

# MCX W23 Miniaturized Secure Bluetooth® Low Energy 5.3 Solution

The MCX W23 is a compact, ultra-low-power Bluetooth® Low Energy 5.3 solution designed for extended battery life in IoT applications. It features an embedded microcontroller with integrated flash memory, enabling efficient operation in power-sensitive environments.

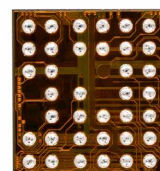
Engineered for flexibility, the MCX W23 supports direct operation from a wide range of primary batteries, including single-cell silver-oxide and lithium types.

Optimized for space-constrained designs, the MCX W23 delivers a cost-effective solution ideal for body-worn sensors and actuator applications. As part of the Certified EdgeLock Assurance program, it supports both SESIP Level 2 and PSA Level 2 security certifications.

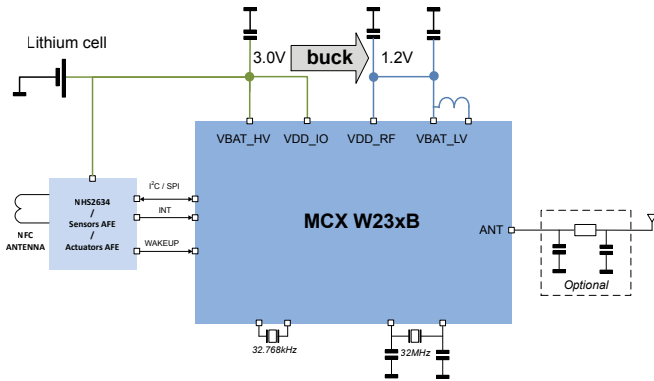
## Key Features

- 2.4 GHz RF transceiver supporting Bluetooth Low Energy 5.3
- Arm® Cortex®-M33 with TrustZone®, floating point unit (FPU) and memory protection unit (MPU) for application control and Bluetooth Low Energy host stack
- To support security requirements, the MCX W23 also offers support for HASH, AES, RSA, ECC, UUID, dynamic encrypt and decrypt of embedded flash memory with the PRINCE engine, PUF based key storage, secure boot and debug authentication.
- Real-time clock (RTC) clocked by the FRO\_32k at 32.768 kHz with 1 s resolution enables operation in the always-on power domain. Additionally, it also supports all low-power modes with 1 ms resolution.
- Integrated flash memory with error code correction enabling autonomous operation or operation with a host microcontroller.
- Multiple interfaces for control, data, debug, and test
- SPIFI with execute-in-place (XIP) feature uses up to four data lines to access off-chip SPI/DSPI/QSPI flash memory at a higher rate than standard SPI interfaces

- Flexible power management unit (PMU) for operation supporting multiple battery types:
  - MCX W23xB:
    - High-voltage supply mode (HV\_SM) for 3 V battery support using integrated buck DC-DC converter
    - External regulated supply mode (XR\_SM) for PMIC support (bypassing the integrated DC-DC converter)
  - MCX W23xA:
    - Low-voltage supply mode (LV\_SM) for 1.5 V battery support using integrated boost DC-DC converter
- High integration enabled by:
  - WLCSP package: < 6.56 mm<sup>2</sup> with 37 bumps
  - QFN package: 5mm x 5mm with 40 pins
- Low number of external passive components
- Operating temperature: -40 °C to +85 °C



MCX W23xB with 3 V lithium cell  
block diagram



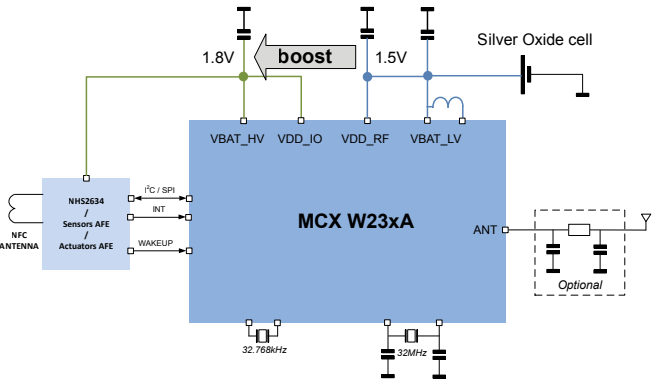
Software and Tools

- FRDM and EVK boards containing MCX W23 with support interfaces for SW development
- VS-Code integrated development environment (IDE) brings developers an easy to use development environment
- Source code for the peripheral drivers and example source code
- MCUXpresso software development kit (SDK) with connectivity stacks and examples
- Zephyr support

The MCX W23 comes with a reference application enabling fast SW development

- A modular SW architecture to allow easy reuse and modification
- Performance optimized for using Bluetooth LE, low-power and security features of the chip

MCX W23xA with 1.5 V silver oxide cell  
block diagram



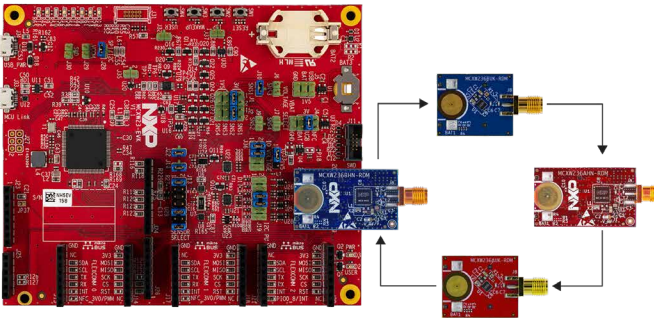
Benefits

- Flexible supply options
- Energy efficient
- Small solution size
- Easy enablement
- Safe and private
- Extensive On-chip memory
- Bluetooth Low Energy 5.3 certified
- Flexible interfaces

FRDM-MCXW23



MCX W23 EVK



EVK base board support is interchangeable with radio device modules.

MCX W23 Variant	Description
MCXW235A	512 kB Flash, 96 kB RAM, DC-DC Boost supply mode (1.1 V – 3.3 V)
MCXW235B	512 kB Flash, 96 kB RAM, DC-DC Buck supply mode (1.7 V – 3.3 V)
MCXW236A	1 MB Flash, 128 kB RAM, DC-DC Boost supply mode (1.1 V – 3.3 V)
MCXW236B	1 MB Flash, 128 kB RAM, DC-DC Buck supply mode (1.7 V – 3.3 V)

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