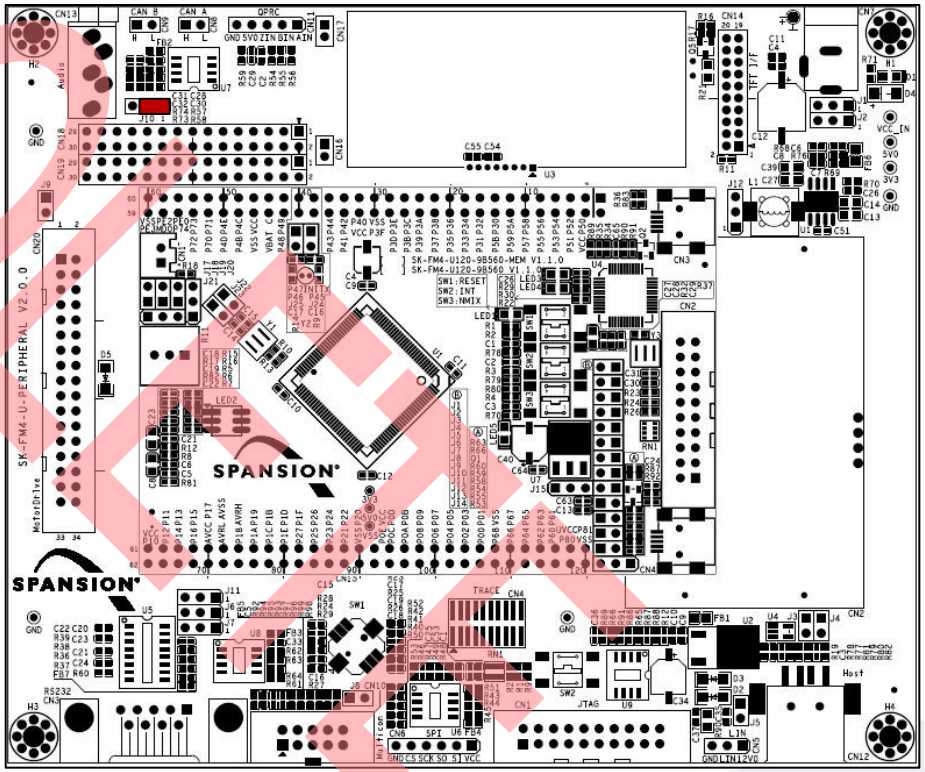
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Jumper Setting (3/3)

- DAC vs. Base Timer

Peripheral	Jumper Setting	Remark
DAC	Close 2~3 of J10	DAC output by Phonejack (CN13)
Base Timer	Close 1~2 of J10	Detect the signal of the HALL sensor by base timer





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Work with FM4 Starterkit

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FM4 Starterkit

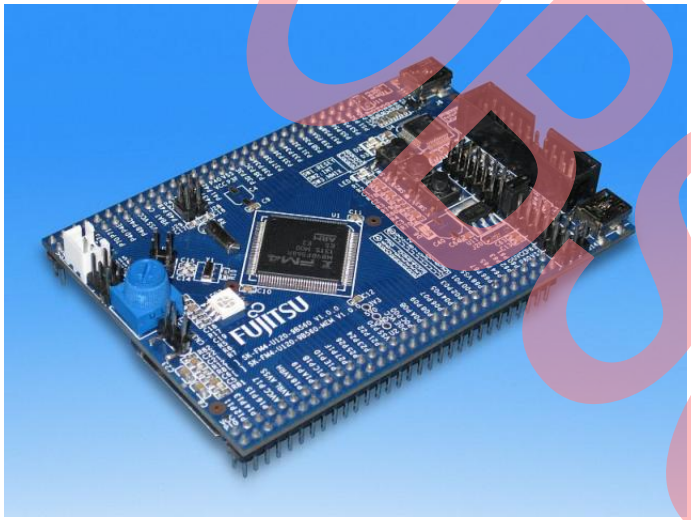
- There are two types of FM4 starterkit to work with this peripheral board:
  - SK-FM4-U120-9B560 (No SDRAM and NAND flash on board)
  - SK-FM4-U120-9B560-MEM (SDRAM and NAND flash are available on board)
- Definition
  - Make following definitions to shorten the spelling:
    - FM4 Starterkit : SK-FM4-U120-9B560(-MEM)
    - FM4 Peripheral : SK-FM4-U-PERIPHERAL
- Please click following link, to find the more information:
  - Go to FM4 Starterkit

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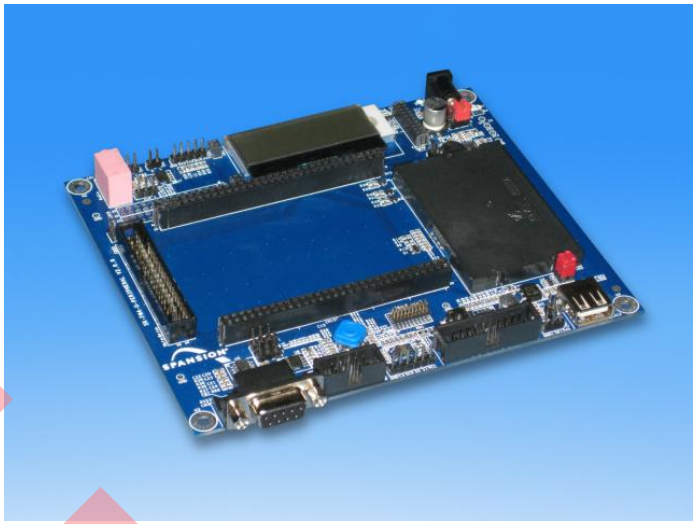
Installation

