

# ED-GW1302S REV1.0

## LORAWAN GATEWAY MODULE

SX1302 + SX1250, MINI PCIE, SPI, US915 / EU868

2021-12-17

EDA TECHNOLOGY CO.,LTD



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## Revision History

| Date       | Version | Description      | Note |
|------------|---------|------------------|------|
| 2021-12-17 | Draft   | Initial release. |      |
|            |         |                  |      |
|            |         |                  |      |
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## Chapter 1 Overview

ED-GW1302S module is a new generation of LoRaWAN gateway module in mini-PCIe form-factor with SPI interfaces based on Semtech® SX1302 and SX1250. It features extremely low power consumption, outstanding performance with CE, FCC certified.

ED-GW1302S 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-GW1302S 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

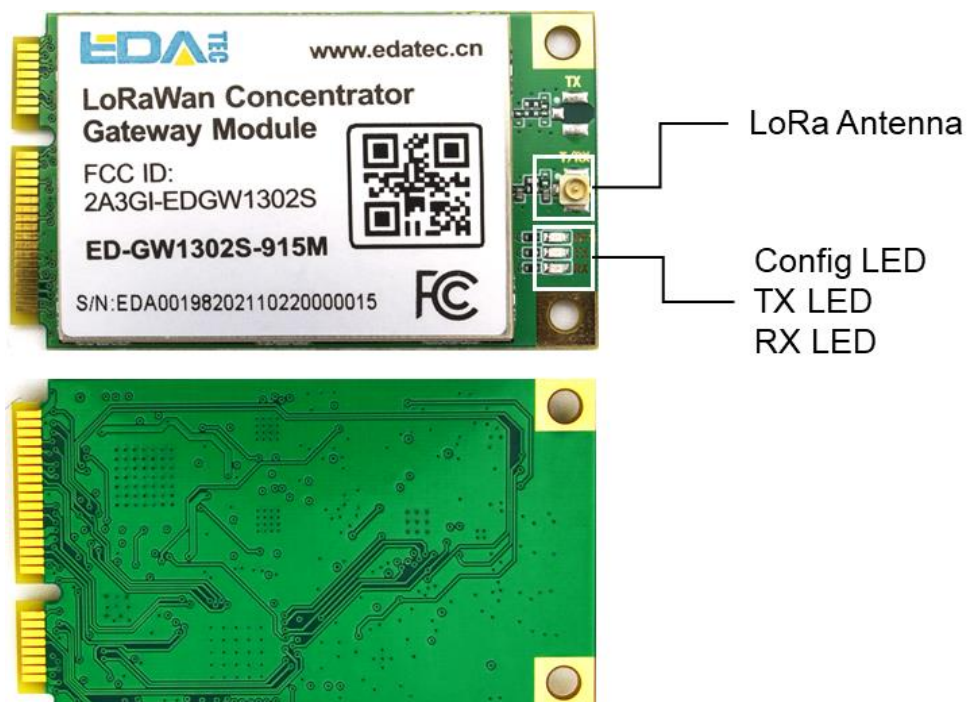
- Mini PCIe form factor with SPI interfaces
- Powered by Semtech® SX1302 baseband processor
- Ultra-low operating temperature without additional heat dissipation needed
- High sensitivity with Semtech® SX1250 TX/RX front-end; TX power up to 25 dBm @3.3V
- Supports global license-free frequency band including EU868, US915, AS923, AU915, KR920 and IN865
- Certified with CE, FCC

### 1.2 Ordering Code

| Code            | Description |
|-----------------|-------------|
| ED-GW1302S-915M | US915       |
| ED-GW1302S-868M | EU868       |

