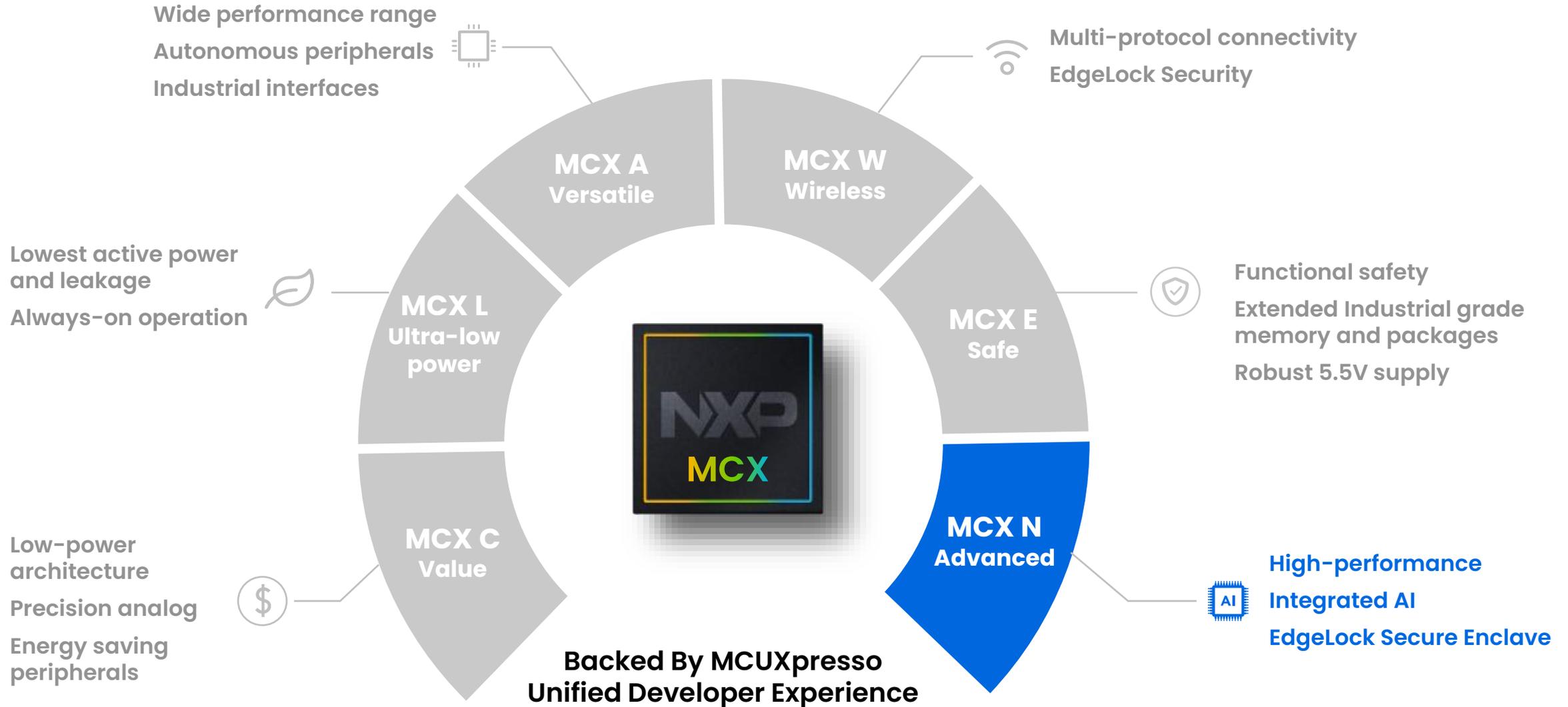




MCX N Series

High-performance MCUs with multitasking capabilities, and robust security features.

