UM12441

FRDM-MCXA344 Board User Manual

Rev. 1.0 — 5 January 2026 User manual

Document information

Information	Content
Keywords	UM12441, FRDM-MCXA344, MCX A344, MCX A, Arduino, mikroBUS, Pmod, MCU-Link
Abstract	The FRDM-MCXA344 board is a design and evaluation platform based on the NXP MCX A344 MCU.

1 Board overview

The FRDM-MCXA344 board is a design and evaluation platform based on the NXP MCX A344 microcontroller (MCU). The MCX A344 MCU is a low-power microcontroller for industrial and consumer Internet of Things (IoT) applications. It has one Arm Cortex-M33 core running at speeds of up to 180 MHz. It supports industrial communication protocol, Brushless Direct Current (BLDC) motor / Permanent Magnet Synchronous Motor (PMSM) control, and integrated sensor interfaces (I^2C and SPI).

The board is compatible with Arduino boards (Arduino UNO R3 and Arduino A4/A5), motor control boards (FRDM-MC-LVBLDC and FRDM-MC-LVPMSM), Mikroe click boards, and Pmod boards. It can be used with a wide range of development tools, including NXP MCUXpresso IDE, IAR Embedded Workbench, and Arm Keil MDK. The board is lead-free and RoHS-compliant.

For debugging the MCX A344 MCU, the FRDM-MCXA344 board uses an Onboard (OB) debug probe, MCU-Link OB, which is based on another NXP MCU: LPC55S16. For simplicity, the MCX A344 MCU and the LPC55S16 MCU are respectively referred to as "target MCU" and "debugger MCU" at some places in this document.

This document provides details about the FRDM-MCXA344 board interfaces, power supplies, clocks, connectors, jumpers, push buttons, LEDs, and MCU-Link OB.

1.1 Block diagram

Figure 1 shows the FRDM-MCXA344 board block diagram.

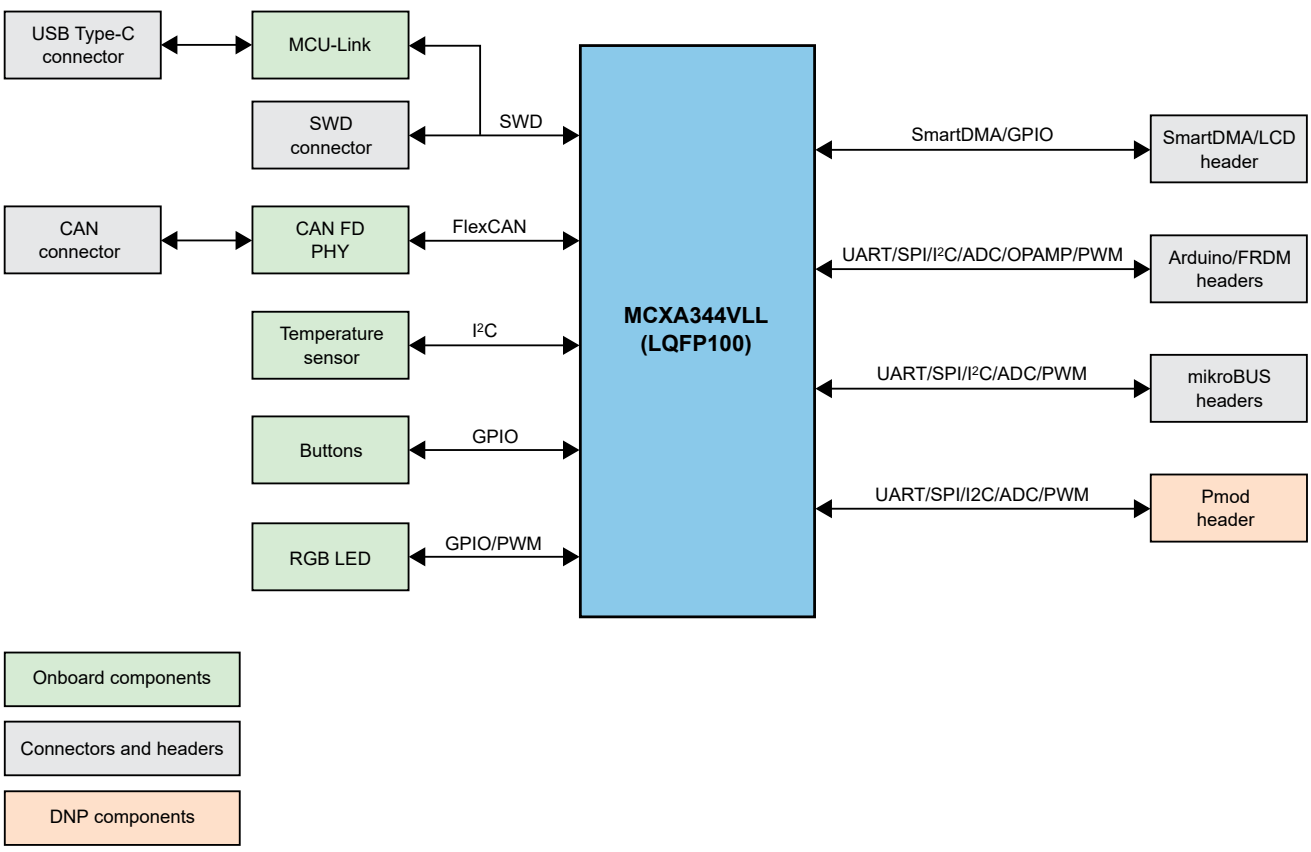

Figure 1. FRDM-MCXA344 block diagram

1.2 Board features

Table 1 lists the features of the FRDM-MCXA344 board.

Table 1. FRDM-MCXA344 features

Board feature	Target MCU features used	Description
MCU (target MCU)		NXP MCX A344 MCU (part number: MCXA344VLL) based on an Arm Cortex-M33 core, running at speeds of up to 180 MHz. ***Note:*** *For details on the MCX A344 MCU, refer to MCX A343 and MCX A344 Reference Manual and MCXA343/344 Data Sheet.*
FlexCAN interface	CAN0 module	Provides a high-speed CAN FD transceiver accessible through a 2x2-pin header J14
LPUART interface	LPUART2 module	• Supports a USB-to-UART bridge connection using MCU-Link • Supports an external UART connection through the Arduino socket connector J1
	LPUART3 module	Supports an external UART connection through the mikroBUS socket connector J5
LPSPI interface	LPSPI0 module	Supports an external SPI connection through the mikroBUS socket connector J6 or the Pmod connector J7 (DNP)
	LPSPI1 module	Supports an external SPI connection through the Arduino socket connector J2
LPI2C interface	LPI2C0 module	• Provides an I^2C connection to the Arduino socket connector J2 • Supports MCU-Link through a USB-to-I^2C bridge connection • Supports a digital temperature sensor (P3T1755DP)
	LPI2C1 module	• Provides an I^2C connection to the mikroBUS socket connector J5 and the Pmod connector J7 (DNP) • Provides an I^2C connection to the SmartDMA/LCD connector J8
LCD interface	SmartDMA module	Supports a SmartDMA connection through the LCD connector J8
ADC interface	ADC0 module	Accepts ADC inputs through the Arduino socket connectors J2 and J4 and the mikroBUS socket connector J6
	ADC1 module	Accepts ADC inputs through the Arduino socket connectors J2 and J4
OPAMP interface	OPAMP0 module	Connects to the test points TP14 (INP), TP17 (INN), and TP15 (OUT)
	OPAMP1 and OPAMP2 modules	Connect to the Arduino socket connector J4
Arduino socket	LPUART2, LPSPI1, LPI2C0, ADC0, ADC1, PWM0, and PWM1 modules	Arduino socket with four connectors J1, J2, J3, and J4
mikroBUS socket	LPUART3, LPSPI0, LPI2C1, ADC0, and CTIMER1 modules	mikroBUS socket with a pair of connectors J5 and J6
Pmod connector	LPSPI0 and LPI2C1 modules	Pmod connector J7 (DNP)
Debug interface	LPUART2 module	Onboard MCU-Link debug probe with the USB Type-C connector J13 for debugging the MCX A344 MCU
Power supply		The FRDM-MCXA344 board is powered with a 5 V power supply (P5V0) using one of the following source options:

Table 1. FRDM-MCXA344 features*...continued*

Board feature	Target MCU features used	Description
		• P5V_MCU_LINK_USB supply from MCU-Link USB Type-C connector J13 • P5V_HDR_IN supply from 5 V regulator populated at 3-pin connector J15 (not populated by default) • P5V0 supply from the Arduino shield compatible header J3 (pin 10), the CAN0 connector J14 (pin 3), the mikroBUS socket connector J5 (pin 7), and the power test point TP4
Clocks		• 8 MHz clock for the MCX A344 MCU • 16 MHz clock for the LPC55S16 MCU
Orderable part number		FRDM-MCXA344

1.3 Kit contents

The FRDM-MCXA344 board hardware kit contains items listed in Table 2.

Table 2. Kit contents

Item	Quantity
FRDM-MCXA344 board hardware assembly	1
FRDM-MCXA344 Quick Start Guide	1

1.4 Board pictures

Figure 2 shows the top-side view of the FRDM-MCXA344 board with the MCX A344 MCU (target MCU), the LPC55S16 MCU (debugger MCU), and the CAN FD transceiver highlighted.

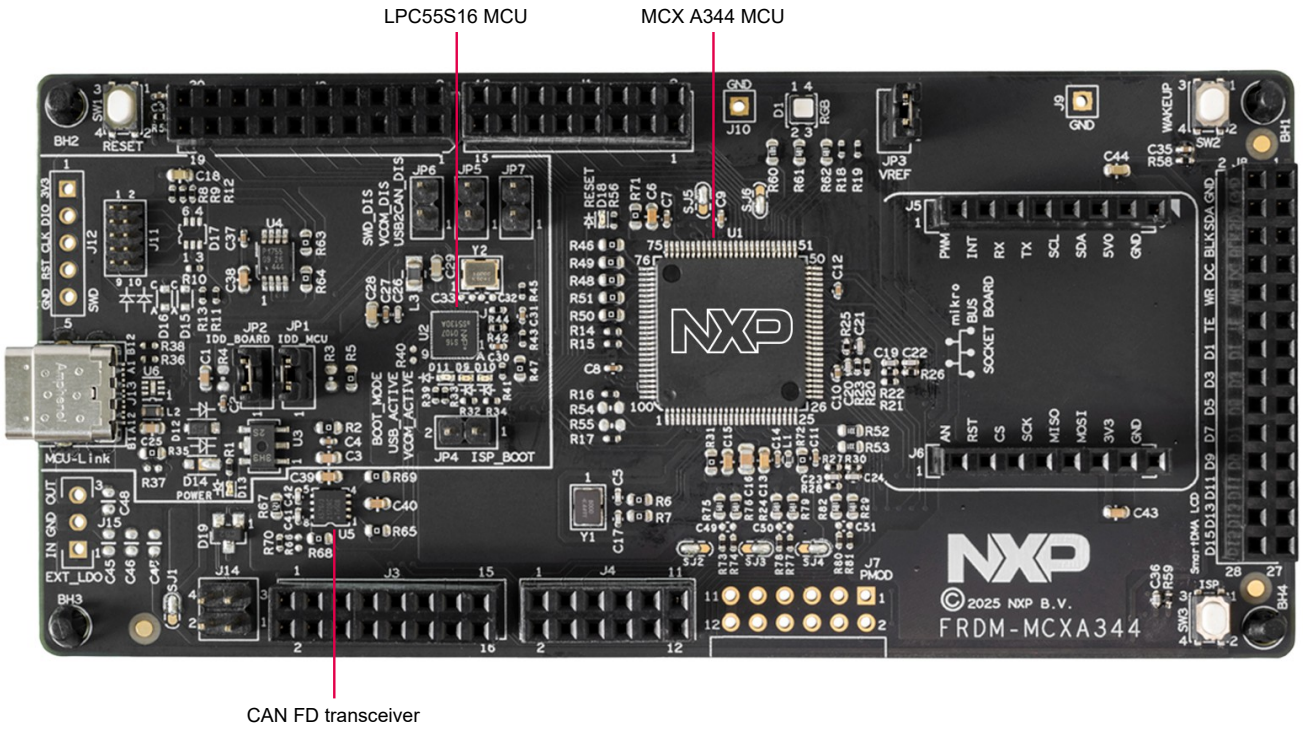

Figure 2. Board top-side view

Figure 3 shows the bottom-side view of the FRDM-MCXA344 board.

