# ED-GW1303S REV1.0

## LORAWAN GATEWAY MODULE

SX1303 + SX1250, MINI PCIE, SPI, US915 / EU868

2021-11-11

EDA TECHNOLOGY CO.,LTD

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# Revision History

| Date | Version | Description | Note |
|---|---|---|---|
| 2021-11-11 | Draft | Initial release. | |
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# Contents

# Chapter 1 Overview

ED-GW1303S module is a new generation of LoRaWAN gateway module in mini-PCIe form-factor with SPI interfaces based on Semtech® SX1303 and SX1250. It features extremely low power consumption, outstanding performance with CE, FCC certified.

ED-GW1303S LoRaWAN gateway module support both US915 and EU868 frequency bands, enable you to have a wide-range of LoRaWAN frequency plans options to choose including EU868, US915, AS923, AS920, AU915, KR920, and IN865.

ED-GW1303S is designed for M2M and IoT applications and can be widely applied in LPWAN gateway supported scenarios. It would be a perfect choice for you to significantly reduce the technical difficulties and time-consumption when developing the LoRa gateway devices, including LoRaWAN gateway, miner hotspots, etc.

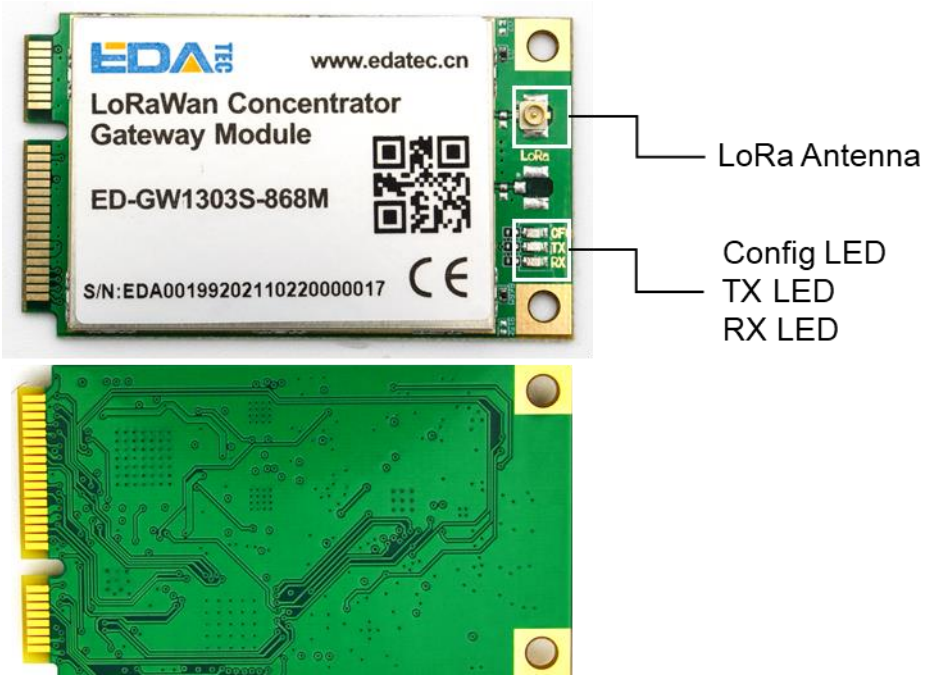
## 1.1 Features

- Mini PCIe form factor with SPI interfaces
- Powered by Semtech® SX1303 baseband processor
- Ultra-low operating temperature without additional heat dissipation needed
- High sensitivity with Semtech® SX1250 TX/RX front-end; TX power up to 25 dBm @3.3V
- Supports global license-free frequency band including EU868, US915, AS923, AU915, KR920 and IN865
- Certified with CE, FCC

