

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.*

Important notice**Important notice**

“Evaluation Boards and Reference Boards” shall mean products embedded on a printed circuit board (PCB) for demonstration and/or evaluation purposes, which include, without limitation, demonstration, reference and evaluation boards, kits and design (collectively referred to as “Reference Board”).

Environmental conditions have been considered in the design of the Evaluation Boards and Reference Boards provided by Infineon Technologies. The design of the Evaluation Boards and Reference Boards has been tested by Infineon Technologies only as described in this document. The design is not qualified in terms of safety requirements, manufacturing and operation over the entire operating temperature range or lifetime.

The Evaluation Boards and Reference Boards provided by Infineon Technologies are subject to functional testing only under typical load conditions. Evaluation Boards and Reference Boards are not subject to the same procedures as regular products regarding returned material analysis (RMA), process change notification (PCN) and product discontinuation (PD).

Evaluation Boards and Reference Boards are not commercialized products, and are solely intended for evaluation and testing purposes. In particular, they shall not be used for reliability testing or production. The Evaluation Boards and Reference Boards may therefore not comply with CE or similar standards (including but not limited to the EMC Directive 2004/EC/108 and the EMC Act) and may not fulfill other requirements of the country in which they are operated by the customer. The customer shall ensure that all Evaluation Boards and Reference Boards will be handled in a way which is compliant with the relevant requirements and standards of the country in which they are operated.

The Evaluation Boards and Reference Boards as well as the information provided in this document are addressed only to qualified and skilled technical staff, for laboratory usage, and shall be used and managed according to the terms and conditions set forth in this document and in other related documentation supplied with the respective Evaluation Board or Reference Board.

It is the responsibility of the customer’s technical departments to evaluate the suitability of the Evaluation Boards and Reference Boards for the intended application, and to evaluate the completeness and correctness of the information provided in this document with respect to such application.

The customer is obliged to ensure that the use of the Evaluation Boards and Reference Boards does not cause any harm to persons or third party property.

The Evaluation Boards and Reference Boards and any information in this document is provided "as is" and Infineon Technologies disclaims any warranties, express or implied, including but not limited to warranties of non-infringement of third party rights and implied warranties of fitness for any purpose, or for merchantability.

Infineon Technologies shall not be responsible for any damages resulting from the use of the Evaluation Boards and Reference Boards and/or from any information provided in this document. The customer is obliged to defend, indemnify and hold Infineon Technologies harmless from and against any claims or damages arising out of or resulting from any use thereof.

Infineon Technologies reserves the right to modify this document and/or any information provided herein at any time without further notice.

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.

Table of contents
Table of contents

	About this document	1
	Important notice	2
	Safety precautions	3
	Table of contents	4
1	Introduction	5
2	Kit details	6
2.1	Kit contents	6
2.2	Board details	6
3	Kit operation	8
3.1	Board support package selection	9
3.2	KitProg3 onboard programmer and debugger	9
3.3	Programming and debugging using ModusToolbox™	9
3.4	Using the OOB demo example - PSOC™ Control C3 MCU	12
4	Hardware	14
4.1	Schematics	14
4.2	Hardware functional description	14
4.2.1	XMC5200 (U1)	14
4.2.2	PSOC™ 5LP-based KitProg3 (U2)	16
4.2.3	Serial interconnection between PSOC™ 5LP and XMC5200	17
4.2.4	Programming and debugging header (J3)	18
4.2.5	Power supply system	18
4.2.6	Current-measurement header	18
4.2.7	I/O headers	19
4.2.7.1	Headers compatible with Arduino Uno R3 (J1, J2, J10, and J11)	19
4.2.7.2	I/O expansion headers (J7, J9, J13)	19
4.2.8	Pin selection jumpers (J14, J15, J16, J17, J18)	20
4.2.9	CAN FD transceiver	21
4.2.10	LEDs	22
4.2.11	Push buttons	22
4.2.12	Potentiometer	22
5	Kit rework	24
6	Frequently asked questions	25
	Revision history	26
	Trademarks	27
	Disclaimer	28

1 Introduction

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

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

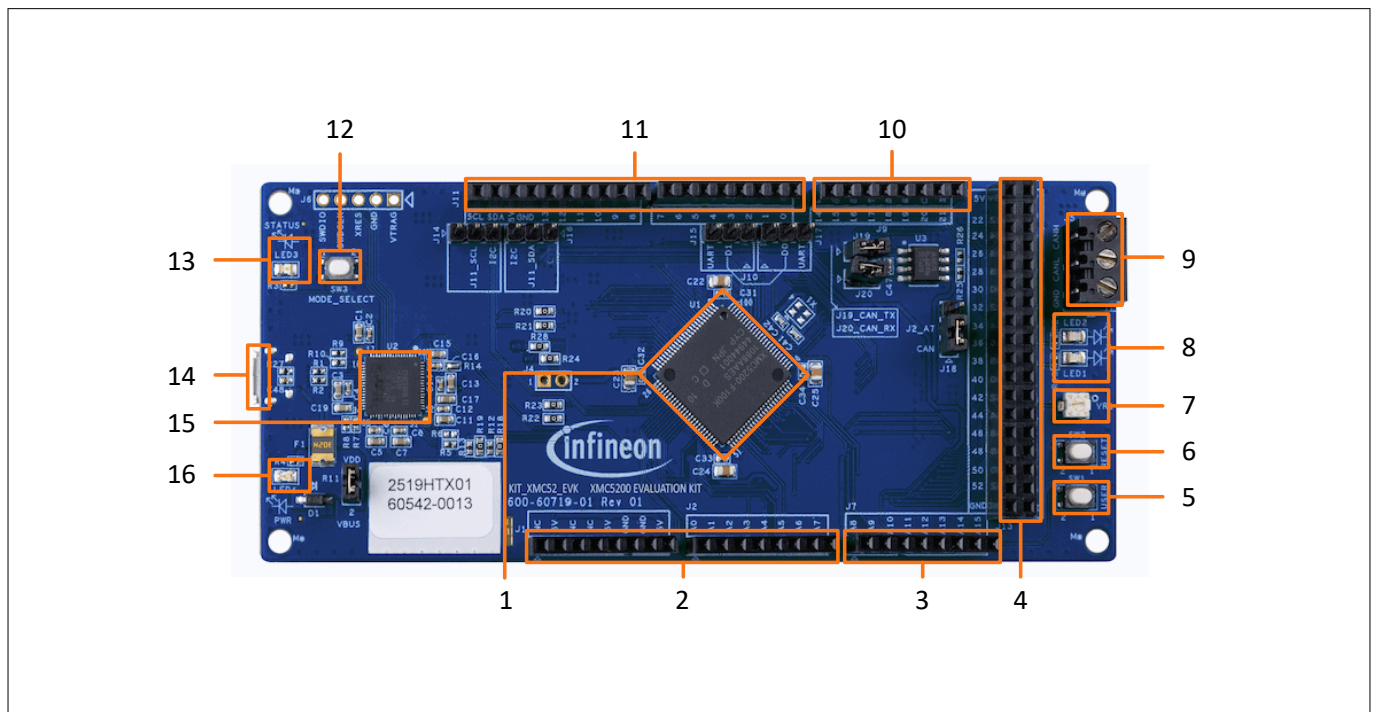


Figure 1 KIT_XMC52_EVK board details

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

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.