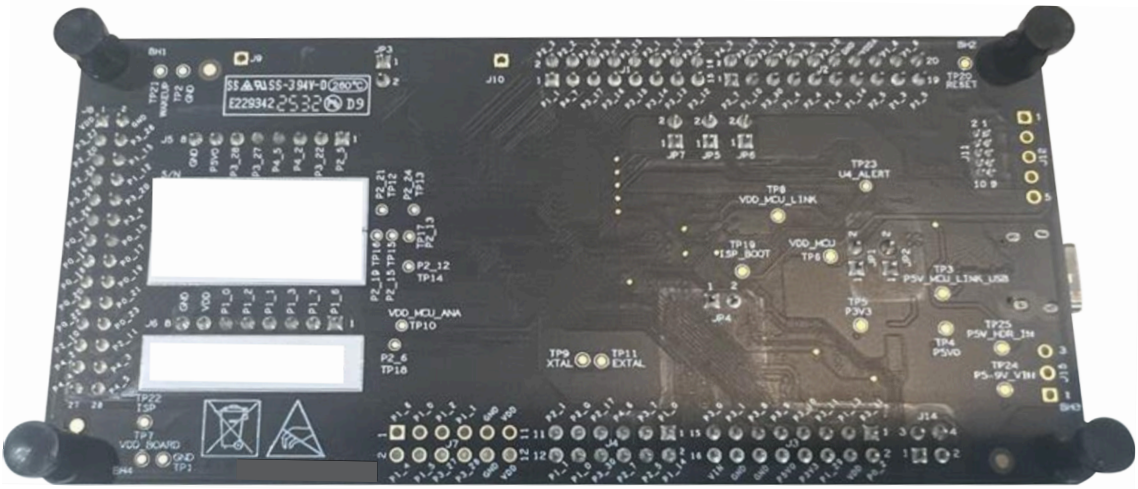

Figure 3. Board bottom-side view

1.5 Connectors

Figure 4 shows the FRDM-MCXA344 board connectors.

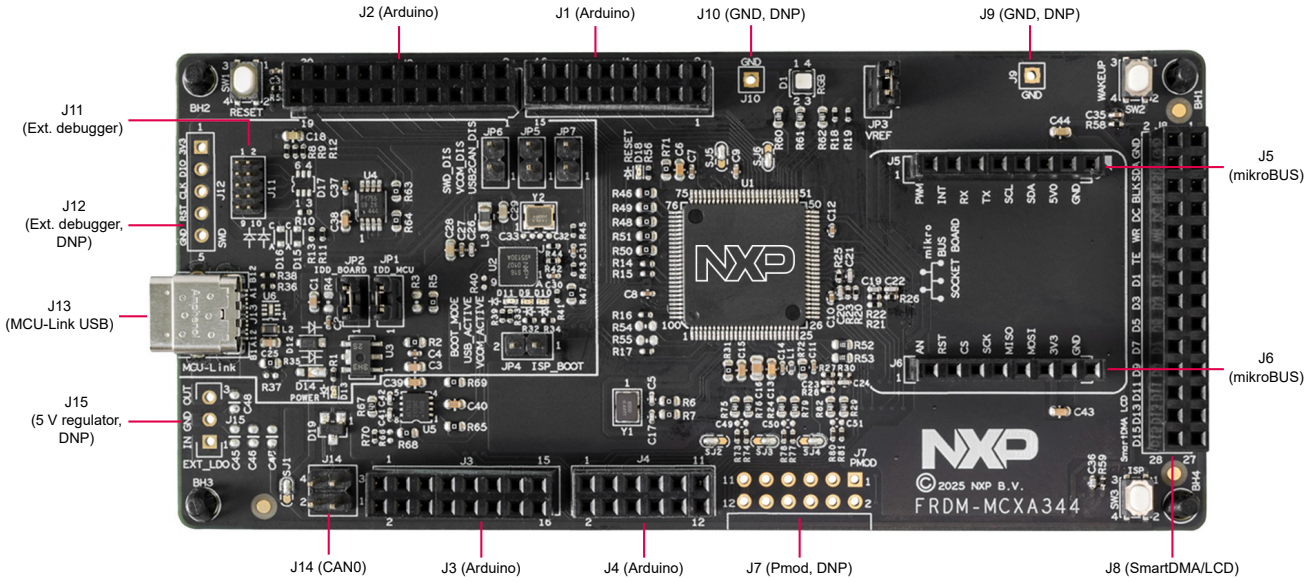

Figure 4. Connectors

Table 3 describes the connectors available on the FRDM-MCXA344 board.

Table 3. FRDM-MCXA344 connectors

Part identifier	Connector type	Description	Reference section
J1	2x8-position receptacle	Arduino socket connectors	Section 2.10
J2	2x10-position receptacle		
J3	2x8-position receptacle		
J4	2x6-position receptacle		
J5	1x8-position receptacle	mikroBUS socket connectors	Section 2.11
J6	1x8-position receptacle		
J7 (DNP)	2x6-position receptacle	Pmod connector	Section 2.12
J8	2x14-position receptacle	SmartDMA/LCD connector	Section 2.7
J9 (DNP)	1-pin/position connector	GND test point	For more information on these connectors, refer to FRDM-MCXA344 board schematics.
J10 (DNP)	1-pin/position connector	GND test point	
J11	2x5-pin header	10-pin, 1.27 mm target MCU (MCX A344) external debugger connector	Section 3.2
J12 (DNP)	1x5-pin header	5-pin, 2.54 mm target MCU (MCX A344) external debugger connector	
J13	USB Type-C connector	MCU-Link USB connector	Section 3.6
J14	2x2-pin header	MCX A344 CAN0 header	Section 2.3
J15 (DNP)	1x3-pin/position connector	5 V DC voltage regulator connector	Section 2.1

1.6 Jumpers

Figure 5 shows the FRDM-MCXA344 board jumpers.

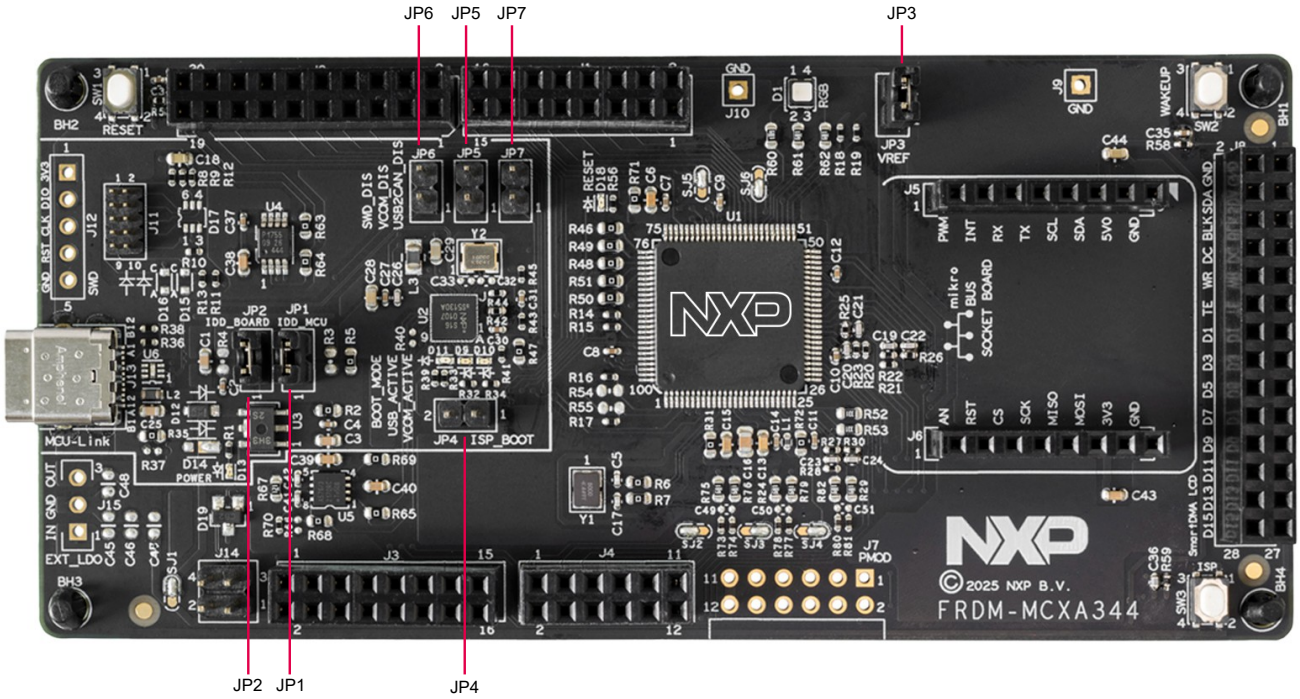

Figure 5. Jumpers

Table 4 describes the FRDM-MCXA344 board jumpers.

Table 4. FRDM-MCXA344 jumpers

Part identifier	PCB label	Jumper type	Description	Reference section
JP1	IDD_MCU	1x2-pin header	Target MCU (MCX A344) digital power (VDD_MCU) measurement jumper: • Open: The VDD_MCU supply is OFF initially. JP1 can be used to measure the current consumption of the MCX A344 digital IPs (see Section 2.1.1 for more details). • Shorted (default setting): JP1 produces the VDD_MCU supply.	Section 2.1
JP2	IDD_BOARD	1x2-pin header	Board power (VDD_BOARD) measurement jumper: • Open: The VDD_BOARD supply is OFF initially. JP2 can be used to measure the current for the VDD_BOARD supply (see Section 2.1.1 for more details). • Shorted (default setting): JP2 produces the VDD_BOARD supply.	
JP3	VREF	1x2-pin header	Target MCU (MCX A344) analog reference power (VREFH) measurement jumper: • Open: The VREFH power source for the target MCU is OFF initially. JP3 can be used to measure the current consumption of the MCX A344 analog reference power (VREFH) (see Section 2.1.1 for more details). • Shorted (default setting): JP3 sources the MCX A344 analog reference power (VREFH) from VDD_MCU_ANA.	