- Install the FM4 Starterkit and the FM4 Peripheral as below:

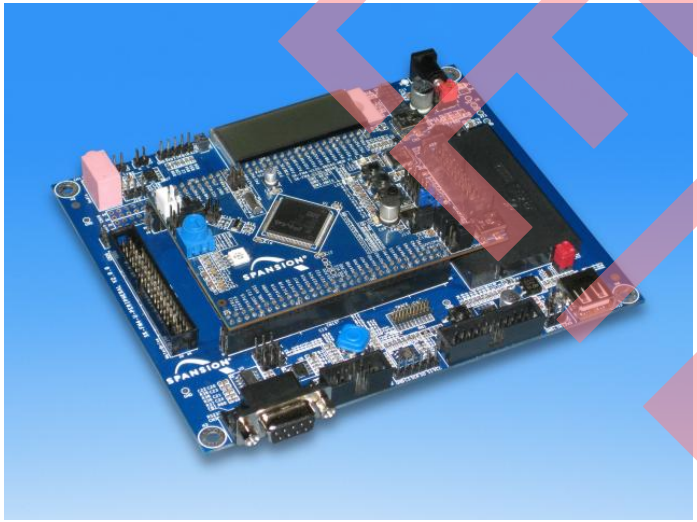


SK-FM4-U120-9B560(-MEM)

+



SK-FM4-U-PERIPHERAL



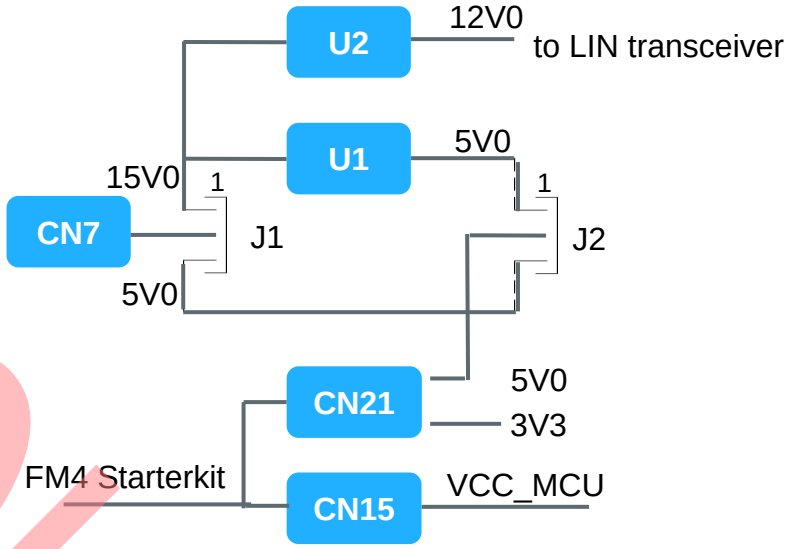
SK-FM4-U120-9B560(-MEM)
assembled on top of
SK-FM4-U-PERIPHERAL

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Power Supply (1/4)

- Three methods to power the boards:
  - Power from 15V0 voltage (support LIN)
  - Power from 5V0 voltage (not support LIN)
  - Power from the FM4 Starterkit
- On-board voltage
  - 5V0/3V3 (Selected by J15 on FM4 Starterkit)
  - 3V3 only from FM4 Starterkit
  - Always 3V3 for SK-FM4-U120-9B560-MEM



- U1: The DC-DC module that converts 15V to 5V
- U2: The regulator that converts 15V to 12V for LIN Master
- CN7: DC power input header
- CN21: 3V3 - power from FM4 Starterkit

