KIT_XMC52_EVK XMC5200 Evaluation Kit user guide

About this document

Scope and purpose

This document provides a comprehensive understanding of the KIT_XMC52_EVK XMC5200 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_XMC52_EVK XMC5200 Evaluation Kit.

Reference board/kit

Product(s) embedded on a PCB with a focus on specific applications and defined use cases that may include software. PCB and auxiliary circuits are optimized for the requirements of the target application.

***Note**: Boards do not necessarily meet safety, EMI, quality standards (for example UL, CE) requirements.*

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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.*

Table of contents

1 Introduction

The KIT_XMC52_EVK XMC5200 Evaluation Kit enables evaluation and development of applications using the XMC5200 MCU. XMC5200 belongs to the XMC5000 microcontroller family designed for industrial systems. It features an Arm® Cortex®-M4F CPU for primary processing and an Arm® Cortex®-M0+ CPU for peripheral and security processing. These devices include embedded peripherals that support Controller Area Network with Flexible Data Rate (CAN FD). XMC5000 series devices are manufactured using an advanced 40 nm process. XMC5200 integrates low-power flash memory and multiple high-performance analog and digital peripherals, enabling creation of secure computing platforms.

2 Kit details

This section describes the details of the XMC5200 Evaluation Kit.

2.1 Kit contents

The KIT_XMC52_EVK XMC5200 Evaluation Kit box includes the following components:

1. KIT_XMC52_EVK Evaluation Kit card
2. USB Type-A to USB Micro-B cable
3. Quick start guide printed on the kit package

2.2 Board details

The XMC5200 Evaluation Kit features:

- XMC5000 MCU XMC5200F100K1088AA
- USB Micro-B connector for USB device interface
- CAN FD interface
- Two user LEDs, one user button, and one reset button for the XMC5200 MCU
- Headers compatible with Arduino Uno R3
- Mode button and Mode LED for KitProg3
- Potentiometer for simulating analog sensor output
- Expansion header

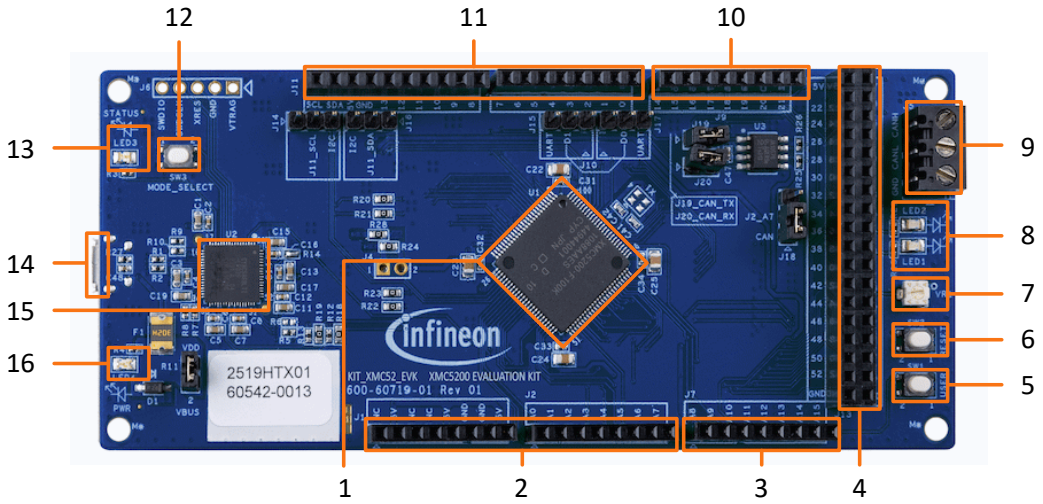


Figure 1 KIT_XMC52_EVK board details

2 Kit details

Table 2 Board components

No.	KIT_XMC52_EVK blocks
1	XMC5200 target MCU (U1)
2	Arduino headers (J1, J2)
3	Arduino extended header (J7)
4	Expansion header (J13)
5	User button (SW1)
6	Reset button (SW2)
7	Potentiometer (VR1)
8	User LEDs (LED1, LED2)
9	CAN header (J10)
10	Arduino extended header (J9)
11	Arduino headers (J10, J11)
12	KitProg3 mode select switch (SW3)
13	KItProg3 status LED (LED3)
14	USB Micro-B connector (J20)
15	PSOC™ 5LP KitProg3 MCU (U2)
16	Power LED (LED4)

3 Kit operation

The XMC5200 Evaluation Kit is built around the XMC5200F100K1088AA MCU. The following section describes the block diagram and peripherals on the board. For detailed information on device features, see the device datasheet.

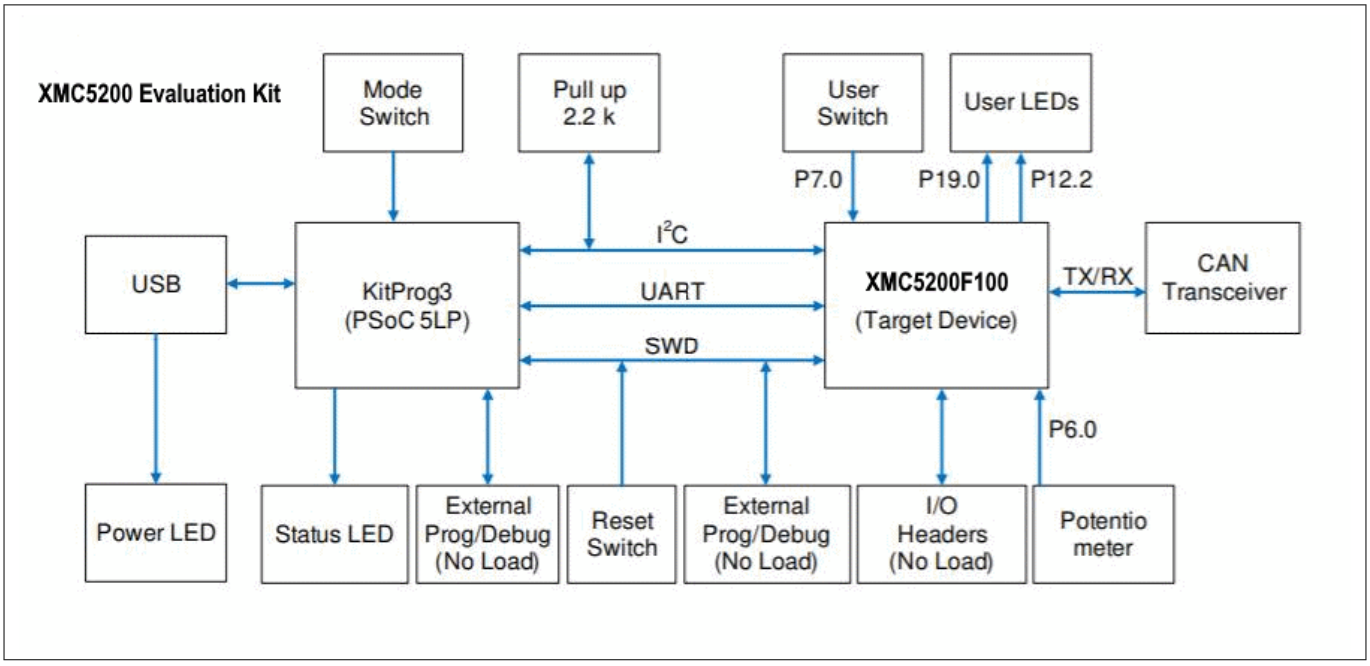


Figure 2 KIT_XMC52_EVK block diagram

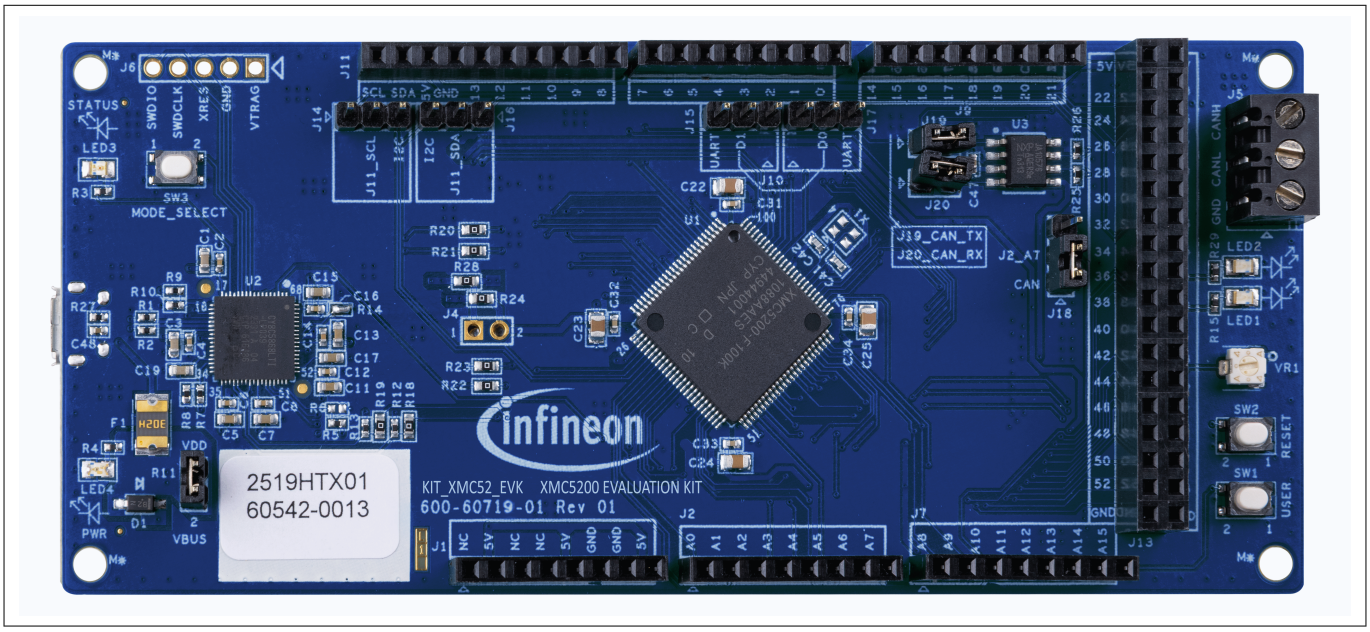


Figure 3 XMC5200 Evaluation Kit top view

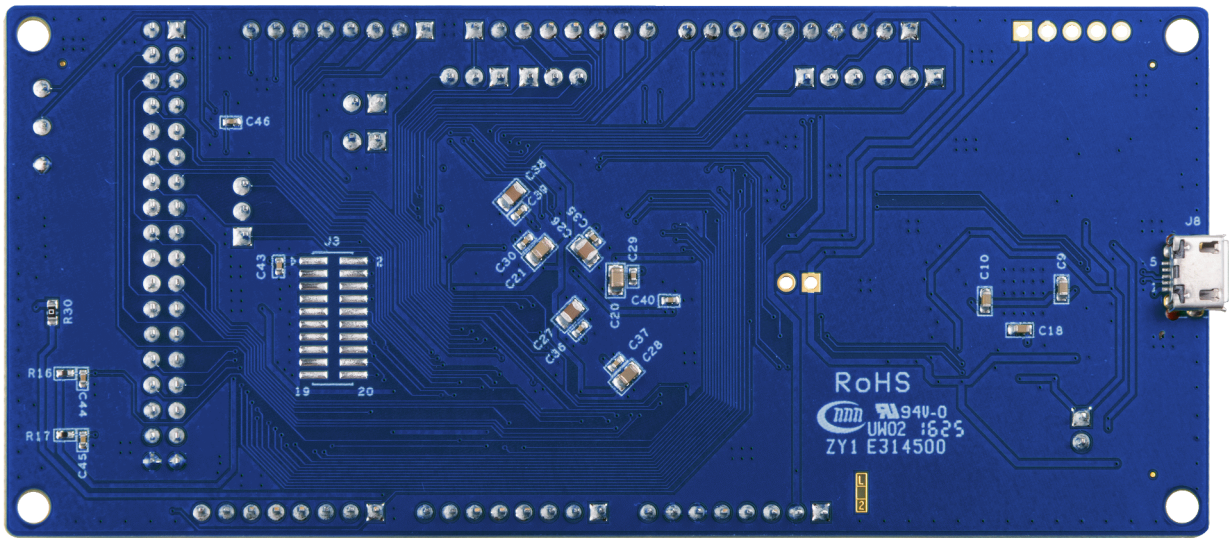


Figure 4 XCM5200 Evaluation Kit bottom view

3.1 Board support package selection

The XMC5200 Evaluation Kit includes the KIT_XMC52_EVK board support package within the XMC™ BSPs. To build and run code examples on the kit, follow the instructions provided in the Create an Application section of the ModusToolbox™ user guide.

