



# CONNECTIVITY CARD NRF52840 M.2

Datasheet. Release 1.6

## 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 on a programming jig 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

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<b>Hardware Features</b>	<ul style="list-style-type: none"><li>• M.2 (key-E) connector pinout compliant (key A+E available)</li><li>• Single-ended U.FL antenna connector</li><li>• Based on Nordic® Semiconductor nRF52840</li><li>• Ultra-low power consumption</li><li>• RF output power up to +8 dBm</li><li>• ARM® Cortex®-M4 32-bit processor with FPU, 64 MHz</li><li>• USB 2.0 full speed (12 Mbps) controller</li><li>• Compatible with CTHINGS.CO Programming Jig</li></ul>
<b>Software Features</b>	<ul style="list-style-type: none"><li>• Compatible with Nordic Semiconductors <b>nRF Connect SDK</b></li><li>• DFU bootloader support for in-system programming of Zephyr RTOS</li><li>• Compatible with Wirepas Mesh 2.4 GHz profile firmware (including sink)</li></ul>
<b>Electrical Specification</b>	<ul style="list-style-type: none"><li>• 3.3 V nominal supply voltage (electrically M.2 compliant)</li><li>• 3.0 V - 5.0 V supply voltage range</li><li>• ESD protected</li><li>• Ultra-low power consumption</li></ul>
<b>RF Interface</b>	<ul style="list-style-type: none"><li>• 2360 - 2500 MHz operating frequency</li><li>• 1 MHz PLL channel spacing</li><li>• ±170 kHz frequency deviation @ 1 Mbps</li><li>• ±320 kHz frequency deviation @ 2 Mbps</li><li>• 125 - 2000 kbps on-the-air data rate</li></ul>
<b>Embedded Security</b>	<ul style="list-style-type: none"><li>• ARM® TrustZone® Cryptocell 310 security subsystem</li><li>• Secure boot ready</li><li>• Secure erase</li></ul>

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## SPECIFICATIONS

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### Certifications

The CTHINGS.CO® nRF52 M.2 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):

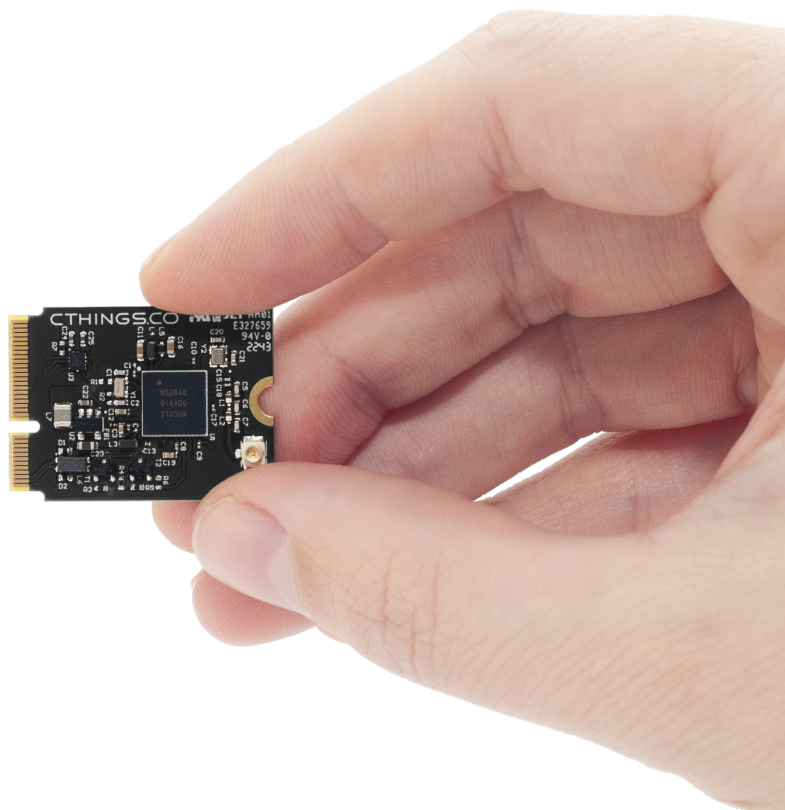
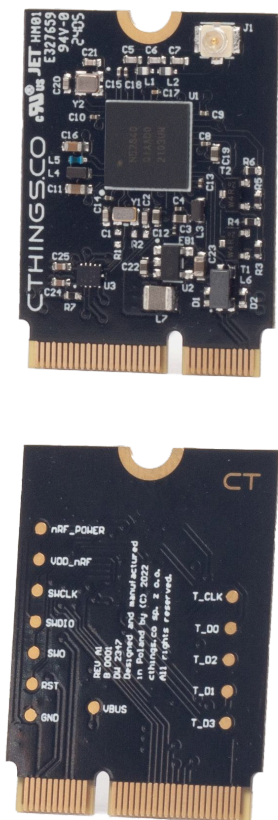
- Electrostatic discharge (ESD) immunity: EN 61000-4-2
- Radiated electromagnetic field immunity: EN 61000-4-3

### Use Cases

- Edge IoT Gateways
- Workstations and Laptops
- Cellular backhaul systems for non-cellular 2.4GHz Mesh Networks
- Bluetooth interface for IoT sensors
- Gateways for Nordic® Semiconductor nRF52 based IoT systems

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

## External appearance



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