

CONNECTIVITY CARD NRF52 M.2

Datasheet. Release 1.3

Remote monitoring of critical infrastructure with edge computing

The nRF52 Connectivity Cards from CTHINGS.CO® are extension cards based on the Nordic® Semiconductor nRF52840 SoC. They are multi-protocol chips designed to empower IoT integrators to implement Bluetooth® 5.3 including Bluetooth Low Energy, Bluetooth Mesh, Wirepas®, Thread®, Zigbee®, IEEE 802.15.4, ANT, and other 2.4 GHz protocol stacks.

The extension card allows for full-fledged utilisation of the on-board 32-bit ARM® Cortex™-M4 CPU with FPU. In addition, the ARM TrustZone® CryptoCell cryptographic unit brings an extensive range of cryptography options.

The product comes with full CE class-B and RED certification and can be used to quickly and reliably add 2.4 GHz protocol stack support to any existing device with **M.2 Key-E** slot (**key A+E** version also available on request) without worrying about certification or radio performance. A full J-Trace connector is available for convenient firmware development.

CTHINGS.CO also provides various pre-flashing options, including support for DFU bootloader for in-system programming of Zephyr® RTOS applications, and tested support for Wirepas Mesh 2.4 GHz profile.

SPECIFICATIONS

Hardware Features

- M.2 (key-E) connector pinout compliant (key A+E available)
- Single-ended U.FL antenna connector
- Based on Nordic® Semiconductor nRF52840
- Ultra-low power consumption
- J-Trace interface for easy debugging and FW development
- RF output power up to +8 dBm
- ARM® Cortex®-M4 32-bit processor with FPU, 64 MHz
- USB 2.0 full speed (12 Mbps) controller

Software Features

- DFU bootloader support for in-system programming of Zephyr RTOS
- Compatible with Wirepas Mesh 2.4 GHz profile firmware (including sink)
- Compatible with nRF Connect SDK

Electrical Specification

- 3.3 V nominal supply voltage (electrically M.2 compliant)
- 3.0 V - 5.0 V supply voltage range
- ESD protected
- Ultra-low power consumption

RF Interface

- 2360 - 2500 MHz operating frequency
- 1 MHz PLL channel spacing
- ±170 kHz frequency deviation @ 1 Mbps
- ±320 kHz frequency deviation @ 2 Mbps
- 125 - 2000 kbps on-the-air data rate

Embedded Security

- ARM® TrustZone® Cryptocell 310 security subsystem
 - Secure boot ready
 - Secure erase
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SPECIFICATIONS

Certifications

The CTHINGS.CO® nRF52 M.2 5G Suite Connectivity Card is CE Class-B, Radio Equipment Directive (RED), & EU RoHS directive compliant. US FCC and UK CA certification is planned. The device has been tested to meet the following electromagnetic compatibility standards:

Electromagnetic emissions:

- Conducted emission: EN 55022, EN 55014-1, EN 55011
- Radiated emission up to 6 GHz
- Harmonic current emission: EN 61000-3-2
- Voltage fluctuations and flicker: EN 61000-3-3

Immunity to electromagnetic interference (EMI):