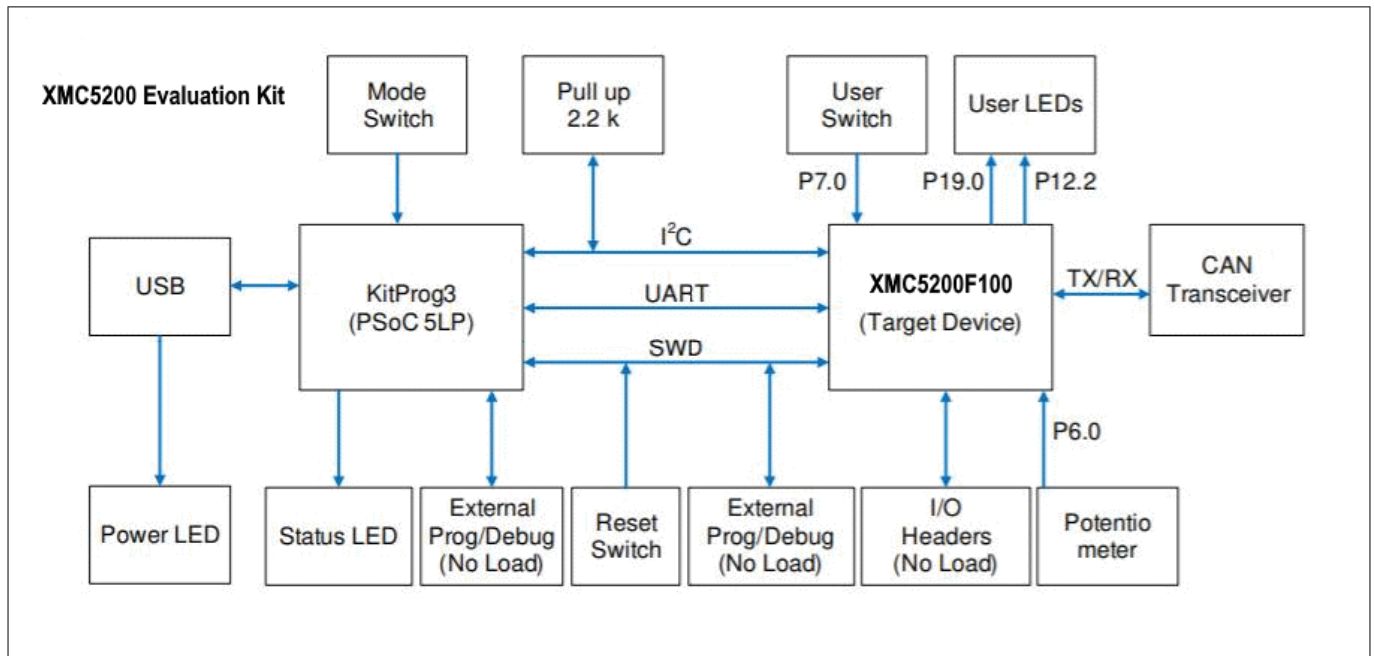


Figure 2 KIT_XMC52_EVK block diagram

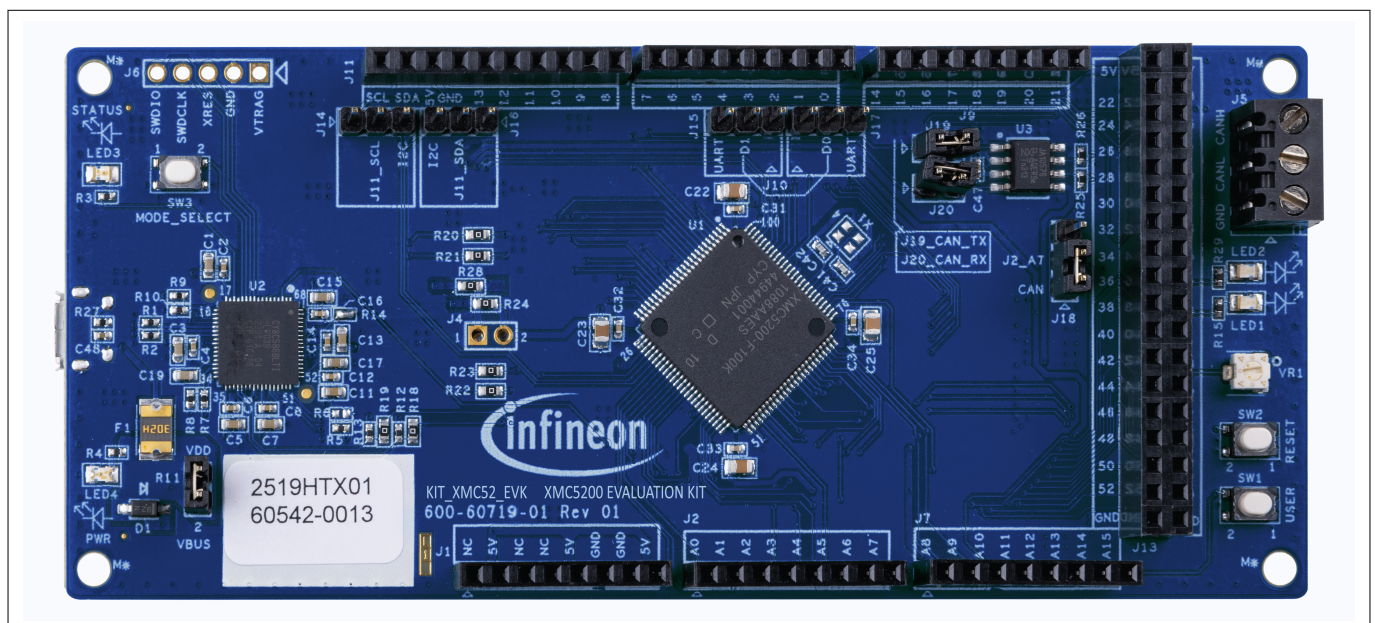


Figure 3 **XMC5200 Evaluation Kit top view**

3 Kit operation

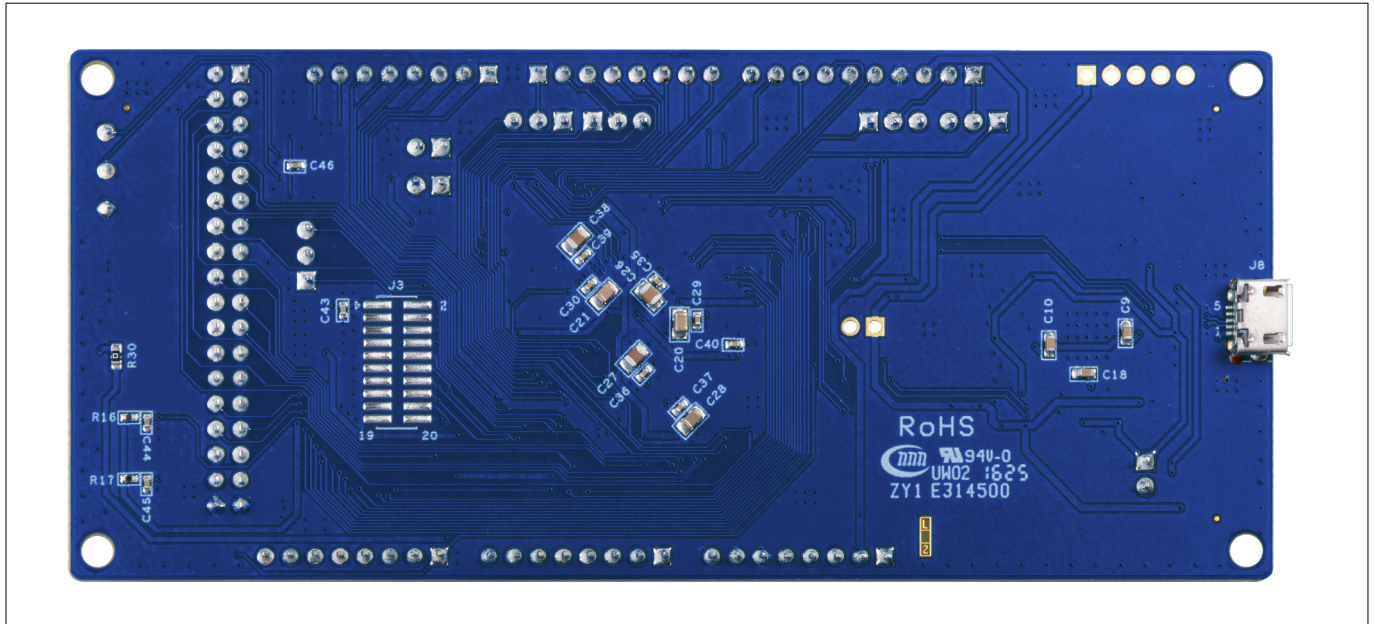


Figure 4 XCM5200 Evaluation Kit bottom view

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-I²C 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**

