MCX E24 microcontrollers

MCX E24 industrial and IoT (IIoT) microcontrollers (MCUs) deliver reliable performance for harsh environments, featuring scalable connectivity options, advanced safety features and robust 5V architecture. Designed to ensure high reliability and safety, the 5V robust MCU series thrives in harsh electrical noise environments, making it ideal for safe appliances and industrial applications.

The MCX E24 MCUs expands on the Kinetis E family, featuring the familiar Arm® Cortex®-M4F core supporting 3V to 5V power supply and enhanced memory configurations—offering up to 2 MB of Flash and 256 KB of SRAM. These improvements ensure powerful, flexible performance across a variety of use cases.

Additionally, the MCX E24 offers multiple connectivity options for local networks, including CAN FD, 10/100 Mbps Ethernet audio and low-power serial communication, enabling seamless integration into diverse systems.

Target applications

- HVAC
- Heat pumps, heaters
- Boilers
- Hydraulic system control unit, power tools
- Home energy storage
- Electric power trains
- Factory automation

Accelerate IEC61508 safety certification

Equipped with integrated ECC on all flash and SRAM memories, as well as internal registers for complete data integrity, the MCX E24 is built for IEC 61508 systems up to SIL2. It incorporates advanced safety features, including program flow monitoring, clock and power supervision and latent fault detection.

These capabilities, combined with comprehensive safety documentation, facilitate the development and certification of IEC61508-compliant safety applications and related industrial safety standards. Additionally, IEC60730 pre-certified software libraries accelerate certification processes for Class B safe appliances.

Designed and qualified for industrial applications

The MCX E24 offers robust operation with both 3V and 5V power rails, optimized for environments with harsh electrical noise and compatible with designs utilizing 5V sensors. Fully qualified for industrial settings, it supports 24/7 operation over a 10-year lifetime and can withstand temperatures up to 125 ºC.

Featuring 8 FlexTimers for PWM acquisition and generation, the MCX E24 efficiently drives consumer and industrial motors with low power consumption, aided by multiple power modes. It can be seamlessly paired with motor control add-on boards to explore motor control algorithms provided in the MCUXpresso SDK.
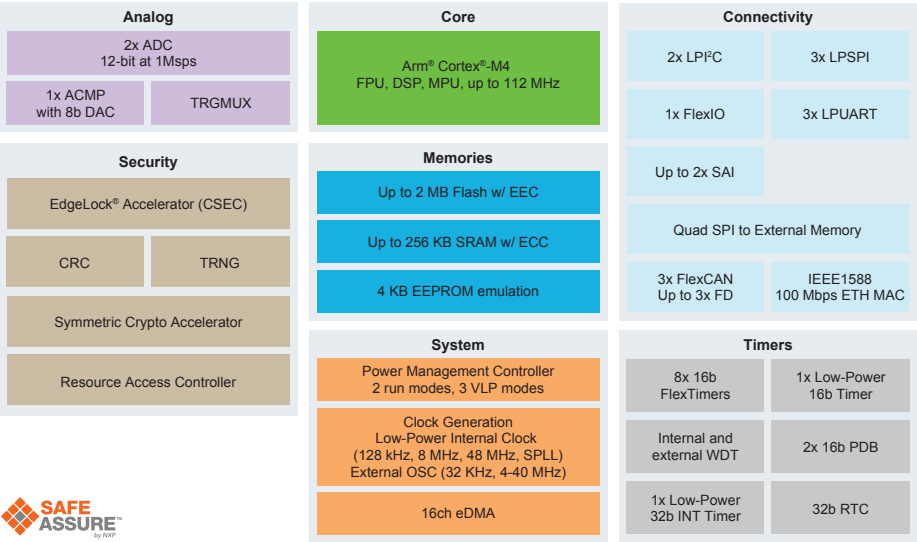
Prepared for modern cybersecurity standards

The MCX E24 MCUs incorporates NXP EdgeLock® essential security features, including secure manufacturing, secure boot, secure debug access and configuration. With pre-provisioned device unique identities and the EdgeLock accelerator (CSEC) for symmetric key cryptography, it enhances power efficiency, performance and long-term resilience against evolving threats.

Developer experience

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 multiple IDEs including MCUXpresso for visual studio code, MCUXpresso IDE, IAR or Keil.

MCX E24 Family block diagram

Analog
- 2x ADC 12-bit at 1Msps
- 1x ACMP with 8b DAC
- TRGMUX

Security
- EdgeLock® Accelerator (CSEC)
- CRC
- TRNG
- Symmetric Crypto Accelerator
- Resource Access Controller

Core
- Arm® Cortex®-M4 FPU, DSP, MPU, up to 112 MHz

Memories
- Up to 2 MB Flash w/ EEC
- Up to 256 KB SRAM w/ ECC
- 4 KB EEPROM emulation

System
- Power Management Controller 2 run modes, 3 VLP modes
- Clock Generation Low-Power Internal Clock (128 kHz, 8 MHz, 48 MHz, SPLL) External OSC (32 KHz, 4-40 MHz)
- 16ch eDMA

Connectivity
- 2x LPI²C
- 3x LPSPI
- 1x FlexIO
- 3x LPUART
- Up to 2x SAI
- Quad SPI to External Memory
- 3x FlexCAN Up to 3x FD
- IEEE1588 100 Mbps ETH MAC

Timers
- 8x 16b FlexTimers
- 1x Low-Power 16b Timer
- Internal and external WDT
- 2x 16b PDB
- 1x Low-Power 32b INT Timer
- 32b RTC

SAFE ASSURE by NXP

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 FRDM ecosystem.

Explore our entire FRDM platform of MCUs and MPUs at nxp.com/FRDM.

MCX E24 family part numbers

Part number	Cortex-M33 fmax (MHz)	Flash (KB)	SRAM (KB)	CAN (with FD)	Ethernet	QSPI	Packages
MCXE245VLF	112	512	64	3 (1)	No	No	LQFP48
MCXE245VLH	112	512	64	3 (1)	No	No	LQFP64
MCXE245VLL	112	512	64	3 (1)	No	No	LQFP100
MCXE246VLH	112	1024	128	3 (2)	No	No	LQFP64
MCXE246VLL	112	1024	128	3 (2)	No	No	LQFP100
MCXE246VLQ	112	1024	128	3 (2)	No	No	LQFP144
MCXE247VLL	112	2048	256	3 (3)	Yes	No	LQFP100
MCXE247VLQ	112	2048	256	3 (3)	Yes	Yes	LQFP144
FRDM- MCXE247	MCX E247 FRDM development board						LQFP144

nxp.com/MCXE