

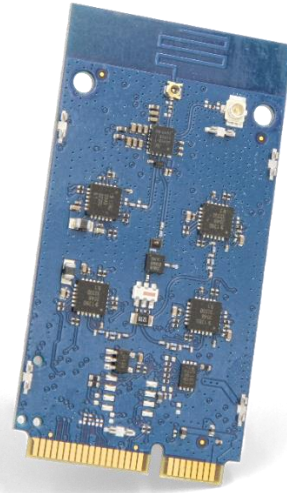
miro

EdgeCard 2G4



HIGH PERFORMANCE 2.4 GHZ LORA® GATEWAY CARD

2.4 GHz LoRa® Gateway mPCIe card with unique performance and features like power amplifier, integrated antenna, diversity



miro EdgeCard 2G4, a high-performance, fully compliant mini PCI Express 2.4 GHz LoRa® gateway card, provides a plug-and-play solution for long-range and low-power wireless communication networks based on the LoRa® standard worldwide license free 2.4 GHz ISM band.

The card is fully firmware binary-compliant to Semtech's 1+3 SX1280-based gateway reference design. It allows to build high-performance LoRa® gateway solutions in the worldwide available 2.4 GHz ISM band. Each Gateway module offers 3 receive channels and a single dedicated transmit channel.

KEY BENEFITS

- Fully binary compatible to Semtech's 1+3 SX1280 LoRa® gateway reference design
- 1 TX channel, 3 RX channels
- Fully mPCI-e compliant card (USB 2.0 CDC)
- Integrated power amplifier option (21 dBm)
- antenna options software selectable (internal, external or antenna diversity)
- HW support for SX1280-ToF advanced ranging and localization

APPLICATIONS

- High performance LoRa® gateways
- Global logistics, Freight tracking, Smart Ships
- Smart buildings, Smart Factories, Industry 4.0
- Indoor and outdoor localization and ranging
- Facility management

ABOUT

File name	miro EdgeCard 2G4 datasheet
Document type	Datasheet
Date	2021/07/12
Revision	1.2.312

REVISION HISTORY

Date	Release	Changes
2021/03/20	1.0	Initial draft
2021/07/21	1.1	Updated Images, specs, added LNA info
2021/08/09	1.2	Updated FCC info

TABLE OF CONTENT

Document Information	2
Functional Description	3
Technical Specifications	4
Integration Guidelines	5
Mechanical Dimensions	5
Additional Documentation	6
Device Options	6
Keep in touch	7

Functional Description

miro EdgeCard 2G4 is a high-performance, fully standard compliant mPCIe 2.4 GHz LoRa® gateway card. It can run any firmware binary built for Semtech's 1+3 SX1280 gateway reference design while providing more features and significant better performance. The powerful ARM-Cortex M4 190 MHz MCU can run any standard or proprietary MAC-layer protocol using various combinations of LoRa® and other SX1280-supported PHYs like FLRC, BLE, G(FSK), ranging, advanced ranging and Time-of-Flight (ToF) localization - both indoor and outdoor. The optionally integrated RF power amplifier provides a maximum transmission output power of up to 21 dBm. Together with the highly optimized HF paths using low pass and SAW filters the **miro EdgeCard 2G4** allows to build highest capacity gateways which can be placed in high-density urban or long-range rural environments and connect a large variety of sensors to LoRa® and proprietary networks.

Applications can take advantage of LoRa® (long range, robustness against radio noise) and the huge ecosystem of LoRaWAN® components and infrastructure like gateways, packet forwarders, network-servers, cloud services and many more. Moreover, existing edge-level network devices can be easily upgraded to act as 2.4 GHz or even dual-band LoRa® gateways (868/915 MHz & 2.4 GHz). Any host system capable of USB CDC is supported. Each Gateway module offers three receive channels and a single dedicated transmit channel. This allows to receive data from multiple devices on different channels at the same time.

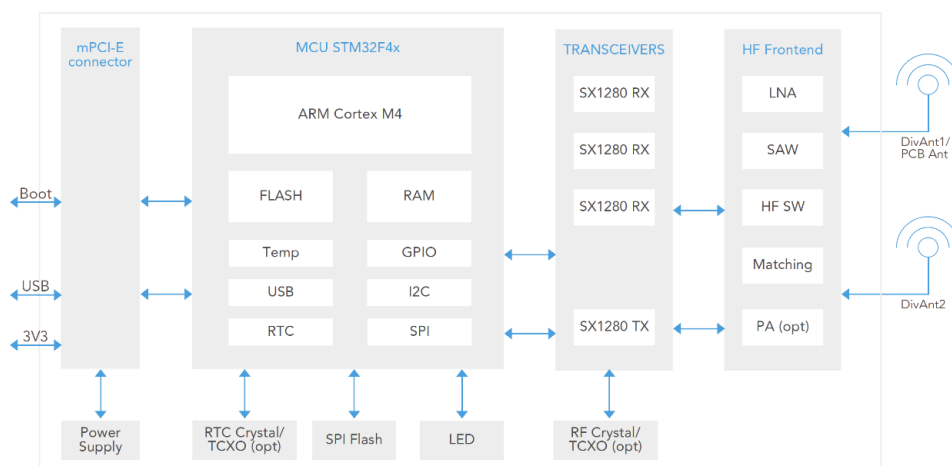


Figure 1: miro EdgeCard Block Diagram

Technical Specifications

MECHANICAL SPECIFICATIONS

Weight	16 g
Dimensions	63.15 x 30 x 25 mm

OPERATING CONDITIONS

Temperature	-25 – 85 °C
Humidity	0 – 95% RH, non-condensing

DEVICE POWER SUPPLY

Power supply	According to PCI Express specifications (3.3VDC)
Power consumption	10..100 mA @ 3.3VDC