3 Kit operation

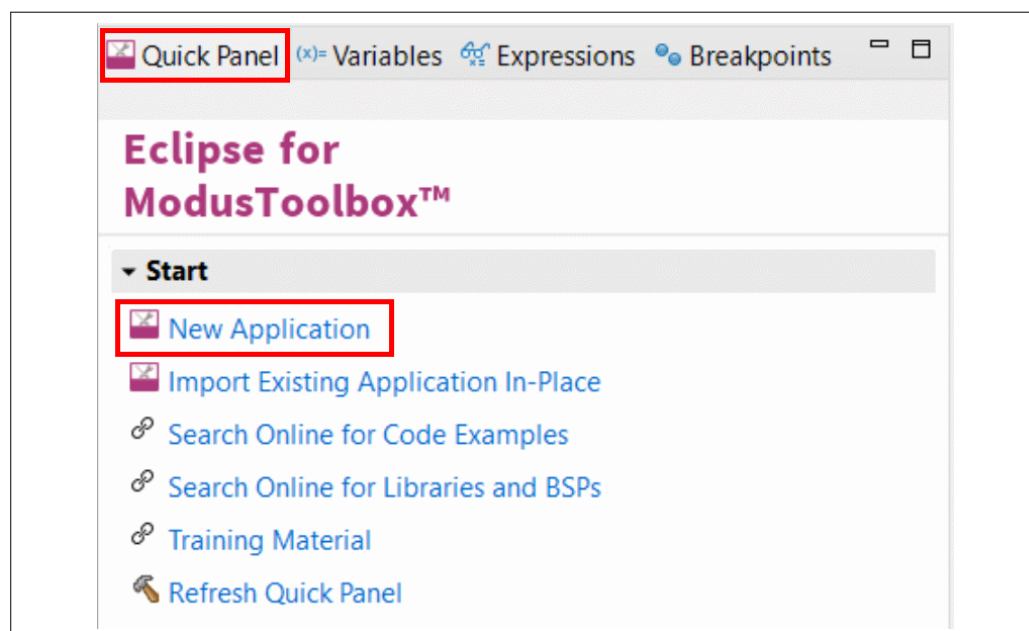


Figure 5 Create a New Application

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

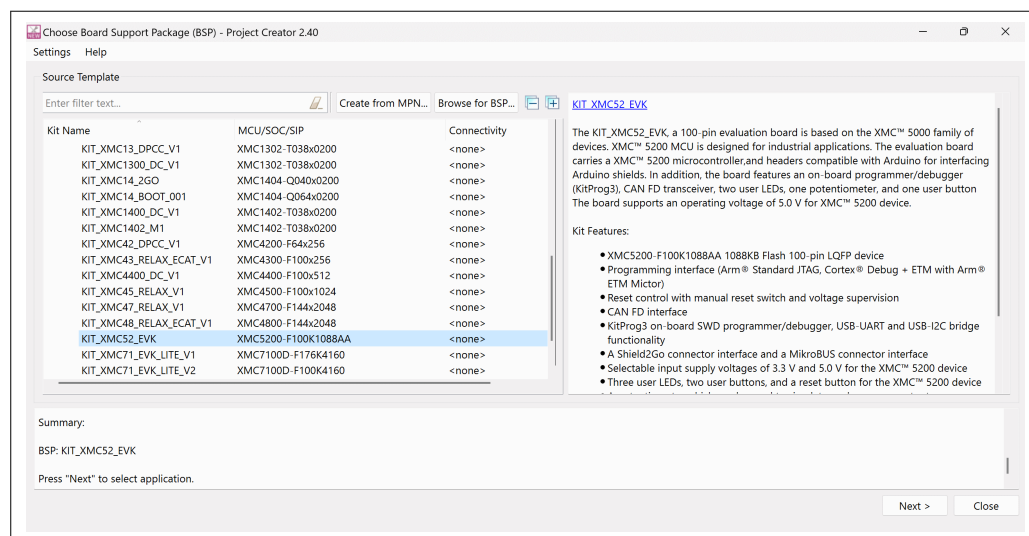


Figure 6 Choose Board Support Package in the new application window

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

3 Kit operation

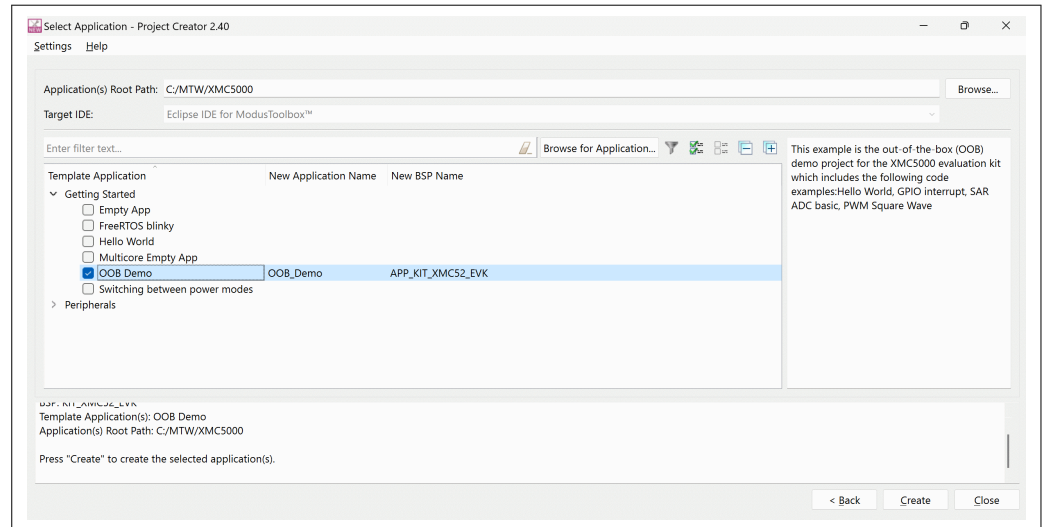


Figure 7 Select Application window

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

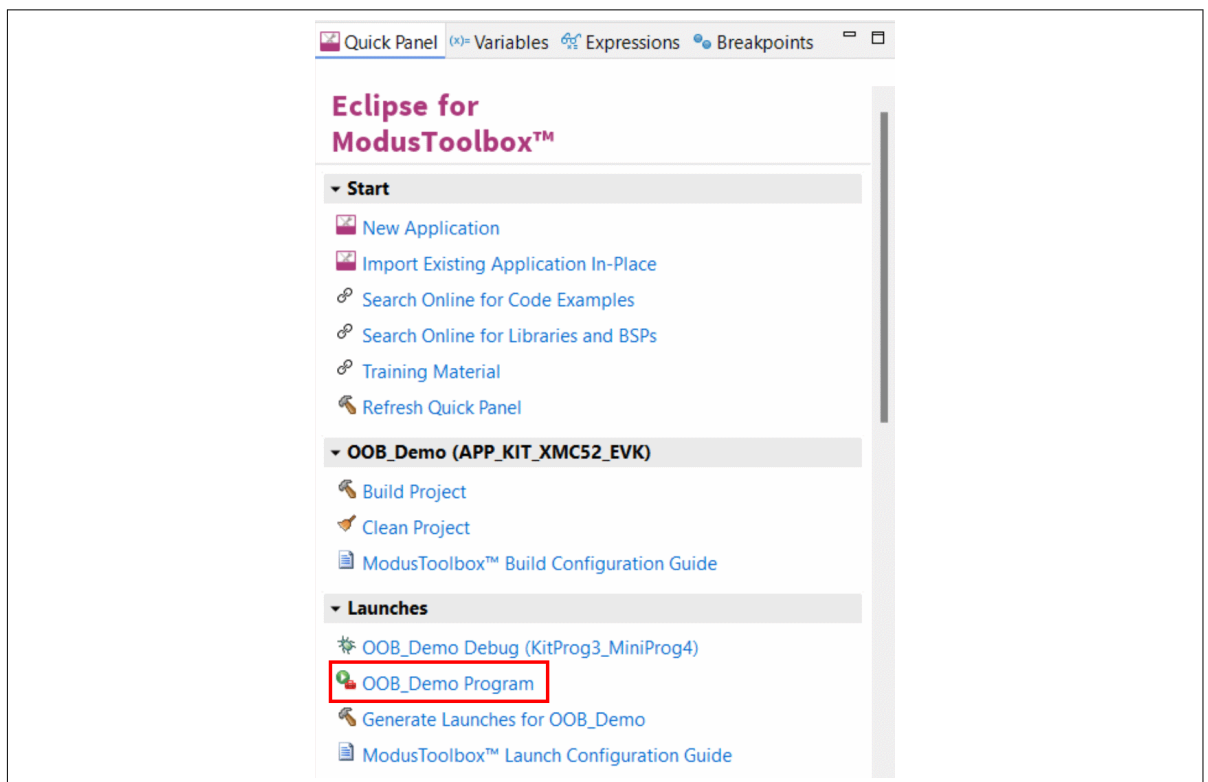


Figure 8 Programming using ModusToolbox™ IDE

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

3 Kit operation

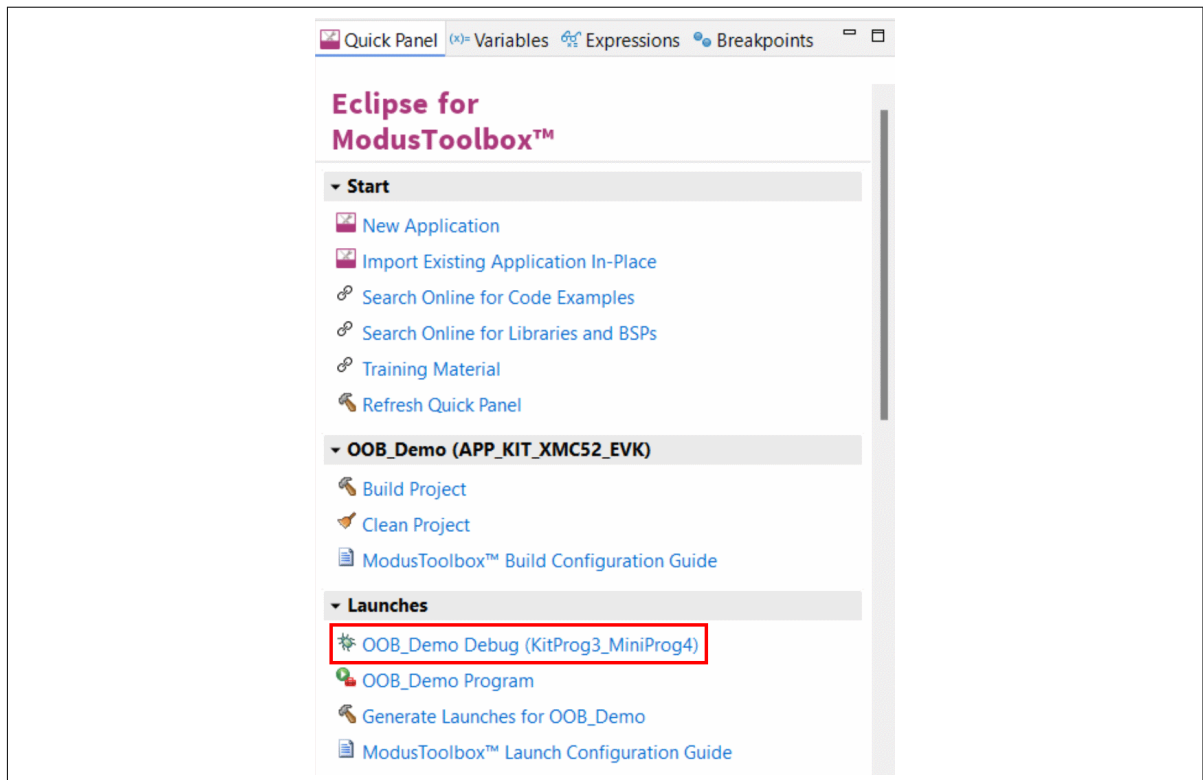


Figure 9 Debugging using ModusToolbox™ IDE

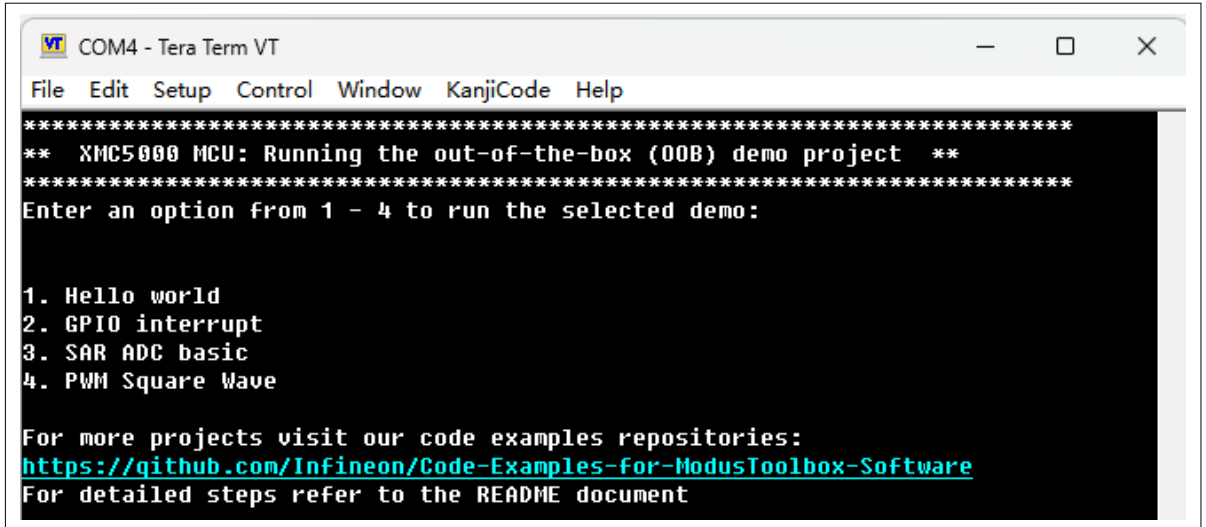
3.4 Using the OOB demo example - PSOC™ Control C3 MCU

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](#)

3 Kit operation



```