3.2 KitProg3 onboard programmer and debugger

The XMC5200 Evaluation Kit can be programmed and debugged using the onboard KitProg3. KitProg3 is an onboard programmer/debugger that provides USB-UART and USB-I^{2}C bridge functionality. It supports CMSIS-DAP only and does not support mass storage. The PSOC™ 5LP device implements the KitProg3 functionality.

3.3 Programming and debugging using ModusToolbox™

1. Connect the board to the PC using the provided USB cable through the KitProg3 USB connector. If connecting for the first time, the board enumerates as a USB composite device
2. On this kit, KitProg3 operates in CMSIS-DAP Bulk mode. The status LED (LED3) remains ON in CMSIS-DAP Bulk mode. If the LED status is not as expected, see the KitProg3 user guide for details on status indicators and troubleshooting instructions
3. In the Eclipse IDE for ModusToolbox™, import the desired code example (application) into a new workspace
   a. Click **New Application** from the **Quick Panel**

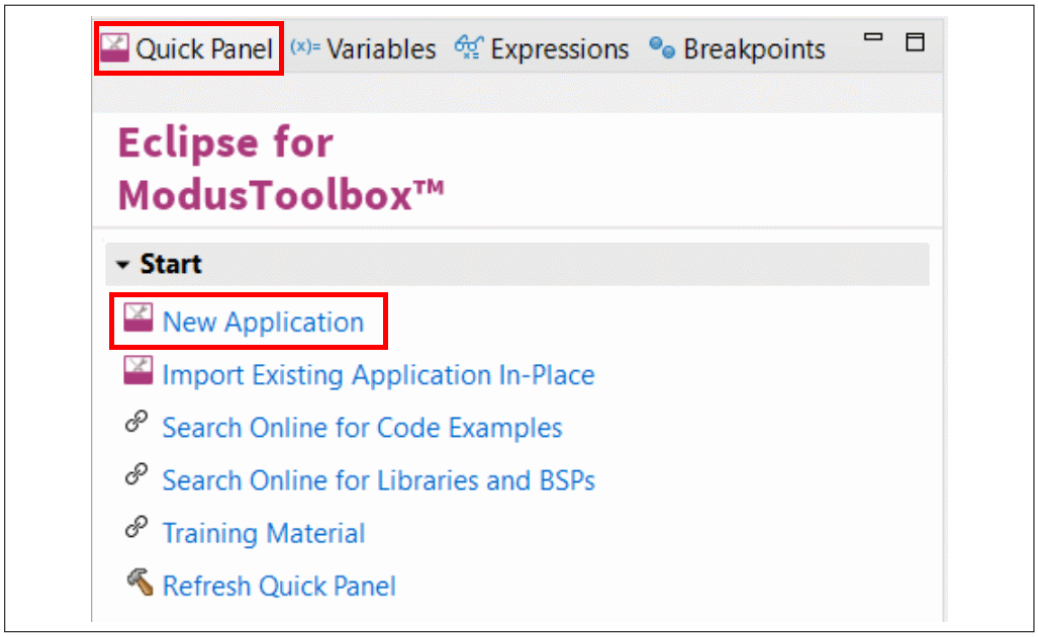


Figure 5 Create a New Application

b. In the **Choose Board Support Package** window, select the BSP and click **Next**

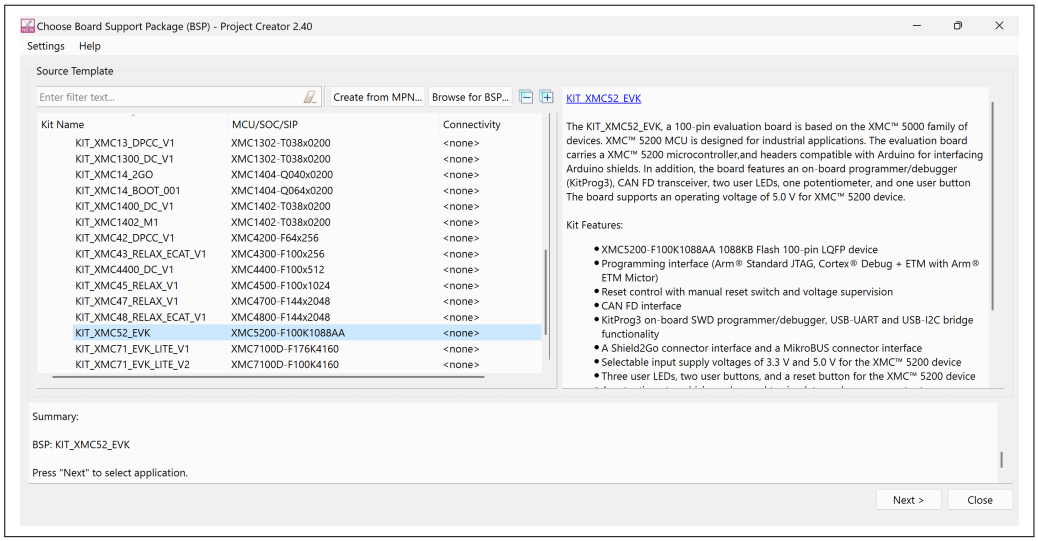


Figure 6 Choose Board Support Package in the new application window

c. In the **Select Application** window, choose the application and click **Create**

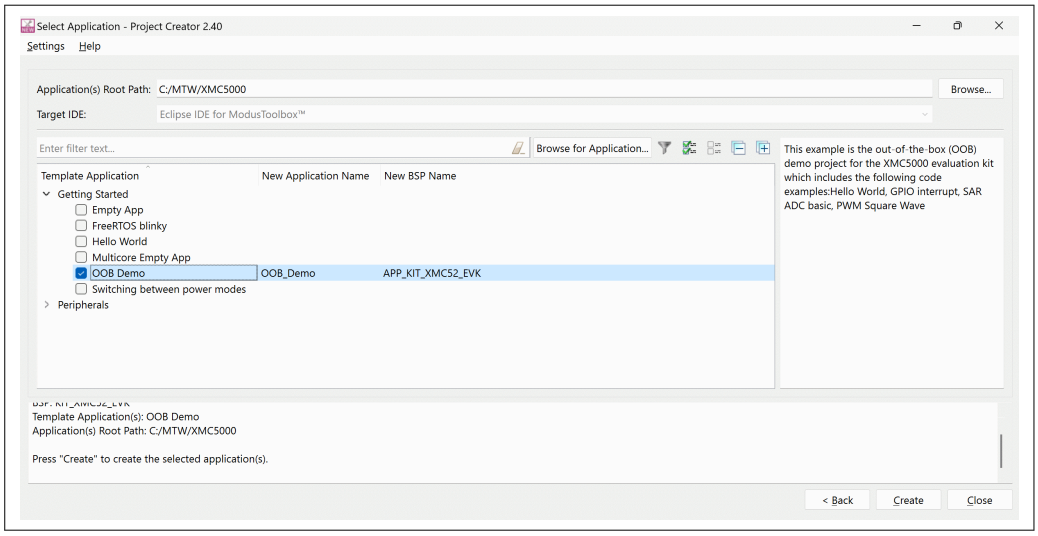


Figure 7 Select Application window

4. To build and program an application in the Project Explorer, select the project. In the Quick Panel, scroll to the **Launches** section and click **Program (KitProg3_MiniProg4)** configuration

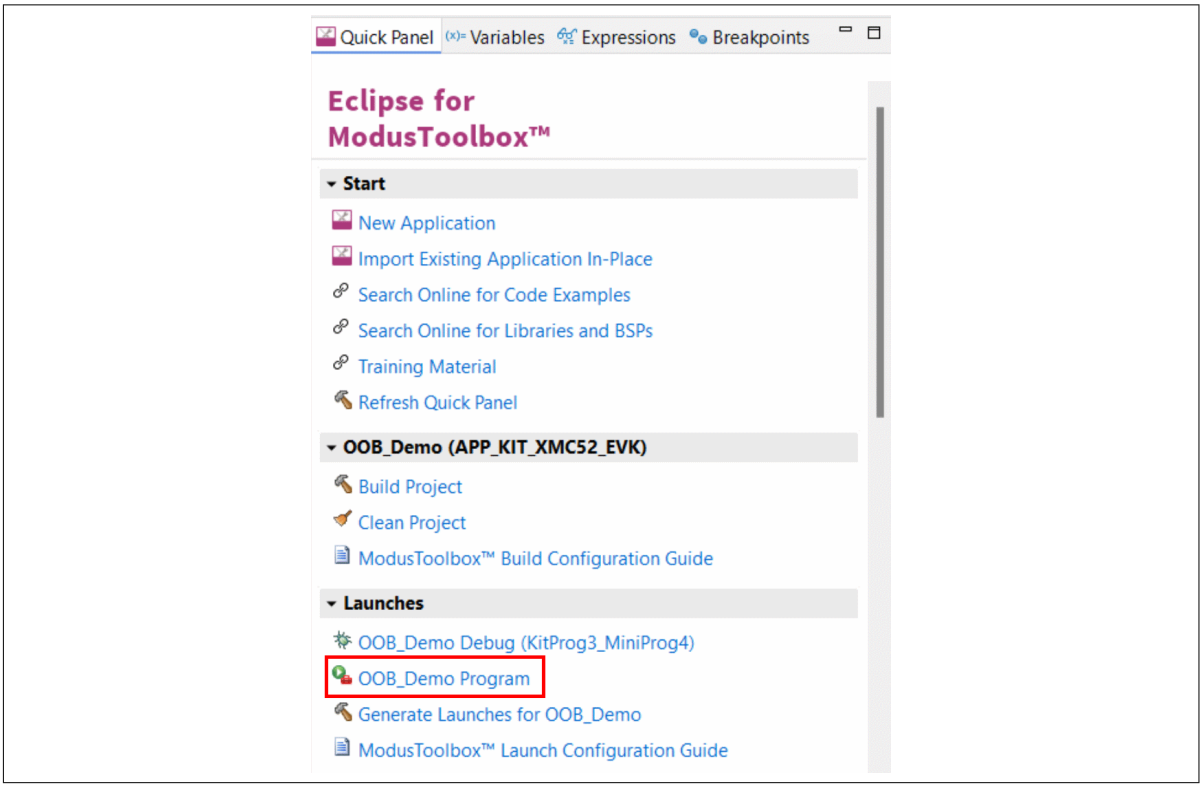


Figure 8 Programming using ModusToolbox™ IDE

5. ModusToolbox™ software includes an integrated debugger. To debug an application:

a. In the Project Explorer, select the project

b. In the **Quick Panel**, scroll to the **Launches** section and click **Debug (KitProg3_MiniProg4)** configuration