RADIO / WIRELESS

Supported ISM bands	2.4 GHz (2400..2480 MHz)
Supported coding schemes	LoRa®, FLRC, BLE, G(FSK)
Data rates	Up to 1.3 MBps
Rx sensitivity	-129.5 dBm (SF12)
LNA gain	11 dB (Typ)
RF transmission power	21 dBm (Pro version with PA, 22 dB gain) 12.5 dBm (standard version)
Supported antennas (software selectable)	2x (on-board PCB antenna, U.FL connector)
Antenna diversity (option)	2x U.FL connector

CERTIFICATIONS

CE	RED 2014/53/EU
FCC	FCC ID 2AUQE14DJC

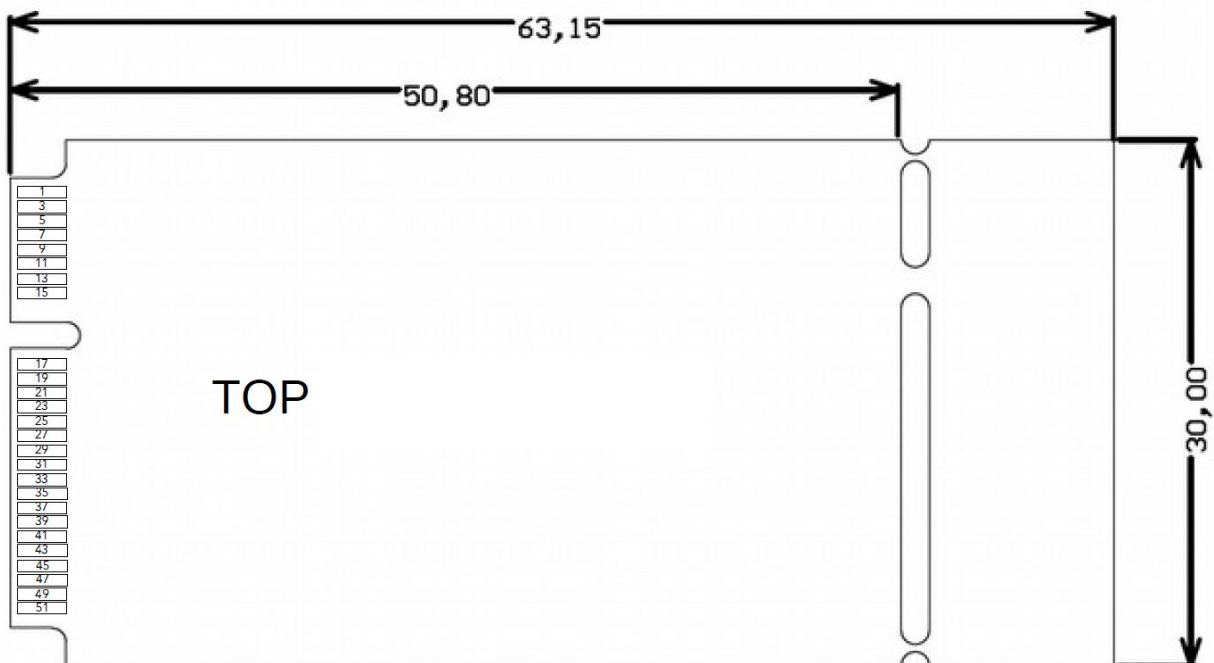
FCC Caution: Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Antenna model 2J0902 by 2J Antennas, 2.2 dBi

Integration Guidelines

The **miro EdgeCard 2G4** is fully backwards compatible to Semtech's 1+3 SX1280 2.4 GHz LoRa reference design. This means that any firmware binary running on any gateway card following the reference design will run on **miro EdgeCard 2G4** and **miro EdgeCard 2G4-PRO** as well. Please keep in mind that you will see slightly different RSSI values of received packets compared to the reference design. This is a result of different LNA gains (16 dB vs 11 dB typical) but has no influence at all on the overall RX performance namely sensitivity limits. Any firmware can correct this offset if required.

More detailed information and schematics available on request.

Mechanical Dimensions



Additional Documentation

ADDITIONAL RESSOURCES

[Product Information Page](#)

[Product Website](#)

[Technical Documentation](#)

[Technical Documentation Website](#)

Device Options

PRODUCT ID	Options				
	12.5 dBm	21 dBm	PCBAnt + .FL Conn	Antenna Diversity	SPI Flash, TCXOs
GWC-EDGE-LW/2G4	■		■		
GWC-EDGE-LW/2G4/PRO		■		■	
GWC-EDGE-LW/2G4/PRO-DM		■		■	■



Keep
in touch

Miromico AG

Gallusstrasse 4
CH-8006 Zürich
Switzerland

info@miromico.ch
www.miromico.ch
<https://forum.miromico.ch>

DISCLAIMER

We reserve the right to make technical changes, which serve to improve the product, without prior notification.

SAFETY-CRITICAL, MILITARY, AND AUTOMOTIVE APPLICATIONS DISCLAIMER: Miromico products are not designed for and will not be used in connection with any applications where the failure of such products would reasonably be expected to result in significant personal injury or death ("Safety-Critical Applications") without an Miromico officer's specific written consent. Safety-Critical applications include, without limitation, life support devices and systems, equipment, or systems for the operation of nuclear facilities and weapons systems. Miromico products are not designed nor intended for use in military or aerospace applications or environments. Miromico products are not designed nor intended for use in automotive applications unless specifically designated by Miromico as automotive grade.

© 2021 Miromico AG. All rights reserved.