

# NHS52S04 Miniaturized Secure BLE 5.3 Solution

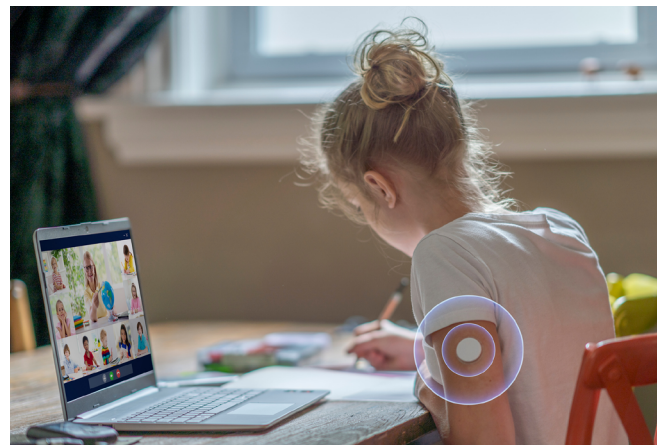
The NHS52S04 is an ultra-low power Bluetooth® Low Energy 5.3 solution with a small footprint. It hosts an embedded microcontroller with flash, enabling extended battery lifetime for healthcare IoT applications.

The NHS52S04 can run directly from a Lithium battery or from an external PMIC.

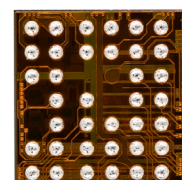
The NHS52S04 provides a cost-effective solution within a miniaturized solution area required for body-worn sensors and actuator applications.

## Key Features

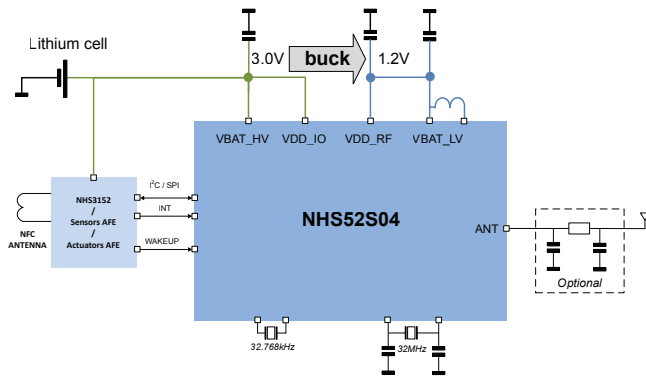
- 2.4 GHz RF transceiver supporting Bluetooth Low Energy 5.3
- Arm® Cortex®-M33 with TrustZone®, floating point unit (FPU) and memory protection unit (MPU) for application control and Bluetooth Low Energy host stack
- To support security requirements, the NHS52S04 also offers support for HASH, AES, RSA, 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



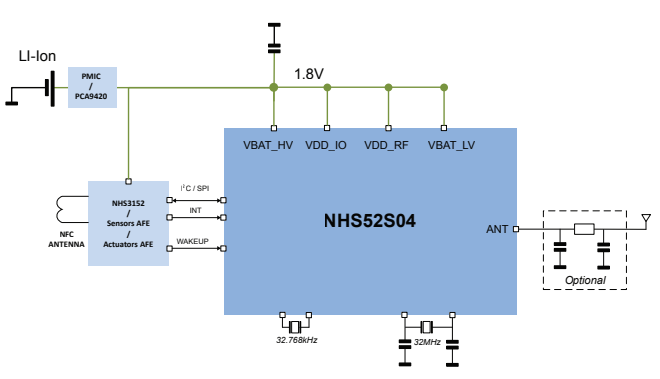
- Flexible power management unit (PMU) for operation supporting multiple battery types
- Flexible supply options:
  - High-voltage supply mode (HV\_SM) for 3 V battery support using integrated buck DC-DC converter
  - External regulated supply mode (XR\_SM) for PMIC support (bypassing the integrated DC-DC converter)
- 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



## NHS52S04 with 3 V Lithium Cell Block Diagram



## NHS52S04 with PMIC Block Diagram



## Software and Tools

- EVK board containing NHS52S04 with support interfaces for SW development
- MCUXpresso integrated development environment (IDE) brings developers an easy to use development environment
- Source code for the peripheral drivers and example source code
- Bluetooth Low Energy host stack

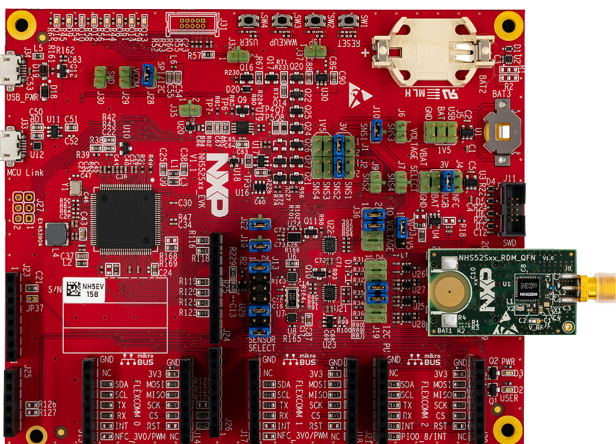
## The NHS52S04 comes with a reference application enabling fast SW development

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

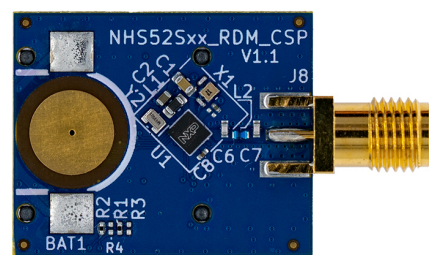
## Benefits

- 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

## NHS52S04 EVK



## NHS52S04 RDM CSP



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