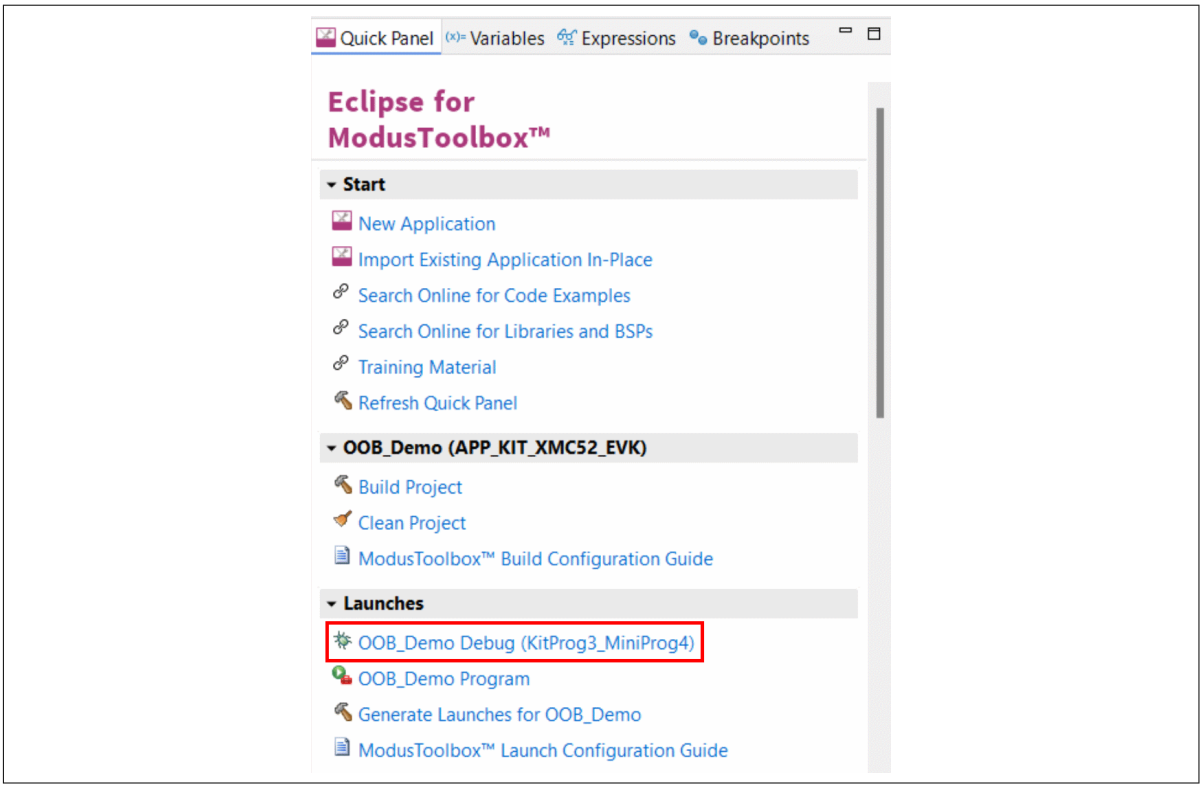


Figure 9 Debugging using ModusToolbox™ IDE

3.4 Using the OOB demo example - PSOC™ Control C3 MCU

The XMC5200 Evaluation Kit comes pre-programmed with the XMC5200 MCU OOB demo code example by default. The following steps explain how to use the example. For a detailed description of the project, see the example's `README.md` file. After creating the application, check the application directory for the `README.md` file.

***Note**: At any time, if you overwrite the OOB demo example, you can restore it by programming the XMC5200 OOB DEMO.*

1. Connect the KitProg3 USB connector of the board to the PC using the provided USB cable
2. Open a terminal program and select the KitProg3 COM port. Set the serial port parameters to **8N1** and **115200 baud**
3. Press the Reset button (`SW1`) on the board and confirm that the terminal application displays the code example title and text as shown in Figure 10

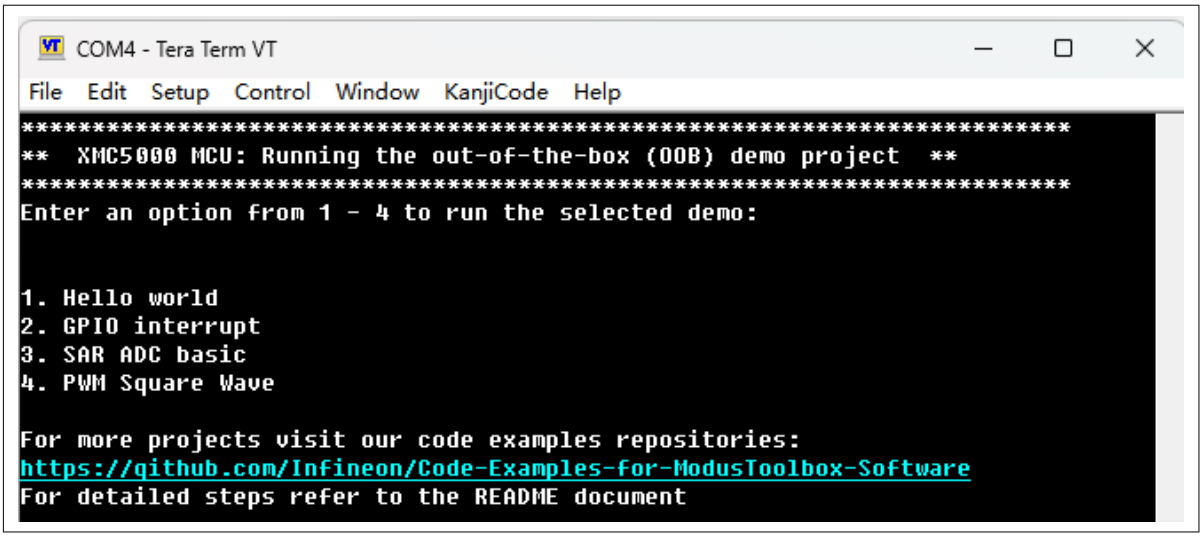


Figure 10 OOB demo message in the terminal

4. Press **1** to select the **Hello World** demo. Confirm that the kit user LED blinks
5. Press the **Enter** key. The LED stops blinking. The terminal displays the message **LED blinking paused**
6. Press the **Enter** key again. The LED resumes blinking. The terminal updates the message to **LED blinking resumed**
7. To run the selected demos, choose the options from the terminal menu

4 Hardware

The following section describes the hardware design of the kit.

4.1 Schematics

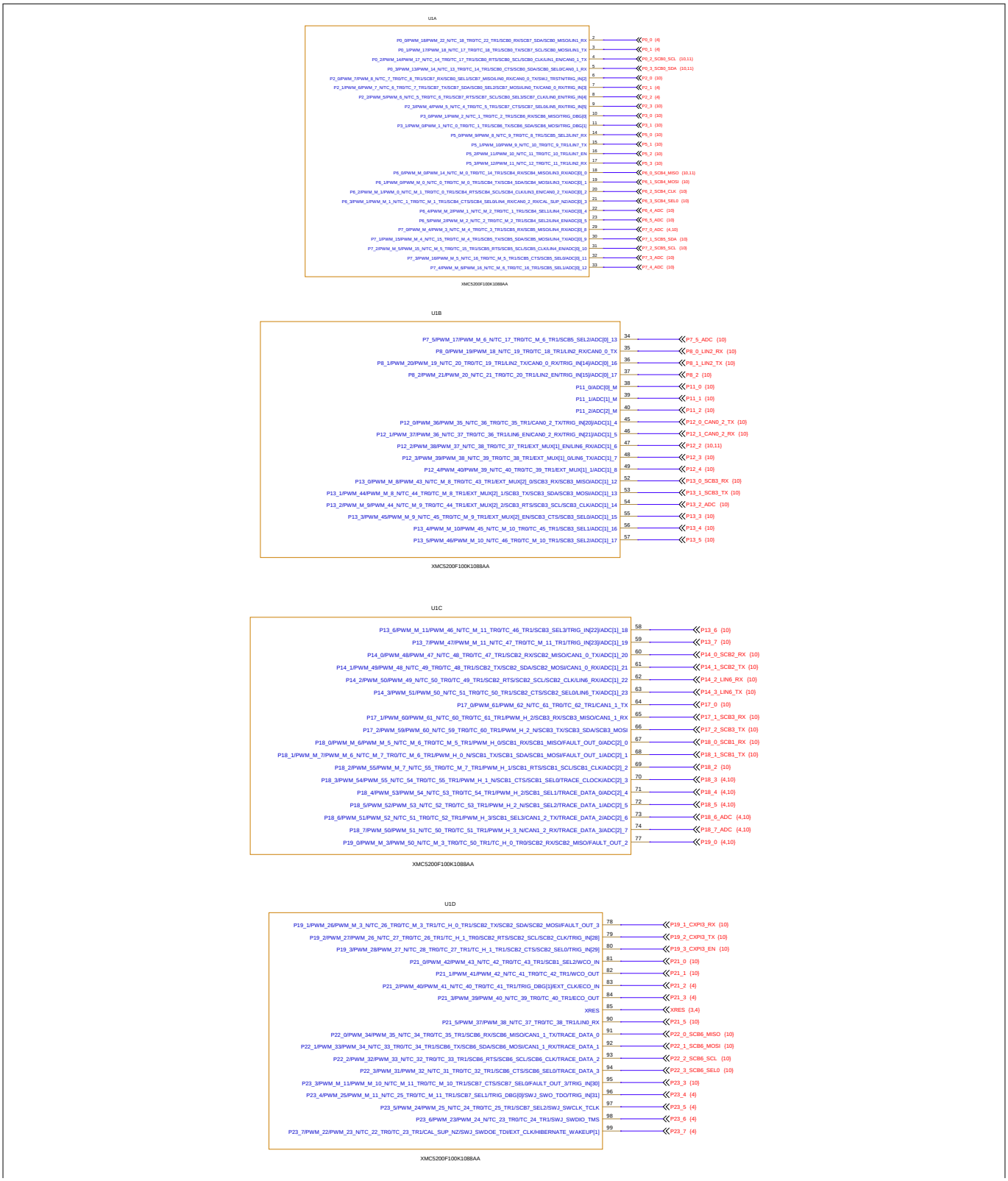
Schematic files are available on the XMC5200 Evaluation Kit webpage.

4.2 Hardware functional description

4.2.1 XMC5200 (U1)

XMC5200 is part of the XMC5000 microcontroller family designed for industrial systems. It features an Arm® Cortex®-M4F CPU for primary processing and an Arm® Cortex®-M0+ CPU for peripheral and security processing. These devices include embedded peripherals that support Controller Area Network with Flexible Data Rate (CAN FD). XMC5000 series devices are manufactured using an advanced 40 nm process. XMC5200 integrates low-power flash memory and multiple high-performance analog and digital peripherals, enabling creation of secure computing platforms.

