

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



Description

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.

Features

- ▶ 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)
- ▶ Optional power amplifier option (20 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

Document Information

About

File name	Document type	Date	Revision
DS miro Edge 2G4	Datasheet	2022/03/01	1.3

Revision history

Date	Release	Changes
2021/03/20	1.0	Initial draft
2021/07/21	1.1	Updated Images, specs, LNA info
2022/01/18	1.2	Updated FCC info
2022/03/01	1.3	New Design

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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 20 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 a 2401MHz-2479MHz LoRa® gateway. 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.

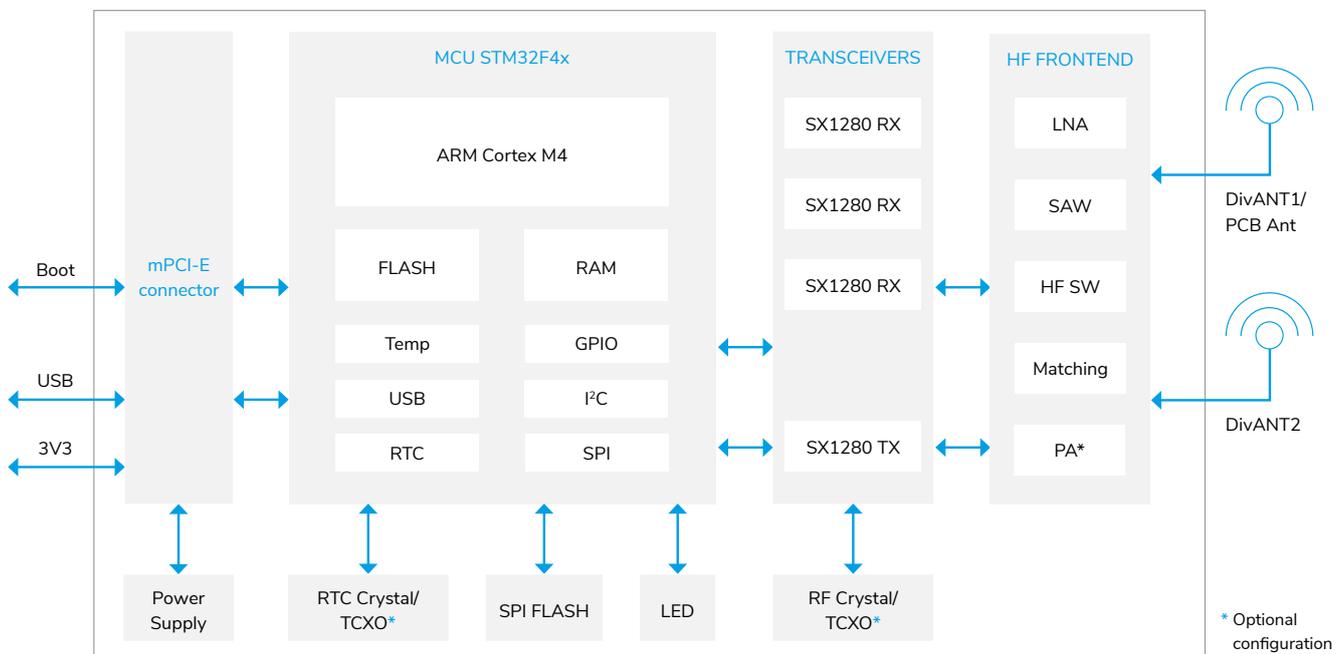


Figure 1: Block diagram miro EdgeCard

Technical Specifications

Mechanical specifications

Weight	16 g
Dimensions	58 × 30 × 2 mm, see Figure 2, Page 6

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	55..85 mA @ 3.3VDC
	175 mA (20 dBm PA) @ 3.3VDC

Radio / wireless

Supported ISM bands	2.4 GHz (2401MHz-2479MHz)
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	20 dBm (Pro version with PA, 22 dB gain)
Supported antennas (software selectable)	2× (on-board PCB antenna, U.FL connector)
Antenna diversity (option)	2× U.FL connector