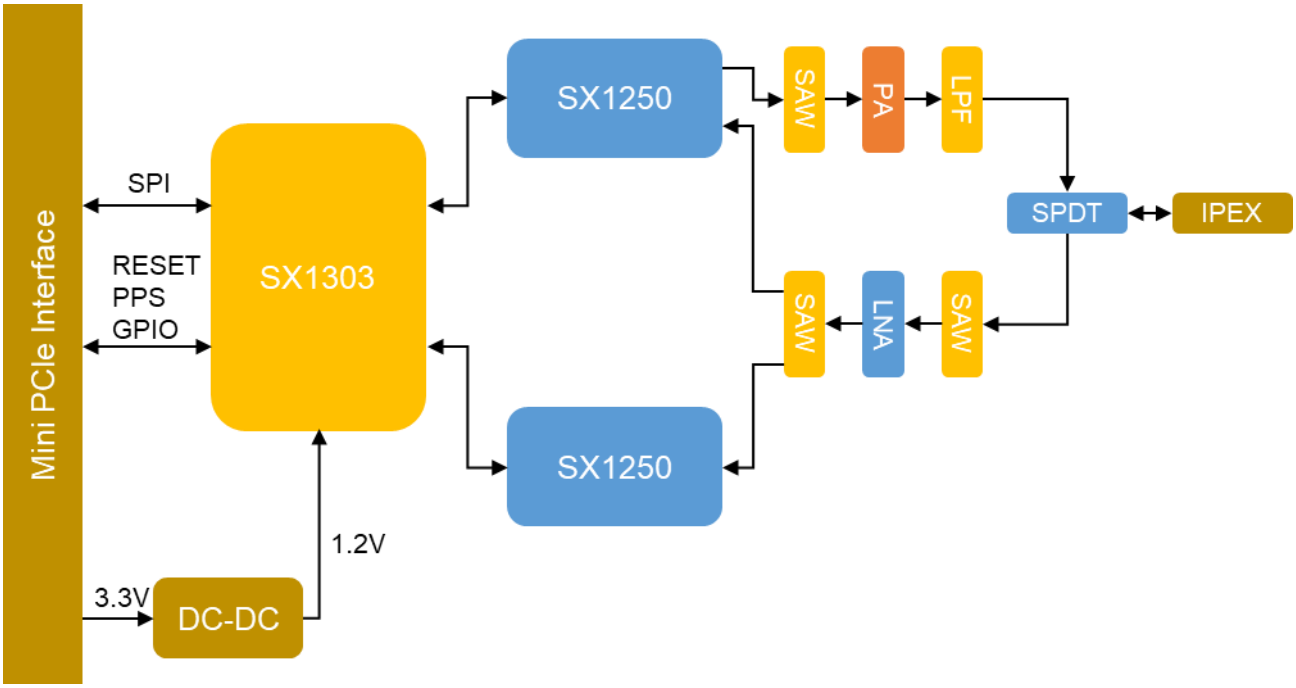
## 1.2 Ordering Code

| Code | Description |
|---|---|
| ED-GW1303S-915M | US915 |
| ED-GW1303S-868M | EU868 |