Table 4. FRDM-MCXA344 jumpers*...continued*

Part identifier	PCB label	Jumper type	Description	Reference section
JP4	ISP_BOOT	1x2-pin header	MCU-Link (LPC55S16) ISP mode enable jumper: • Open (default setting): MCU-Link follows the normal boot sequence (MCU-Link boots from its internal flash if a boot image is found). With the internal flash erased, the MCU-Link normal boot sequence falls through to In-System Programming (ISP) boot mode. • Shorted: MCU-Link is forced to ISP mode (USB1). Use this jumper setting to reprogram the MCU-Link internal flash with a new image by using the MCUXpresso IDE with the CMSIS-DAP protocol. ***Note:*** *By default, the MCU-Link internal flash is preprogrammed with a version of the CMSIS-DAP firmware.*	Section 3.4
JP5	VCOM_DIS	1x2-pin header	MCU-Link VCOM port disable jumper: • Open (default setting): The MCU-Link Virtual Communication (VCOM) port (USB-to-UART bridge) is enabled. • Shorted: The MCU-Link VCOM port (USB-to-UART bridge) is disabled.	Section 3.7
JP6	SWD_DIS	1x2-pin header	MCU-Link SWD disable jumper: • Open (default setting): The MCU-Link Serial Wire Debug (SWD) feature is enabled. MCU-Link can be used to drive the SWD of the target MCU. • Shorted: The MCU-Link SWD feature is disabled. Use this jumper setting when debugging the target MCU with an external debugger that is connected through the connector J11 or J12 (DNP).	Section 3.2
JP7	USB2CAN_DIS	1x2-pin header	MCU-Link USB2CAN port disable jumper: • Open (default setting): The MCU-Link USB-to-CAN bridge[1] is enabled. • Shorted: The MCU-Link USB-to-CAN bridge is disabled.	

[1] The USB-to-CAN feature is not currently supported by MCU-Link. It is planned for the future.

1.7 Push buttons

Figure 6 shows the FRDM-MCXA344 board push buttons.

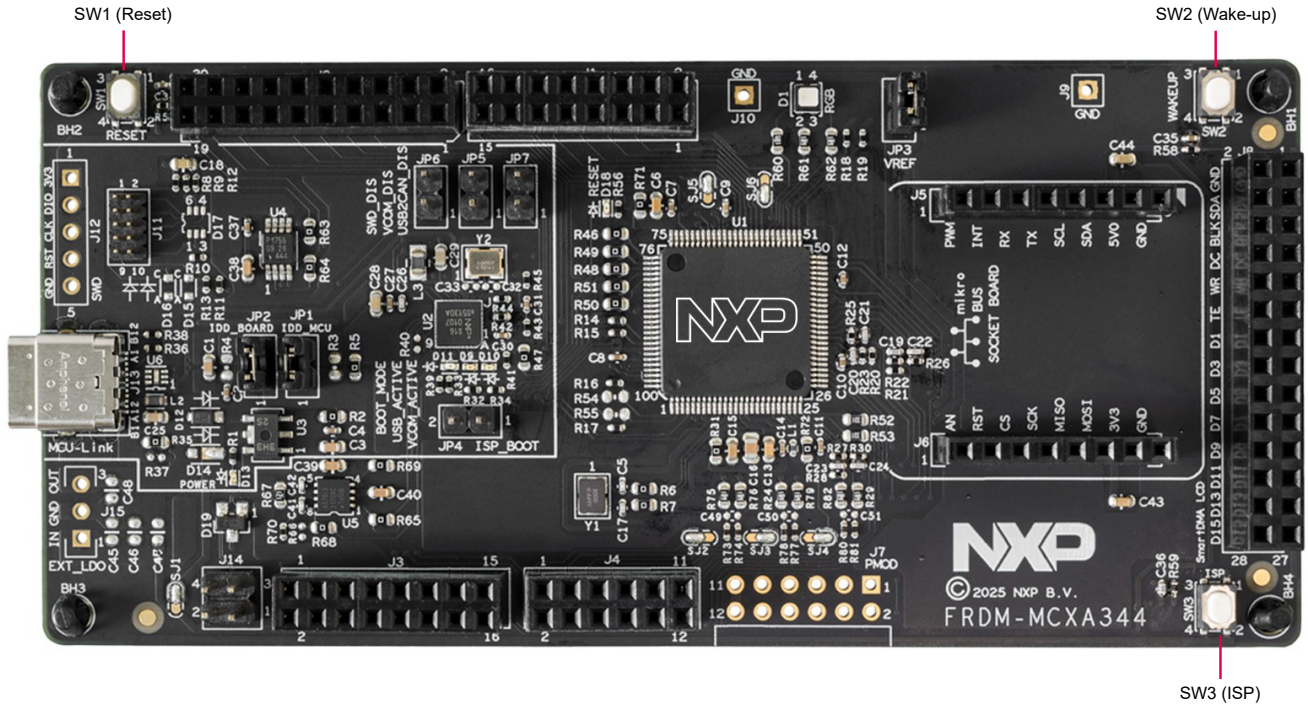

Figure 6. Push buttons

Table 5 describes the FRDM-MCXA344 board push buttons.

Table 5. FRDM-MCXA344 push buttons

Part identifier	PCB label	Name/function	Description
SW1	RESET	Reset button	Pressing SW1 asserts the MCX A344 MCU pin P1_29 (RESET_B), which wakes up the MCU from any low-power mode. When you press SW1, the reset LED D18 turns ON.
SW2	WAKEUP	Wake-up button	Pressing SW2 asserts the MCX A344 MCU pin P1_7 (WUU0_IN9). You can configure this pin through software to wake up the MCU from a low-power mode.
SW3	ISP	ISP button	Pressing SW3 asserts the MCX A344 MCU pin P0_6 (ISPMODE_N), which forces the MCU extended bootloader to run in In-System Programming (ISP) mode. To boot the MCU in ISP mode, hold down SW3 while pressing SW1 (reset button) or while supplying power to the board. For more details on the MCX A344 ISP mode, refer to *MCX A343 and MCX A344 Reference Manual*.

1.8 LEDs

The FRDM-MCXA344 board provides Light-Emitting Diodes (LEDs) for monitoring system status. The information collected from the LEDs can be used for debugging purposes.

Figure 7 shows the FRDM-MCXA344 board LEDs.

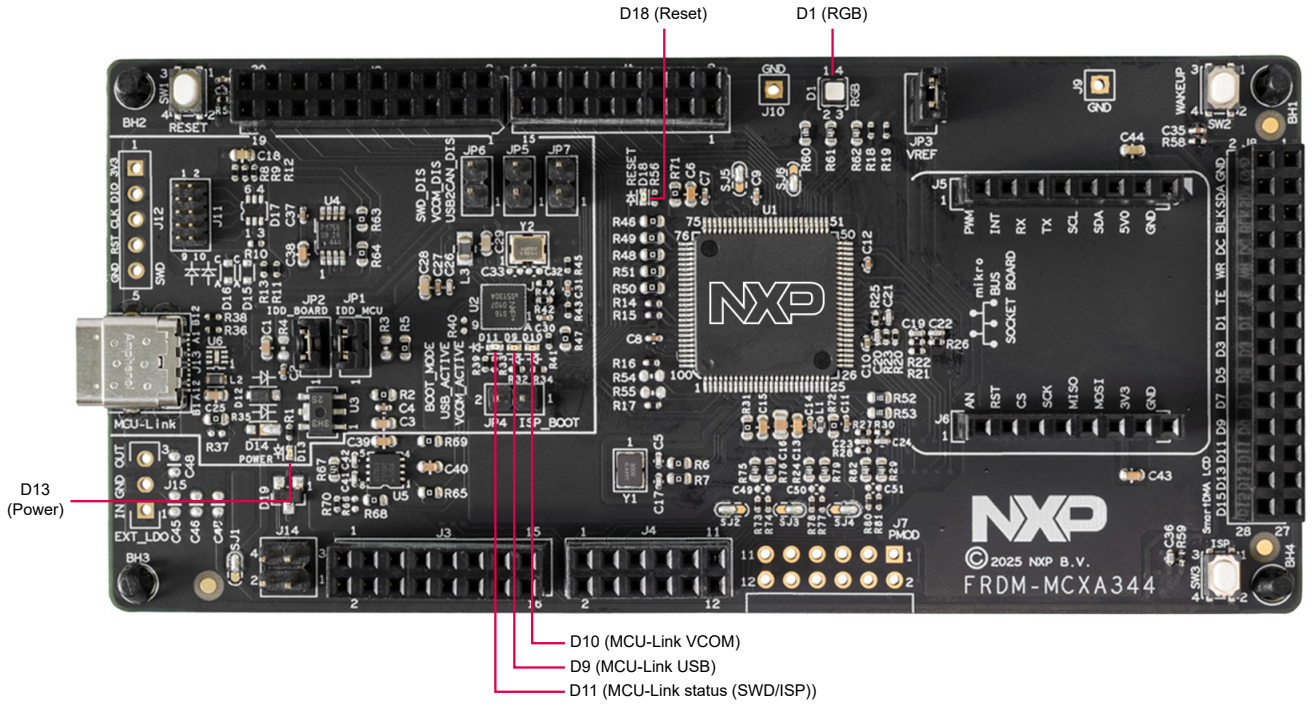

Figure 7. LEDs

Table 6 describes the FRDM-MCXA344 board LEDs except for MCU-Link-specific LEDs, which are described in Section 3.9.

Table 6. FRDM-MCXA344 LEDs

Part identifier	PCB label	LED color	Description (when LED is on)
D13	POWER	Green	Indicates that the LDO 3.3 V (P3V3) supply is available.
D18	RESET	Red	Indicates system reset activity. When board reset is initiated, for example, by pressing the reset button (SW1), D18 turns ON.
D1	RGB	Red / green / blue	This LED can be used for user-defined indications in application software. Each color channel (red, green, and blue) of the RGB LED is connected to a specific GPIO pin of the MCX A344 MCU as follows: • Red LED: P3_18 • Green LED: P3_19 • Blue LED: P3_21 Driving a low level on any of these pins turns on the corresponding LED color, as the LEDs are typically connected in an active-low configuration.

Note: *MCU-Link-specific LEDs D9, D10, and D11 are described in Section 3.9.*

2 Functional description

This section contains the following subsections:

2.1 Power supplies

The FRDM-MCXA344 board is powered with a 5 V power supply (P5V0) using one of the following source options:

- P5V_MCU_LINK_USB supply from MCU-Link USB Type-C connector J13
- P5V_HDR_IN supply from 5 V regulator populated at 3-pin connector J15 (not populated by default)
- P5V0 supply from Arduino shield compatible header J3 (pin 10), CAN0 connector J14 (pin 3), mikroBUS socket connector J5 (pin 7), and power test point TP4

The primary power supply is used to produce secondary power supplies for powering other board components. These components include the MCX A344 MCU, the LPC55S16 MCU, CAN FD transceiver, CAN connector, Arduino socket, mikroBUS socket, Pmod connector, SmartDMA/LCD connector, and external debugger connector.

Table 7 describes the FRDM-MCXA344 board power supplies.

