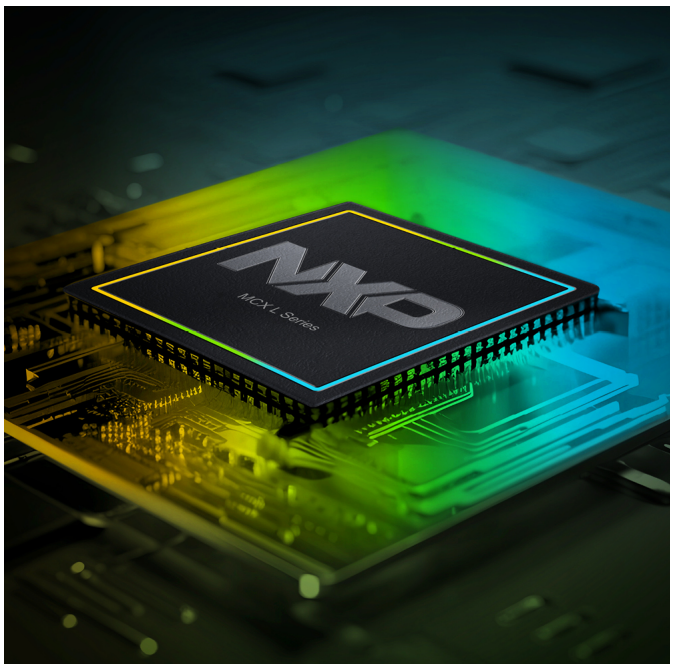
MCX L series microcontrollers

Ultra-low-power MCUs with a dedicated sense domain that provides optimized performance at the lowest energy consumption for battery-operated IIoT devices.



The MCX L series of Industrial and IoT (IIoT) MCUs feature an Arm® Cortex®-M33 core operating up to 96 MHz and an Arm® Cortex®-M0+ core up to 10 MHz. This series features our Adaptive Dynamic Voltage Control (ADVC) for optimized power consumption at low frequency operation. Compared to traditional low-power MCUs, a dedicated ultra-low-power (ULP) Sense Domain allows operation of low-power peripherals while keeping the main core in Deep Power Mode. This avoids event triggering and keeps data acquisition to extremely low power levels.

The dual domain architecture also enables physical separation of applications, on top of code isolation provided by TrustZone on the Cortex®-M33 core, simplifying the development and certification of metrology applications.

The MCX L Series features EdgeLock® security capabilities for secure boot and crypto accelerators to meet demanding requirements for wired and over-the-air low power transactions.

Target applications

- Building control
- Industrial sensing
- Smoke and fire alarms
- Flow meters
- Smart appliances
- Motion detectors

Ultra-low-power and sense domain

MCX L series feature optimized power in run mode down to 23 µA/MHz at 3.3 V at room temperature. They support up to seven different low power modes, this allows fine-tuning of which peripherals and clocks are gated. This optimizes average power consumption and wake-up time.

A dedicated ULP Sense domain with an open Cortex-M0+ runs sense code for data acquisition, data pre-processing and thresholding at even lower power up to 10 MHz. Peripherals runs independently from the Cortex-M33 core in this mode, with or without Cortex-M0+ assistance to optimize time during which the real-time domain is running. The MCX L25x series can be easily coupled with connectivity solutions, such as an external UBX100 sub-GHz transceiver to transmit data to a centralized cloud for further processing.

MCX L series features NXP EdgeLock® security capabilities, including secure manufacturing, fast and secure boot, secure debug access and configuration. The MCX L25x series also includes pre-provisioned device unique identity, public key cryptography acceleration to further improve power consumption and performance as well as Arm TrustZone® technology for the isolation of sensitive code such as cryptographic stacks or metrology software.

Developer experience

The MCX MCU portfolio is supported by the MCUXpresso Developer Experience to optimize, ease and help accelerate embedded system development.

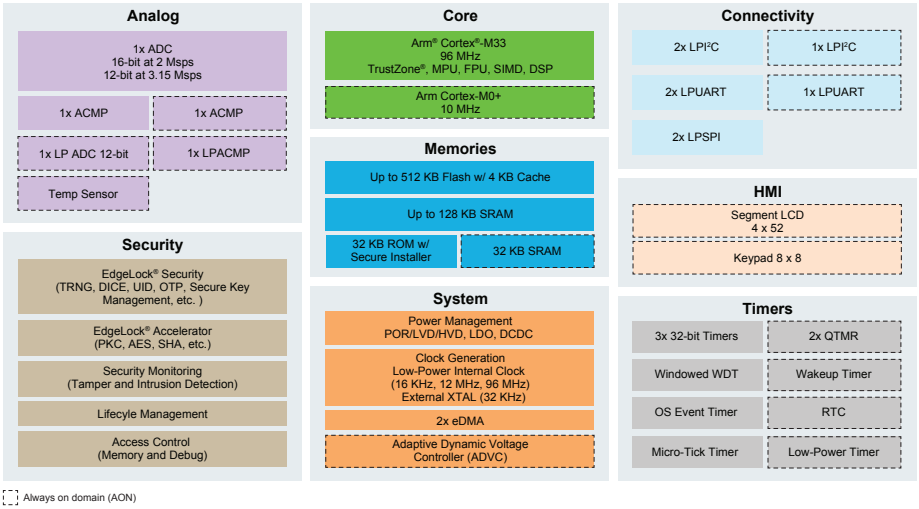
The MCUXpresso suite includes tools for simple device configuration and secure programming. Developers can choose multiple IDEs including MCUXpresso for Visual Studio Code, MCUXpresso IDE, IAR or Keil.

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 platforms, we offer both 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 L25x block diagram



MCX L series part numbers

Part number	Flash (KB)	SRAM (KB)	SLCD	Keypad	Cortex-M33 fmax (MHz)	EdgeLock PKC accelerators	Packages
MCXL142VLL	64	16	No	No	48	No	LQFP100
MCXL142VPJ	64	16	No	No	48	No	VFBGA112
MCXL143VLL	128	32	No	No	48	No	LQFP100
MCXL143VPJ	128	32	No	No	48	No	VFBGA112
MCXL144VLL	256	64	No	No	48	No	LQFP100
MCXL144VPJ	256	64	No	No	48	No	VFBGA112
MCXL253VLL	128	32	Yes	Yes	96	Yes	LQFP100
MCXL253VDF	128	32	Yes	Yes	96	Yes	VFBGA184
MCXL254VLL	256	64	Yes	Yes	96	Yes	LQFP100
MCXL254VDF	256	64	Yes	Yes	96	Yes	VFBGA184
MCXL255VLL	512	128	Yes	Yes	96	Yes	LQFP100
MCXL255VDF	512	128	Yes	Yes	96	Yes	VFBGA184
FRDM-MCXL144	MCX L144 FRDM development board						VFBGA112
FRDM-MCXL255	MCX L255 FRDM development board						VFBGA184

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Document Number: MCXLFS REV 0