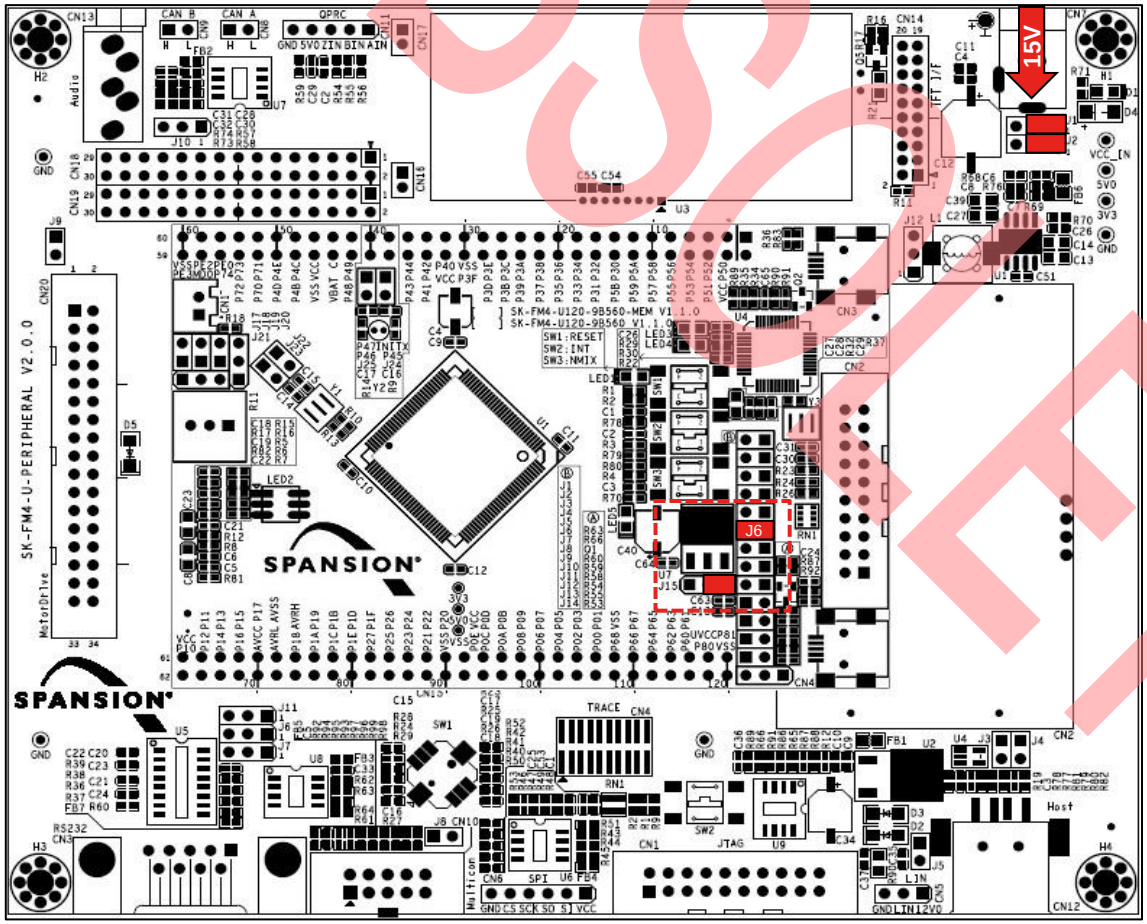
  5V0 - a power source for FM4 starterkit
- CN15: VCC_MCU input, the value of voltage determined by the FM4 Starterkit
- J1: Selection of using DC-DC or bypassing it, depending on the voltage from CN7
- J2: selection of connecting the DC-DC output or direct 5V0 to VCC_MCU

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Power Supply (2/4) – 15V external DC input

Power Source	On-board voltage	Jumper Setting (FM4 Starterkit)	Jumper Setting (FM4 Peripheral)
CN7-15V0	5V0	Close J6 Close 2~3/J15	Close 1~2/J1 Close 1~2/J2
CN7-15V0	3V3	Close J6 Close 1~2/J15	Close 1~2/J1 Close 1~2/J2

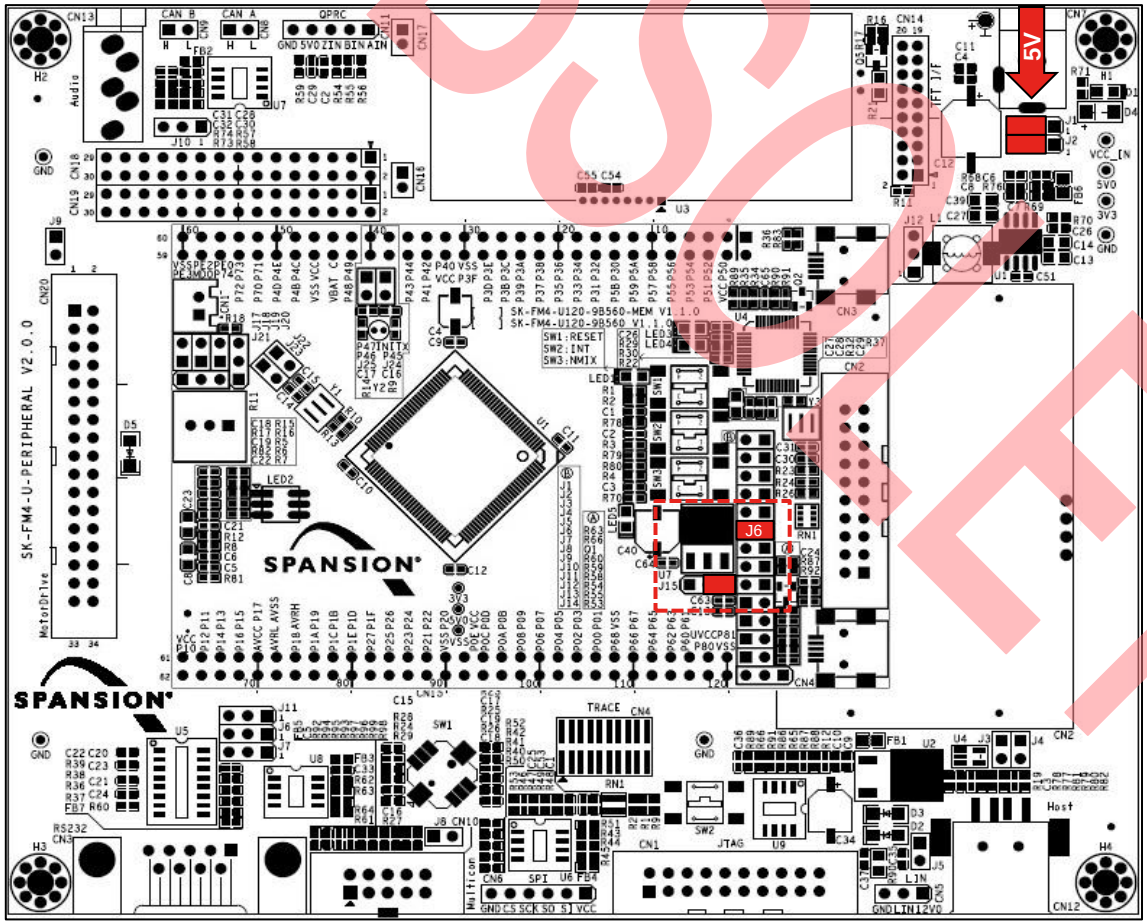


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Power Supply (3/4) – 5V external DC input