4 Hardware


U1A
P0_0/PWM_18/PWM_22_N/TC_18_TR0/TC_22_TR1/SCB0_RX/SCB7_SDA/SCB0_MISO/LIN1_RX
P0_1/PWM_17/PWM_18_N/TC_17_TR0/TC_18_TR1/SCB0_TX/SCB7_SCL/SCB0_MOSI/LIN1_TX
P0_2/PWM_14/PWM_17_N/TC_14_TR0/TC_17_TR1/SCB0_RTS/SCB0_SCL/SCB0_CLK/LIN1_EN/CAN0_1_TX
P0_3/PWM_13/PWM_14_N/TC_13_TR0/TC_14_TR1/SCB0_CTS/SCB0_SDA/SCB0_SEL0/CAN0_1_RX
P2_0/PWM_7/PWM_8_N/TC_7_TR0/TC_8_TR1/SCB7_RX/SCB0_SEL1/SCB7_MISO/LIN0_RX/CAN0_0_TX/SWJ_TRSTN/TRIG_IN[2]
P2_1/PWM_6/PWM_7_N/TC_6_TR0/TC_7_TR1/SCB7_TX/SCB7_SDA/SCB0_SEL2/SCB7_MOSI/LIN0_TX/CAN0_0_RX/TRIG_IN[3]
P2_2/PWM_5/PWM_6_N/TC_5_TR0/TC_6_TR1/SCB7_RTS/SCB7_SCL/SCB0_SEL3/SCB7_CLK/LIN0_EN/TRIG_IN[4]
P2_3/PWM_4/PWM_5_N/TC_4_TR0/TC_5_TR1/SCB7_CTS/SCB7_SEL0/LIN0_RX/TRIG_IN[5]
P3_0/PWM_1/PWM_2_N/TC_1_TR0/TC_2_TR1/SCB6_RX/SCB6_MISO/TRIG_DBG[0]
P3_1/PWM_0/PWM_1_N/TC_0_TR0/TC_1_TR1/SCB6_TX/SCB6_SDA/SCB6_MOSI/TRIG_DBG[1]
P5_0/PWM_9/PWM_8_N/TC_9_TR0/TC_8_TR1/SCB5_SEL2/LIN7_RX
P5_1/PWM_10/PWM_9_N/TC_10_TR0/TC_9_TR1/LIN7_TX
P5_2/PWM_11/PWM_10_N/TC_11_TR0/TC_10_TR1/LIN7_EN
P5_3/PWM_12/PWM_11_N/TC_12_TR0/TC_11_TR1/LIN2_RX
P6_0/PWM_M_0/PWM_14_N/TC_M_0_TR0/TC_14_TR1/SCB4_RX/SCB4_MISO/LIN3_RX/ADC[0]_0
P6_1/PWM_0/PWM_M_0_N/TC_0_TR0/TC_M_0_TR1/SCB4_TX/SCB4_SDA/SCB4_MOSI/LIN3_TX/ADC[0]_1
P6_2/PWM_M_1/PWM_0_N/TC_M_1_TR0/TC_0_TR1/SCB4_RTS/SCB4_SCL/SCB4_CLK/LIN3_EN/CAN0_2_TX/ADC[0]_2
P6_3/PWM_1/PWM_M_1_N/TC_1_TR0/TC_M_1_TR1/SCB4_CTS/SCB4_SEL0/LIN4_RX/CAN0_2_RX/CAL_SUP_NZ/ADC[0]_3
P6_4/PWM_M_2/PWM_1_N/TC_M_2_TR0/TC_1_TR1/SCB4_SEL1/LIN4_TX/ADC[0]_4
P6_5/PWM_2/PWM_M_2_N/TC_2_TR0/TC_M_2_TR1/SCB4_SEL2/LIN4_EN/ADC[0]_5
P7_0/PWM_M_4/PWM_3_N/TC_M_4_TR0/TC_3_TR1/SCB5_RX/SCB5_MISO/LIN4_RX/ADC[0]_8
P7_1/PWM_15/PWM_M_4_N/TC_15_TR0/TC_M_4_TR1/SCB5_TX/SCB5_SDA/SCB5_MOSI/LIN4_TX/ADC[0]_9
P7_2/PWM_M_5/PWM_15_N/TC_M_5_TR0/TC_15_TR1/SCB5_RTS/SCB5_SCL/SCB5_CLK/LIN4_EN/ADC[0]_10
P7_3/PWM_16/PWM_M_5_N/TC_16_TR0/TC_M_5_TR1/SCB5_CTS/SCB5_SEL0/ADC[0]_11
P7_4/PWM_M_6/PWM_16_N/TC_M_6_TR0/TC_16_TR1/SCB5_SEL1/ADC[0]_12
P0_0 (4)
P0_1 (4)
P0_2_SCB0_SCL (10,11)
P0_3_SCB0_SDA (10,11)
P2_0 (10)
P2_1 (4)
P2_2 (4)
P2_3 (10)
P3_0 (10)
P3_1 (10)
P5_0 (10)
P5_1 (10)
P5_2 (10)
P5_3 (10)
P6_0_SCB4_MISO (10,11)
P6_1_SCB4_MOSI (10)
P6_2_SCB4_CLK (10)
P6_3_SCB4_SEL0 (10)
P6_4_ADC (10)
P6_5_ADC (10)
P7_0_ADC (4,10)
P7_1_SCB5_SDA (10)
P7_2_SCB5_SCL (10)
P7_3_ADC (10)
P7_4_ADC (10)
XMC5200F100K1088AA
U1B
P7_5/PWM_17/PWM_M_6_N/TC_17_TR0/TC_M_6_TR1/SCB5_SEL2/ADC[0]_13
P8_0/PWM_19/PWM_18_N/TC_19_TR0/TC_18_TR1/LIN2_RX/CAN0_0_TX
P8_1/PWM_20/PWM_19_N/TC_20_TR0/TC_19_TR1/LIN2_TX/CAN0_0_RX/TRIG_IN[14]/ADC[0]_16
P8_2/PWM_21/PWM_20_N/TC_21_TR0/TC_20_TR1/LIN2_EN/TRIG_IN[15]/ADC[0]_17
P11_0/ADC[0]_M
P11_1/ADC[1]_M
P11_2/ADC[2]_M
P12_0/PWM_36/PWM_35_N/TC_36_TR0/TC_35_TR1/CAN0_2_TX/TRIG_IN[20]/ADC[1]_4
P12_1/PWM_37/PWM_36_N/TC_37_TR0/TC_36_TR1/LIN6_EN/CAN0_2_RX/TRIG_IN[21]/ADC[1]_5
P12_2/PWM_38/PWM_37_N/TC_38_TR0/TC_37_TR1/EXT_MUX[1]_EN/LIN6_RX/ADC[1]_6
P12_3/PWM_39/PWM_38_N/TC_39_TR0/TC_38_TR1/EXT_MUX[1]_0/LIN6_TX/ADC[1]_7
P12_4/PWM_40/PWM_39_N/TC_40_TR0/TC_39_TR1/EXT_MUX[1]_1/ADC[1]_8
P13_0/PWM_M_8/PWM_43_N/TC_M_8_TR0/TC_43_TR1/EXT_MUX[2]_0/SCB3_RX/SCB3_MISO/ADC[1]_12
P13_1/PWM_44/PWM_M_8_N/TC_44_TR0/TC_M_8_TR1/EXT_MUX[2]_1/SCB3_TX/SCB3_SDA/SCB3_MOSI/ADC[1]_13
P13_2/PWM_M_9/PWM_44_N/TC_M_9_TR0/TC_44_TR1/EXT_MUX[2]_2/SCB3_RTS/SCB3_SCL/SCB3_CLK/ADC[1]_14
P13_3/PWM_45/PWM_M_9_N/TC_45_TR0/TC_M_9_TR1/EXT_MUX[2]_EN/SCB3_CTS/SCB3_SEL0/ADC[1]_15
P13_4/PWM_M_10/PWM_45_N/TC_M_10_TR0/TC_45_TR1/SCB3_SEL1/ADC[1]_16
P13_5/PWM_46/PWM_M_10_N/TC_46_TR0/TC_M_10_TR1/SCB3_SEL2/ADC[1]_17
P7_5_ADC (10)
P8_0_LIN2_RX (10)
P8_1_LIN2_TX (10)
P8_2 (10)
P11_0 (10)
P11_1 (10)
P11_2 (10)
P12_0_CAN0_2_TX (10)
P12_1_CAN0_2_RX (10)
P12_2 (10,11)
P12_3 (10)
P12_4 (10)
P13_0_SCB3_RX (10)
P13_1_SCB3_TX (10)
P13_2_ADC (10)
P13_3 (10)
P13_4 (10)
P13_5 (10)
XMC5200F100K1088AA
U1C
P13_6/PWM_M_11/PWM_46_N/TC_M_11_TR0/TC_46_TR1/SCB3_SEL3/TRIG_IN[22]/ADC[1]_18
P13_7/PWM_47/PWM_M_11_N/TC_47_TR0/TC_M_11_TR1/TRIG_IN[23]/ADC[1]_19
P14_0/PWM_48/PWM_47_N/TC_48_TR0/TC_47_TR1/SCB2_RX/SCB2_MISO/CAN1_0_TX/ADC[1]_20
P14_1/PWM_49/PWM_48_N/TC_49_TR0/TC_48_TR1/SCB2_TX/SCB2_SDA/SCB2_MOSI/CAN1_0_RX/ADC[1]_21
P14_2/PWM_50/PWM_49_N/TC_50_TR0/TC_49_TR1/SCB2_RTS/SCB2_SCL/SCB2_CLK/LIN6_RX/ADC[1]_22
P14_3/PWM_51/PWM_50_N/TC_51_TR0/TC_50_TR1/SCB2_CTS/SCB2_SEL0/LIN6_TX/ADC[1]_23
P17_0/PWM_61/PWM_62_N/TC_61_TR0/TC_62_TR1/CAN1_1_TX
P17_1/PWM_60/PWM_61_N/TC_60_TR0/TC_61_TR1/PWM_H_2/SCB3_RX/SCB3_MISO/CAN1_1_RX
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P18_0/PWM_M_6/PWM_M_5_N/TC_M_6_TR0/TC_M_5_TR1/PWM_H_0/SCB1_RX/SCB1_MISO/FAULT_OUT_0/ADC[2]_0
P18_1/PWM_M_7/PWM_M_6_N/TC_M_7_TR0/TC_M_6_TR1/PWM_H_0_N/SCB1_TX/SCB1_SDA/SCB1_MOSI/FAULT_OUT_1/ADC[2]_1
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P18_5/PWM_52/PWM_53_N/TC_52_TR0/TC_53_TR1/PWM_H_2_N/SCB1_SEL2/TRACE_DATA_1/ADC[2]_5
P18_6/PWM_51/PWM_52_N/TC_51_TR0/TC_52_TR1/PWM_H_3/SCB1_SEL3/CAN1_2_TX/TRACE_DATA_2/ADC[2]_6
P18_7/PWM_50/PWM_51_N/TC_50_TR0/TC_51_TR1/PWM_H_3_N/CAN1_2_RX/TRACE_DATA_3/ADC[2]_7
P19_0/PWM_M_3/PWM_50_N/TC_M_3_TR0/TC_50_TR1/TC_H_0_TR0/SCB2_RX/SCB2_MISO/FAULT_OUT_2
P13_6 (10)
P13_7 (10)
P14_0_SCB2_RX (10)
P14_1_SCB2_TX (10)
P14_2_LIN6_RX (10)
P14_3_LIN6_TX (10)
P17_0 (10)
P17_1_SCB3_RX (10)
P17_2_SCB3_TX (10)
P18_0_SCB1_RX (10)
P18_1_SCB1_TX (10)
P18_2 (10)
P18_3 (4,10)
P18_4 (4,10)
P18_5 (4,10)
P18_6_ADC (4,10)
P18_7_ADC (4,10)
P19_0 (4,10)
XMC5200F100K1088AA
U1D
P19_1/PWM_26/PWM_M_3_N/TC_26_TR0/TC_M_3_TR1/TC_H_0_TR1/SCB2_TX/SCB2_SDA/SCB2_MOSI/FAULT_OUT_3
P19_2/PWM_27/PWM_26_N/TC_27_TR0/TC_26_TR1/TC_H_1_TR0/SCB2_RTS/SCB2_SCL/SCB2_CLK/TRIG_IN[28]
P19_3/PWM_28/PWM_27_N/TC_28_TR0/TC_27_TR1/TC_H_1_TR1/SCB2_CTS/SCB2_SEL0/TRIG_IN[29]
P21_0/PWM_42/PWM_43_N/TC_42_TR0/TC_43_TR1/SCB1_SEL2/WCO_IN
P21_1/PWM_41/PWM_42_N/TC_41_TR0/TC_42_TR1/WCO_OUT
P21_2/PWM_40/PWM_41_N/TC_40_TR0/TC_41_TR1/TRIG_DBG[1]/EXT_CLK/ECO_IN
P21_3/PWM_39/PWM_40_N/TC_39_TR0/TC_40_TR1/ECO_OUT
XRES
P21_5/PWM_37/PWM_38_N/TC_37_TR0/TC_38_TR1/LIN0_RX
P22_0/PWM_34/PWM_35_N/TC_34_TR0/TC_35_TR1/SCB6_RX/SCB6_MISO/CAN1_1_TX/TRACE_DATA_0
P22_1/PWM_33/PWM_34_N/TC_33_TR0/TC_34_TR1/SCB6_TX/SCB6_SDA/SCB6_MOSI/CAN1_1_RX/TRACE_DATA_1
P22_2/PWM_32/PWM_33_N/TC_32_TR0/TC_33_TR1/SCB6_RTS/SCB6_SCL/SCB6_CLK/TRACE_DATA_2
P22_3/PWM_31/PWM_32_N/TC_31_TR0/TC_32_TR1/SCB6_CTS/SCB6_SEL0/TRACE_DATA_3
P23_3/PWM_M_11/PWM_M_10_N/TC_M_11_TR0/TC_M_10_TR1/SCB7_CTS/SCB7_SEL0/FAULT_OUT_3/TRIG_IN[30]
P23_4/PWM_25/PWM_M_11_N/TC_25_TR0/TC_M_11_TR1/SCB7_SEL1/TRIG_DBG[0]/SWJ_SWO_TDO/TRIG_IN[31]
P23_5/PWM_24/PWM_25_N/TC_24_TR0/TC_25_TR1/SCB7_SEL2/SWJ_SWCLK_TCLK
P23_6/PWM_23/PWM_24_N/TC_23_TR0/TC_24_TR1/SWJ_SWDIO_TMS
P23_7/PWM_22/PWM_23_N/TC_22_TR0/TC_23_TR1/CAL_SUP_NZ/SWJ_SWDOE_TDI/EXT_CLK/HIBERNATE_WAKEUP[1]
P19_1_CXPI3_RX (10)
P19_2_CXPI3_TX (10)
P19_3_CXPI3_EN (10)
P21_0 (10)
P21_1 (10)
P21_2 (4)
P21_3 (4)
XRES (3,4)
P21_5 (10)
P22_0_SCB6_MISO (10)
P22_1_SCB6_MOSI (10)
P22_2_SCB6_SCL (10)
P22_3_SCB6_SEL0 (10)
P23_3 (10)
P23_4 (4)
P23_5 (4)
P23_6 (4)
P23_7 (4)
XMC5200F100K1088AA