Table 7. FRDM-MCXA344 power supplies

Power source	Manufacture and part number	Power supply	Description
External supply through the USB Type-C connector J13		P5V_MCU_ LINK_USB (5 V)	• One of the three power source options for the system 5 V power supply (P5V0) • Provides the USB1_VBUS power to the LPC55S16 MCU (MCU-Link) • Test point TP3 is provided for P5V_MCU_ LINK_USB power supply measurement.
Arduino socket connector J3 (pin 16) or CAN0 connector J14 (pin 3) ***Note:*** *Getting the P5-9V_VIN supply at pin 3 of CAN0 connector J14 requires changing*		P5-9V_VIN (5–9 V)	• Supplies power to 5 V DC voltage regulator connector J15 (not populated) • Acts as an alternative power supply for the CAN0 connector J14 (pin 3)

Table 7. FRDM-MCXA344 power supplies*...continued*

Power source	Manufacture and part number	Power supply	Description
the SJ1 setting from 1-2 shorted to 2-3 shorted.			
5 V DC voltage regulator attached to the connector J15 (DNP)		P5V_HDR_IN (5 V)	A second power source option (disabled by default) for the system 5 V power supply (P5V0) ***Note:*** *An external 5 V power at pin 3 of the CAN0 connector J14 is the third power source option for the system 5 V power supply (P5V0). Getting 5 V input power through J14 requires SJ1 set to 1-2 shorted (default setting).*
From the P5V_MCU_LINK_USB / P5V_HDR_IN supply or external supply through the CAN0 connector J14 (pin 3) ***Note:*** *By default, the option to produce the P5V0 supply from the P5V_HDR_IN supply is disabled.* ***Note:*** *Getting the P5V0 supply at pin 3 of CAN0 connector J14 requires SJ1 set to 1-2 shorted (default setting).*		P5V0 (5 V)	• Provides the VCC power to the CAN FD transceiver U5 • Acts as the default power supply for the CAN0 connector J14 (pin 3) • Supplies power to the LDO voltage regulator U3, the Arduino socket connector J3 (pin 10), and the mikroBUS socket connector J5 (pin 7) • Test point TP4 is provided for P5V0 power supply measurement.
LDO voltage regulator U3	Torex Semiconductor XC6227C331 PR-G	P3V3 (3.3 V)	• Produces the VDD_MCU (3.3 V) supply through either the jumper JP1 or the 0 Ω resistor R3 (not populated) • Produces the VDD_BOARD (3.3 V) supply through either the jumper JP2 or the 0 Ω resistor R4 (not populated) • Produces the VDD_MCU_LINK (3.3 V) supply through the 0 Ω resistor R5 • Supplies power to the Arduino socket connector J3 (pin 8) and the power LED D13 • Test point TP5 is provided for P3V3 power supply measurement.
From the P3V3 supply through the jumper JP1 or the resistor R3 (DNP)		VDD_MCU (3.3 V)	• Produces the VDD_MCU_ANA supply through the 0 Ω resistor R72 • Provides the VDD power to the MCX A344 MCU through the 0 Ω resistor R71 • Supplies power to the SWD connector J12 (DNP) • Test point TP6 is provided for VDD_MCU power supply measurement.
From the VDD_MCU supply through the resistor R72		VDD_MCU_ANA (3.3 V)	• Provides the VDD_ANA power to the MCX A344 MCU • Provides the VREFH power to the MCX A344 MCU through the jumper JP3. Alternatively, you can open JP3 and connect to its pin 2 an external VREF source for the MCX A344 MCU. • Supplies power to the Arduino socket connector J2 (pin 16)
From the P3V3 supply through the jumper JP2 or the resistor R4 (DNP)		VDD_BOARD (3.3 V)	• Provides the VIO power to CAN FD transceiver U5 • Supplies power to: – Arduino socket connector J3 (pin 4)

Table 7. FRDM-MCXA344 power supplies*...continued*

Power source	Manufacture and part number	Power supply	Description
			– mikroBUS socket connector J6 – Pmod connector J7 (not populated) – SmartDMA/LCD connector J8 – External debugger connector J11 – Push buttons SW1, SW2, and SW3 – Reset LED D18 and RGB LED D1 – Temperature sensor U4 • Test point TP7 is provided for VDD_BOARD power supply measurement.
From the P3V3 supply through the resistor R5		VDD_MCU_LINK (3.3 V)	• Provides the VDD, VDDA, and USB1_3V3 powers to the LPC55S16 MCU (MCU-Link) • Supplies power to MCU-Link LEDs D9, D10, and D11 • Test point TP8 is provided for VDD_MCU_LINK power supply measurement.

2.1.1 Current measurement

The FRDM-MCXA344 board supports current measurement using an ampere meter (ammeter) on the power supplies shown in Table 8.

Note: *By default, the VDD_MCU supply is connected to the debugger MCU (LPC55S16) through the resistor R43. Due to some current leakage between R43 and the debugger MCU, the target MCU current is slightly higher than its expected value. To fix this issue, perform a board rework by connecting R43 to the VDD_MCU_LINK supply.*

Table 8. Power supplies with current measurement support

Source power supply	Power supply to be measured	Jumper (2-pin)	Resistor	Current measurement steps
P3V3	VDD_MCU: Target MCU total power (analog + digital)	JP1	R3 (DNP)	1. Open the jumper (JP1). 2. Connect an ammeter to the jumper pins 1 and 2.
	VDD_BOARD: Board power	JP2	R4 (DNP)	1. Open the jumper (JP2). 2. Connect an ammeter to the jumper pins 1 and 2.
VDD_MCU	Target MCU digital power		R71	1. Remove the resistor R71. 2. Connect an ammeter to the resistor R71 pins 1 and 2.
	VDD_MCU_ANA: Target MCU analog power		R72	1. Remove the resistor R72. 2. Connect an ammeter to the resistor R72 pins 1 and 2.
VDD_MCU_ANA	Target MCU analog reference power	JP3		1. Open the jumper (JP3). 2. Connect an ammeter to the jumper pins 1 and 2.

2.2 Clocks

Table 9 provides details about inputs clocks on the FRDM-MCXA344 board.

Table 9. FRDM-MCXA344 clocks

Clock generator	Manufacturer and part number	Clock	Frequency	Destination
Crystal Y1	Würth Elektronik 830055663	XTAL48M, EXTAL48M	8 MHz	MCX A344 MCU
Crystal Y2	Würth Elektronik 830064296	XTAL32M_[P, N]	16 MHz	LPC55S16 MCU

On the FRDM-MCXA344 board, you can generate a clock output (CLKOUT) using the MCX A344 MCU pin P3_6 or P4_2. With MCU pin P3_6 configured for a clock output, you can get the clock output at pin 12 of the SmartDMA/LCD connector J8. With MCU pin P4_2 configured for a clock output, you can get the clock output at pin 25 of the SmartDMA/LCD connector J8 or at pin 3 of the mikroBUS connector J5.

2.3 FlexCAN interface

The MCX A344 MCU has one Flexible Data Rate Controller Area Network (FlexCAN) module: CAN0. The FRDM-MCXA344 board supports communication with the CAN0 module.

Figure 8 shows the FRDM-MCXA344 FlexCAN diagram.

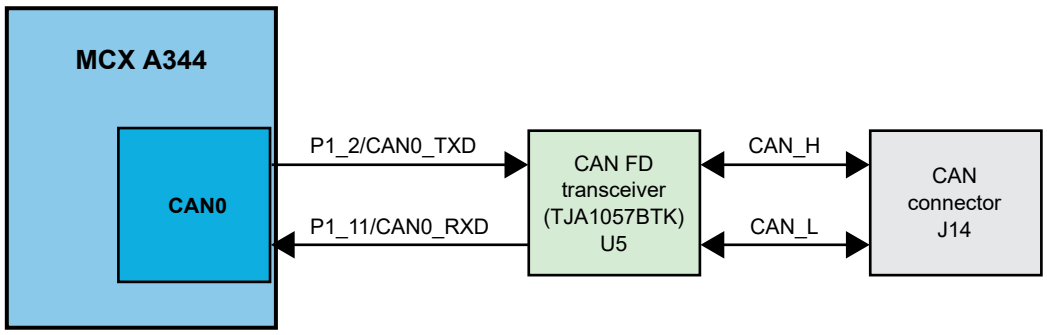

Figure 8. FlexCAN diagram

Table 10 describes the FRDM-MCXA344 FlexCAN connections.

Table 10. FlexCAN connections

FlexCAN module	Peripheral devices		
	Part identifier	Manufacturer and part number	Description
CAN0	U5	NXP TJA1057BTK	A high-speed CAN Flexible Data rate (FD) transceiver, which drives CAN signals between the CAN0 module of the MCX A344 MCU and a physical two-wire CAN bus. It performs the following functions: • Receives digital data from the MCU, converts it into analog data, and sends it to CAN bus lines. • Receives analog data from the CAN bus lines, converts it into digital data, and sends it to the MCU.
	J14		A 2x2-pin header that allows external CAN connection with the CAN bus. It has the following pinout: • Pin 1: High-level CAN bus line connection • Pin 2: Low-level CAN bus line connection • Pin 3: Power connection (P5V0 (default) / P5-9V_VIN (alternative)) • Pin 4: Ground

Note: *To use the CAN0 connection with the MCXA344 MCU on the FRDM-MCXA344 board, you must disable the USB-to-CAN feature of MCU-Link by shorting jumper JP7.*

2.4 LPUART interface

The MCX A344 MCU has four Low-Power Universal Asynchronous Receiver/Transmitter (LPUART) modules: LPUART0, LPUART1, LPUART2, and LPUART3. The FRDM-MCXA344 board only supports communication with the LPUART2 and LPUART3 modules.

Figure 9 shows the FRDM-MCXA344 LPUART diagram.

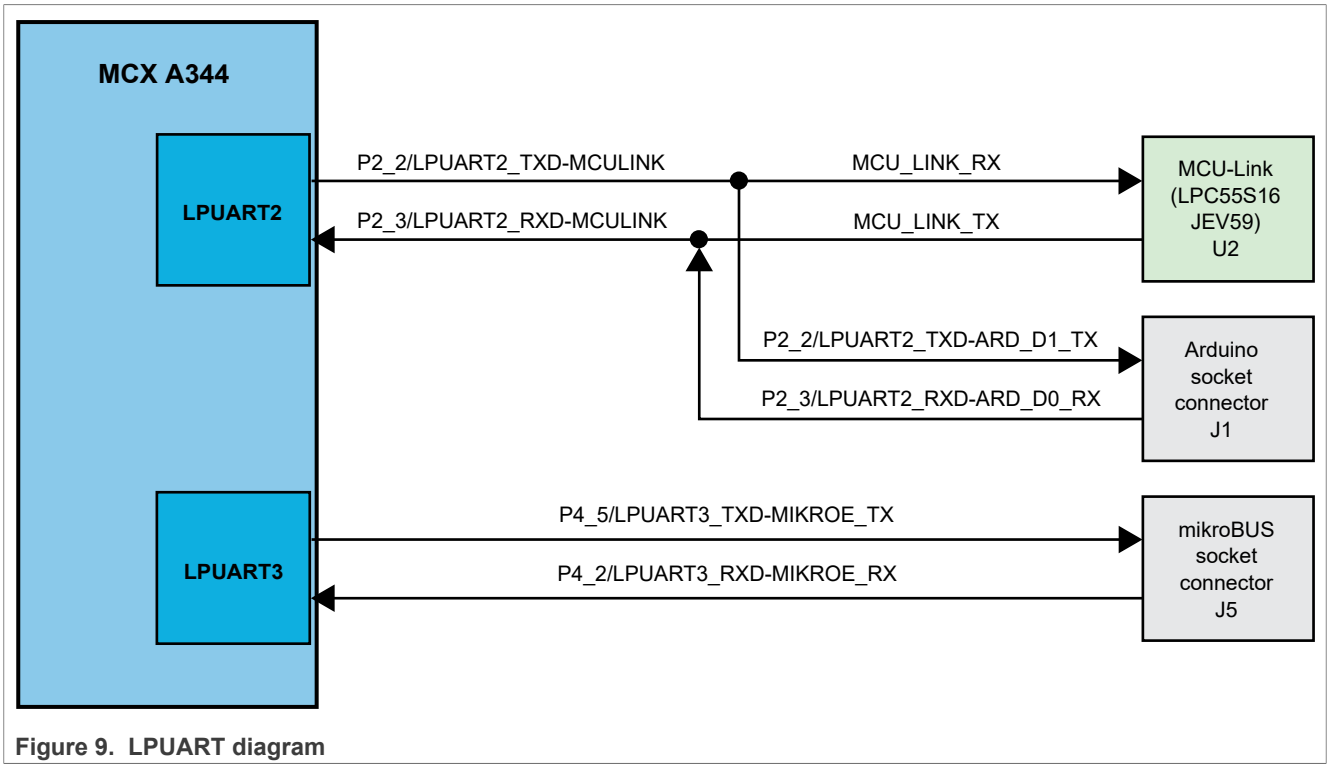

Figure 9. LPUART diagram

Table 11 describes the FRDM-MCXA344 LPUART connections.