Power Source	On-board voltage	Jumper Setting (FM4 Starterkit)	Jumper Setting (FM4 Peripheral)
CN7-5V0	5V0	Close J6 Close 2~3/J15	Close 1~2/J1 Close 1~2/J2
CN7-5V0	3V3	Close J6 Close 1~2/J15	Close 1~2/J1 Close 1~2/J2

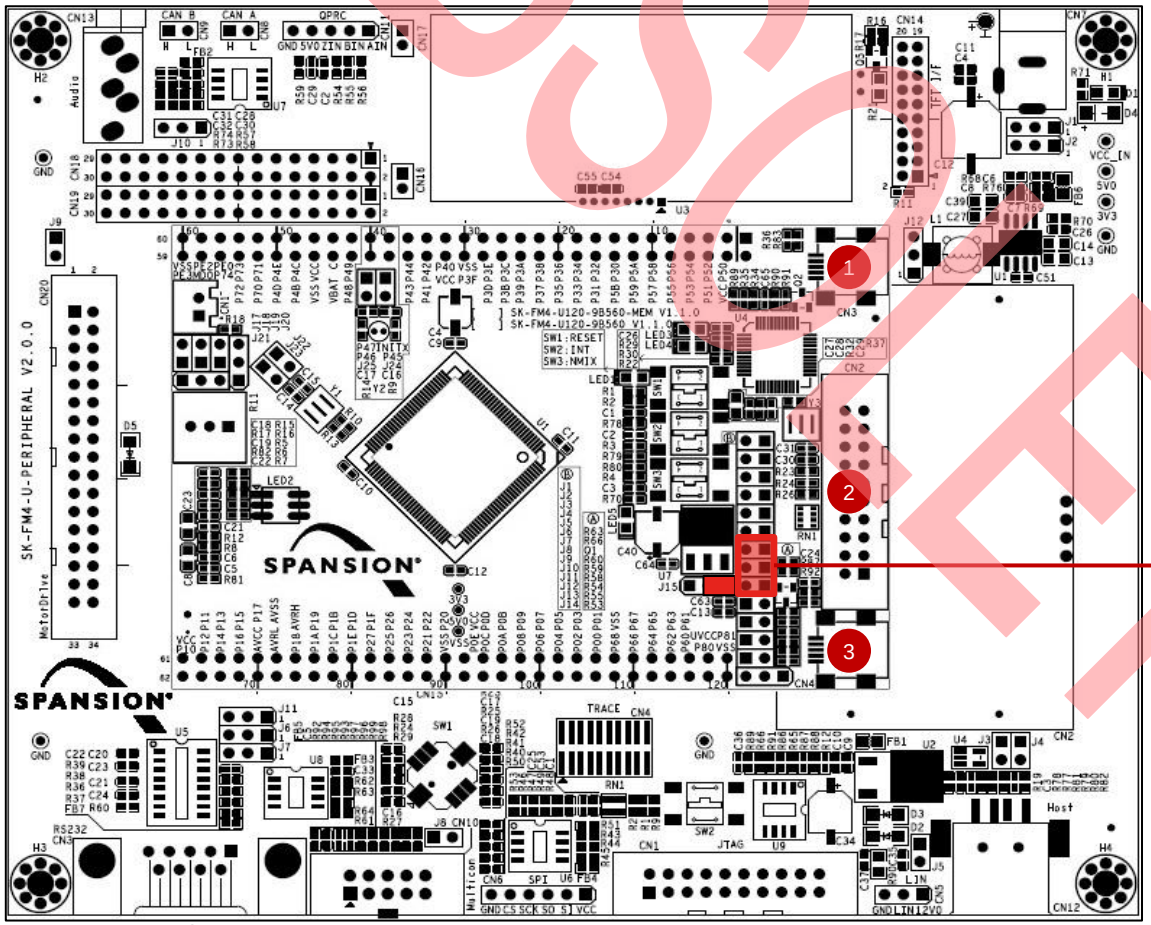


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Power Supply (4/4) – powered via FM4 starter kit

	Power Source (FM4 starter kit)	On-board voltage (FM4 starter kit)	Jumper Setting (FM4 Starterkit)	Jumper Setting (FM4 Peripheral)
1	CN3 (CMSIS-DAP)	Depends on J15 selection of FM4 starter kit 1-2: 3V3 2-3: 5V	Close J7 when power from CN3	N/A
2	CN2 (JTAG)		Close J8 when power from CN2	N/A
3	CN4 (USB Host)		Close J9 when power from CN4	N/A



Close one of them (J7-J9)

Note:
Please refer to user manual of SK-FM4-U120-9B560(-MEM)

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Pin Overview (1/6)