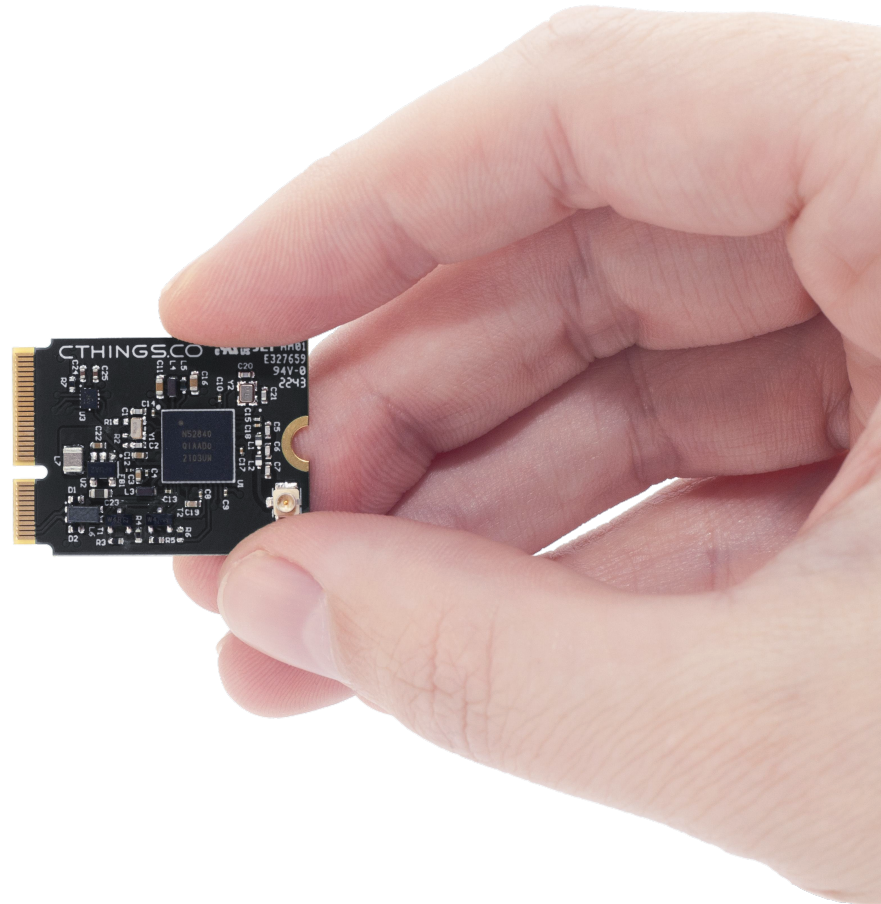
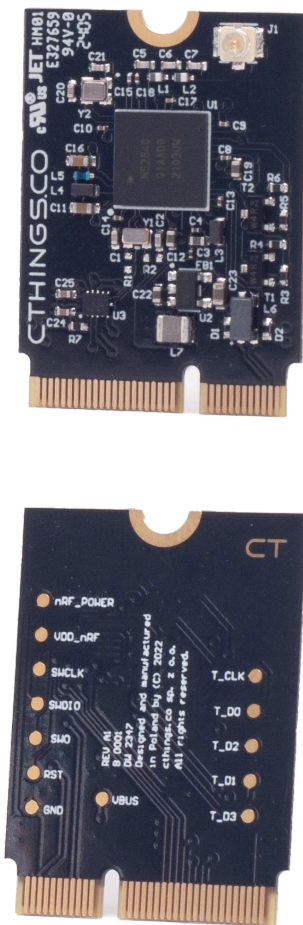
- Electrostatic discharge (ESD) immunity: EN 61000-4-2
- Radiated electromagnetic field immunity: EN 61000-4-3
- Electrical fast transient / burst immunity: EN 61000-4-4
- Surge immunity: EN 61000-4-5
- Conducted disturbance immunity: EN 61000-4-6
- Power frequency magnetic field immunity: EN 61000-4-8
- Pulse magnetic field immunity: EN 61000-4-9
- Voltage dips & short interruptions: EN 61000-4-11

Use Cases

- IoT Gateways
- Workstations and Laptops
- Cellular backhaul systems for non-cellular Wirepas meshes
- Bluetooth interface for IoT sensors
- Gateways for Nordic® Semiconductor nRF52 based IoT systems

Wirepas Mesh	Plug-and-play support for Wirepas 2.4 GHz profile mesh networks	M.2 Pinout Compliance	Small and standardised form factor compliant with common hardware
Bluetooth® 5.3	IEEE 802.15.4-2006, 2.4 GHz transceiver	Multiprotocol	Bluetooth Low Energy, Bluetooth Mesh, Thread, Zigbee, IEEE 802.15.4, ANT, Wirepas
Certified Radio Equipment	Full CE Class-B & Radio Equipment Directive (RED) certification	In-system firmware upgrades	Support for in-system programming with an optional factory-provided DFU bootloader for Zephyr RTOS applications
Performant CPU	32-bit ARM Cortex-M4 CPU with floating-point unit	Zephyr support	Out-of-the-box support for Zephyr RTOS

External appearance



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