

# MCX A Series Microcontrollers

## Addressing challenges engineers face while designing for the edge

MCX A1xx Series all-purpose microcontrollers (MCUs) address a wide range of applications with scalable device options, low power and intelligent peripherals.

The [MCX A1xx Series](#) Arm® Cortex®-M33 general purpose MCUs operate at up to 96 MHz with high levels of integration and analog. The low power cache enhances the system performance with built-in RAM self-test hardware and supporting safety applications.

They offer a wide range of low power and intelligent peripherals including Timers that generate three complementary PWM pairs with deadband insertion, 3.2 Msps 16b ADC with hardware windowing and averaging features.

The innovative power architecture is designed to support high utilization of I/Os and power efficiency with a simple supply circuit in a smaller footprint. Designed to support more GPIO pins for additional external connections, the MCX A allows designers to utilize a smaller package, simpler board design and lower system BOM costs.

### Target Applications

- Sensing & metering
- Building control & automation
- Smart circuit breaker
- Home appliances
- USB accessories
- Compressor drive
- Smart lighting
- Hand-held devices
- Power tools
- IoT nodes



Developer experience

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

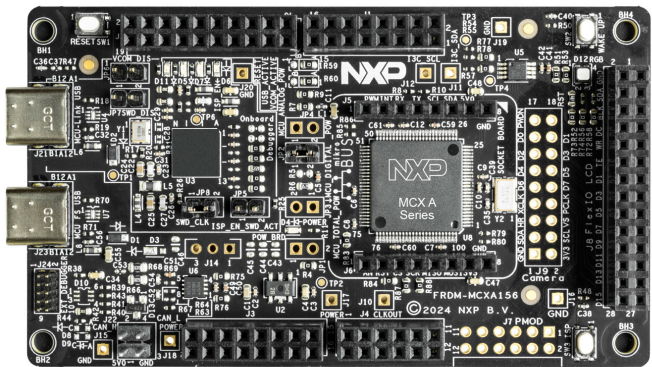
The MCUXpresso suite includes tools for simple device configuration and secure programming. Developers can choose to work with multiple IDEs including MCUXpresso for VS Code, MCUXpresso IDE, IAR, or Keil.