COM4 - Tera Term VT
File Edit Setup Control Window KanjiCode Help
*****
** XMC5000 MCU: Running the out-of-the-box (OOB) demo project **
*****
Enter an option from 1 - 4 to run the selected demo:

1. Hello world
2. GPIO interrupt
3. SAR ADC basic
4. PWM Square Wave

For more projects visit our code examples repositories:
https://github.com/Infineon/Code-Examples-for-ModusToolbox-Software
For detailed steps refer to the README document
```

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

4 Hardware

The following section describes the hardware design of the kit.

4.1 Schematics

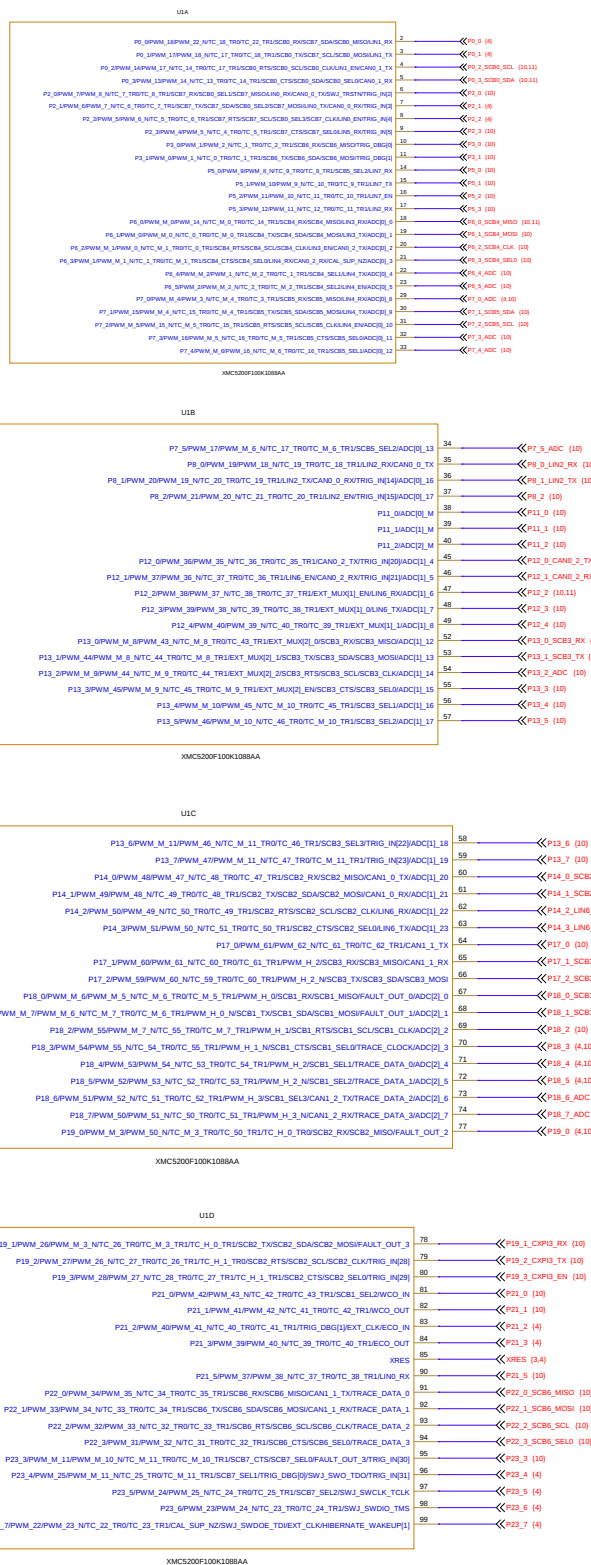
Schematic files are available on the [XMC5200 Evaluation Kit](#) webpage.

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



4 Hardware

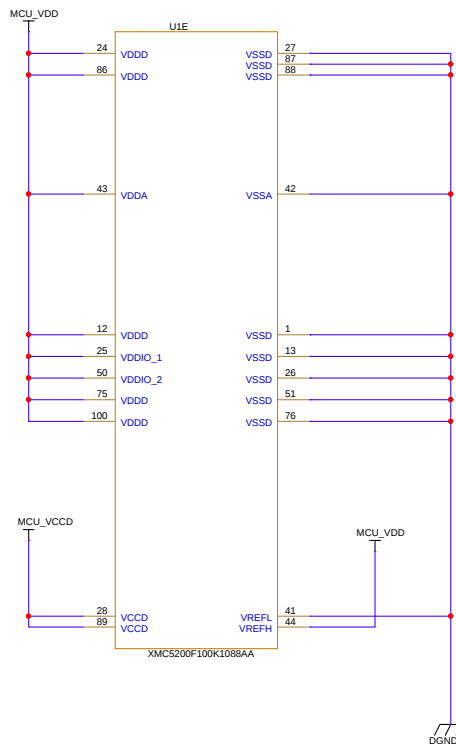


Figure 11 XMC5200 MCU

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.