## 1.3 Interface Diagram



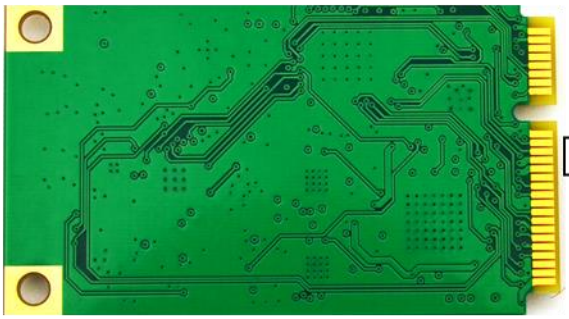
## 1.4 Block Diagram



# Chapter 2 Interfaces

## 2.1 Pinout

| | | | | | |
|---|---|---|---|---|---|
| RESERVED | 1 | | | 2 | VCC_3V3 |
| NC | 3 | | | 4 | GND |
| NC | 5 | | | 6 | NC |
| NC | 7 | | | 8 | NC |
| GND | 9 | | | 10 | RESERVED |
| RESERVED | 11 | | | 12 | RESERVED |
| RESERVED | 13 | | | 14 | NC |
| GND | 15 | | | 16 | NC |
| NC | 17 | | | 18 | GND |
| PPS | 19 | | | 20 | NC |
| GND | 21 | | | 22 | NRESET |
| RESERVED | 23 | | | 24 | VCC_3V3 |
| NC | 25 | | | 26 | GND |
| GND | 27 | | | 28 | NC |
| GND | 29 | | | 30 | NC |
| RESERVED | 31 | | | 32 | NC |
| NC | 33 | | | 34 | GND |
| GND | 35 | | | 36 | RESERVED |
| GND | 37 | | | 38 | RESERVED |
| VCC_3V3 | 39 | | | 40 | GND |
| VCC_3V3 | 41 | | | 42 | RX_ON |
| GND | 43 | | | 44 | TX_ON |
| SX_SCK | 45 | | | 46 | CFG_ON |
| SX_MISO | 47 | | | 48 | NC |
| SX_MOSI | 49 | | | 50 | GND |
| SX_CSN | 51 | | | 52 | VCC_3V3 |

## 2.2 Power

| Pin Name | Pin ID | Pin Type | Description |
|---|---|---|---|
| GND | 4,9,15,18,21,26,27,29,34,35,37,40,43,50 | | |
| 3.3V | 2,24,39,41,52 | PI | Power In |

The power in voltage of ED-GW1303S is 3.3V. Under TX mode, the max current can be 400mA.

## 2.3 SPI Interface

| Pin Name | Pin ID | Pin Type | Description |
|---|---|---|---|
| SX_CLK | 45 | DI | SPI Clock |
| SX_MISO | 47 | DO | SPI MISO |
| SX_MOSI | 49 | DI | SPI MOSI |
| SX_CSN | 51 | DI | SPI CS |

## 2.4 Control Signals

| Pin Name | Pin ID | Pin Type | Description |
|---|---|---|---|
| PPS | 11 | DI | GPS PPS |
| NRESET | 13 | DI | RESET Pin |
| RX_ON | 42 | DO | RX Indicate |
| TX_ON | 44 | DO | TX Indicate |
| CFG_ON | 46 | DO | CONFIG Indicate |

### 2.4.1 PPS

Support GPS-PPS, this can be used to receive data packets with timestamps.

### 2.4.2 NRESET

This signal can be used to reset the module, active HIGH.

### 2.4.3 RX_ON

When receive is enabled, the RX_ON signal will output HIGH, and the RX LED will on.