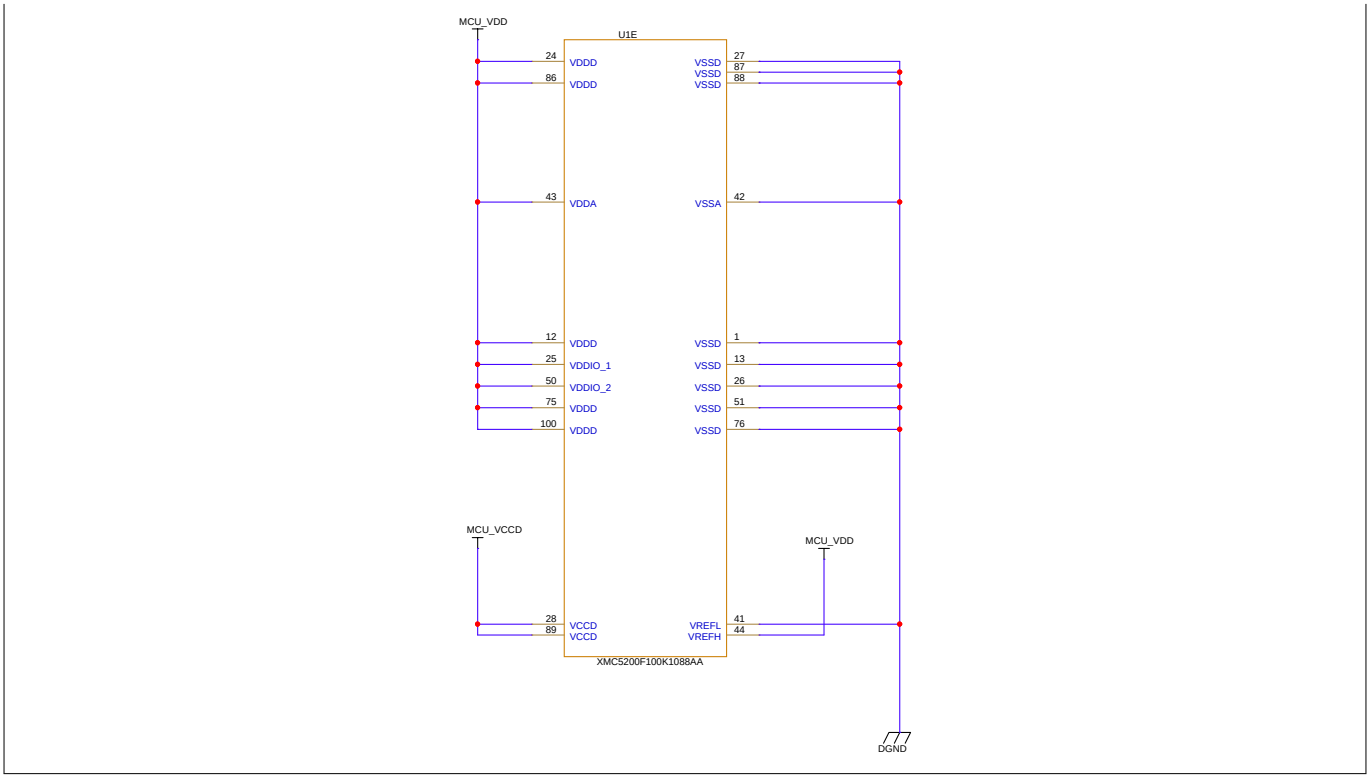

Figure 11 XMC5200 MCU

4.2.2 PSOC™ 5LP-based KitProg3 (U2)

An onboard PSOC™ 5LP (CY8C5868LTI-LP039) functions as KitProg3 to program and debug the XMC5200F100K1088AA. The PSOC™ 5LP device connects to the PC through a USB connector and interfaces with the SWD and other communication ports of the XMC5200F100K1088AA.

For additional information, see the PSOC™ 5LP webpage, and CY8C58LPxx family datasheet.

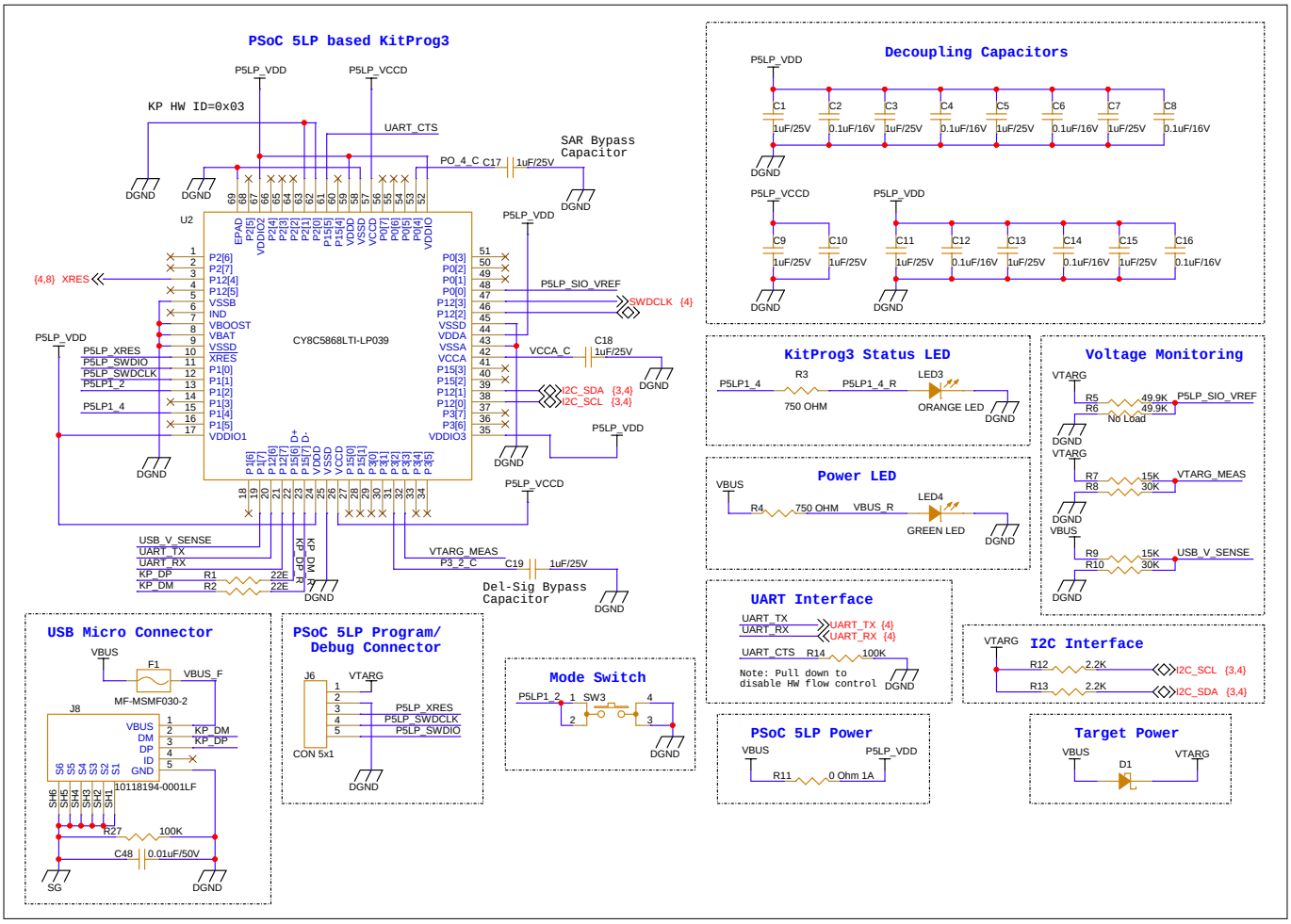

Figure 12 **PSOC™ 5LP-based KitProg3 (U2)**

4.2.3 Serial interconnection between PSOC™ 5LP and XMC5200

The PSOC™ 5LP device functions as an interface for USB-UART and USB-I²C bridges and also serves as an onboard programmer. Its USB-serial pins are hard-wired to the I²C and UART pins of the XMC5200 device, enabling serial communication between the two components.