4 Hardware

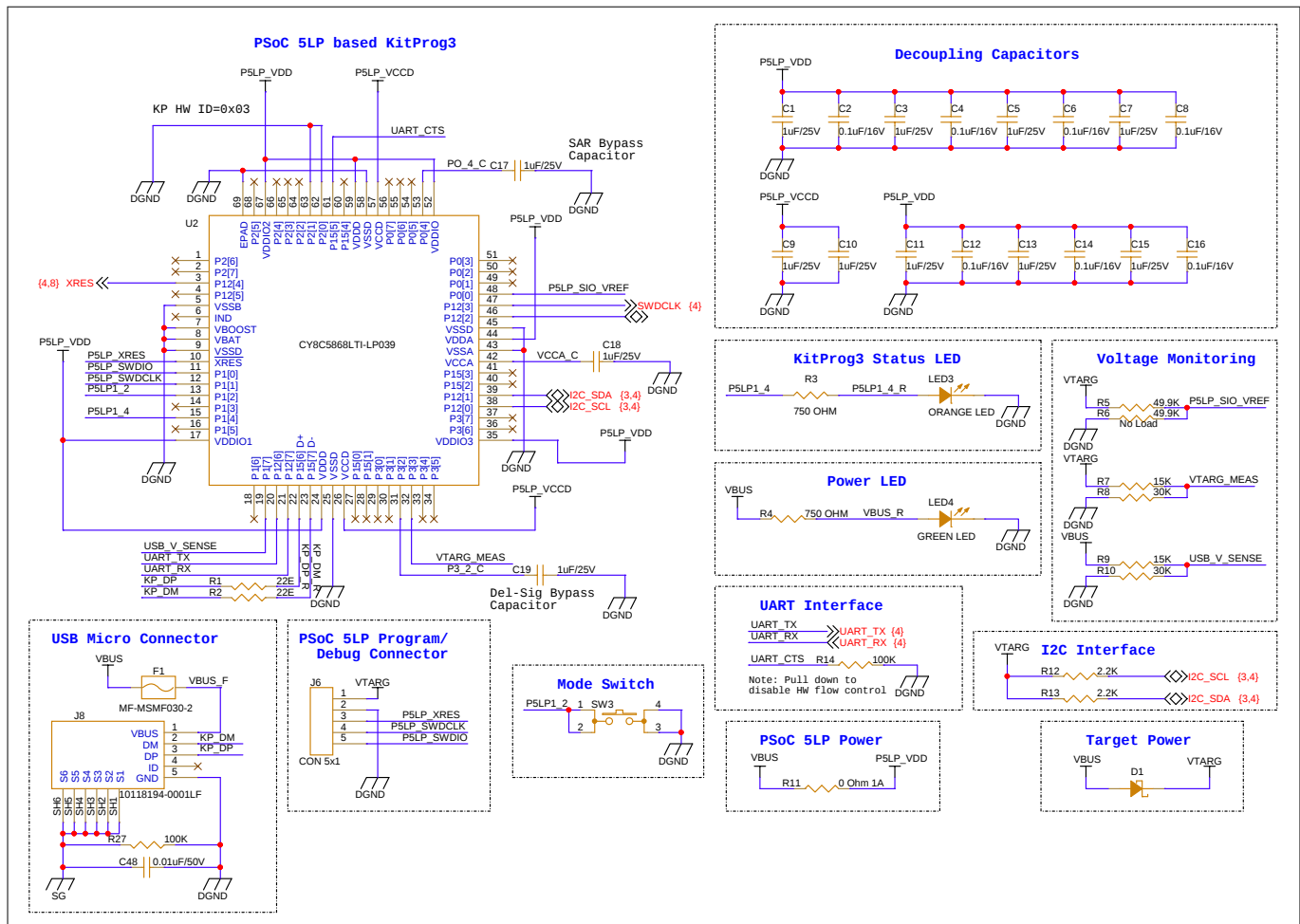


Figure 12 PSOC™ 5LP-based KitProg3 (U2)

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.

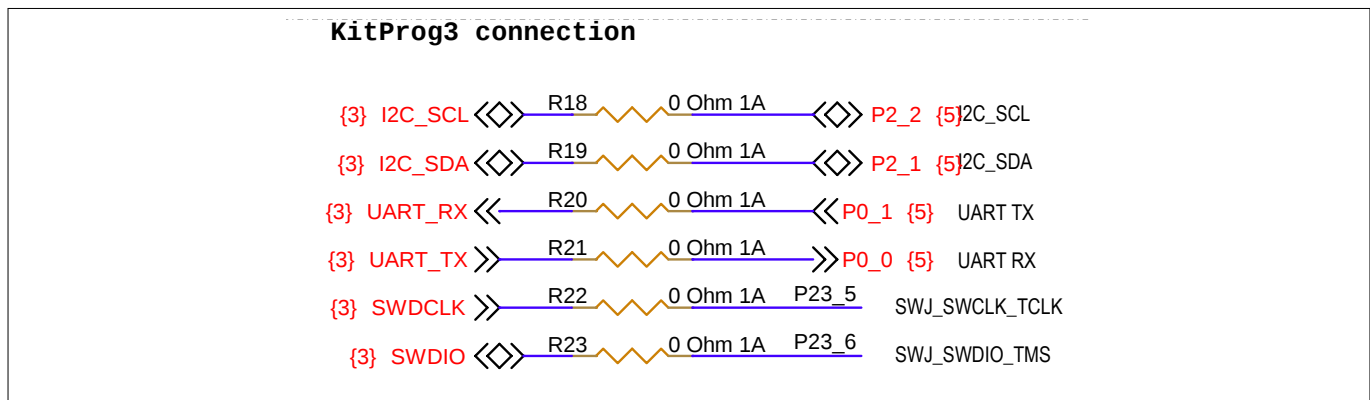


Figure 13 KitProg3 serial communication

4 Hardware

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.

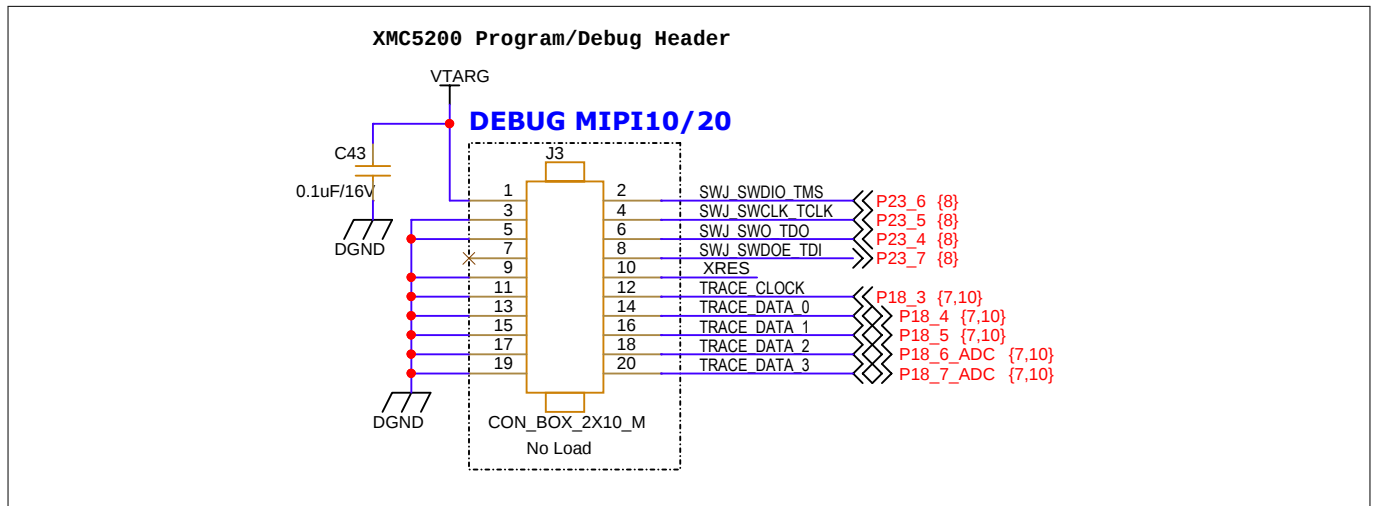


Figure 14 **Programming and debugging header (J3)**

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.