MCX MCUs – One portfolio, addressing numerous application needs



MCX N Addresses Challenges Engineers Face while Designing for the Edge



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

EMERGING TECHNOLOGIES ARE ASKING MORE OF EDGE DEVICES

Multi-tasking & Performance Efficiency

- Multi-core design
- On-chip accelerators
- Efficient distribution of workloads to reduce power

DESIGNERS NEED SMALLER, MORE ENERGY EFFICIENT EDGE DEVICES

Intelligent & Autonomous Peripherals

- Built-in intelligence to collect and average local data
- Autonomous peripherals offload main CPU to save power
- Peripheral flexibility and combination

EDGE GROWTH AND INCREASING CYBER SECURITY REGULATIONS ARE DEMANDING MORE DEVICE PROTECTION

Advanced Security

- EdgeLock® Secure Enclave, Core Profile
- Immutable ROM and physically unclonable function as root of trust and security monitoring
- Hardware-accelerated cryptography

DEVELOPERS NEED TO KEEP UP WITH THE LATEST TECHNIQUES WHILE DESIGNING EDGE PRODUCTS

MCUXpresso Developer Experience

- Power of choice for development environments & software
- Low-cost, scalable platforms for rapid prototyping
- Easy access to a broad range of application examples

MCX N Series – Key Features

MULTI-TASKING & PERFORMANCE EFFICIENCY

- Dual-core at 150 MHz, co-processors, accelerators and intelligent peripherals provide autonomous operation to reduce power consumption and latency
- On-chip accelerators with software tool and library support:
 - PowerQuad for DSP and CORDIC Functions
 - eIQ[®] Neutron NPU for machine learning
 - SmartDMA for parallel CSI, Boolean operation

INTELLIGENT & AUTONOMOUS PERIPHERALS

- Mixed-signal and on-chip analog peripherals to save space and BOM cost
- Rich digital communication including Ethernet, CAN, USB, audio and serial comms
- Motor control subsystem for fast and precise real-time control loop, with PMSM and BLDC software examples and tuning tools
- Unique peripherals for smart HMI such as graphic LCD, audio and capacitive touch sensing complemented by comprehensive software and design tools

ADVANCED SECURITY

- Comprehensive security tools for device configuration, code signing and programming
- Dual secure boot mode and secure firmware update application examples
- Device Life cycle management including secure authenticated debug
- Data and IP protection with high-performance memory encryption
- Device Attestation with support of DICE standard
- Secure connection and TLS 1.2/1.3 software
- Key management over-the-air with pre-integration of EdgeLock 2GO

MCUXpresso DEVELOPER EXPERIENCE

- MCUXpresso for VS Code with full support for Zephyr development
- GitHub and Open-CMSIS-Pack support for easier adoption of open source software
- Software Hubs to easily find application examples and expansion board software
- Low cost FRDM development boards with popular interfaces and a range of NXP and partner add-on boards for scalable and rapid prototyping

Key Applications and Enabling Technologies



INDUSTRIAL

Factory Automation
Power & Energy
Building Control
Medical Equipment



SMART HOME

Control & Security
Smart Appliances
Home Entertainment
Health & Fitness



GENERAL EMBEDDED

Industrial/Consumer HMI
Hand-held Devices
Power Tools
General Purpose Embedded Control

Accelerators

- eIQ Neutron NPU with eIQ ML development tools
- Hardware DSP acceleration (PowerQuad) with libraries
- SmartDMA
- PLU with graphical, schematic and Verilog based design tools
- Dual 150MHz M33 core

HMI

- SAI and DMIC with HW/SW VAD
- Conversa voice processing with hardware optimization
- Cap touch sensing with tuning tools*
- Multiple free and premium graphics libraries and design tools
- Parallel and SPI LCD options
- VoiceSeeker / VoiceSpot / VIT voice wake word & commands
- Keyboard scanning

Motor Control

- High speed & performance ADC
- Advanced Timers (FlexPWM)
- Quadrature Encoder/Decoder
- AOI (AND/OR/INVERT) modules for logic operation
- Programmable Gain Amplifiers (PGAs)
- Example motor control algorithms and tuning tools

