

MCX N Series microcontrollers

Highly integrated, low-power MCUs designed with intelligent peripherals and on-chip accelerators that provide the ultimate balance of performance and energy consumption

The MCX N Series of Industrial and IoT (IIoT) MCUs feature dual Arm® Cortex®-M33 cores operating up to 150 MHz. This series features our [eIQ® Neutron Neural Processing Unit](#) (NPU) for machine learning (ML) acceleration. Compared to CPU cores alone, the eIQ Neutron NPU delivers up to 42x faster ML inference performance, PowerQuad accelerates DSP voice processing by 8x or more. This higher performance can be used in spending less time awake and reducing overall power consumption.

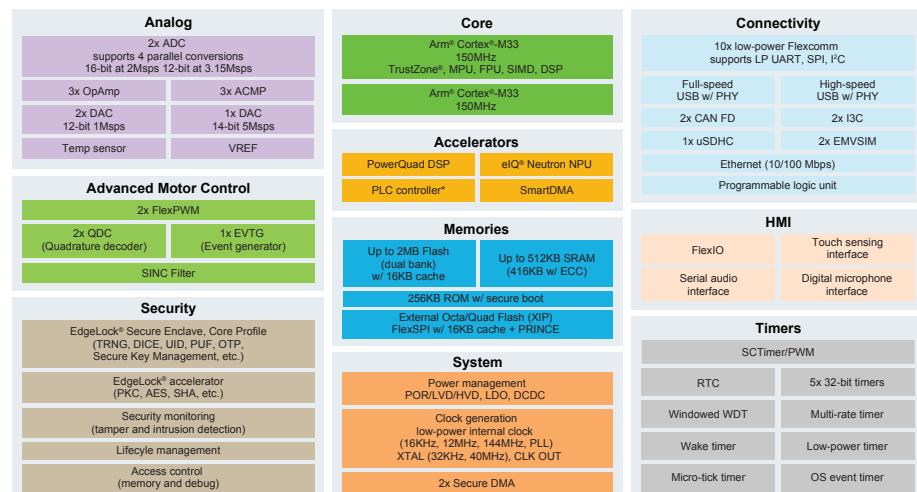
The low power cache enhances system performance and the dual bank Flash and full ECC RAM support system safety providing an extra layer of protection and assurance.

Our N Series security features the EdgeLock® Secure Enclave, Core Profile and a secured boot and crypto accelerators to meet demanding requirements for over-the-air transactions. The on-the-fly encrypt and decrypt for external serial Flash/PSRAM is connected via the FlexSPI to ensure code and externally stored data is protected.

Target applications

- Power & Energy
- Factory Automation
- Building Control
- Medical Equipment
- Control & Security
- Smart Appliances
- Home Entertainment
- Health & Fitness
- Industrial/Consumer HMI
- Hand-held Devices
- Power Tools

MCX N94x block diagram



* Supported by 3rd party software. Contact NXP for details



High integration and memory expansion

The multicore design improves system performance and reduces consumption by enabling smart, efficient distribution of workloads to the analog and digital peripherals. The MCU N series offers a combination of analog integration (operational amplifier, precision reference supply for ADC and DAC), low power consumption and motor control PWMs.

With multiple connectivity options including Ethernet, CAN 2.0, CAN FD, USB HS, FS (Device/Host) and FlexComm interfaces (configurable as either SPI/I²C/UART), these devices feature versatile integration for demanding application needs. The FlexSPI with 16KB Cache support on-the-fly Encrypt/Decrypt enables applications to expand the on-chip memory, supporting various boot options and execute directly from external serial memories.

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 N Series options

Part Number	Flash (KB)	SRAM	NPU	FlexSPI	PLC Controller	USB HS	DAC	Op Amp	Flexcomm	CAN FD	Packages
MCXN235VDF	512	192 KB (160 KB w/ ECC)	No	No	No	Yes			8	2	VFBGA184
MCXN235VKL	512	192 KB (160 KB w/ ECC)	No	No	No	Yes			8	2	HLQFP100
MCXN236VDF	1024	352 KB (288 KB w/ ECC)	No	No	No	Yes			8	2	VFBGA184
MCXN236VKL	1024	352 KB (288 KB w/ ECC)	No	No	No	Yes			8	2	HLQFP100
MCXN546VDF	1024	352 KB (288 KB w/ ECC)	Yes	Yes	No	Yes	1 x 12b		10	1	VFBGA184
MCXN546VKL	1024	352 KB (288 KB w/ ECC)	Yes	Yes	No	Yes	1 x 12b		10	1	HLQFP100
MCXN547VDF	2048	512 KB (416 KB w/ ECC)	Yes	Yes	No	Yes	1 x 12b		10	1	VFBGA184
MCXN547VKL	2048	512 KB (416 KB w/ ECC)	Yes	Yes	No	Yes	1 x 12b		10	1	HLQFP100
MCXN946VDF	1024	352 KB (288 KB w/ ECC)	Yes	Yes	Yes	Yes	2 x 12b + 1 x 14b	3	10	2	VFBGA184
MCXN946VKL	1024	352 KB (288 KB w/ ECC)	Yes	Yes	Yes	No	2 x 12b + 1 x 14b	3	10	2	HLQFP100
MCXN947VDF	2048	512 KB (416 KB w/ ECC)	Yes	Yes	Yes	Yes	2 x 12b + 1 x 14b	3	10	2	VFBGA184
MCXN947VKL	2048	512 KB (416 KB w/ ECC)	Yes	Yes	Yes	No	2 x 12b + 1 x 14b	3	10	2	HLQFP100
MCX-N5xx-EVK	MCX N54x full evaluation kit										VFBGA184
MCX-N9xx-EVK	MCX N94x full evaluation kit										VFBGA184
FRDM-MCXN236	MCX N236 FRDM development board										VFBGA184
FRDM-MCXN947	MCX N947 FRDM development board										VFBGA184

www.nxp.com/MCXN

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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.

The MCX MCU portfolio is also supported by [eIQ ML SW development](#) environment and eIQ Toolkit for developing or converting ML models to run efficiently on the MCX CPU and eIQ Neutron NPU.

Hardware platforms

For quick prototyping platforms, we offer both our low-cost, compact and scalable FRDM development boards and a full-featured EVK. 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.