CONNECTIVITY CARD
LTE + NRF52840 MPCIE

Datasheet. Release 1.2

Remote monitoring of critical infrastructure with edge computing

The Combo Connectivity Cards from CTHINGS.CO® are extension cards based on the Nordic® Semiconductor nRF52840 SoC and Quectel EG25 series of LTE Cat 4 modules optimized specially for M2M and IoT applications. Adopting the 3GPP Rel-11 LTE technology, it delivers maximum data rates up to 150 Mbps downlink and 50 Mbps uplink. It's a combination of multi-protocol chips designed to empower IoT integrators to implement LTE Cat 4, UMTS/HSPA(+), Bluetooth® 5.3 including Bluetooth Low Energy, Bluetooth Mesh, Wirepas®, Thread®, Zigbee®, 802.15.4, ANT, and other 2.4 GHz protocol stacks.

The product comes with full CE class-B and RED certification and can be used to quickly and reliably add 2.4 GHz and Cellular LTE protocol stack support to any existing device with a **mini-PCIe** 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, and tested support for Wirepas Mesh 2.4 GHz profile.

SPECIFICATIONS

Hardware Features	• Mini PCI-express connector pinout compliant • Single-ended U.FL antenna connectors • Based on Nordic® Semiconductor nRF52840 • Based on Quectel® EG25-G • Ultra-low power consumption • 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 • Compatible with CTHINGS.CO Programming Jig
Software Features	• 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 mini-PCIe compliant) • 3.0 V – 3.5 V supply voltage range • ESD protected • Ultra-low power consumption
Cellular Modem features	• 3GPP LTE release 11 Cat 4 compliant

RF transceiver for global coverage	• Up to 23 dBm output power in LTE
	• RX sensitivity:
	   • –100 dBm for LTE
	   • –110 dBm for WCDMA

Cellular band support in hardware:	• LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B12/B13/B18/ B19/B20/B25/B26/B28 • LTE-TDD: B38/B39/B40/B41 • WCDMA: B1/B2/B4/B5/B6/B8/B19 GSM: B2/B3/B5/B8
Embedded Security	• ARM® TrustZone® Cryptocell 310 security subsystem • Secure boot ready • Secure erase
RF transceiver for local coverage	• 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

© CTHINGS.CO   contact@cthings.co   2

SPECIFICATIONS

Certifications

The CTHINGS.CO® Combo mPCIe 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

Wirepas Mesh	Plug-and-play support for Wirepas 2.4 GHz profile mesh networks	**Mini-PCIe Pinout Compliance**	Small and standardised form factor compliant with common hardware
Bluetooth® 5.3	IEEE 802.15.4-2006, 2.4 GHz transceiver	**Multiprotocol**	LTE, WCDMA, GPS, Bluetooth Low Energy, Bluetooth Mesh, Thread, Zigbee, Wirepas 2.4GHz
Certified Radio Equipment	Full CE Class-B & Radio Equipment Directive (RED) certification	**In-system firmware upgrades**	Support for in-system programming (SWD)
Performant CPU	32-bit ARM Cortex-M4 CPU with floating-point unit	**Cellular Network**	LTE Cat. 4, WCDMA/HSPA(+)

External appearance
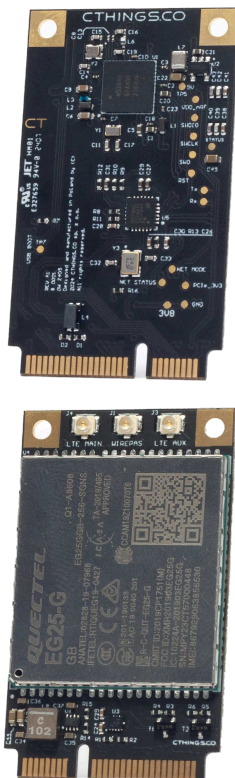
Start your digital transformation journey

Order now

© CTHINGS.CO   contact@cthings.co   4

Confidentiality

This document is based on information provided by CTHINGS.CO Sp. z o.o. (the "Company"). It is being communicated on behalf of the Company to you solely for information and for the exclusive use of the selected persons to whom it is addressed for the purpose of their considering whether to proceed with a further analysis of a potential transaction (the "Transaction") involving the Company. This document should not be used for any other purpose. This document is strictly confidential and cannot be disclosed, revealed, reproduced or redistributed, in whole or in part, by or to any other person without the prior written consent of the Company.

All rights reserved

Disclaimer

The information herein is believed to be correct as of the date issued. The Company will not be responsible for damages of any nature resulting from the use or reliance upon the information contained herein. The Company makes no warranties, expressed or implied, of merchantability or fitness for a particular purpose or course of performance or usage of trade. Therefore, it is the user's responsibility to thoroughly test the product in their particular application to determine its performance, efficacy, and safety. Users should obtain the latest relevant information before placing orders.

Unless The Company has explicitly designated an individual product as meeting the requirement of a particular industry standard, The Company is not responsible for any failure to meet such industry standard requirements.

Unless explicitly stated herein this document, The Company has not performed any regulatory conformity test. It is the user's responsibility to assure that necessary regulatory conditions are met and approvals have been obtained when using the product. Regardless of whether the product has passed any conformity test, this document does not constitute any regulatory approval of the user's product or application using the product.

Nothing contained herein is to be considered as permission or a recommendation to infringe any patent or any other intellectual property right. No license, expressed or implied, to any intellectual property right is granted by The Company herein.

The Company reserves the right to at any time correct, change, amend, enhance, modify, and improve this document and/or products without notice. This document supersedes and replaces all information supplied prior to the publication hereof.