### 2.4.4 TX_ON

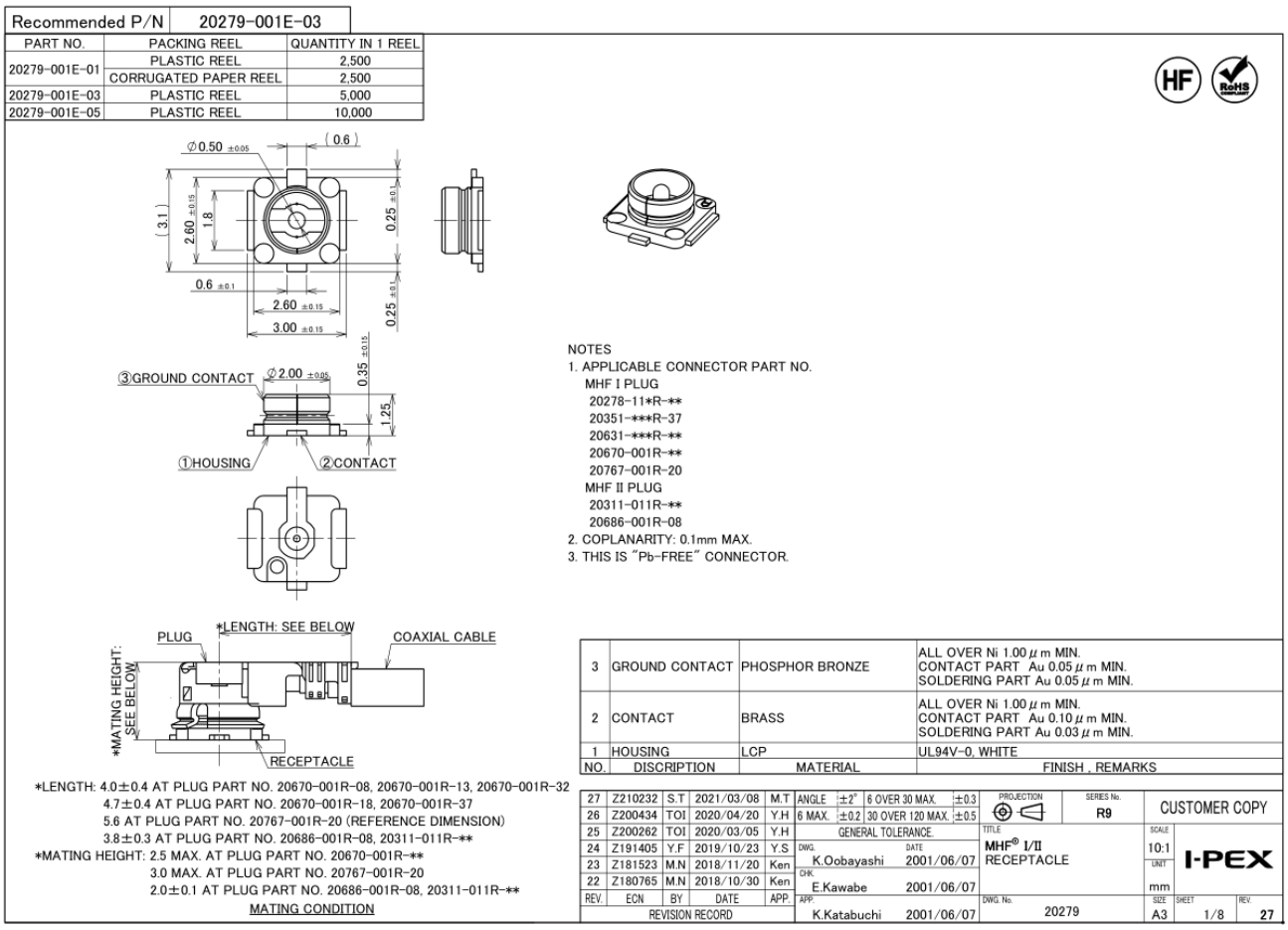
When transmit is enabled, the TX_ON signal will output HIGH, and the TX LED will on.

### 2.4.5 CFG_ON

When the module is configurated successful, the CFG_ON signal will output HIGH, and the CFG LED will on.

## 2.5 Antenna Connector

The Antenna connector is compatible with I-PEX 1 standard.



# Chapter 3 Electrical Characteristics

## 3.1 Power

| Parameter | Description | Min | Type | Max | Unit |
|---|---|---|---|---|---|
| VCC | Power In | 3.0 | 3.3 | 3.6 | V |