Pin	Microcontroller-Function	SK-FM4-U120-9B560	SK-FM4-U120-9B560-MEM	SK-FM4-U-PERIPHERAL
1	VCC	VCC_MCU 3V3 or 5V0	VCC_MCU 3V3 or 5V0	VCC_MCU 3V3 or 5V0
2	P50/CTS4_0/AIN0_2/RTO10_0/INT00_0/MADATA00_0		SDRAM, NAND FLASH	TFT LCD I/F
3	P51/RTS4_0/BIN0_2/RTO11_0/INT01_0/MADATA01_0		SDRAM, NAND FLASH	TFT LCD I/F
4	P52/SCK4_0/ZIN0_2/RTO12_0/MADATA02_0		SDRAM, NAND FLASH	TFT LCD I/F
5	P53/TIOA1_2/SOT4_0/RTO13_0/MADATA03_0		SDRAM, NAND FLASH	TFT LCD I/F
6	P54/TIOB1_2/SIN4_0/RTO14_0/INT02_0/MADATA04_0		SDRAM, NAND FLASH	TFT LCD I/F
7	P55/ADTG_1/SIN6_0/RTO15_0/INT07_2/MADATA05_0		SDRAM, NAND FLASH	TFT LCD I/F
8	P56/SOT6_0/DTTI1X_0/INT08_2/MADATA06_0		SDRAM, NAND FLASH	TFT LCD I/F
9	P57/SCK6_0/MADATA07_0		SDRAM, NAND FLASH	TFT LCD I/F
10	P58/SIN4_2/AIN1_0/INT04_2/MADATA08_0		SDRAM	QPRC
11	P59/RX1_1/SOT4_2/BIN1_0/INT07_1/MADATA09_0		SDRAM	QPRC
12	P5A/TX1_1/SCK4_2/ZIN1_0/MADATA10_0		SDRAM	QPRC
13	P5B/CTS4_2/MADATA11_0		SDRAM	
14	P30/TIOB0_1/RTS4_2/INT15_2/WKUP1/MADATA12_0		SDRAM	
15	P31/TIOB1_1/SIN3_1/INT09_2/MADATA13_0		SDRAM	LIN
16	P32/TIOB2_1/SOT3_1/INT10_1/MADATA14_0		SDRAM	Smart Card
17	P33/ADTG_6/TIOB3_1/SCK3_1/INT04_0/MADATA15_0		SDRAM	Smart Card
18	P34/TX0_1/TIOB4_1/FRCK0_0/MNALE_0		NAND FLASH	Smart Card
19	P35/RX0_1/TIOB5_1/IC03_0/INT08_1/MNCLE_0		NAND FLASH	Smart Card
20	P36/SIN5_2/IC02_0/INT09_1/MNWEX_0		NAND FLASH	MotorDrive

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Pin Overview (2/6)

Pin	Microcontroller-Function	SK-FM4-U120-9B560	SK-FM4-U120-9B560-MEM	SK-FM4-U-PERIPHERAL
21	P37/SOT5_2/IC01_0/INT05_2/MNREX_0		NAND FLASH	MotorDrive
22	P38/SCK5_2/IC00_0/INT06_2	LED_G	LED_G	MotorDrive
23	P39/ADTG_2/DTTI0X_0/RTCCO_2/SUBOUT_2/MSDCLK_0		SDRAM	MotorDrive
24	P3A/TIOA0_1/AIN0_0/RTO00_0/MSDCKE_0		SDRAM	MotorDrive
25	P3B/TIOA1_1/BIN0_0/RTO01_0/MRASX_0		SDRAM	MotorDrive
26	P3C/TIOA2_1/ZIN0_0/RTO02_0/MCASX_0		SDRAM	MotorDrive
27	P3D/TIOA3_1/RTO03_0/MAD00_0		SDRAM	MotorDrive, TFT LCD I/F
28	P3E/TIOA4_1/RTO04_0/MAD01_0		SDRAM	MotorDrive
29	P3F/TIOA5_1/RTO05_0/MAD02_0		SDRAM	MotorDrive
30	VSS	GND	GND	
31	VCC	VCC_MCU 3V3 or 5V0	VCC_MCU 3V3 or 5V0	
32	P40/TIOA0_0/RTO10_1/INT12_1			
33	P41/TIOA1_0/RTO11_1/INT13_1			
34	P42/TIOA2_0/RTO12_1/MSDWEX_0		SDRAM	
35	P43/ADTG_7/TIOA3_0/RTO13_1/MCSX8_0		SDRAM	
36	P44/TIOA4_0/RTO14_1/DA0			Audio
37	P45/TIOB0_0/RTO15_1/DA1			Audio
38	INITX	Button Reset / JTAG	Button Reset / JTAG	Button Reset / JTAG
39	P46/X0A	Sub-Crystal 32.768 kHz	Sub-Crystal 32.768 kHz	
40	P47/X1A	Sub-Crystal 32.768 kHz	Sub-Crystal 32.768 kHz	

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Pin Overview (3/6)

Pin	Microcontroller-Function	SK-FM4-U120-9B560	SK-FM4-U120-9B560-MEM	SK-FM4-U-PERIPHERAL
41	P48/VREGCTL			
42	P49/VWAKEUP	Pull-Down resistor	Pull-Down resistor	
43	VBAT	Battery (CN1)	Battery (CN1)	
44	C	Capacitor 4u7	Capacitor 4u7	
45	VSS	GND	GND	
46	VCC	VCC_MCU 3V3 or 5V0	VCC_MCU 3V3 or 5V0	
47	P4B/TIOB1_0/SCS7_1/MAD03_0		SDRAM	
48	P4C/TIOB2_0/SCK7_1/AIN1_2/MAD04_0		SDRAM	
49	P4D/TIOB3_0/SOT7_1/BIN1_2/INT13_2/MAD05_0		SDRAM	
50	P4E/TIOB4_0/SIN7_1/ZIN1_2/FRCK1_1/INT11_1/WKUP2/MAD06_0		SDRAM	
51	P70/TX0_0/TIOA4_2/AIN0_1/IC13_1			CAN
52	P71/RX0_0/TIOB4_2/BIN0_1/IC12_1/INT15_1			CAN
53	P72/TIOA6_0/SIN2_0/ZIN0_1/IC11_1/INT14_2			USB
54	P73/TIOB6_0/SOT2_0/IC10_1/INT03_2	USB	USB	
55	P74/SCK2_0/DTTI1X_1			CAN
56	PE0/MD1	LED_B / MD1	LED_B / MD1	
57	MD0	MD0	MD0	
58	PE2/X0	Main-Crystal 4 MHz	Main-Crystal 4 MHz	
59	PE3/X1	Main-Crystal 4 MHz	Main-Crystal 4 MHz	
60	VSS	GND	GND	