Table 11. LPUART connections

LPUART modules	Peripheral devices		
	Part identifier	Manufacturer and part number	Description
LPUART2	U2	NXP LPC55S16JEV59	MCU-Link, which is a 32-bit MCU based on the Arm Cortex-M33 core running at speeds of up to 150 MHz. MCU-Link can be used as a USB-to-UART bridge to debug the target MCU (MCX A344) through a Virtual Communication (VCOM) port.
	J1		A 2x8-position Arduino socket connector that allows the plugged-in Arduino board to communicate with the MCX A344 MCU through a UART connection.
LPUART3	J5		A 1x8-position mikroBUS socket connector that allows the plugged-in mikroBUS click board to communicate with the MCX A344 MCU through a UART connection

2.5 LPSPI interface

The MCX A344 MCU has two Low-Power Serial Peripheral Interface (LPSPI) modules: LPSPI0 and LPSPI1.

Each LPSPI module supports two modes:

- Controller mode, with support for up to four Peripheral Chip Selects (PCSes)
- Peripheral mode

The FRDM-MCXA344 board supports communication with both LPSPI modules of the MCX A344 MCU. Figure 10 shows the FRDM-MCXA344 LPSPI diagram.

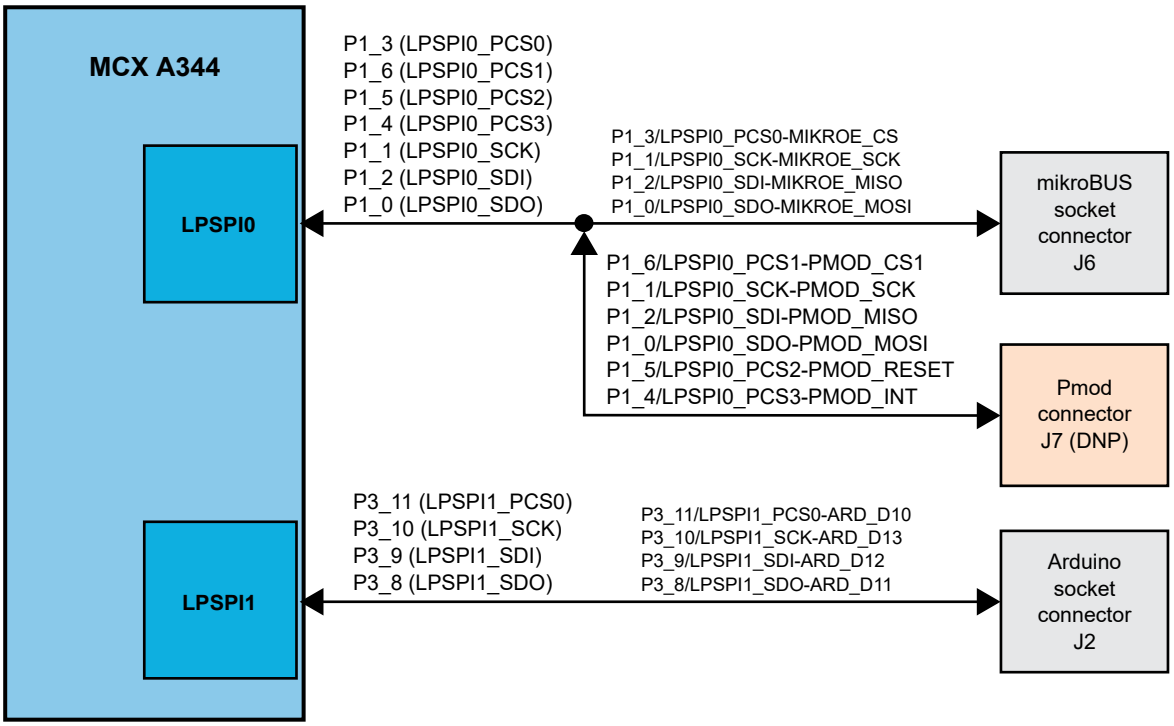

Figure 10. LPSPI diagram

Table 12 describes the FRDM-MCXA344 LPSPI connections.

Table 12. LPSPI connections

LPSPI module	Peripheral chip select	Peripheral devices	
		Part identifier	Description
LPSPI0	PCS0	J6	A 1x8-position mikroBUS socket connector that allows the plugged-in mikroBUS click board to communicate with the MCX A344 MCU through an SPI connection
	PCS1	J7 (DNP)	A 2x6-pin/position Pmod connector that allows the plugged-in Pmod board to communicate with the MCX A344 MCU through an SPI connection. J7 also supports LPSPI0 working in Quad SPI mode. By default, J7 is not populated on the board.
LPSPI1	PCS1	J2	A 2x10-position Arduino socket connector that allows the plugged-in Arduino board to communicate with the MCX A344 MCU through an SPI connection.

2.6 LPI2C interface

The MCX A344 MCU has two Low-Power Inter-Integrated Circuit (LPI2C) modules: LPI2C0 and LPI2C1. Each LPI2C module supports serial I^2C communication through a pair of control and data signals and can act as a controller or target.

The FRDM-MCXA344 board supports communication with both the LPI2C modules. Figure 11 shows the FRDM-MCXA344 LPI2C diagram.

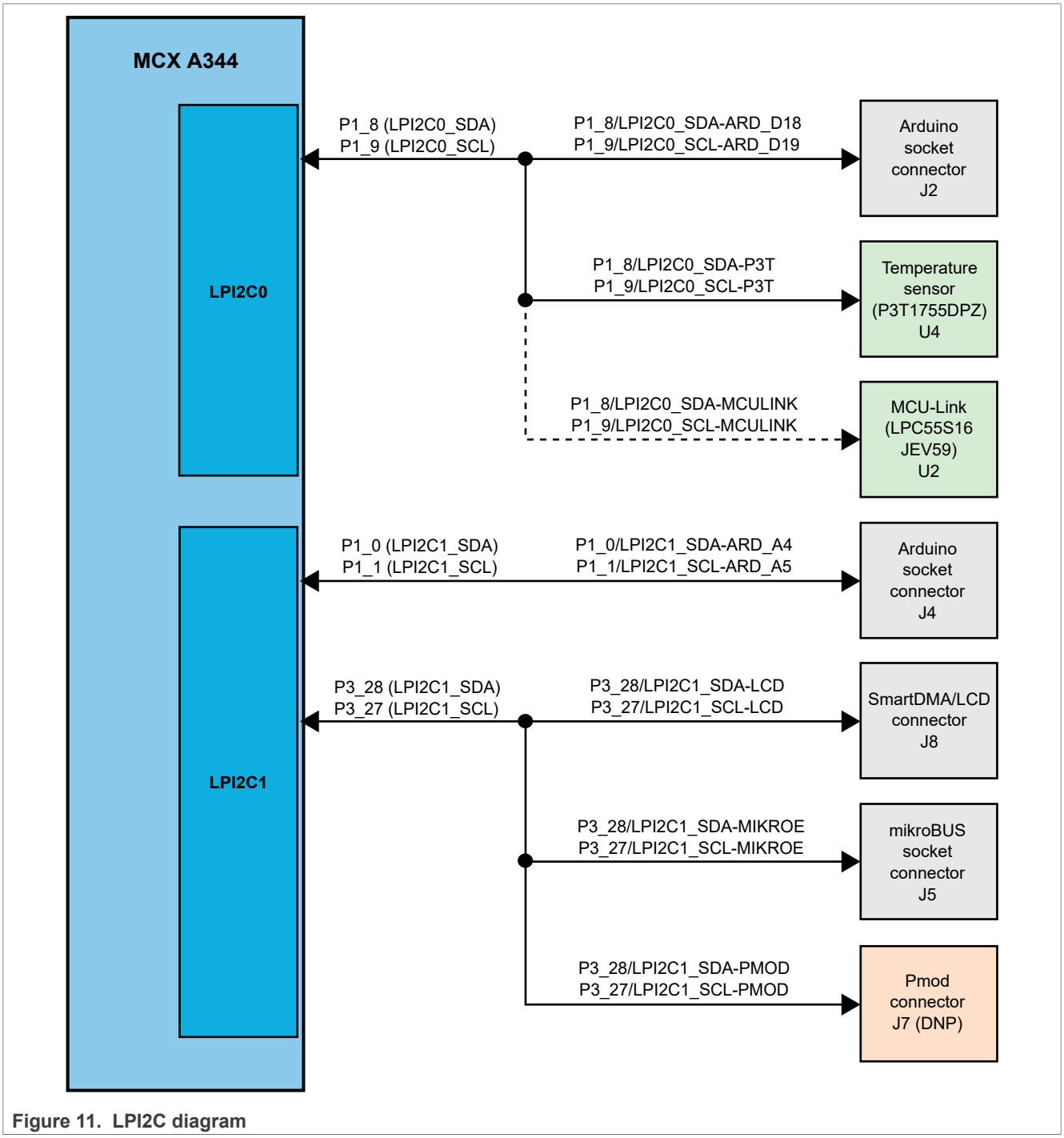

Figure 11. LPI2C diagram

Table 13 describes the FRDM-MCXA344 LPI2C devices.

Note: *The I^2C address of a connector depends on the plugged-in board/module.*

Table 13. LPI2C devices

LPSPI module	Peripheral devices		
	Part identifier	Manufacturer and part number	Description
LPI2C0	J2		A 2x10-position Arduino socket connector that allows the plugged-in Arduino board to communicate with the MCX A344 MCU through an I^2C connection
	U4	NXP P3T1755DP	A digital temperature sensor with support for over-temperature detection. It can measure temperature in the range from -40 ℃ to +125 ℃ with ±0.5 ℃ accuracy. It has an on-chip band gap temperature sensor and uses the analog-to-digital conversion technique. It has a temperature register to store the digital temperature reading that can be read by a controller via the 2-wire serial I3C (up to 12.5 MHz) or I^2C (up to 3.4 MHz) interface. On the FRDM-MCXA344 board, the 7-bit I^2C address of U4 is 0x48. For more information on P3T1755DP, visit nxp.com.
	U2	NXP LPC55S16JEV59	MCU-Link, which is a 32-bit MCU based on the Arm Cortex-M33 core running at speeds of up to 150 MHz. MCU-Link can be used as a USB-to-I^2C bridge to debug the target MCU (MCX A344) through a USB port. In this way, MCU-Link acts as an I^2C controller.
LPI2C1	J4		A 2x6-position Arduino socket connector that allows the plugged-in Arduino board to communicate with the MCX A344 MCU through an I^2C connection.
	J8		A 2x14-position SmartDMA/LCD connector that allows the plugged-in LCD module to communicate with the MCX A344 MCU through an I^2C connection. Pins 3 and 4 of J8 are connected to the SCL and SDA signals, respectively, of LPI2C1.
	J5		A 1x8-position mikroBUS socket connector that allows the plugged-in mikroBUS click board to communicate with the MCX A344 MCU through an I^2C connection
	J7 (DNP)		A 2x6-pin/position Pmod connector that allows the plugged-in Pmod board to communicate with the MCX A344 MCU through an I^2C connection. By default, J7 is not populated on the board.

2.7 SmartDMA/LCD interface

The MCX A344 MCU has one Smart DMA Controller (SmartDMA) core that supports unique, reduced instruction sets. It operates in a way similar to an Arm core. It provides emulation of various serial or parallel communication protocols, such as:

- UART
- SPI
- I^2C
- LCD interface
- Camera interface

The FRDM-MCXA344 board supports communication with the SmartDMA module through connector J8.