Security

- EdgeLock Secure Enclave, Core Profile
- Device Life Cycle management
- Memory encryption with on-the-fly decryption
- Security configuration and programming tools
- Dual bank flash & device firmware update software enablement
- Debug authentication

Safety*

- Safety manual
- FMEDA
- Safety libraries
- SRAM with ECC
- Windowed WDT and Code Watchdog

Networking

- Multiple communication protocols support
- Easy support of WIFI devices
- Powerline Communication
- Ethernet and CAN-FD with stack support

Low Power

- Advanced power management
- Autonomous, flexible low power peripherals
- Buck DC-DC supply

Interfaces

- FlexSPI for external memory
- Parallel camera
- 16-bit ADC
- SINC Filter
- Programmable smart interfaces

MCX N Series Highlights

On-chip Accelerators

- SmartDMA for camera, display and fast IO
- PowerQuad for digital signal processing
- PLC Controller



NXP eIQ® Neutron NPU

Up to 42x faster
ML inference



Rich Integrated Analog

- 16-bit high-speed ADC
- 12/14-bit high-speed DAC
- On-chip OpAmp



Communication Peripherals



- Low Power FlexComm
- High-Speed USB w/ PHY
- CAN-FD, I3C, Ethernet
- Touch Sensing, FlexIO

MCX N Series

Dual or Single 150MHz
Arm® Cortex®-M33

Platform Security

- EdgeLock® Secure Enclave
- Crypto, PKC, Intrusion & Tamper detection
- Secure boot
- Life-cycle management



Low Power



- DC-DC Supply
- Autonomous peripherals

Packages

VFBGA184, HLQFP100
HDQFP172, WLCSP123



BOM Savings
Active connection
w/o low frequency
crystal

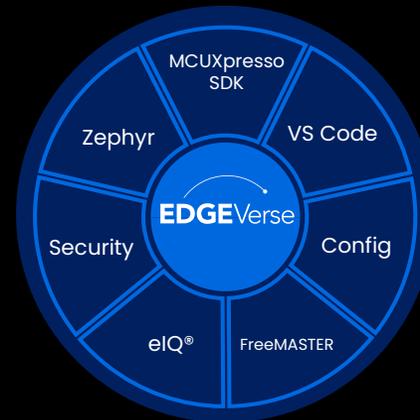
FRDM to innovate

Open-source developer ecosystem

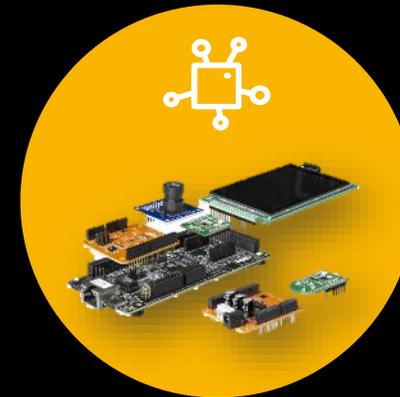
- Comprehensive software and tools for rapid development
- Modular, quick-start FRDM & [expansion boards](#) with open design files and schematics
- Access 170+ code snippets and tutorials through our [Application Code Hub](#)

Ease development for reduced time to market

Software
& tools



Modular
hardware



Application
Code Hub



Summary



**Multi-tasking &
Performance Efficiency**



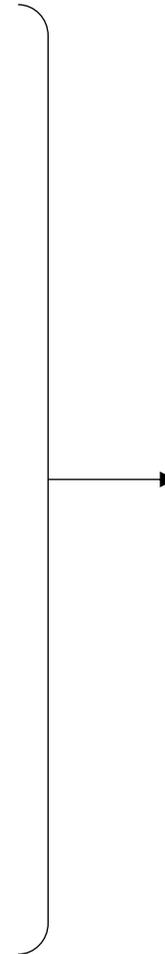
**Intelligent &
Autonomous Peripherals**



Advanced Security



Developer Experience



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