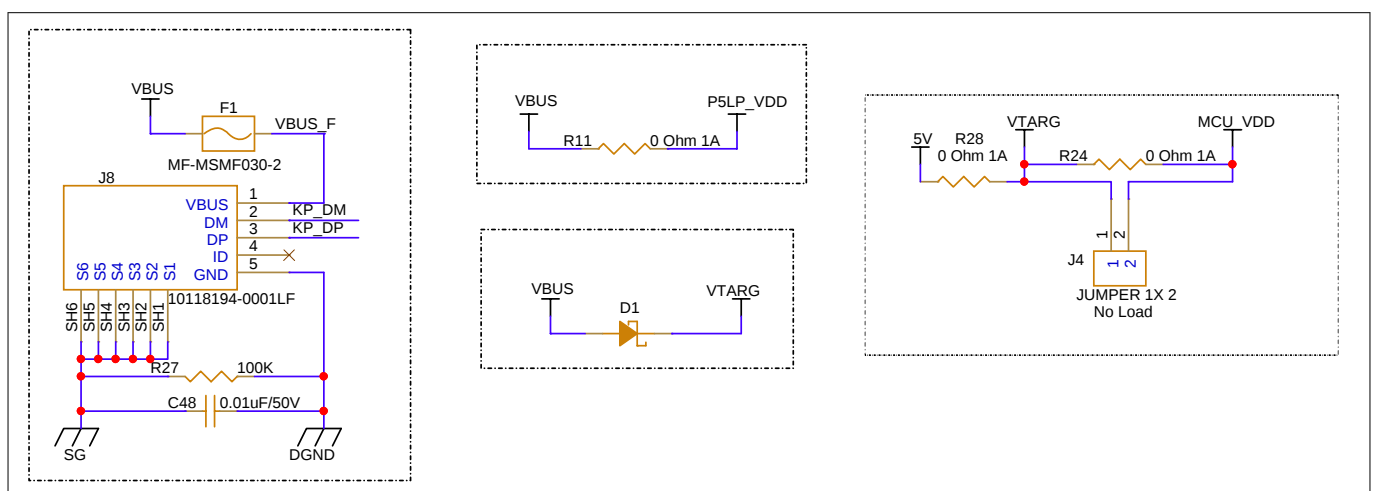


Figure 15 **KIT_XMC52_EVK powering scheme**

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 Hardware

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.

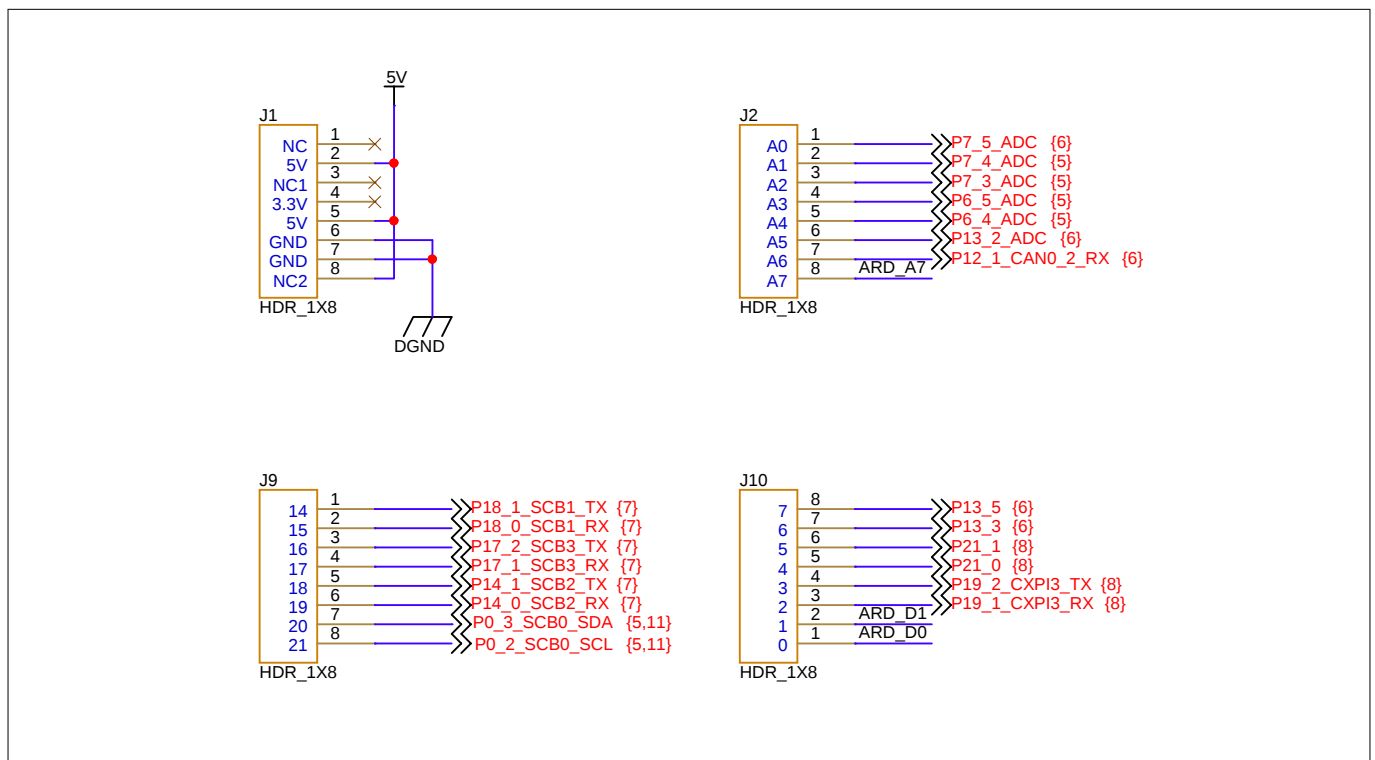


Figure 16 Arduino Uno R3-compatible headers

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.

4 Hardware

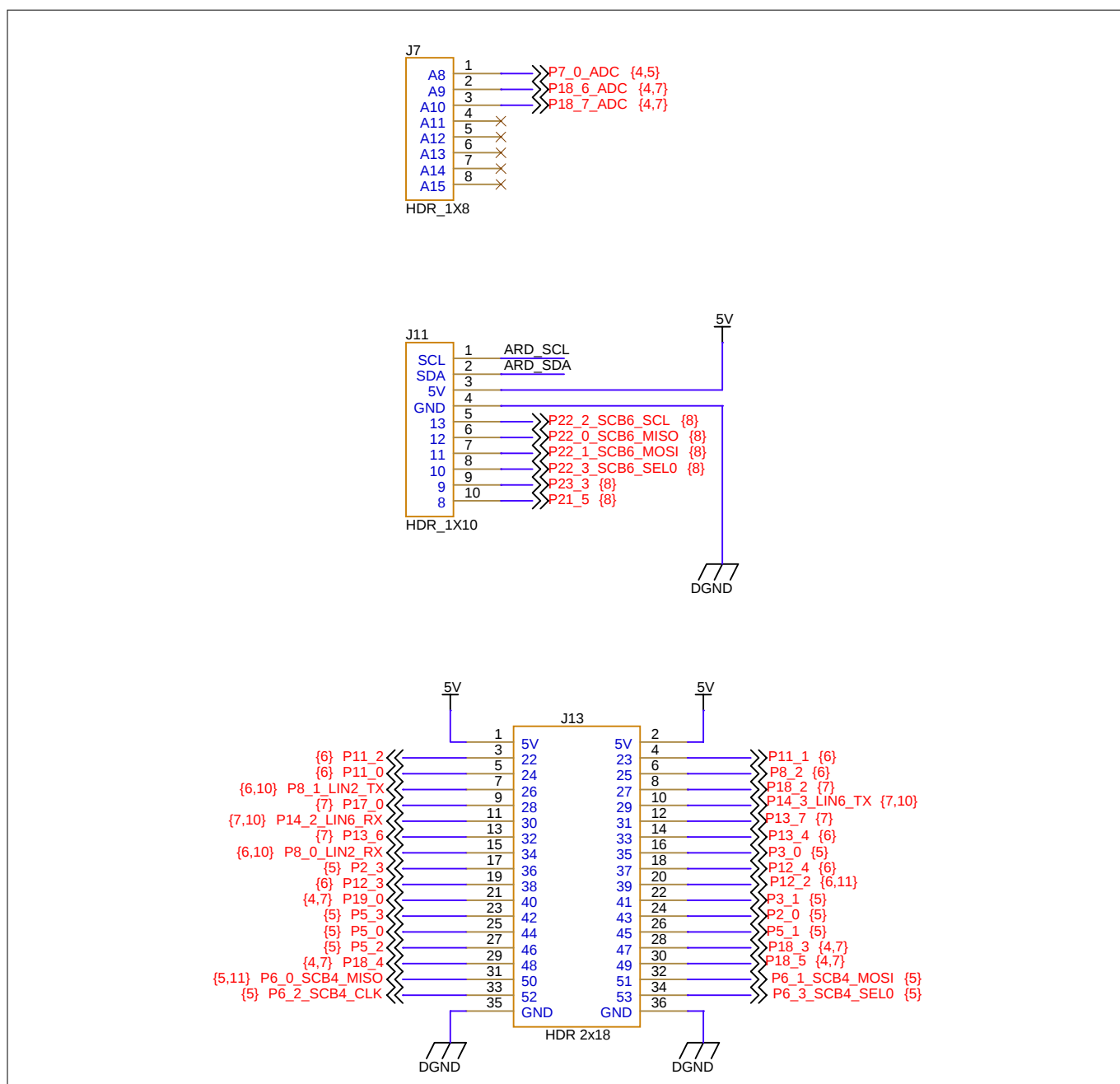


Figure 17 I/O expansion headers

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](#).