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Pin Overview (4/6)

Pin	Microcontroller-Function	SK-FM4-U120-9B560	SK-FM4-U120-9B560-MEM	SK-FM4-U-PERIPHERAL
61	VCC	VCC_MCU 3V3 or 5V0	VCC_MCU 3V3 or 5V0	
62	P10/AN00/RX1_2/SIN1_1/FRCK0_2/INT02_1/MAD07_0		SDRAM	MotorDrive
63	P11/AN01/TX1_2/SOT1_1/IC00_2/MAD08_0		SDRAM	MotorDrive
64	P12/AN02/SCK1_1/IC01_2/RTCCO_1/SUBOUT_1/MAD09_0		SDRAM	MotorDrive
65	P13/AN03/SIN0_1/IC02_2/INT03_1/MAD10_0		SDRAM	MotorDrive
66	P14/AN04/SOT0_1/IC03_2/MAD11_0		SDRAM	MotorDrive
67	P15/AN05/SCK0_1/MAD12_0			MotorDrive
68	P16/AN06/SIN2_2/INT14_1/MAD13_0			MotorDrive
69	P17/AN07/SOT2_2/WKUP3/MAD14_0		SDRAM	MotorDrive
70	AVCC	VCC_MCU	VCC_MCU	
71	AVSS	GND	GND	
72	AVRL	GND	GND	
73	AVRH	VCC_MCU	VCC_MCU	
74	P18/AN08/SCK2_2/MAD15_0		SDRAM	
75	P19/AN09/SIN4_1/IC00_1/INT05_1/MAD16_0			RS232
76	P1A/AN10/SOT4_1/IC01_1/MAD17_0			RS232
77	P1B/AN11/SCK4_1/IC02_1/MAD18_0			Joystick
78	P1C/AN12/CTS4_1/IC03_1/MAD19_0			RS232
79	P1D/AN13/RTS4_1/DTTI0X_1/MAD20_0			RS232
80	P1E/AN14/ADTG_5/FRCK0_1/MAD21_0			Multicon

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Pin Overview (5/6)

Pin	Microcontroller-Function	SK-FM4-U120-9B560	SK-FM4-U120-9B560-MEM	SK-FM4-U-PERIPHERAL
81	P1F/ADTG_4/TIOB6_2/RTO05_1			SPI
82	P27/TIOA6_2/RTO04_1/INT02_2	LED_R	LED_R	
83	P26/TIOB5_0/SCK2_1/RTO03_1			E2, Multicon, Dot LCD
84	P25/TX1_0/TIOA5_0/SOT2_1/RTO02_1			E2, Multicon, Dot LCD
85	P24/RX1_0/SIN2_1/RTO01_1/INT01_2			Multicon
86	P23/AN15/TIOA7_1/SCK0_0/RTO00_1/MAD22_0			Smart Card
87	P22/CROUT_0/AN16/TIOB7_1/SOT0_0/ZIN1_1	JTAG	JTAG	RS232
88	P21/AN17/SIN0_0/BIN1_1/INT06_1/MAD23_0	JTAG	JTAG	RS232
89	P20/AN18/AIN1_1/INT05_0/MAD24_0	Potentiometer R11	Potentiometer R11	
90	VSS	GND	GND	GND
91	VCC	VCC_MCU 3V3 or 5V0	VCC_MCU 3V3 or 5V0	
92	P0E/TIOB5_2/SCS6_1/IC13_0/S_CLK_0/MDQM1_0	SD-Card	SDRAM	SPI
93	P0D/TIOA5_2/SCK6_1/IC12_0/S_CMD_0/MDQM0_0	SD-Card	SDRAM	SPI
94	P0C/TIOA6_1/SOT6_1/IC11_0/S_DATA1_0/MALE_0	SD-Card		SPI
95	P0B/TIOB6_1/SIN6_1/IC10_0/INT00_1/S_DATA0_0/MCSX0_0	SD-Card	NAND FLASH	SPI
96	P0A/SIN1_0/FRCK1_0/INT12_2/S_DATA3_0/MCSX1_0	SD-Card		TFT LCD I/F
97	P09/AN19/TRACED0/TIOA3_2/SOT1_0/S_DATA2_0/MCSX5_0	SD-Card		TRACE
98	P08/AN20/TRACED1/TIOB3_2/SCK1_0/MCSX4_0			TRACE
99	P07/AN21/TRACED2/TIOA0_2/SCK7_0/MCLKOUT_0			TRACE
100	P06/AN22/TRACED3/TIOB0_2/SOT7_0/MCSX3_0			TRACE

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Pin Overview (6/6)

