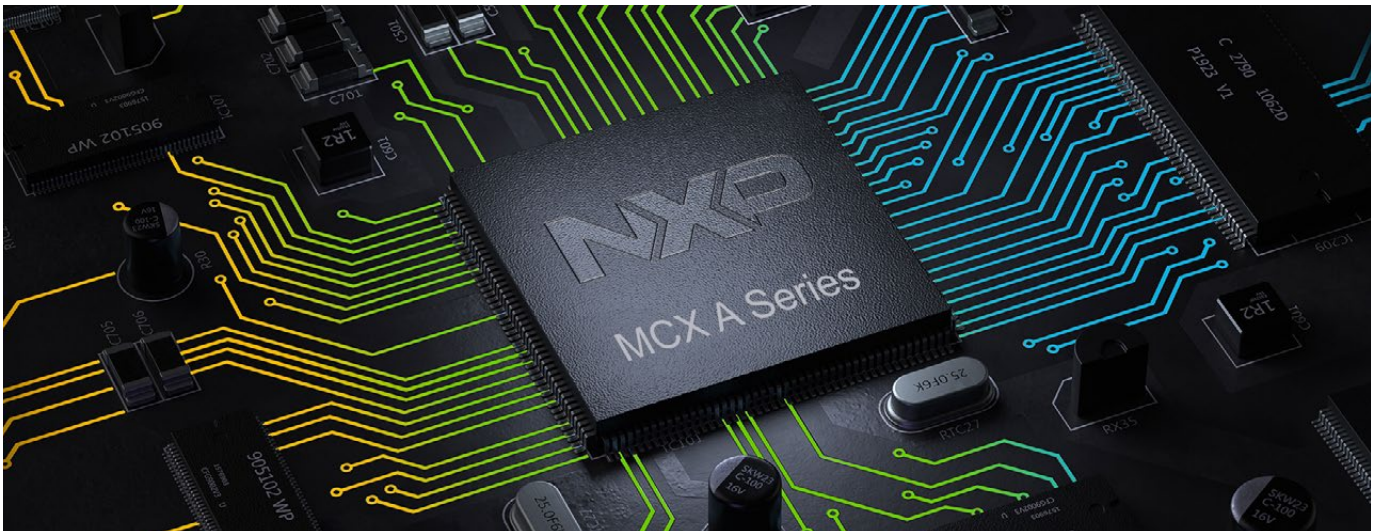


MCX A3 family of microcontrollers

Mixed-signal architecture with rich analog,
optimized for motor control



The **MCX A3 families** mixed signal microcontrollers (MCUs) deliver high speed performance, rich analog integration and scalable compute capabilities for motor control, sensing and advanced mixed signal edge applications. Built on the Arm® Cortex® M33 core and operating at 180 to 240 MHz, these MCUs combine high integration with enhanced analog functionality to support precise signal acquisition and real time control across industrial and edge designs.

Designed with broad analog capability, the MCX A3 devices support up to 4× 16-bit ADCs with windowing and averaging, up to 4× operational amplifiers, and up to 3× comparators—reducing the need for external components and streamlining board design and BOM cost. An optimized math acceleration unit (MAU) enables ultra fast trigonometric calculations for high

speed control loops, while SmartDMA, a dedicated co processor, enhances versatility by executing instruction code, mathematical operations, data manipulation, and control logic. This enables efficient implementation of functions such as keypad scanning, parallel camera interfaces and endian conversion.

A low power cache improves system performance and includes built in RAM self test features for safety related designs. Higher end MCX A3 devices also add enhanced security support, providing protection for connected and safety critical applications while maintaining software and pin compatibility across the **MCX portfolio**.

With scalable memory options from 128 KB to 1 MB of flash and multiple package choices that simplify layout, the MCX A3 devices offer a flexible, cost effective platform for designers building intelligent, high performance mixed signal solutions at the edge.