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

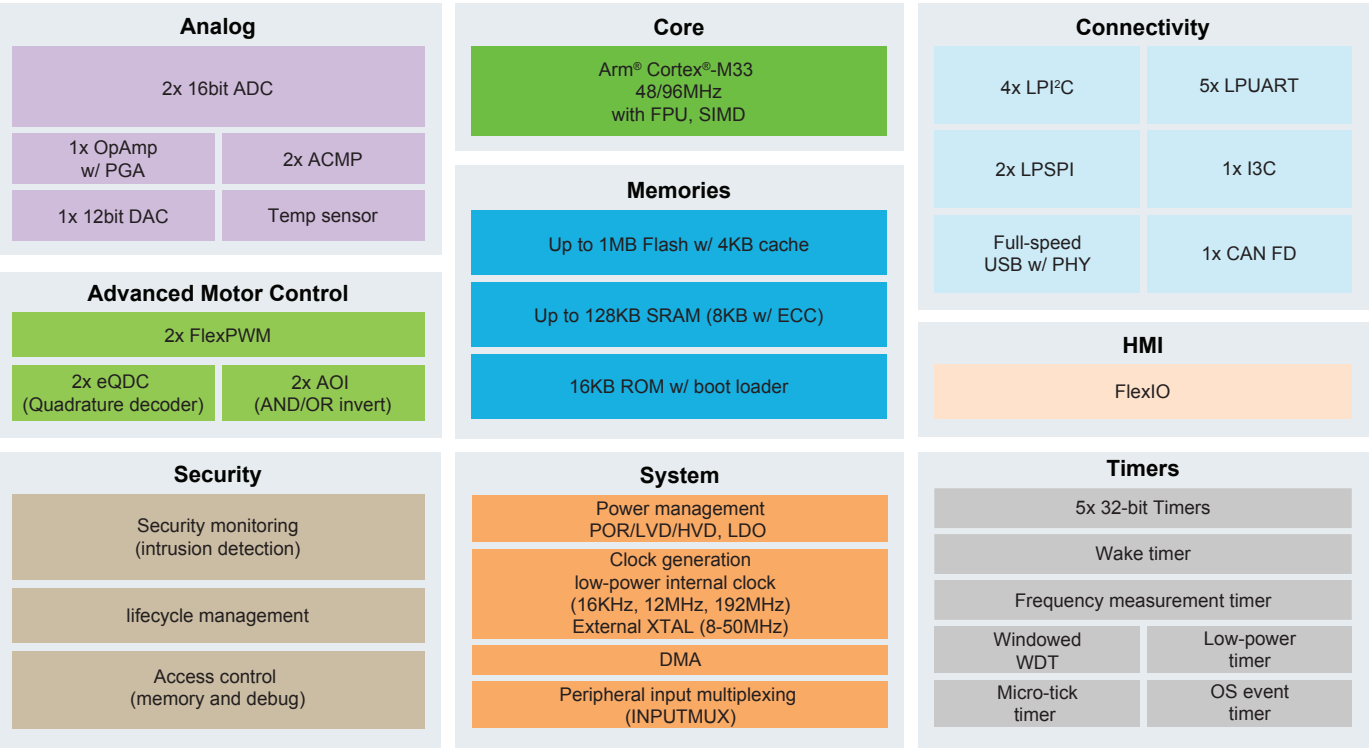
For quick prototyping, we offer our low-cost, compact and scalable FRDM development boards.

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.