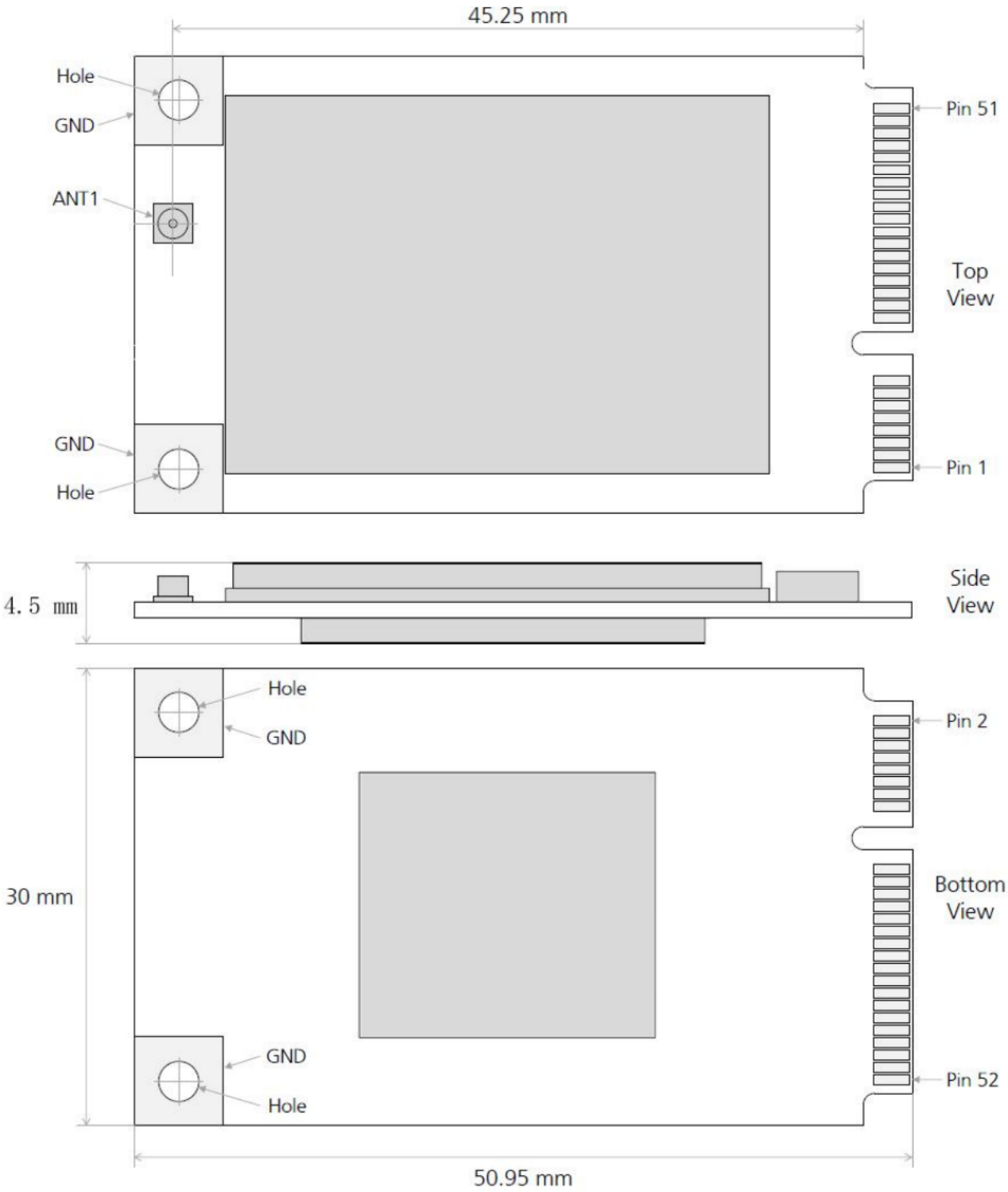
## 3.2 IO

| Parameter | Description | Min | Max | Unit |
|---|---|---|---|---|
| VIH | Input High Voltage | 0.7 * VCC | VCC + 0.3 | V |
| VIL | Input Low Voltage | -0.3 | 0.3 * VCC | V |
| VOH | Output High Voltage | VCC – 0.5 | VCC | V |
| VOL | Output Low Voltage | 0 | 0.4 | V |