4 Hardware

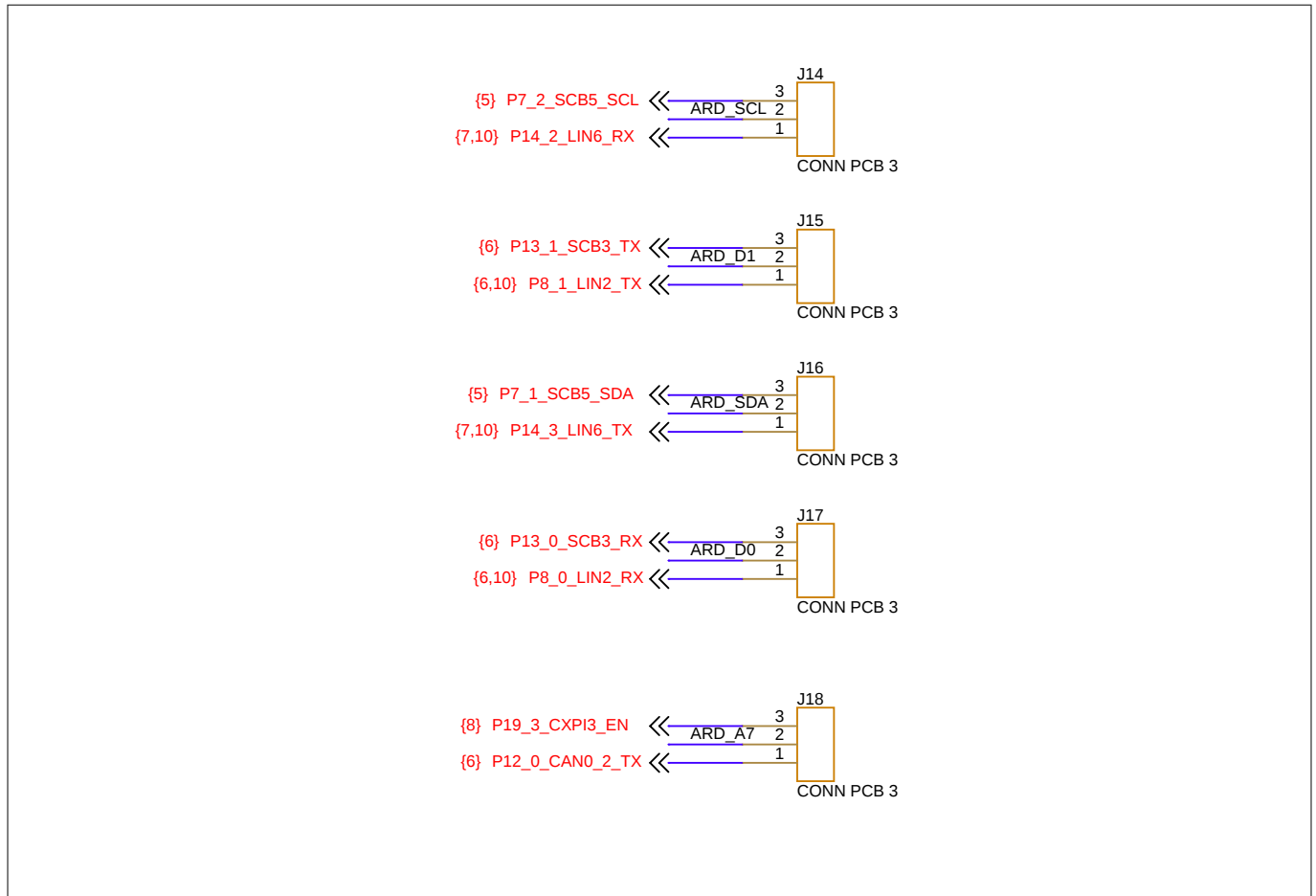


Figure 18 Pin selection jumpers

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).

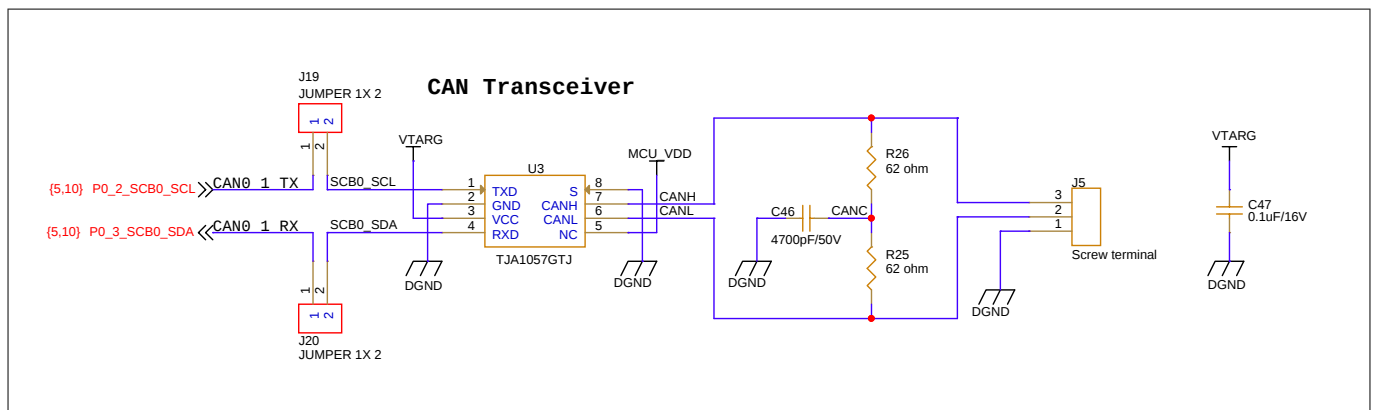


Figure 19 CAN FD transceiver

4 Hardware

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)