FRDM-MCXA156 FRDM board

MCX A1xx block diagram



## MCX A1xx MCU Options

| Part Number  | Frequency                       | Flash   | SRAM   | LP12C | LPUART | LPSP1 | I3C | USB FS | FlexIO | CAN       | 16b SE ADC | ADC Channels | 12b DAC | OpAmp | FlexPWM | Comparator | GPIOs | Package  |
|--------------|---------------------------------|---------|--------|-------|--------|-------|-----|--------|--------|-----------|------------|--------------|---------|-------|---------|------------|-------|----------|
| MCXA156VPJ   | 96 MHz                          | 1024 KB | 128 KB | 4     | 5      | 2     | 1   | 1      | 1      | 1x CAN FD | 2          | 39           | 1       | 1     | 2       | 2          | 82    | VFBGA112 |
| MCXA156VMP   | 96 MHz                          | 1024 KB | 128 KB | 4     | 5      | 2     | 1   | 1      | 1      | 1x CAN FD | 2          | 26           | 1       | 1     | 2       | 2          | 50    | LFBGA64  |
| MCXA156VLL   | 96 MHz                          | 1024 KB | 128 KB | 4     | 5      | 2     | 1   | 1      | 1      | 1x CAN FD | 2          | 39           | 1       | 1     | 2       | 2          | 81    | LQFP100  |
| MCXA156VLH*  | 96 MHz                          | 1024 KB | 128 KB | 4     | 5      | 2     | 1   | 1      | 1      | 1x CAN FD | 2          | 28           | 1       | 1     | 2       | 2          | 52    | LQFP64   |
| MCXA156VFT   | 96 MHz                          | 1024 KB | 128 KB | 4     | 5      | 2     | 1   | 1      | 1      | 1x CAN FD | 2          | 20           | 1       | 1     | 2       | 2          | 41    | HVQFN48  |
| MCXA155VPJ   | 96 MHz                          | 512 KB  | 96 KB  | 4     | 5      | 2     | 1   | 1      | 1      | 1x CAN FD | 2          | 39           | 1       | 1     | 2       | 2          | 82    | VFBGA112 |
| MCXA155VMP   | 96 MHz                          | 512 KB  | 96 KB  | 4     | 5      | 2     | 1   | 1      | 1      | 1x CAN FD | 2          | 26           | 1       | 1     | 2       | 2          | 50    | LFBGA64  |
| MCXA155VLL   | 96 MHz                          | 512 KB  | 96 KB  | 4     | 5      | 2     | 1   | 1      | 1      | 1x CAN FD | 2          | 39           | 1       | 1     | 2       | 2          | 81    | LQFP100  |
| MCXA155VLH*  | 96 MHz                          | 512 KB  | 96 KB  | 4     | 5      | 2     | 1   | 1      | 1      | 1x CAN FD | 2          | 28           | 1       | 1     | 2       | 2          | 52    | LQFP64   |
| MCXA155VFT   | 96 MHz                          | 512 KB  | 96 KB  | 4     | 5      | 2     | 1   | 1      | 1      | 1x CAN FD | 2          | 20           | 1       | 1     | 2       | 2          | 41    | HVQFN48  |
| MCXA154VPJ   | 96 MHz                          | 256 KB  | 64 KB  | 4     | 5      | 2     | 1   | 1      | 1      | 1x CAN FD | 2          | 39           | 1       | 1     | 2       | 2          | 82    | VFBGA112 |
| MCXA154VMP   | 96 MHz                          | 256 KB  | 64 KB  | 4     | 5      | 2     | 1   | 1      | 1      | 1x CAN FD | 2          | 26           | 1       | 1     | 2       | 2          | 50    | LFBGA64  |
| MCXA154VLL   | 96 MHz                          | 256 KB  | 64 KB  | 4     | 5      | 2     | 1   | 1      | 1      | 1x CAN FD | 2          | 39           | 1       | 1     | 2       | 2          | 81    | LQFP100  |
| MCXA154VLH*  | 96 MHz                          | 256 KB  | 64 KB  | 4     | 5      | 2     | 1   | 1      | 1      | 1x CAN FD | 2          | 28           | 1       | 1     | 2       | 2          | 52    | LQFP64   |
| MCXA154VFT   | 96 MHz                          | 256 KB  | 64 KB  | 4     | 5      | 2     | 1   | 1      | 1      | 1x CAN FD | 2          | 20           | 1       | 1     | 2       | 2          | 41    | HVQFN48  |
| MCXA153VLH   | 96 MHz                          | 128 KB  | 32 KB  | 1     | 3      | 2     | 1   | 1      | -      | -         | 1          | 23           | -       | -     | 1       | 2          | 52    | LQFP64   |
| MCXA153VLF   | 96 MHz                          | 128 KB  | 32 KB  | 1     | 3      | 2     | 1   | 1      | -      | -         | 1          | 15           | -       | -     | 1       | 2          | 41    | LQFP48   |