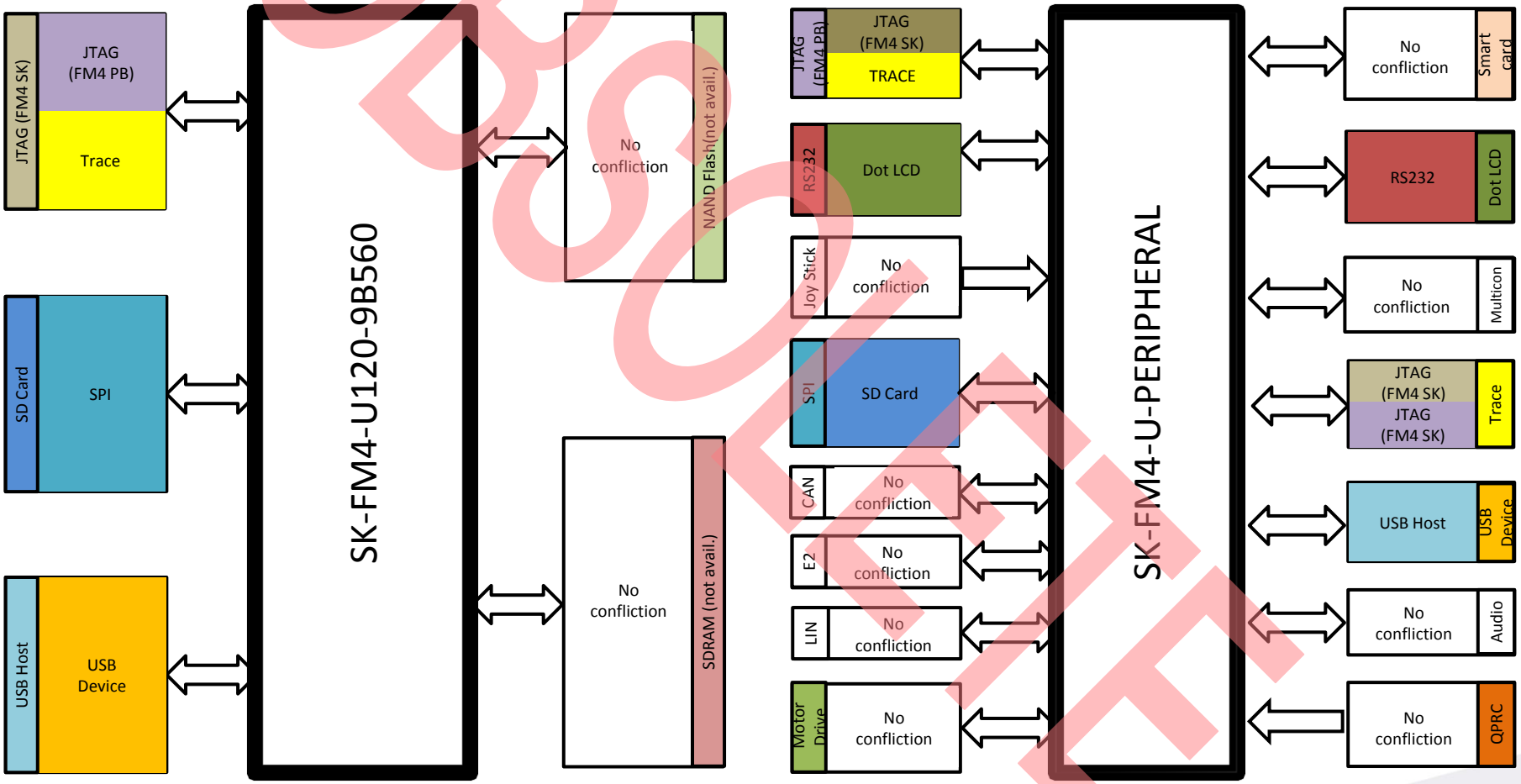
Pin	Microcontroller-Function	SK-FM4-U120-9B560	SK-FM4-U120-9B560-MEM	SK-FM4-U-PERIPHERAL
101	P05/AN23/ADTG_0/TRACECLK/SIN7_0/INT01_1/MCSX2_0			TRACE
102	P04/TDO/SWO	JTAG	JTAG	JTAG, TRACE
103	P03/TMS/SWDIO	JTAG	JTAG	JTAG, TRACE
104	P02/TDI/MCSX6_0	JTAG	JTAG	JTAG, TRACE
105	P01/TCK/SWCLK	JTAG	JTAG	JTAG, TRACE
106	P00/TRSTX/MCSX7_0	JTAG	JTAG	JTAG
107	VSS	GND	GND	GND
108	P68/TIOB7_2/SCK3_0/INT00_2	Button INT	Button INT	
109	P67/TIOA7_2/SOT3_0			LIN
110	P66/ADTG_8/SIN3_0/INT11_2			LIN
111	P65/TIOB7_0/SCK5_1			TFT LCD I/F
112	P64/TIOA7_0/SOT5_1/INT10_2			USB
113	P63/CROUT_1/RX0_2/SIN5_1/INT03_0/S_CD_0/MWEX_0	SD-Card		TFT LCD I/F
114	P62/ADTG_3/TX0_2/SIN5_0/INT04_1/S_WP_0/MOEX_0	SD-Card		TFT LCD I/F
115	P61/UHCONX0/TIOB2_2/SOT5_0/RTCCO_0/SUBOUT_0	USB	USB	
116	P60/TIOA2_2/SCK5_0/NMIX/WKUP0/MRDY_0	Button NMIX	Button NMIX	
117	USBVCC	3V3	3V3	
118	P80/UDM0	USB	USB	USB
119	P81/UDP0	USB	USB	USB
120	VSS	GND	GND	GND