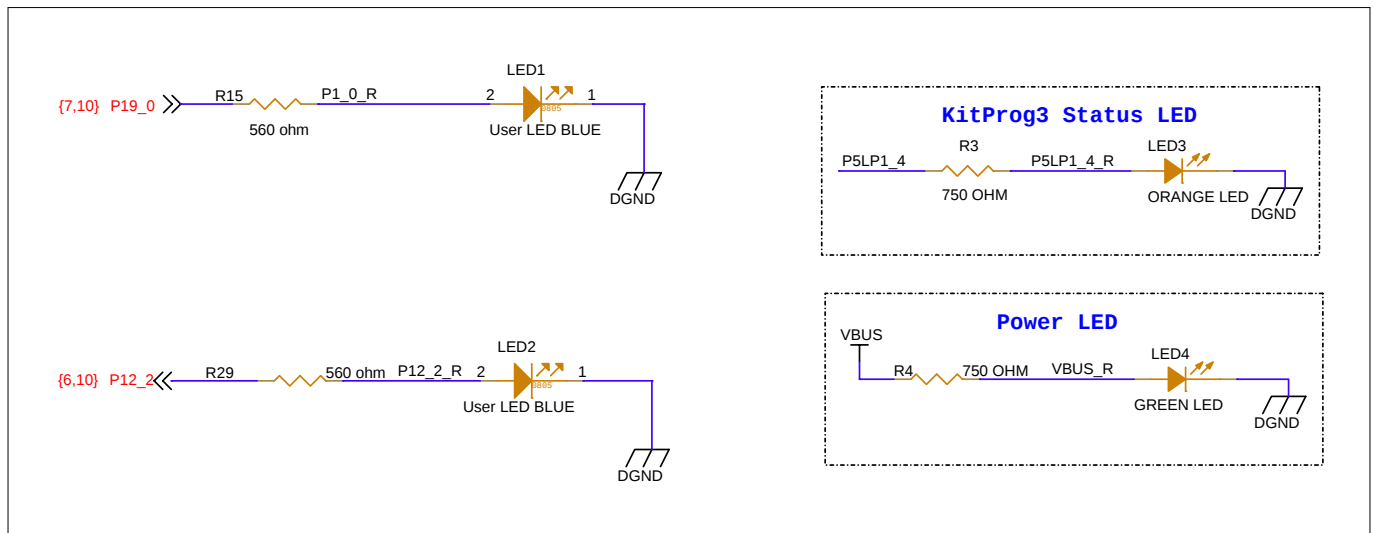


Figure 20 KIT_XMC52_EVK LEDs

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

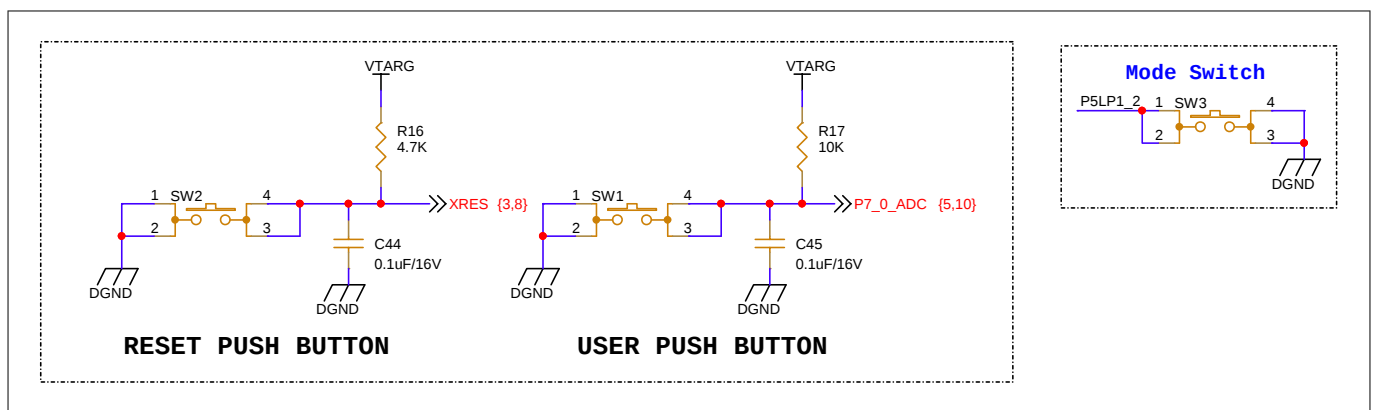


Figure 21 KIT_XMC52_EVK push buttons

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

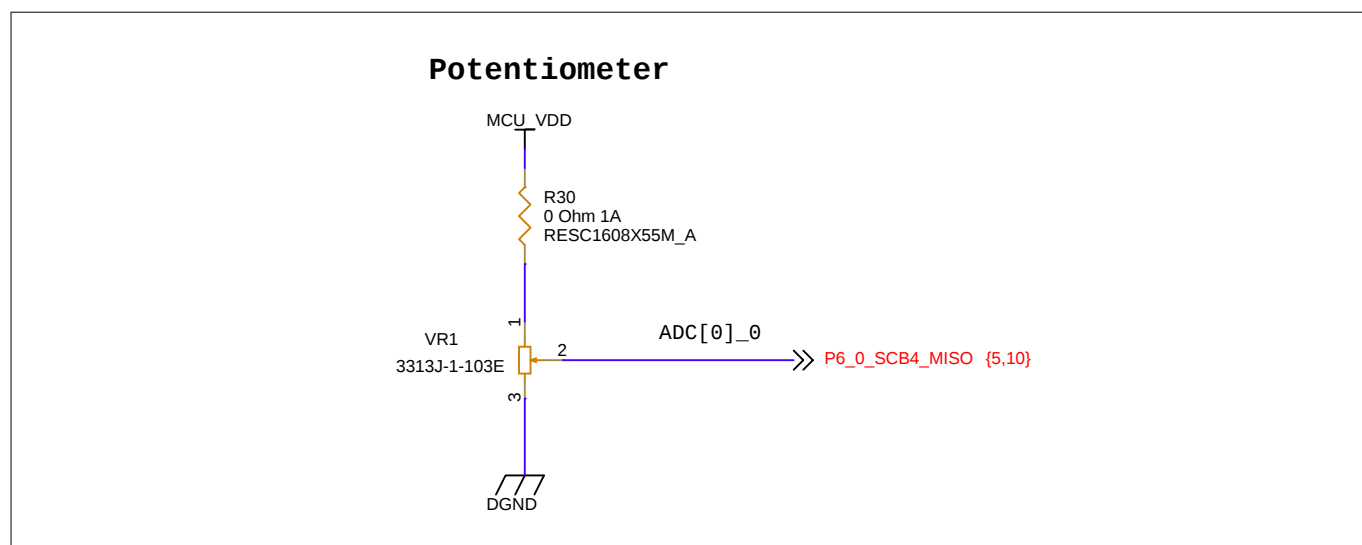


Figure 22 KIT_XMC52_EVK potentiometer

5 Kit rework

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

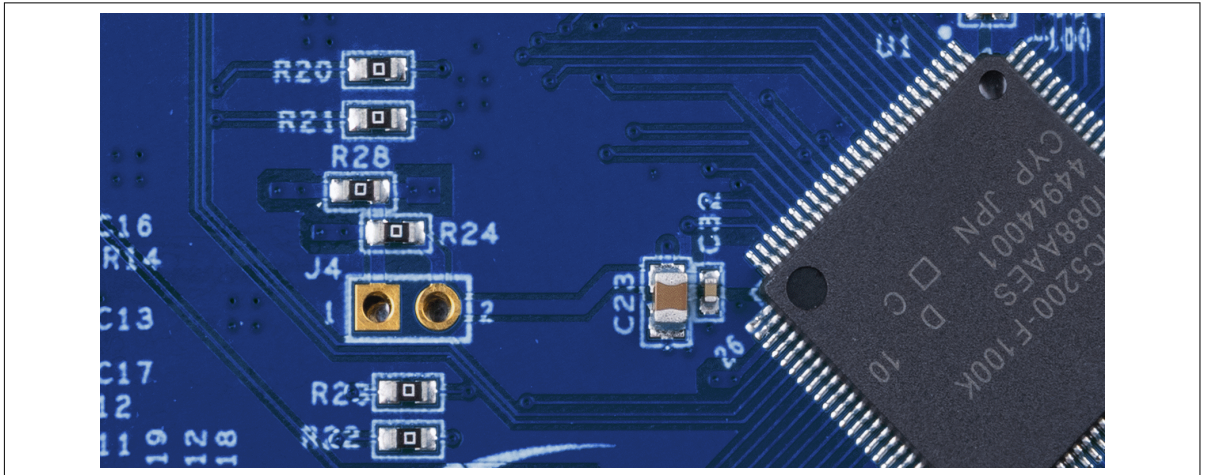


Figure 23 Rework for the target MCU current measurement

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

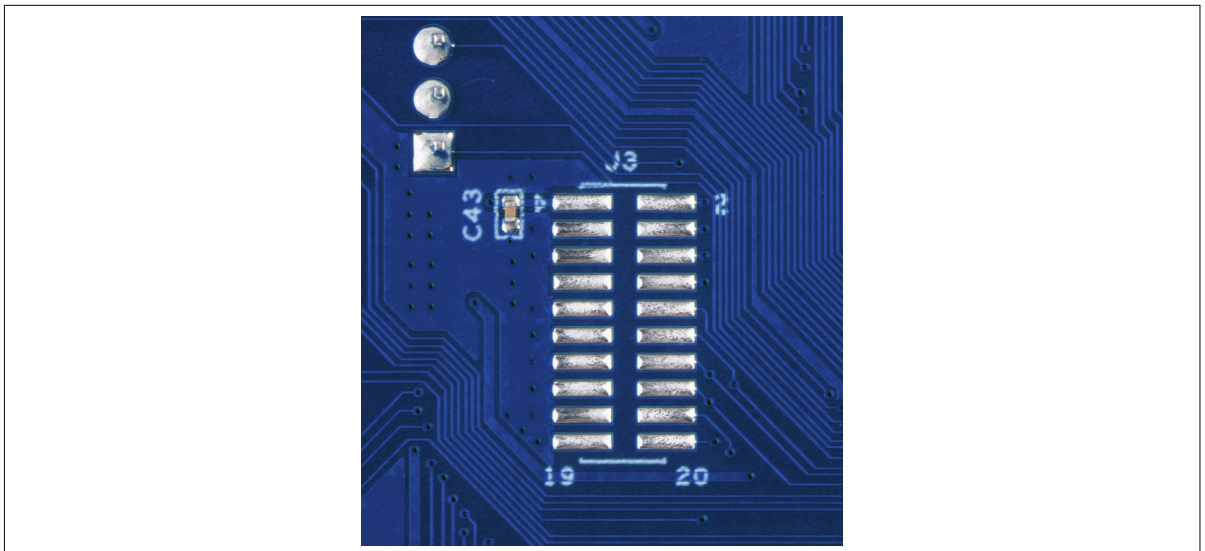


Figure 24 Header location for the program/debug/trace functionality

6 Frequently asked questions

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 $\pm$ 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**Revision history**

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

Trademarks

Trademarks

PSOC™, formerly known as PSoC™, is a trademark of Infineon Technologies. Any references to PSoC™ in this document or others shall be deemed to refer to PSOC™.

Trademarks

All referenced product or service names and trademarks are the property of their respective owners.

Edition 2025-11-24

Published by

Infineon Technologies AG
81726 Munich, Germany

© 2025 Infineon Technologies AG
All Rights Reserved.

Do you have a question about any aspect of this document?

Email: erratum@infineon.com

Document reference
IFX-ydq1752750612400

For further information on the product, technology, delivery terms and conditions and prices please contact your nearest Infineon Technologies office (www.infineon.com)

Warnings

Due to technical requirements products may contain dangerous substances. For information on the types in question please contact your nearest Infineon Technologies office.

Except as otherwise explicitly approved by Infineon Technologies in a written document signed by authorized representatives of Infineon Technologies, Infineon Technologies' products may not be used in any applications where a failure of the product or any consequences of the use thereof can reasonably be expected to result in personal injury.