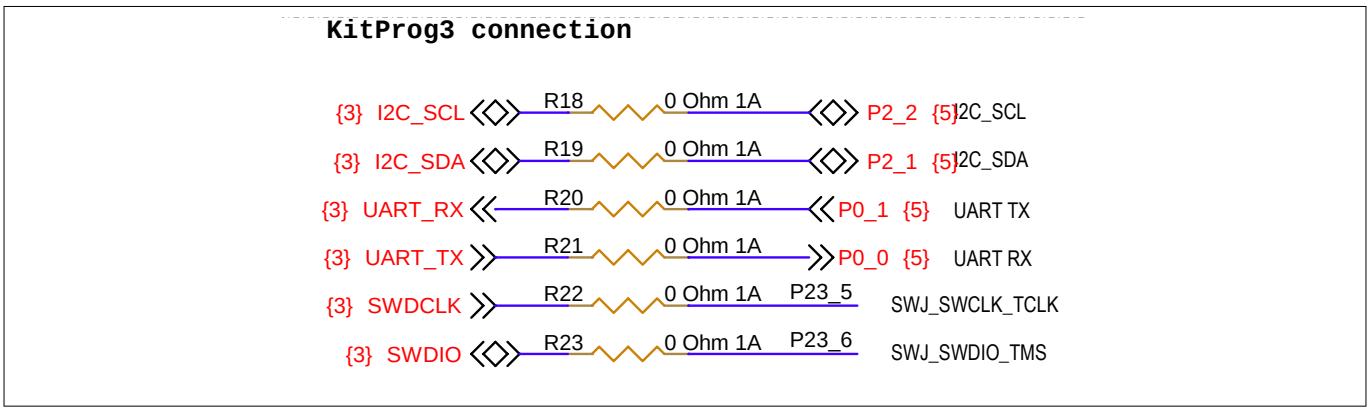

Figure 13 **KitProg3 serial communication**

4.2.4 Programming and debugging header (J3)

KIT_XMC52_EVK provides the option to mount a standard 10-pin or 20-pin SMD header with a 1.27 mm pitch on connector J3 located on the back side of the board. This header supports both SWD and JTAG interfaces and enables Trace functionality when a 20-pin header is used.

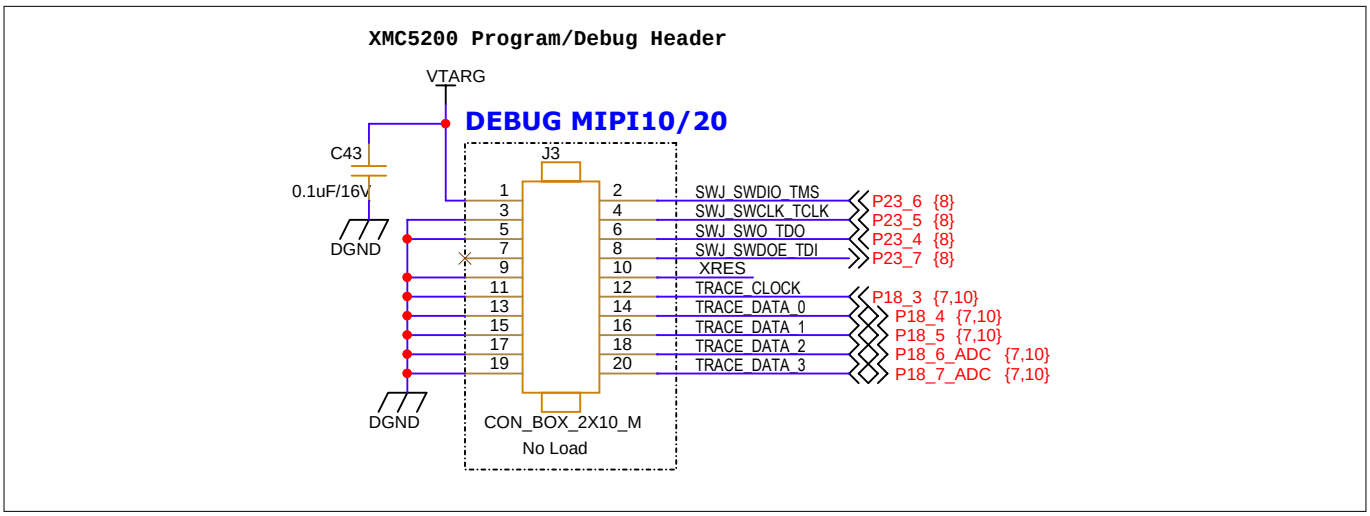

Figure 14 Programming and debugging header (J3)

4.2.5 Power supply system

The kit is powered directly through the 5 V USB bus. The power supply connections are shown in Figure 15. Fuse (F1) and reverse-current protection diode (D1) provide passive fault protection. By default, the current-measurement jumper (J4) is not mounted and is bypassed by resistor (R24) to supply 5 V directly to the target MCU.

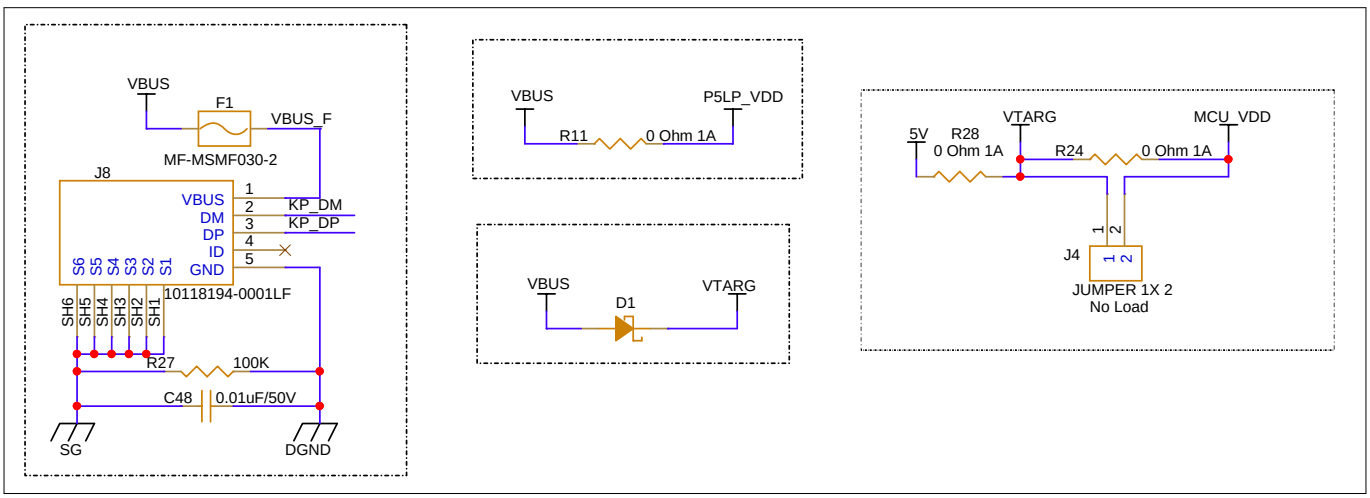

Figure 15 KIT_XMC52_EVK powering scheme

4.2.6 Current-measurement header

As shown in Figure 15, the current-measurement header is bypassed and not mounted by default. To measure the XMC5200 MCU current, remove resistor (R24) and install a 2-pin, 2.54 mm pitch through-hole header on J4. This configuration allows current measurement by connecting an ammeter or multimeter in series with the two terminals of the header.

4.2.7 I/O headers

The evaluation kit provides headers in a standard form factor compatible with Arduino Uno R3, along with generic headers for accessing MCU I/Os.

***Note**: The kit is only compatible with 5 V shields.*

4.2.7.1 Headers compatible with Arduino Uno R3 (J1, J2, J10, and J11)

The board includes four headers (J1, J2, J10, J11) that are compatible with the Arduino Uno R3. Users can connect 5 V shields designed for Arduino Uno R3 to develop applications based on the shield hardware.

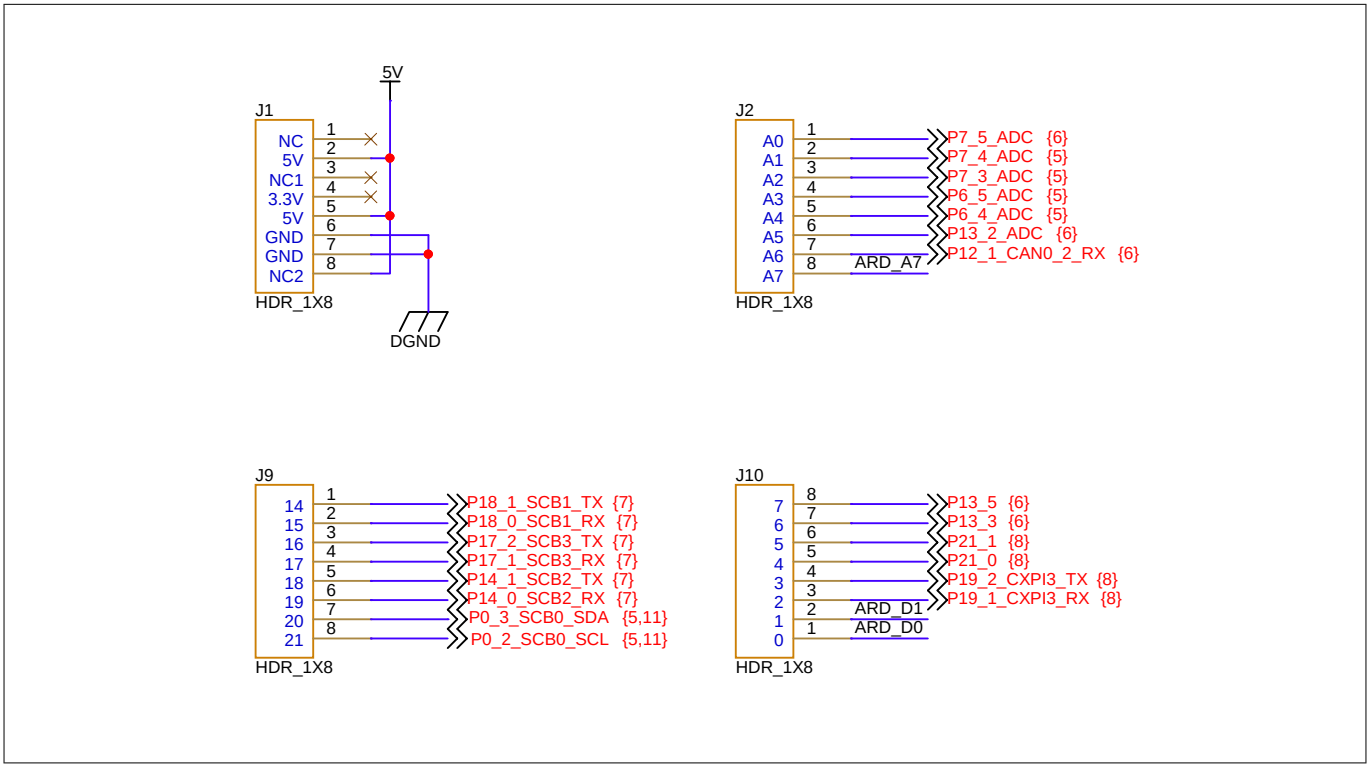

Figure 16 Arduino Uno R3-compatible headers

4.2.7.2 I/O expansion headers (J7, J9, J13)

The board includes two headers (J7 and J9) that provide additional analog and digital I/Os beyond those available on the Arduino Uno R3 standard headers. A 38-pin general-purpose header (J13) offers more I/Os for connecting external peripherals and circuits.