## 3.3 Current

| Parameter | Operation Mode | Type | Unit |
|---|---|---|---|
| RX | RX Enable, TX Disable | 54 | mA |
| TX / RX | RX Enable, TX@25dBm | 360 | mA |
| IDLE | RX Disable, TX Disable | 27 | mA |

# Chapter 4 Dimension



# Chapter 5 Contact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## 5.1 About EDATEC

EDA Technology Co.,Ltd is located in Shanghai, it is one of Raspberry Pi's Global Design Partners. Our vision is to offer the hardware solutions for IoT, Industrial Control, Automation, Green Energy & Artificial Intelligence solutions based on Raspberry Pi Technology platform.

We provide the standard hardware solution, custom design &manufacturing services that accelerate the electronic product development and time to market.

# Peripheral Design Requirement

## List of applicable FCC rules:

FCC Part15 Subpart C, Section 15.247

## Specific operational use conditions

The information in this article, including the URL for reference, if there is any change, without prior notice.

Documents are provided by the current version without any guarantee responsibility, including merchantability, suitable for any particular purpose or non-infringement guarantees, and any guarantees presented by any proposal, specification, or sample mentioned elsewhere. This document has no any responsibility, including the use of the information within this document produced by the infringement of any patent rights. This document in this, by estoppel or otherwise, grant any intellectual property licensing, whether express or implied license.

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**FCC regulatory information**
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.
Warning: changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

**End Device Labelling**
Please notice that if the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains FCC ID: 2A3GI-EDGW1303S" any similar wording that expresses the same meaning may be used.

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

**Installation Notice**

The module is limited to OEM installation ONLY. The OEM integrator is responsible for ensuring that the end-user has no manual instruction to remove or install module.

**FCC Part 15B Compliance of End Device**

The OEM integrator is responsible for ensuring that the host product which is installed and operating with the module is in compliant with Part 15B unintentional Radiator requirements, please note that For a Class B digital device or peripheral, the instructions furnished the user manual of the end-user product shall include the following or similar statement, placed in a prominent location in the text of the manual:

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio, which can be determined by turning the equipment off and on.

# Limited module procedures

This module is an unrestricted module

# FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

FCC INFORMATION (additional)

OEM INTEGRATION INSTRUCTIONS:

This device is intended only for OEM integrators under the following conditions: The module must be installed in the host equipment such that 20 cm is maintained between the antenna and users, and the transmitter module may not be co-located with any other transmitter or antenna. The module shall be only used with the internal antenna(s) that has been originally tested and certified with this module. As long as 3 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

Validity of using the module certification:

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization for this module in combination with

the host equipment is no longer considered valid and the FCC ID of the module cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

## Antennas

The module doesn’t have onboard antenna, but has an antenna connector which is compatible with I-PEX 1 standard.

## Label and compliance information

| |
|---|
| FCC ID: XXX-XXX |

The final end product must be labeled in a visible area with the following: “Contains FCC ID: 2A3GI-EDGW1303S”. Information that must be placed in the end user manual:

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual. The module not applicable Limited module procedures. The module is a Single module and complies with the requirement of FCC Part 15.247

*Warning: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.*

*NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to IC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio, which can be determined by turning the equipment off and on.*

## Information on test modes and additional testing requirements

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

RADIATED EMISSION TEST (BELOW 1GHz):

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports (if EUT with antenna

diversity architecture).
For the test results, only the worst case was shown in test report.
RADIATED EMISSION TEST (ABOVE 1GHz):
Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports (if EUT with antenna diversity architecture).

# Additional testing Part 15 Subpart B disclaimer

The grantee should include a statement that the modular transmitter is only FCC authorized for the specific rule parts (i.e.， FCC transmitter rules ) listed on the grant, and that 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 .If the grantee markets their product as being Part 15 Sub part B compliant( when it also contains unintentional - radiator digital circuit y), then the grantee shall provide a notice stating that the final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.