| MCXA153VFT   | 96 MHz                          | 128 KB  | 32 KB  | 1     | 3      | 2     | 1   | 1      | -      | -         | 1          | 17           | -       | -     | 1       | 2          | 41    | HVQFN48  |
| MCXA153VFM   | 96 MHz                          | 128 KB  | 32 KB  | 1     | 3      | 2     | 1   | 1      | -      | -         | 1          | 8            | -       | -     | 1       | 2          | 26    | HVQFN32  |
| MCXA152VLH   | 96 MHz                          | 64 KB   | 16 KB  | 1     | 3      | 2     | 1   | 1      | -      | -         | 1          | 23           | -       | -     | 1       | 2          | 52    | LQFP64   |
| MCXA152VLF   | 96 MHz                          | 64 KB   | 16 KB  | 1     | 3      | 2     | 1   | 1      | -      | -         | 1          | 15           | -       | -     | 1       | 2          | 41    | LQFP48   |
| MCXA152VFT   | 96 MHz                          | 64 KB   | 16 KB  | 1     | 3      | 2     | 1   | 1      | -      | -         | 1          | 17           | -       | -     | 1       | 2          | 41    | HVQFN48  |
| MCXA152VFM   | 96 MHz                          | 64 KB   | 16 KB  | 1     | 3      | 2     | 1   | 1      | -      | -         | 1          | 8            | -       | -     | 1       | 2          | 26    | HVQFN32  |
| MCXA146VPJ   | 48 MHz                          | 1024KB  | 128KB  | 4     | 5      | 2     | 1   | 1      | 1      | 1xFlexCAN | 2          | 39           | -       | -     | 1       | 2          | 82    | VFBGA112 |
| MCXA146VMP   | 48MHz                           | 1024KB  | 128KB  | 4     | 5      | 2     | 1   | 1      | 1      | 1xFlexCAN | 2          | 26           | -       | -     | 1       | 2          | 50    | LFBGA64  |
| MCXA146VLL   | 48MHz                           | 1024KB  | 128KB  | 4     | 5      | 2     | 1   | 1      | 1      | 1xFlexCAN | 2          | 39           | -       | -     | 1       | 2          | 81    | LQFP100  |
| MCXA146VLH*  | 48MHz                           | 1024KB  | 128KB  | 4     | 5      | 2     | 1   | 1      | 1      | 1xFlexCAN | 2          | 28           | -       | -     | 1       | 2          | 52    | LQFP64   |
| MCXA146VFT   | 48MHz                           | 1024KB  | 128KB  | 4     | 5      | 2     | 1   | 1      | 1      | 1xFlexCAN | 2          | 20           | -       | -     | 1       | 2          | 41    | HVQFN48  |
| MCXA145VPJ   | 48MHz                           | 512KB   | 96KB   | 4     | 5      | 2     | 1   | 1      | 1      | 1xFlexCAN | 2          | 39           | -       | -     | 1       | 2          | 82    | VFBGA112 |
| MCXA145VMP   | 48MHz                           | 512KB   | 96KB   | 4     | 5      | 2     | 1   | 1      | 1      | 1xFlexCAN | 2          | 26           | -       | -     | 1       | 2          | 50    | LFBGA64  |
| MCXA145VLL   | 48MHz                           | 512KB   | 96KB   | 4     | 5      | 2     | 1   | 1      | 1      | 1xFlexCAN | 2          | 39           | -       | -     | 1       | 2          | 81    | LQFP100  |
| MCXA145VLH*  | 48MHz                           | 512KB   | 96KB   | 4     | 5      | 2     | 1   | 1      | 1      | 1xFlexCAN | 2          | 28           | -       | -     | 1       | 2          | 52    | LQFP64   |
| MCXA145VFT   | 48MHz                           | 512KB   | 96KB   | 4     | 5      | 2     | 1   | 1      | 1      | 1xFlexCAN | 2          | 20           | -       | -     | 1       | 2          | 41    | HVQFN48  |
| MCXA144VPJ   | 48MHz                           | 256KB   | 64KB   | 4     | 5      | 2     | 1   | 1      | 1      | 1xFlexCAN | 2          | 39           | -       | -     | 1       | 2          | 82    | VFBGA112 |
| MCXA144VMP   | 48MHz                           | 256KB   | 64KB   | 4     | 5      | 2     | 1   | 1      | 1      | 1xFlexCAN | 2          | 26           | -       | -     | 1       | 2          | 50    | LFBGA64  |
| MCXA144VLL   | 48MHz                           | 256KB   | 64KB   | 4     | 5      | 2     | 1   | 1      | 1      | 1xFlexCAN | 2          | 39           | -       | -     | 1       | 2          | 81    | LQFP100  |