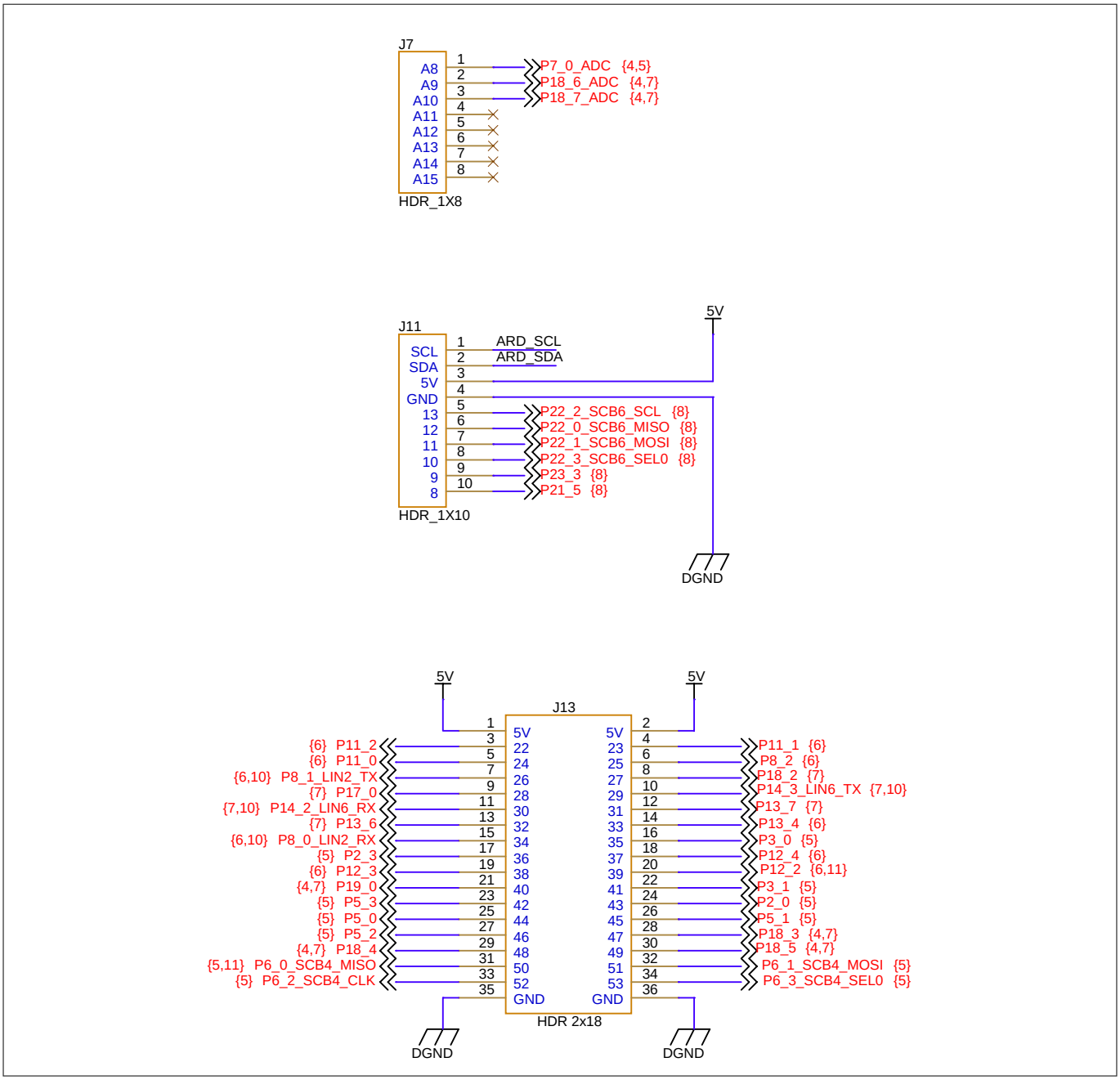

Figure 17 I/O expansion headers

4.2.8 Pin selection jumpers (J14, J15, J16, J17, J18)

Some header pins can be routed to two different MCU pins using pin-selection jumpers (J14 to J18). The available port-pin options are shown in Figure 18.

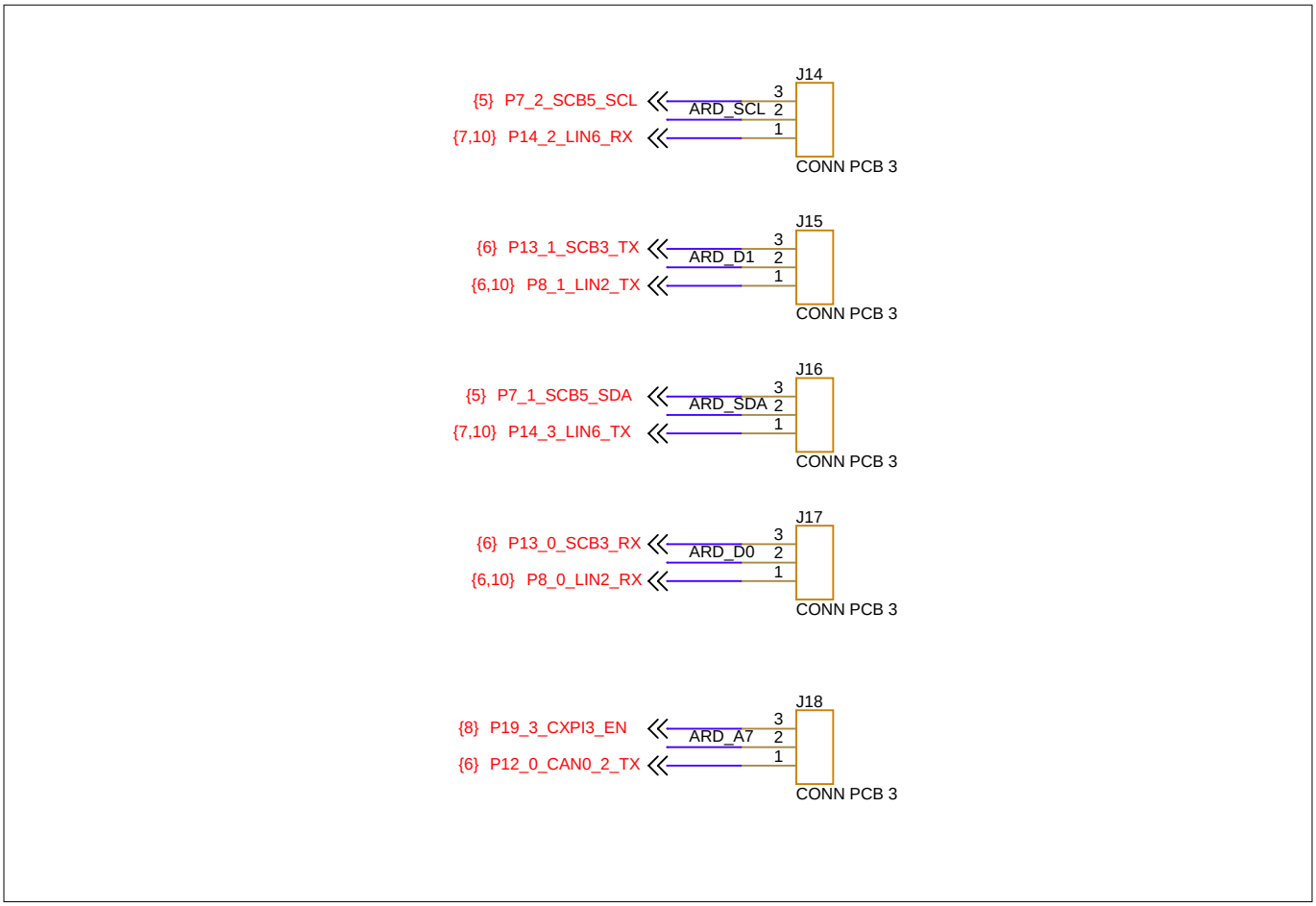

Figure 18 Pin selection jumpers

4.2.9 CAN FD transceiver

The TJA1057GTJ high-speed CAN transceiver operates as an interface between the CAN controller and the physical bus. A high-speed CAN network is a two-wire differential network that supports data transmission rates up to 5 Mbps. The CANH and CANL pins connect to the CAN bus and function as both input and output. The RxD and TxD pins interface with the MCU, where TxD serves as the serial data input from the CAN controller (U3) and RxD serves as the serial data output from the CAN controller (U3).

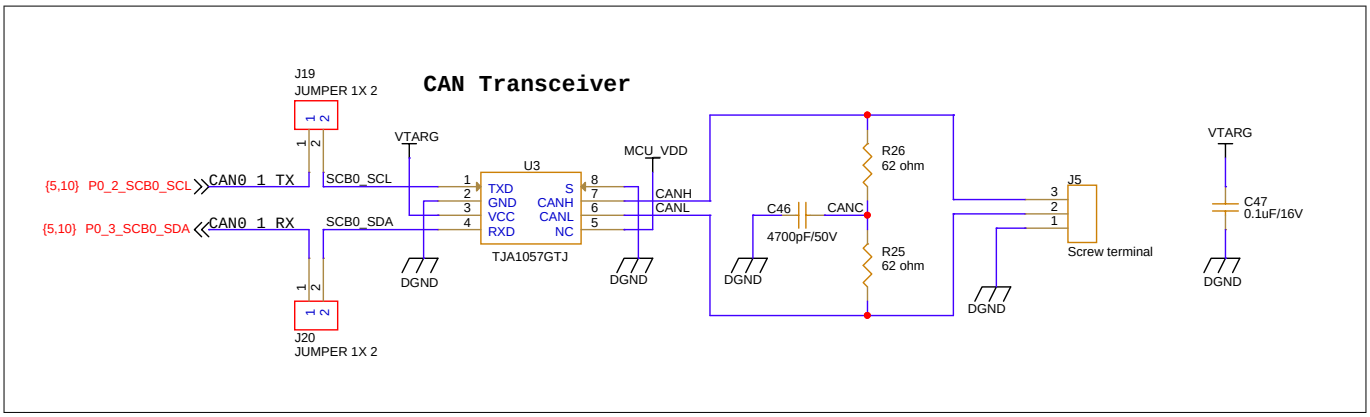

Figure 19 CAN FD transceiver

4.2.10 LEDs

The kit features four LEDs:

- Two blue user LEDs (LED1 and LED2)
- One orange KitProg3 status LED (LED3)
- One green power LED (LED4)