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Peripheral Confliction (1/2)

- Confliction between SK-FM4-U120-9B560 and SK-FM4-U-PERIPHERAL

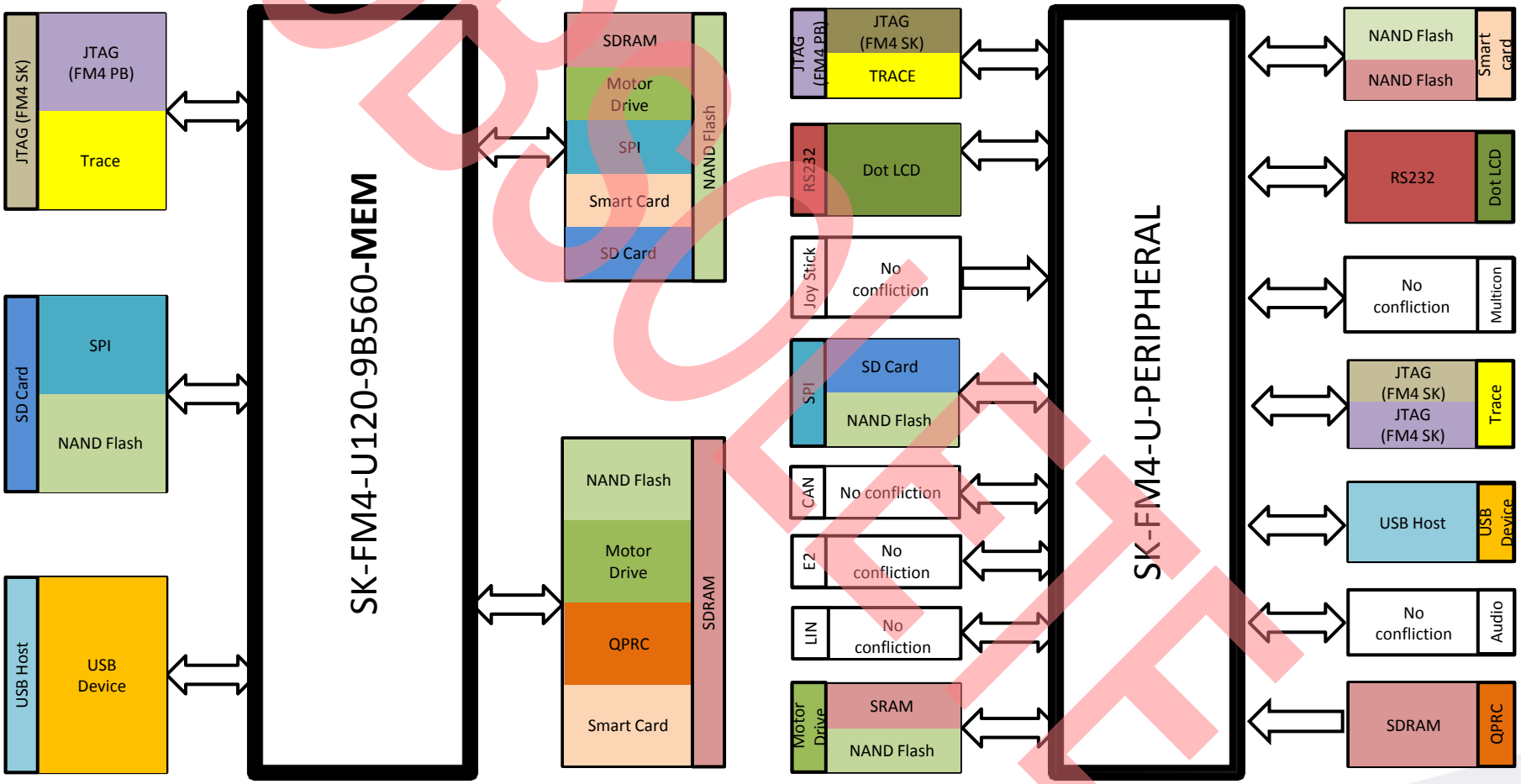


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Peripheral Confliction (2/2)

- Confliction between SK-FM4-U120-9B560-MEM and SK-FM4-U-PERIPHERAL



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Finally

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Contact us

- Please check the following web sites, for any available updates:

  www.spansion.com/starterkit

- Please contact local support team for technical support:

  America: Spansion.Solutions@spansion.com

  China : mcu-ticket-cn@spansion.com

  Europe : mcu-ticket-de@spansion.com

  Japan : mcu-ticket-jp@spansion.com

  Other: http://www.spansion.com/Support/SES/Pages/Ask-Spansion.aspx

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Recycling

- Gültig für EU-Länder:
  - Gemäß der Europäischen WEEE-Richtlinie und deren Umsetzung in landesspezifische Gesetze nehmen wir dieses Gerät wieder zurück.
  - Zur Entsorgung schicken Sie das Gerät bitte an die folgende Adresse:
- Valid for European Union Countries:
  - According to the European WEEE-Directive and its implementation into national laws we take this device back.
  - For disposal please send the device to the following address:



CCS Express GMBH
c/o Spansion International Inc.
Frankfurter Str. 83-107
D-65479 Raunheim
Germany

- This board is compliant with China RoHS

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