Figure 12 shows the FRDM-MCXA344 SmartDMA/LCD diagram.

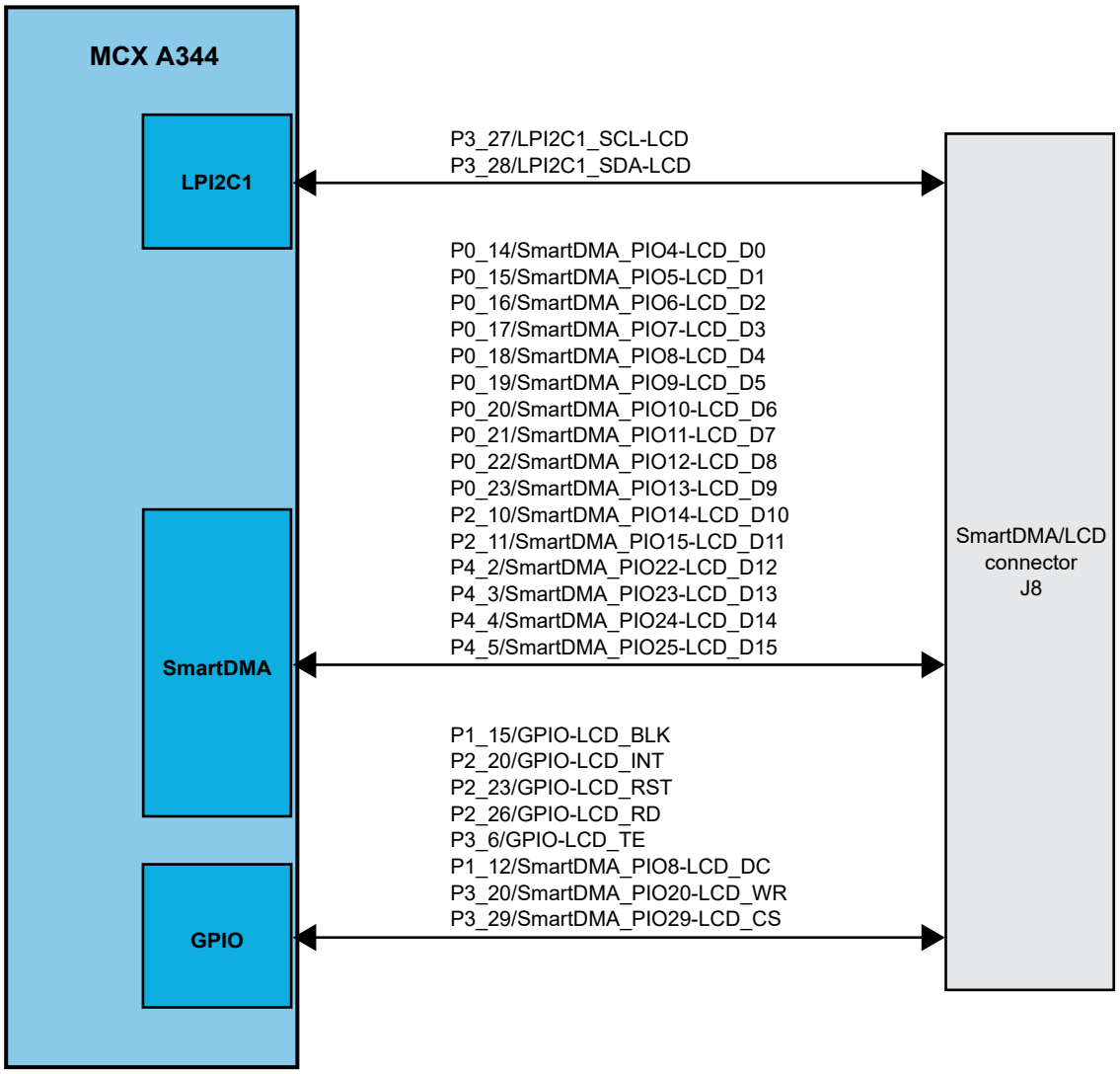

Figure 12. SmartDMA/LCD diagram

Table 14 shows the pinout of the SmartDMA/LCD connector J8.

Table 14. SmartDMA/LCD connector pinout

Pin number	Signal name	Description
1	VDD_BOARD	Power supply
2	GND	Ground
3	P3_27/LPI2C1_SCL-LCD	I^2C signals
4	P3_28/LPI2C1_SDA-LCD	
5	P2_20/GPIO-LCD_INT	LCD interrupt signal
6	P1_15/GPIO-LCD_BL	LCD backlight signal
7	P2_23/GPIO-LCD_RST	LCD reset signal

Table 14. SmartDMA/LCD connector pinout...*continued*

Pin number	Signal name	Description
8	P1_12/SmartDMA_PIO8-LCD_DC	LCD Data/Command (DC) signal
9	P3_29/SmartDMA_PIO29-LCD_CS	LCD Chip Select (CS) signal
10	P3_20/SmartDMA_PIO20-LCD_WR	LCD write data signal
11	P2_26/GPIO-LCD_RD	LCD read data signal
12	P3_6/GPIO-LCD_TE	LCD Tearing Effect (TE) signal
13	P0_14/SmartDMA_PIO4-LCD_D0	LCD data signals
14	P0_15/SmartDMA_PIO5-LCD_D1	
15	P0_16/SmartDMA_PIO6-LCD_D2	
16	P0_17/SmartDMA_PIO7-LCD_D3	
17	P0_18/SmartDMA_PIO8-LCD_D4	
18	P0_19/SmartDMA_PIO9-LCD_D5	
19	P0_20/SmartDMA_PIO10-LCD_D6	
20	P0_21/SmartDMA_PIO11-LCD_D7	
21	P0_22/SmartDMA_PIO12-LCD_D8	
22	P0_23/SmartDMA_PIO13-LCD_D9	
23	P2_10/SmartDMA_PIO14-LCD_D10	
24	P2_11/SmartDMA_PIO15-LCD_D11	
25	P4_2/SmartDMA_PIO22-LCD_D12	
26	P4_3/SmartDMA_PIO23-LCD_D13	
27	P4_4/SmartDMA_PIO24-LCD_D14	
28	P4_5/SmartDMA_PIO25-LCD_D15	

2.8 ADC interface

The MCX A344 MCU has two 16-bit Analog-to-Digital Converter (ADC) modules: ADC0 and ADC1. The FRDM-MCXA344 board supports communication with both ADC modules of the MCX A344 MCU.

Table 15 describes the FRDM-MCXA344 ADC connections.

Table 15. ADC connections

ADC modules	ADC input connections		Peripheral devices	
	MCX A344 I/O number	ADC function	Part identifier	Description
ADC0 and ADC1	P2_4	ADC0_A1	J2	A 2x10-position Arduino socket connector that allows the plugged-in Arduino board to communicate with the MCX A344 MCU through an ADC connection
	P2_7	ADC0_A7		
	P1_3	ADC0_A19		
	P1_4	ADC0_A20		
	P1_5	ADC0_A21		
	P1_6	ADC0_A22		
	P2_5	ADC1_A1		

Table 15. ADC connections...*continued*

ADC modules	ADC input connections		Peripheral devices	
	MCX A344 I/O number	ADC function	Part identifier	Description
	P1_10	ADC1_A8		
	P1_14	ADC1_A12		
	P3_30	ADC1_A21		
ADC0 and ADC1	P2_7	ADC0_A7	J4	A 2x6-position Arduino socket connector that allows the plugged-in Arduino board to communicate with the MCX A344 MCU through an ADC connection
	P1_0	ADC0_A16		
	P1_1	ADC0_A17		
	P2_5	ADC1_A1		
	P1_14	ADC1_A12		
	P3_30	ADC1_A21		
ADC0	P1_6	ADC0_A22	J6	A 1x8-position mikroBUS socket connector that allows the plugged-in mikroBUS click board to communicate with the MCX A344 MCU through an ADC connection

2.9 OPAMP interface

The MCX A344 MCU has three Operational Amplifier (OPAMP) modules (without PGA): OPAMP0, OPAMP1, and OPAMP2.

The FRDM-MCXA344 board supports communication with all the OPAMP modules of the MCX A344 MCU through the Arduino socket connector J4. Table 16 describes the FRDM-MCXA344 OPAMP connections.

Table 16. OPAMP connections

OPAMP module	MCU pin	OPAMP I/O function	Connection requirements	Note
OPAMP0	P2_12	OPAMP0_INP	This connection requires changing the SJ2 and SJ3 settings from 1-2 shorted to 2-3 shorted.	The I/O function can use test point TP14 on the bottom side of the PCB.
	P2_13	OPAMP0_INN		The I/O function can use test point TP17 on the bottom side of the PCB.
	P2_15	OPAMP0_OUT		The I/O function can use test point TP15 on the bottom side of the PCB.
OPAMP1	P2_16	OPAMP1_INP	This connection requires changing the SJ4 setting from 1-2 shorted to 2-3 shorted.	
	P2_17	OPAMP1_INN		
	P2_19	OPAMP1_OUT		The I/O function can use test point TP16 on the bottom side of the PCB.
OPAMP2	P2_0	OPAMP2_INP		
	P2_1	OPAMP2_INN		
	P2_6	OPAMP2_OUT		The I/O function can use test point TP18 on the bottom side of the PCB.

2.10 Arduino socket

The FRDM-MCXA344 board has an Arduino socket with the following four connectors:

- J1: 2x8-position receptacle
- J2: 2x10-position receptacle
- J3: 2x8-position receptacle
- J4: 2x6-position receptacle

The two 2x8-position receptacles are placed diagonally opposite to each other. Figure 13 shows the pinouts of the Arduino socket connectors.

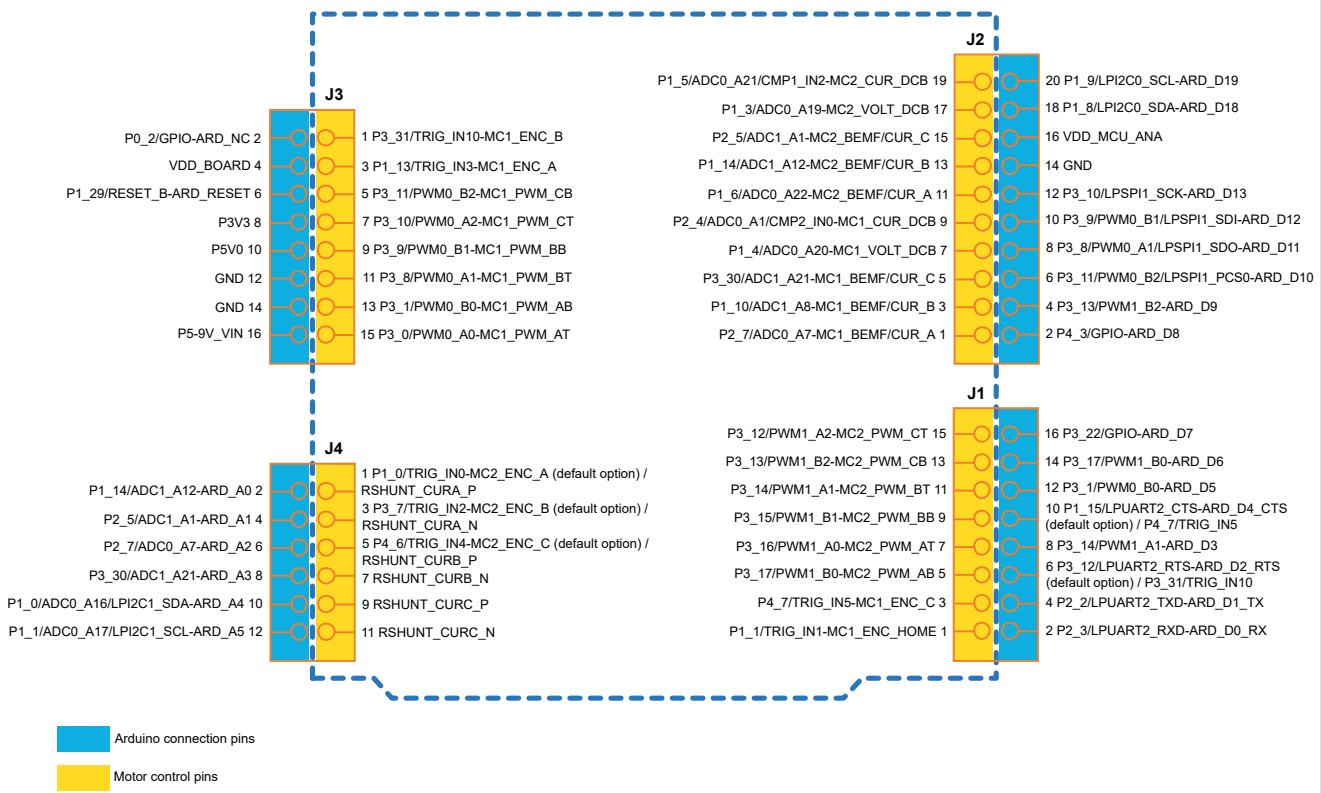

Figure 13. Arduino socket connector pinouts

The Arduino socket allows communication with the following modules of the MCX A344 MCU:

- Low-Power Universal Asynchronous Receiver/Transmitter 2 (LPUART2)
- Low-Power Serial Peripheral Interface 1 (LPSPI1)
- Low-Power Inter-Integrated Circuit 0 (LPI2C0)
- Low-Power Inter-Integrated Circuit 1 (LPI2C1)
- Analog-to-Digital Converter 0 (ADC0)
- Analog-to-Digital Converter 1 (ADC1)
- Flex Pulse Width Modulator 0 (FlexPWM0)
- Flex Pulse Width Modulator 1 (FlexPWM1)

The Arduino socket is pin-compatible with the following Arduino and motor control boards:

- Arduino Uno revision 3 (R3)
- Arduino A4/A5
- FRDM-MC-LVBLDC

- FRDM-MC-LVPMSM

2.11 mikroBUS socket

A mikroBUS socket is a pair of 1x8-position receptacles (connectors) with a proprietary pin configuration and silkscreen markings. The major benefit with a mikroBUS socket is that it provides many hardware expansion options with few pins.

The FRDM-MCXA344 board has a mikroBUS socket with connectors J5 and J6. Figure 14 shows the pinouts of the mikroBUS socket connectors.

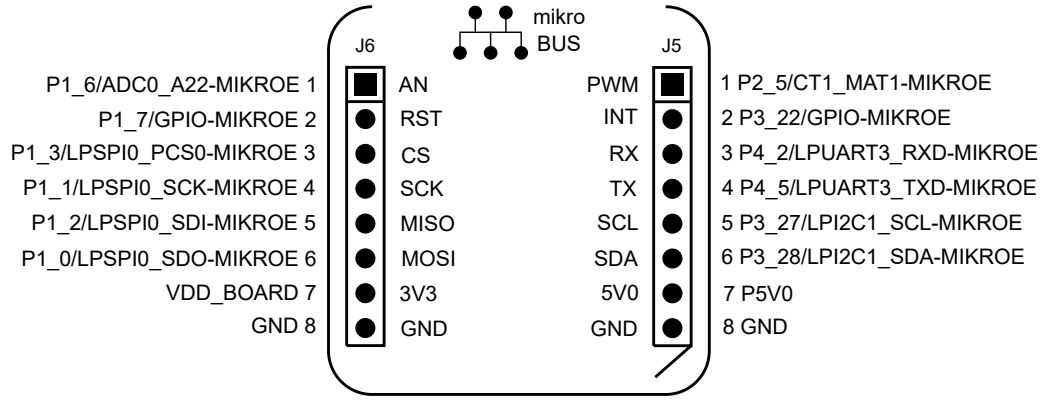

Figure 14. mikroBUS socket connector pinouts

The mikroBUS socket allows communication with the following modules of the MCX A344 MCU:

- Low-Power Universal Asynchronous Receiver/Transmitter 3 (LPUART3)
- Low-Power Serial Peripheral Interface 0 (LPSPI0)
- Low-Power Inter-Integrated Circuit 1 (LPI2C1)
- Analog-to-Digital Converter 0 (ADC0)
- Standard, general-purpose asynchronous Counter/Timer 1 (CTIMER1)

An add-on board, called click board, can be installed on a mikroBUS socket. A click board provides a plug-and-play solution for adding new functionality to a board design. A click board has a pair of 1x8-pin headers that connects to the pair of receptacles on a mikroBUS socket. MikroElektronika (MIKROE) is one of the manufacturers of click boards. To find an example click board for the FRDM-MCXA344 mikroBUS socket, visit MIKROE website.

2.12 Pmod connector

Peripheral module (Pmod) devices are small input/output interface boards that can be easily integrated with embedded control boards for expanding their capabilities.

The FRDM-MCXA344 board supports a Pmod connector J7 (Digilent PPPC062LJBN-RC) for expanding the capabilities of the board. J7 is not populated on the board by default. If populated, it can be used to work with a remote host, or as an interface to a Pmod expansion board.

Table 17 shows the pinout of the Pmod connector J7.

Table 17. Pmod connector pinout

Pin number	Signal name	Description
1	P1_6/LPSPI0_PCS1-PMOD_CS1	SPI signals
3	P1_0/LPSPI0_SDO-PMOD_MOSI	

Table 17. Pmod connector pinout*...continued*

Pin number	Signal name	Description
5	P1_2/LPSPI0_SDI-PMOD_MISO	
7	P1_1/LPSPI0_SCK-PMOD_SCK	
2	P1_4/LPSPI0_PCS3-PMOD_INT	GPIO signals
4	P1_5/LPSPI0_PCS2-PMOD_RESET	
6	P3_27/LPI2C1_SCL-PMOD_SCL	I^2C signals
8	P3_28/LPI2C1_SDA-PMOD_SDA	
11, 12	VDD_BOARD	Power supply
9, 10	GND	Ground

The Pmod connector allows communication with the following modules of the MCX A344 MCU:

- Low-Power Serial Peripheral Interface 0 (LPSPI0)
- Low-Power Inter-Integrated Circuit 1 (LPI2C1)

Note: *In quad SPI mode, the MCX A344 pins P1_0, P1_1, P1_2, P1_4, P1_5, and P1_6 can act as LPSPI0. For details, refer to the "Low Power Serial Peripheral Interface (LPSPI)" chapter of MCX A343 and MCX A344 Reference Manual.*

3 MCU-Link OB debug probe

MCU-Link is a debug probe architecture jointly developed by NXP and Embedded Artists. It can be configured to support different debug feature options.

The MCU-Link architecture is used in:

- Standalone debug probes, such as MCU-Link Pro
- Onboard debug probes implemented on NXP evaluation boards, such as FRDM-MCXA344. The onboard implementation of MCU-Link is referred to as MCU-Link OB.

In the FRDM-MCXA344 board, the MCU-Link architecture is based on the NXP LPC55S16 MCU, which is based on an Arm Cortex-M33 core. The board implements a subset of the MCU-Link architecture features, as mentioned in Section 3.1. For more details on the MCU-Link architecture, visit the MCU-Link Debug Probe Architecture page.

The MCU-Link OB on the FRDM-MCXA344 board is factory-programmed with the firmware based on the NXP CMSIS-DAP protocol. The firmware also supports all other features supported in the hardware. A custom version of the J-Link firmware is also available to make the MCU-Link OB compatible with J-Link LITE. However, this firmware version only supports limited features, including debug/SWO and VCOM. For information on how to update the firmware, see Section 3.4.

3.1 Supported MCU-Link features

MCU-Link includes several mandatory and optional features. Table 18 summarizes the MCU-Link features supported on the FRDM-MCXA344 board.

Table 18. Supported MCU-Link features

Feature	Description
Serial Wire Debug (SWD) / Serial Wire Output (SWO)	MCU-Link allows SWD-based debugging with SWO for profiling and/or low overhead debug standard I/O communication.
Virtual Communication (VCOM) serial port	MCU-Link adds a serial COM port on the host computer and connects it to the target MCU, while acting as a USB-to-UART bridge.
USB Serial Input/Output (USBSIO)[1] port	MCU-Link adds a USB serial I/O port on the host computer and connects it to the target MCU, while acting as a USB-to-I^2C or USB-to-CAN[2] bridge.
External debug probe support	The MCU-Link interface supports debugging the target MCU (MCX A344) using an external debug probe, instead of MCU-Link. To enable support for an external debug probe, disable the SWD feature by shorting the jumper JP6.

[1] J-Link firmware does not support this feature.
[2] The USB-to-CAN feature is not currently supported by MCU-Link. It is planned for the future.

3.2 Supported debug scenarios

Table 19 describes the debug scenarios supported on the FRDM-MCXA344 board.

Table 19. Supported debug scenarios

Debug scenario	MCU-Link feature enabled/disabled?	Note
Target MCU (MCX A344 MCU) debugging with MCU-Link	• SWD: Enabled if the jumper JP6 is open (default setting). • VCOM: Enabled if the jumper JP5 is open (default setting). • USB-to-CAN[1]: Enabled if the jumper JP7 is open (default setting).	Target MCU external debugger connector J11 or J12 (DNP) is not used for an external connection.

Table 19. Supported debug scenarios*...continued*

Debug scenario	MCU-Link feature enabled/disabled?	Note
Target MCU debugging with an external debugger	• SWD: Disabled • VCOM: Disabled • USB-to-CAN: Disabled	Target MCU external debugger connector J11 or J12 (DNP) is used to connect an external debugger.

[1] The USB-to-CAN feature is not currently supported by MCU-Link. It is planned for the future.

3.3 MCU-Link firmware update utility installation

The MCU-Link debug probe is supported on a host computer running a Windows 10/11, MacOS X, or Ubuntu Linux Operating System (OS). The debug probe works with standard OS drivers. For Windows, the MCU-Link firmware installation program also includes information files to provide user-friendly device names.

Support for MCU-Link can be enabled using the LinkServer utility, which is an NXP GDB server and flash utility that supports many NXP debug probes. For more details on this utility, visit the https://nxp.com/linkserver page.

Running the LinkServer installer also installs a firmware update utility and the drivers (information files) required for MCU-Link. NXP recommends you to use the LinkServer installer for installing the MCU-Link firmware update utility.

Note: *If the MCU-Link firmware version is 3.155 or later, an automatic firmware update can be done using LinkServer installer version 24.12.15 or later. For more details on automatic firmware update, refer to the Readme mark-down file in the LinkServer installation package. However, if the current firmware version is earlier than 3.155, you require to run the MCU-Link firmware update utility manually. The utility is included in the LinkServer installation package. To update the MCU-Link firmware using the firmware update utility, see Section 3.4.*

To work with MCU-Link, NXP recommends using the latest MCU-Link firmware. The steps to update the MCU-Link firmware manually is provided in Section 3.4. Before updating the MCU-Link firmware, check the versions of the MCUXpresso IDE and LIBUSBIO (if you are using these tools) installed on your host computer. Then, check the compatibility of these tools with the MCU-Link firmware by referring to Table 20. If you are using the MCUXpresso for Visual Studio Code extension or a third-party IDE from IAR or Keil, get the latest MCU-Link firmware version.