Target applications

Power and energy

- HVAC control
- Smart circuit breaker
- Solar inverter

Factory automation

- Water pump
- AC motor drive
- Process control
- Instruments and meters

Factory automation

- Water pump
- AC motor drive
- Process control
- Instruments and meters

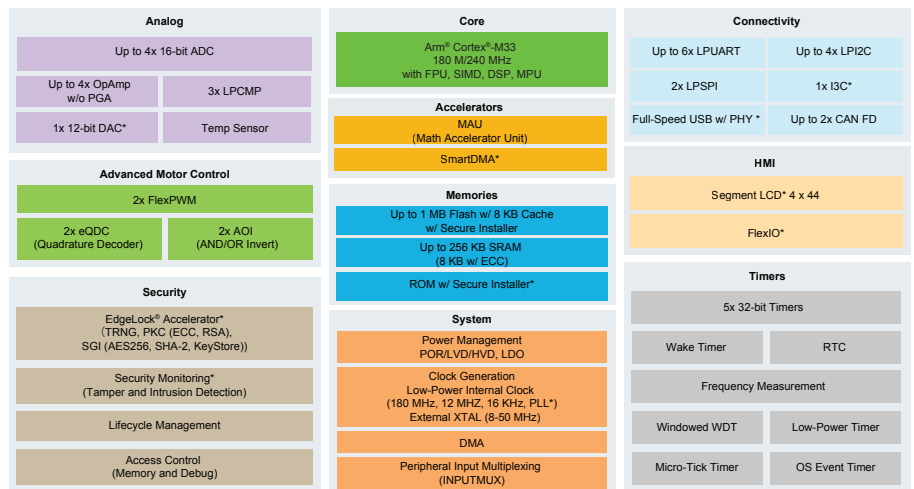
Home and building

- Appliances motor control
- Induction cooker
- Building control
- Fan control

General embedded

- Medical pump
- Power tools
- Drones and mobile robots

MCX A3 block diagram



* Feature is only enabled on selected products

Comprehensive enablement

The MCX MCU portfolio is supported by the [MCUXpresso developer experience](#) to optimize, ease and help accelerate embedded system development.

The MCUXpresso suite includes tools for simple device configuration and secure programming. Developers can choose to work with multiple IDEs including MCUXpresso for VS Code, MCUXpresso IDE, IAR or Keil.

NXP provides drivers and middleware with extensive examples and support for a range of RTOS choices, further complemented by a wide range of compatible middleware from NXP's partner ecosystem, allowing rapid development of a broad range of end applications.

Hardware platforms

For quick prototyping, we offer our low-cost, compact and scalable FRDM development boards. Developers have easy access to additional tools like our [expansion board hub](#) for add-on boards and the [application code hub](#) for software examples through the MCUXpresso developer experience.