| MCXA144VLH*  | 48MHz                           | 256KB   | 64KB   | 4     | 5      | 2     | 1   | 1      | 1      | 1xFlexCAN | 2          | 28           | -       | -     | 1       | 2          | 52    | LQFP64   |
| MCXA144VFT   | 48MHz                           | 256KB   | 64KB   | 4     | 5      | 2     | 1   | 1      | 1      | 1xFlexCAN | 2          | 20           | -       | -     | 1       | 2          | 41    | HVQFN48  |
| MCXA143VLH   | 48MHz                           | 128 KB  | 32 KB  | 1     | 3      | 2     | 1   | 1      | -      | -         | 1          | 23           | -       | -     | 1       | 2          | 52    | LQFP64   |
| MCXA143VLF   | 48MHz                           | 128 KB  | 32 KB  | 1     | 3      | 2     | 1   | 1      | -      | -         | 1          | 15           | -       | -     | 1       | 2          | 41    | LQFP48   |
| MCXA143VFT   | 48MHz                           | 128 KB  | 32 KB  | 1     | 3      | 2     | 1   | 1      | -      | -         | 1          | 17           | -       | -     | 1       | 2          | 41    | HVQFN48  |
| MCXA143VFM   | 48MHz                           | 128 KB  | 32 KB  | 1     | 3      | 2     | 1   | 1      | -      | -         | 1          | 8            | -       | -     | 1       | 2          | 26    | HVQFN32  |
| MCXA142VLH   | 48MHz                           | 64 KB   | 16 KB  | 1     | 3      | 2     | 1   | 1      | -      | -         | 1          | 23           | -       | -     | 1       | 2          | 52    | LQFP64   |
| MCXA142VLF   | 48MHz                           | 64 KB   | 16 KB  | 1     | 3      | 2     | 1   | 1      | -      | -         | 1          | 15           | -       | -     | 1       | 2          | 41    | LQFP48   |
| MCXA142VFT   | 48MHz                           | 64 KB   | 16 KB  | 1     | 3      | 2     | 1   | 1      | -      | -         | 1          | 17           | -       | -     | 1       | 2          | 41    | HVQFN48  |
| MCXA142VFM   | 48MHz                           | 64 KB   | 16 KB  | 1     | 3      | 2     | 1   | 1      | -      | -         | 1          | 8            | -       | -     | 1       | 2          | 26    | HVQFN32  |
| MCXA133VLF   | 96MHz                           | 128 KB  | 32 KB  | 1     | 3      | 2     | 1   | -      | -      | -         | 1          | 15           | -       | -     | 1       | 2          | 44    | LQFP48   |
| MCXA133VFT   | 96MHz                           | 128 KB  | 32 KB  | 1     | 3      | 2     | 1   | -      | -      | -         | 1          | 17           | -       | -     | 1       | 2          | 44    | HVQFN48  |
| MCXA133VFM   | 96MHz                           | 128 KB  | 32 KB  | 1     | 3      | 2     | 1   | -      | -      | -         | 1          | 9            | -       | -     | 1       | 2          | 29    | HVQFN32  |
| MCXA132VLF   | 96MHz                           | 64 KB   | 16 KB  | 1     | 3      | 2     | 1   | -      | -      | -         | 1          | 15           | -       | -     | 1       | 2          | 44    | LQFP48   |
| MCXA132VFT   | 96MHz                           | 64 KB   | 16 KB  | 1     | 3      | 2     | 1   | -      | -      | -         | 1          | 17           | -       | -     | 1       | 2          | 44    | HVQFN48  |
| MCXA132VFM   | 96MHz                           | 64 KB   | 16 KB  | 1     | 3      | 2     | 1   | -      | -      | -         | 1          | 9            | -       | -     | 1       | 2          | 29    | HVQFN32  |
| FRDM-MCXA156 | MCX A156 FRDM Development Board |         |        |       |        |       |     |        |        |           |            |              |         |       |         |            |       | LQFP100  |
| FRDM-MCXA153 | MCX A153 FRDM Development Board |         |        |       |        |       |     |        |        |           |            |              |         |       |         |            |       | LQFP64   |

\*: Part is planned to launch in Q2 2025

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