Table 20. Compatibility check between MCUXpresso IDE and MCU-Link firmware

MCUXpresso IDE version	Supported MCU-Link firmware version	USB driver type	CMSIS-SWO support	FreeMASTER support via	
				SWD / JTAG	USB bridge
MCUXpresso 11.3 or later	V1.xxx and V2.xxx	HID	No	Yes	Yes
MCUXpresso 11.7.0 or later	V3.xxx (up to and including V3.108)	WinUSB	No	Yes	FreeMASTER V3.2.2 or later
MCUXpresso 11.7.1 or later	V3.117 and later	WinUSB	Yes	Yes	FreeMASTER V3.2.2 or later
MCUXpresso 24.12.100 or later	V3.155 and later	WinUSB	YES	Yes	FreeMASTER V3.2.2 or later

3.4 Updating MCU-Link firmware using firmware update utility

To update the MCU-Link firmware using the firmware update utility included in the LinkServer installation package, the MCU-Link must be powered up in ISP mode. To configure MCU-Link in ISP mode and update MCU-Link firmware, follow these steps:

1. Disconnect the board from the host computer, short the jumper JP4, and reconnect the board. The red MCU-Link status LED D11 (color: red) lights up and stays on. For more details on MCU-Link LEDs, see Section 3.9.
2. Download the LinkServer installation package from https://nxp.com/linkserver and install the LinkServer utility. For example, download and install "Linkserver 24.12.15 installer for Windows".
3. Navigate to the MCU-LINK_installer_Vx_xxx directory, where Vx_xxx indicates the version number, for example, V3.155.
4. Follow the instructions in the `Readme.txt` file to find and run the firmware update utility for CMSIS-DAP or J- Link firmware version.
5. Disconnect the board from the host computer, open the jumper JP4, and reconnect the board. The board is enumerated on the host computer as a WinUSB or HID device depending on the firmware version (see Table 20 for details).

Note: *Starting version V3.xxx, the MCU-Link firmware uses WinUSB (instead of HID) for higher performance. However, it is not compatible with MCUXpresso IDE versions earlier than 11.7.0.*

Note: *To enable SWO-related features in non-NXP IDEs, CMSIS-SWO support was introduced in firmware version V3.117.*

3.5 Using MCU-Link with development tools

The MCU-Link debug probe can be used with IDEs supported within the MCUXpresso ecosystem, such as:

- MCUXpresso IDE
- MCUXpresso for Visual Studio Code
- IAR Embedded Workbench
- Arm Keil MDK

3.5.1 Using MCU-Link with MCUXpresso IDE

The MCUXpresso IDE recognizes any type of MCU-Link probe that uses either the CMSIS-DAP or J-Link firmware. When you start a new debug session, the IDE checks for all the available debug probes. For all the probes it finds, the IDE displays the probe types and unique identifiers in the **Probes discovered** dialog box.

If a debug probe requires a firmware update, the probe is displayed with a warning in the **Probes discovered** dialog box. For each such probe, the latest firmware version is indicated and a link to download the latest firmware package is provided. To update the firmware for the MCU-Link debug probe, see the instructions provided in Section 3.4.

You are advised to use the latest MCU-Link firmware to take the benefit of the latest MCU-Link functionality. However, the MCU-Link firmware version that you can use depends on the MCUXpresso IDE installed on your host computer. To check the compatibility of the MCU-Link firmware you want to use with your MCUXpresso IDE, see Table 20.

3.5.2 Using MCU-Link with MCUXpresso for Visual Studio Code

The MCU-Link debug probe can be used with the MCUXpresso for Visual Studio Code extension from NXP. This extension uses the LinkServer debug server. To work with MCUXpresso for Visual Studio Code, install the LinkServer utility using the MCUXpresso Installer tool or as described in Section 3.3. For more details on MCUXpresso for Visual Studio Code, visit the MCUXpresso for Visual Studio Code page.

3.5.3 Using MCU-Link with third-party IDEs

The MCU-Link debug probe can be used with third-party IDEs, such as IAR Embedded Workbench and Arm Keil MDK. For more details, refer to the third-party tool documentation that covers the use of generic CMSIS-DAP probes or J-Link probes (depending on the firmware image you are using).

3.6 MCU-Link USB connector

The FRDM-MCXA344 board has a USB Type-C connector J13, which allows you to connect MCU-Link with your host computer. It can also be used to supply 5 V power to the board.

3.7 VCOM port (USB to target UART bridge)

MCU-Link supports a feature, known as Virtual Communication (VCOM) serial port. This feature allows MCU-Link to add a serial COM port on the host computer and connect it to the target MCU. In this setup, MCU-Link acts as a USB-to-UART bridge.

In the FRDM-MCXA344 board, MCU-Link is connected to the LPUART2 module of the target MCU.

To use MCU-Link as a USB-to-UART bridge, follow these steps:

1. Ensure that the jumper JP4 is open (MCU-Link boots normally).
2. Ensure that the jumper JP5 is open (MCU-Link VCOM port is enabled).
3. Connect the MCU-Link USB connector J13 to the USB port of the host computer.

When you boot the FRDM-MCXA344 board, a VCOM port with the name MCU-Link Vcom Port (COMxx) is enumerated on the host computer, where “xx” may vary from one computer to another. Each MCU-Link-based board has a unique VCOM number associated with it.

To disable the VCOM function, short the jumper JP5 before powering up the board. Changing the JP5 setting (open/short) after powering up the board does enable/disable the MCU-Link VCOM feature.

3.8 USBSIO port (USB to target I^2C bridge)

MCU-Link supports a feature, known as USB Serial Input/Output (USBSIO) port. This feature allows MCU-Link to add a USB serial I/O port on the host computer and connect it to the target MCU. In this setup, MCU-Link acts as a USB-to-I^2C bridge.

Support for the USBSIO feature can be enabled on the host computer using the libusbsio library, which is a free host library from NXP for Windows/Linux/MacOS systems. For more details on the libusbsio library, see http://www.nxp.com/libusbsio.

The FRDM-MCXA344 board supports connecting MCU-Link to the LPI2C0 module of the target MCU. By default, this I^2C connection is disabled. It can be enabled by populating the 0 Ω resistors R54 and R55.

To use MCU-Link as a USB-to-I^2C bridge, the board must be connected to the host computer through a USB cable from its J13 connector. A USB-to-I^2C bridge can be used to emulate the host system / board peripherals.

By default, the USBSIO feature is disabled for I^2C on the FRDM-MCXA344 board, allowing the target MCU I^2C port to be used for other purposes. Disabling the USBSIO feature instructs the firmware not to enumerate the USB endpoint for USBSIO (which is called “MCU-Link LPCSIO” for backward compatibility reasons). Disabling the USBSIO feature also frees more USB bandwidth for the SWO profiling feature and energy measurement feature (not supported on this board) of MCU-Link.

3.9 MCU-Link status LEDs

The FRDM-MCXA344 board has three status indicator LEDs for MCU-Link. Table 21 lists these LEDs and describes how each LED behaves in different MCU-Link modes.

Table 21. MCU-Link LEDs

Part identifier	PCB label	LED color	LED function		
			Normal operation (with CMSIS-DAP)	Normal operation (with J-Link)	ISP (firmware update) mode
D9	USB_ ACTIVE	Green	Indicates USB communication. The LED lights up after successful USB enumeration at startup, and then stays ON.	The LED remains OFF.	The LED remains OFF.
D10	VCOM_ ACTIVE	Green	Indicates if the VCOM port is receiving/sending data. The LED lights up when MCU-Link boots, and then blinks when debug activity happens.	Indicates if the VCOM port is receiving/sending data. The LED lights up when MCU-Link boots, and then blinks when debug activity happens.	The LED remains OFF.
D11	BOOT_ MODE	Red	Indicates MCU-Link status / SWD activity. It acts as a heartbeat LED (fades in/ out repeatedly), with SWD activity overlaid. If an error occurs at startup, the D11 LED blinks rapidly.	The LED remains OFF.	The LED lights up when MCU-Link (LPC55S16) boots in ISP mode.

4 Board errata

This section describes the errata applicable to the FRDM-MCXA344 board.

4.1 Erratum: Resistor R43 affects MCX A344 power consumption measurement

Description

By default, the VDD_MCU supply is connected to the debugger MCU (LPC55S16) through the resistor R43. Due to some current leakage between R43 and the debugger MCU, the target MCU current is slightly higher than its expected value.

Workaround

Rework the FRDM-MCXA344 board by connecting R43 to the VDD_MCU_LINK supply.

5 Related documentation

Table 22 lists some additional documents and resources that you can refer to for more information on the FRDM-MCXA344 board. Some of these documents may only be available under a Non-Disclosure Agreement (NDA). To access such a document, contact a local NXP Field Applications Engineer (FAE) or sales representative.

Table 22. Related documentation

Document	Description	Link / how to obtain
MCX A343 and MCX A344 Reference Manual	Provides a detailed description about the MCX A343/344 MCU and its features, including memory maps, power supplies, and clocks.	Contact an NXP FAE / sales representative
MCXA343/344 Data Sheet	Describes the features, electrical characteristics, packaging information, and ordering details about the MCX A343/344 MCU.	
FRDM-MCXA344 board schematics	Provides a circuit representation showing the functionality and connectivity of the FRDM-MCXA344 board components.	
LPC55S1x/LPC551x User Manual (UM11295)	Provides a detailed description about the LPC55S1x/ LPC551x MCU and its features, including memory maps, power supplies, and clocks.	UM11295.pdf

6 Acronyms

Table 23 lists the acronyms used in this document.

Table 23. Acronyms

Acronym	Description
ADC	Analog-to-Digital Converter
BLDC	Brushless Direct Current
CAN	Controller Area Network
CMSIS	Cortex Microcontroller Software Interface Standard
CTIMER	Counter/Timer
DAP	Debug Authentication Protocol
DC	Data/Command
DMA	Direct Memory Access
DNP	Do Not Populate / Do Not Place
FD	Flexible Data rate
FlexCAN	Flexible Controller Area Network
FlexIO	Flexible Input/Output
FlexPWM	Flex Pulse Width Modulator
GND	Ground
GPIO	General-Purpose Input/Output
HID	Human Interface Device
I^2C	Inter-Integrated Circuit
I3C	Improved Inter-Integrated Circuit
IDE	Integrated Development Environment
I/O	Input/Output
IoT	Internet of Things
ISP	In-System Programming
JTAG	Joint Test Action Group
LCD	Liquid-Crystal Display
LDO	Low-Dropout Regulator
LED	Light-Emitting Diode
LPI2C	Low-Power Inter-Integrated Circuit
LPSPI	Low-Power Serial Peripheral Interface
LPUART	Low-Power Universal Asynchronous Receiver/Transmitter
MCU	Microcontroller Unit
OB	Onboard
OPAMP	Operational Amplifier
OS	Operating System

Table 23. Acronyms...*continued*

Acronym	Description
PCB	Printed-Circuit Board
PCS	Peripheral Chip Select
PGA	Programmable Gain Amplifier
Pmod	Peripheral module
PMSM	Permanent Magnet Synchronous Motor
PWM	Pulse Width Modulator
RoHS	Restriction of Hazardous Substances
SCL	Serial Clock
SCK	Serial Clock
SDA	Serial Data
SPI	Serial Peripheral Interface
SWD	Serial Wire Debug
SWO	Serial Wire Output
UART	Universal Asynchronous Receiver/Transmitter
USB	Universal Serial Bus
USBSIO	USB Serial Input/Output
VCOM	Virtual Communication
VREF	Voltage Reference

7 Revision history

Table 24 summarizes the revisions to this document.

Table 24. Revision history

Document ID	Release date	Description
UM12441 v.1.0	5 January 2026	Initial public release

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