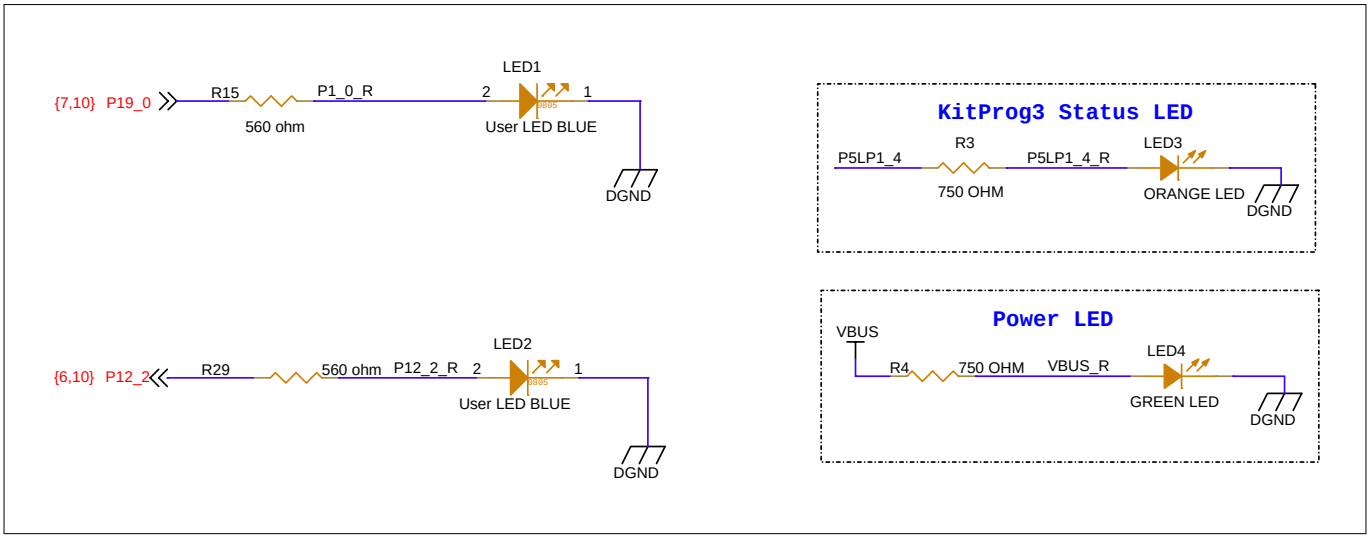

Figure 20 KIT_XMC52_EVK LEDs

4.2.11 Push buttons

The kit includes three push buttons in an active-low configuration:

1. **User button (SW1)**: Connected to P7.0 of the target MCU
2. **Reset button (SW2)**: Resets the target MCU
3. **KitProg3 mode switch (SW3)**: Selects the KP3 mode

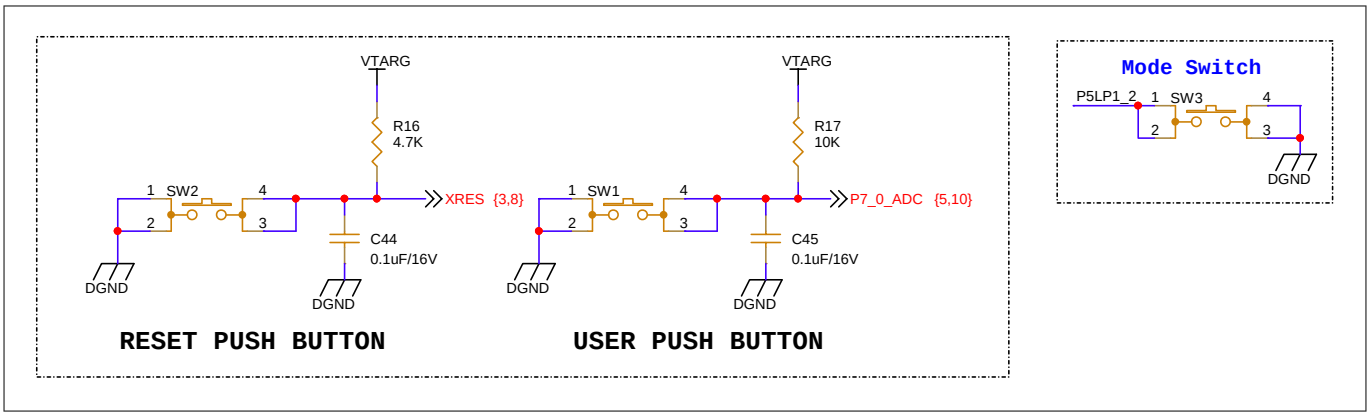

Figure 21 KIT_XMC52_EVK push buttons

4.2.12 Potentiometer

KIT_XMC52_EVK includes one onboard potentiometer connected to P6.0 of the target MCU. The potentiometer setting can be adjusted using a small screwdriver.

4 Hardware

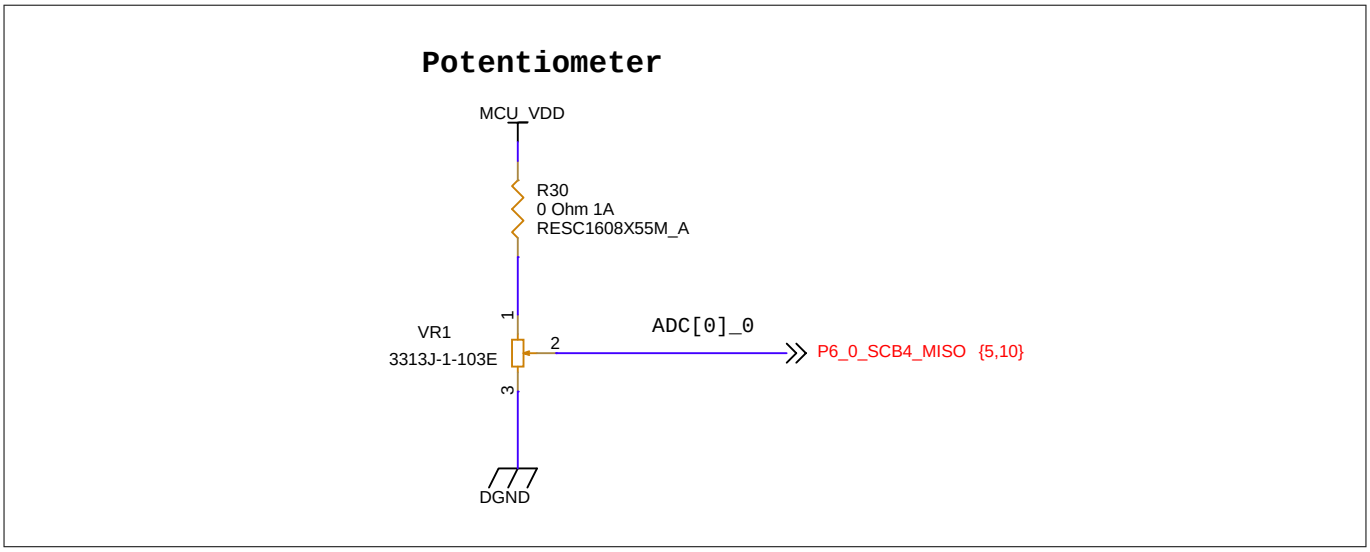

Figure 22 KIT_XMC52_EVK potentiometer

5 Kit rework

The kit may require rework for the following use cases:

1. **XMC5200 current measurement**: Remove resistor (R24) and install a two-pin 2.54 mm pitch header at J4

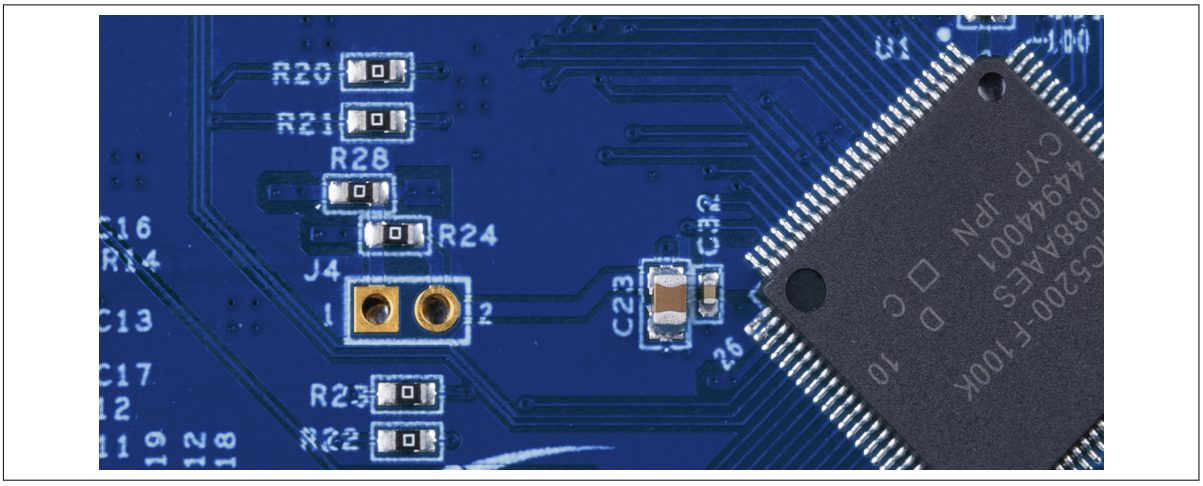

Figure 23 Rework for the target MCU current measurement

2. **Program/debug/trace header**: The program/debug/trace header (J3) is not installed by default. Users can install:
   - A 10-pin header (2 × 5 header with 1.27 mm pitch) on the first 10 pins for SWD/JTAG support
   - A 20-pin header (2 × 10 header with 1.27 mm pitch) to support SWD/JTAG and trace functionality

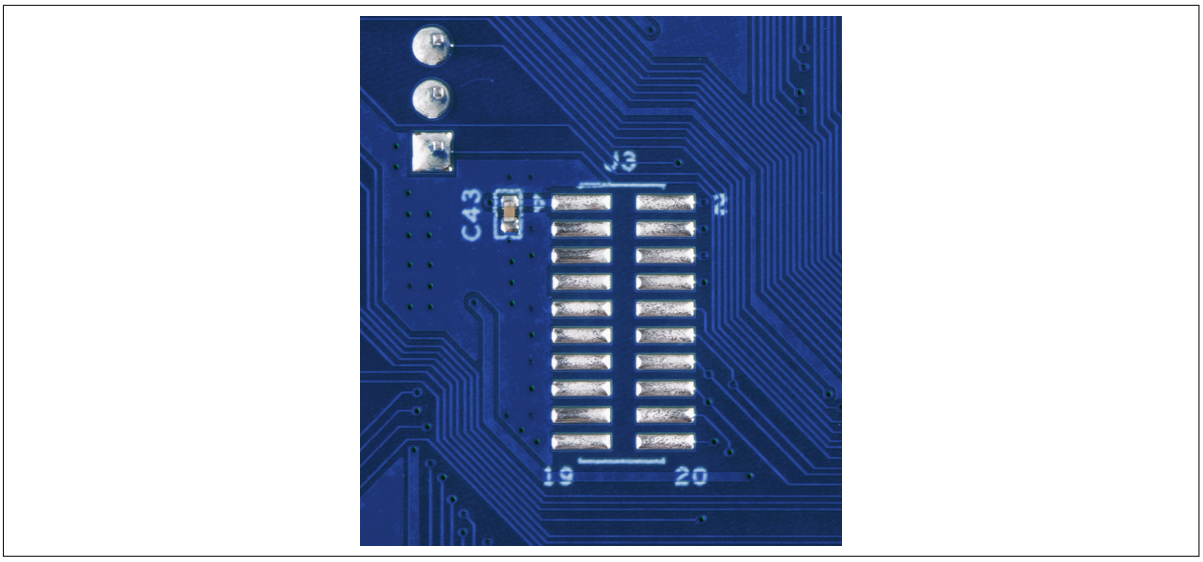

Figure 24 Header location for the program/debug/trace functionality

6 Frequently asked questions

1. Why does the kit supply voltage measure less than 5 V at J4?

- The kit is powered directly from the USB bus voltage. The standard USB port voltage range is 5 V ± 5%
- In addition to the fuse (F1), a reverse-polarity protection diode (D1) is placed in series between the USB bus supply and the MCU supply voltage, which causes an additional voltage drop at the MCU supply

2. How much current can I draw from the USB port when using KIT_XMC52_EVK along with shields and external circuits?

- The maximum current that a standard USB port can supply is limited to 500 mA. If the kit and all connected external boards draw more than this, the USB port may stop supplying power
- The kit can be powered in standalone mode using a 5 V USB charger or adapter, or a custom USB Micro-B cable connected to a regulated power supply

Revision history

Document version	Date of release	Description of changes
**	2025-11-24	Initial release

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