Certifications

CE	
UKCA	
FCC	FCC ID: 2AUQEBQN90

FCC Information

CAUTION

FCC ID	2AUQEBQN90
Antenna Manufacturer	2J Antennas
Antenna Model	2J0902-C115N
Antenna type	External
Antenna gain	2.2dBi

Host product manufacturers need to provide a physical or e-label stating, “Contains FCC ID: 2AUQEBQN90” with their finished product. Only those antennas with same type and lesser gain filed under this FCC ID can be used with this device. The host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. The final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed. The final host integrator must ensure there is no instruction provided in the user manual or customer documentation indicating how to install or remove the transmitter module except such device has implemented two-ways authentication between module and the host system. The final host manual shall include the following regulatory statement: This equipment has been tested and found to comply with the limits. 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. This module has been tested and found to comply with part 15.247 requirements for Modular Approval. This module is intended for OEM integrator. The OEM integrator is responsible for the compliance to all the rules that apply to the product into which this certified RF module is integrated. Additional testing and certification may be necessary when multiple modules are used.

FCC RF Radiation Exposure Statement:

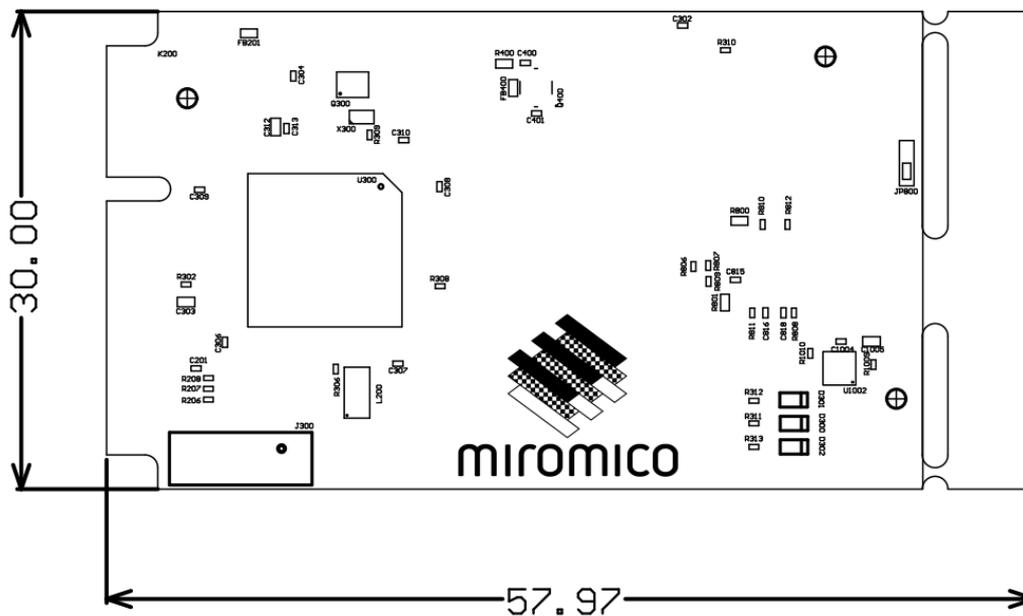
1. This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
2. This equipment complies with RF radiation exposure limits set forth for an uncontrolled environment.
3. This equipment should be installed and operated with minimum distance 20cm between the radiator& your body.

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 Resources

Product Information Page	https://miromico.ch/miro-edgecard
Technical Documentation	https://docs.miromico.ch/datasheets/gateways.html

Device Options

Product ID	Options				
	12.5 dBm	20 dBm	Int. Antenna/ U.FL Conn	Ext Antenna Diversity	SPI Flash, RTC TCXO
GWC-EDGE-LW/2G4	✓		✓		
GWC-EDGE-LW/2G4/PRO		✓		✓	
GWC-EDGE-LW/2G4/PRO-DM		✓			✓
GWC-EDGE-LW/2G4/PRO-DIV		✓		✓	✓

Keep in touch

Miromico AG
Gallusstrasse 4
CH-8006 Zürich
Switzerland

info@miromico.ch
www.miromico.ch

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