MCX A3 MCU options

Part number	Frequency	MAU	Enhanced security	Flash	SRAM	LPI2C	LPUART	LPSPi	I3C	USB FS	FlexIO	Segment LCD	CAN	16b SE ADC	ADC channels	12b DAC	OpAmp	FlexPWM	Comparator	GPIOs	Package
MCXA366VPN	240 MHz	Y	Y	1024 KB	256 KB	4	6	2	1	1	1	4x44	2x CAN FD	4	82	1	4	2	3	114	WFBGA169
MCXA366VLQ	240 MHz	Y	Y	1024 KB	256 KB	4	6	2	1	1	1	4x44	2x CAN FD	4	82	1	4	2	3	114	LQFP144
MCXA366VLL	240 MHz	Y	Y	1024 KB	256 KB	4	6	2	1	1	1	4x44	2x CAN FD	4	62	1	4	2	3	83	LQFP100
MCXA366VLH	240 MHz	Y	Y	1024 KB	256 KB	4	6	2	1	1	1	4x44	2x CAN FD	4	35	1	2	2	3	52	LQFP64
MCXA365VPN	240 MHz	Y	Y	512 KB	128 KB	4	6	2	1	1	1	4x44	2x CAN FD	4	82	1	4	2	3	114	WFBGA169
MCXA365VLQ	240 MHz	Y	Y	512 KB	128 KB	4	6	2	1	1	1	4x44	2x CAN FD	4	82	1	4	2	3	114	LQFP144
MCXA365VLL	240 MHz	Y	Y	512 KB	128 KB	4	6	2	1	1	1	4x44	2x CAN FD	4	62	1	4	2	3	83	LQFP100
MCXA365VLH	240 MHz	Y	Y	512 KB	128 KB	4	6	2	1	1	1	4x44	2x CAN FD	4	35	1	2	2	3	52	LQFP64
MCXA356VPN	240 MHz	Y	-	1024 KB	256 KB	4	6	2	-	-	-	-	1x CAN FD	4	82	1	4	2	3	114	WFBGA169
MCXA356VLQ	240 MHz	Y	-	1024 KB	256 KB	4	6	2	-	-	-	-	1x CAN FD	4	82	1	4	2	3	114	LQFP144
MCXA356VLL	240 MHz	Y	-	1024 KB	256 KB	4	6	2	-	-	-	-	1x CAN FD	4	64	1	4	2	3	86	LQFP100
MCXA356VLH	240 MHz	Y	-	1024 KB	256 KB	4	6	2	-	-	-	-	1x CAN FD	4	38	1	3	2	3	55	LQFP64
MCXA355VPN	240 MHz	Y	-	512 KB	128 KB	4	6	2	-	-	-	-	1x CAN FD	4	82	1	4	2	3	114	WFBGA169
MCXA355VLQ	240 MHz	Y	-	512 KB	128 KB	4	6	2	-	-	-	-	1x CAN FD	4	82	1	4	2	3	114	LQFP144
MCXA355VLL	240 MHz	Y	-	512 KB	128 KB	4	6	2	-	-	-	-	1x CAN FD	4	64	1	4	2	3	86	LQFP100
MCXA355VLH	240 MHz	Y	-	512 KB	128 KB	4	6	2	-	-	-	-	1x CAN FD	4	38	1	3	2	3	55	LQFP64
MCXA346VPN	180 MHz	Y	-	1024 KB	256 KB	4	6	2	-	-	-	-	1x CAN FD	4	82	1	4	2	3	114	WFBGA169
MCXA346VLQ	180 MHz	Y	-	1024 KB	256 KB	4	6	2	-	-	-	-	1x CAN FD	4	82	1	4	2	3	114	LQFP144
MCXA346VLL	180 MHz	Y	-	1024 KB	256 KB	4	6	2	-	-	-	-	1x CAN FD	4	64	1	4	2	3	86	LQFP100
MCXA346VLH	180 MHz	Y	-	1024 KB	256 KB	4	6	2	-	-	-	-	1x CAN FD	4	38	1	3	2	3	55	LQFP64
MCXA345VPN	180 MHz	Y	-	512 KB	128 KB	4	6	2	-	-	-	-	1x CAN FD	4	82	1	4	2	3	114	WFBGA169
MCXA345VLQ	180 MHz	Y	-	512 KB	128 KB	4	6	2	-	-	-	-	1x CAN FD	4	82	1	4	2	3	114	LQFP144
MCXA345VLL	180 MHz	Y	-	512 KB	128 KB	4	6	2	-	-	-	-	1x CAN FD	4	64	1	4	2	3	86	LQFP100
MCXA345VLH	180 MHz	Y	-	512 KB	128 KB	4	6	2	-	-	-	-	1x CAN FD	4	38	1	3	2	3	55	LQFP64
MCXA344VLL	180 MHz	Y	-	256 KB	64 KB	2	4	2	-	-	-	-	1x CAN FD	2	39	-	3	2	3	86	LQFP100
MCXA344VLH	180 MHz	Y	-	256 KB	64 KB	2	4	2	-	-	-	-	1x CAN FD	2	31	-	3	2	3	55	LQFP64
MCXA344VLF	180 MHz	Y	-	256 KB	64 KB	2	4	2	-	-	-	-	1x CAN FD	2	21	-	3	2	3	41	LQFP48
MCXA344VFM	180 MHz	Y	-	256 KB	64 KB	2	4	2	-	-	-	-	1x CAN FD	2	13	-	1	2	3	29	HP-QFN32
MCXA343VLL	180 MHz	Y	-	128 KB	32 KB	2	4	2	-	-	-	-	1x CAN FD	2	39	-	3	2	3	86	LQFP100
MCXA343VLH	180 MHz	Y	-	128 KB	32 KB	2	4	2	-	-	-	-	1x CAN FD	2	31	-	3	2	3	55	LQFP64
MCXA343VLF	180 MHz	Y	-	128 KB	32 KB	2	4	2	-	-	-	-	1x CAN FD	2	21	-	3	2	3	41	LQFP48
MCXA343VFM	180 MHz	Y	-	128 KB	32 KB	2	4	2	-	-	-	-	1x CAN FD	2	13	-	1	2	3	29	HP-QFN32
FRDM-MCX A366	MCX A366 FRDM development board, supporting MCX A355/356/365/366																				LQFP144
FRDM-MCX A346	MCX A346 FRDM development board, supporting MCX A345/346																				LQFP144
FRDM-MCX A344	MCX A344 FRDM development board, supporting MCX A343/344																				LQFP100

nxp.com/MCXA

NXP and the NXP logo are trademarks of NXP B.V. All other product or service names are the property of their respective owners. © 2015–2026 NXP B.V.

Document Number: Document Number: MCXA3FS REV 0