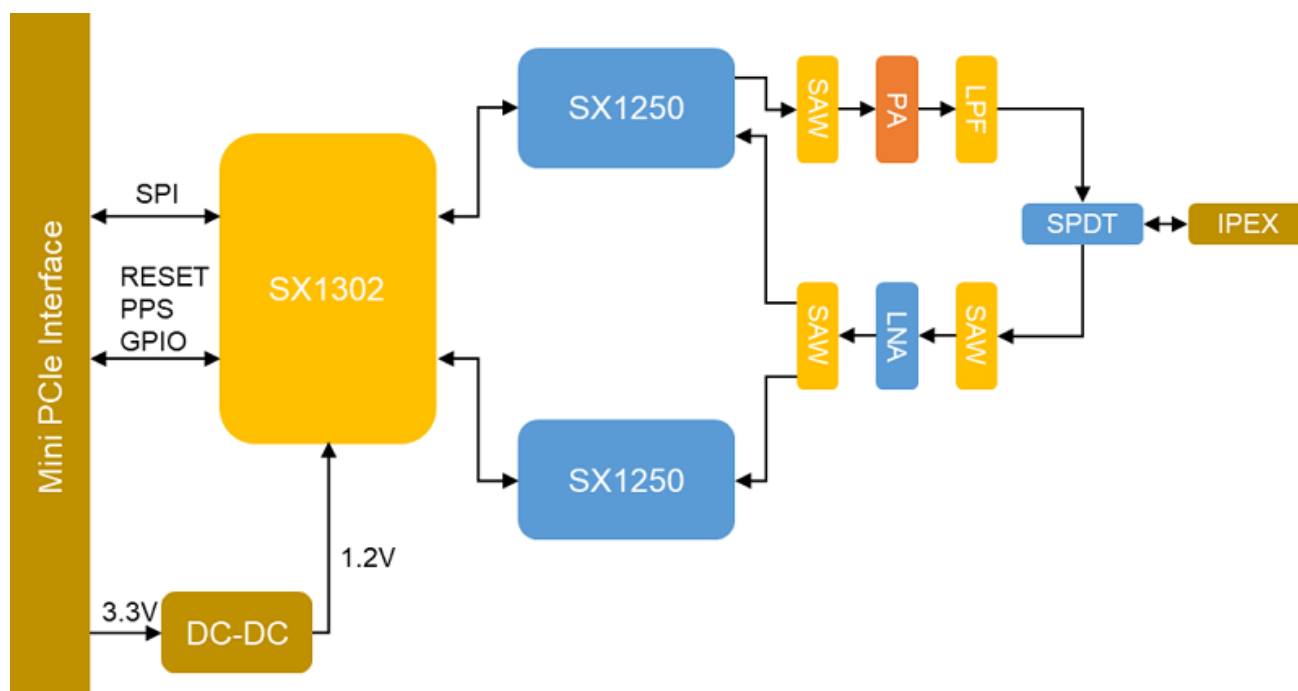


### 1.3 Interface Diagram





## 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-GW1302S 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 configured 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.

|                               |                       |                    |  |  |  |
|-------------------------------|-----------------------|--------------------|--|--|--|
| Recommended P/N 20279-001E-03 |                       |                    |  |  |  |
| PART NO.                      | PACKING REEL          | QUANTITY IN 1 REEL |  |  |  |
| 20279-001E-01                 | PLASTIC REEL          | 2,500              |  |  |  |
| 20279-001E-03                 | CORRUGATED PAPER REEL | 2,500              |  |  |  |
| 20279-001E-05                 | PLASTIC REEL          | 5,000              |  |  |  |
| 20279-001E-05                 | PLASTIC REEL          | 10,000             |  |  |  |

$\phi 0.50 \pm 0.05$   
 $(0.6)$   
 $(3.1)$   
 $2.60 \pm 0.15$   
 $1.8$   
 $0.6 \pm 0.1$   
 $2.60 \pm 0.15$   
 $3.00 \pm 0.15$   
 $0.25 \pm 0.1$   
 $0.25 \pm 0.1$   
 $0.35 \pm 0.1$   
 $1.25$   
 $\phi 2.00 \pm 0.05$   
 ③ GROUND CONTACT  
 ① HOUSING  
 ② CONTACT

PLUG  
 \*LENGTH: SEE BELOW  
 COAXIAL CABLE  
 \*MATING HEIGHT: SEE BELOW  
 RECEPTACLE

\*LENGTH: 4.0±0.4 AT PLUG PART NO. 20670-001R-08, 20670-001R-13, 20670-001R-32  
 4.7±0.4 AT PLUG PART NO. 20670-001R-18, 20670-001R-37  
 5.6 AT PLUG PART NO. 20767-001R-20 (REFERENCE DIMENSION)  
 3.8±0.3 AT PLUG PART NO. 20686-001R-08, 20311-011R-\*\*  
 \*MATING HEIGHT: 2.5 MAX. AT PLUG PART NO. 20670-001R-\*\*  
 3.0 MAX. AT PLUG PART NO. 20767-001R-20  
 2.0±0.1 AT PLUG PART NO. 20686-001R-08, 20311-011R-\*\*  
 MATING CONDITION

NOTES

1. APPLICABLE CONNECTOR PART NO.  
 MHF I PLUG  
 20278-11R-\*\*  
 20351-\*\*\*R-37  
 20631-\*\*\*R-\*\*  
 20670-001R-\*\*  
 20767-001R-20  
 MHF II PLUG  
 20311-011R-\*\*  
 20686-001R-08  
 2. COPLANARITY: 0.1mm MAX.  
 3. THIS IS "Pb-FREE" CONNECTOR.

|     |                |                 |   |
|-----|----------------|-----------------|---|
| 3   | GROUND CONTACT | PHOSPHOR BRONZE | ALL OVER Ni 1.00 $\mu$ m MIN.<br>CONTACT PART Au 0.05 $\mu$ m MIN.<br>SOLDERING PART Au 0.05 $\mu$ m MIN. |
| 2   | CONTACT        | BRASS           | ALL OVER Ni 1.00 $\mu$ m MIN.<br>CONTACT PART Au 0.10 $\mu$ m MIN.<br>SOLDERING PART Au 0.03 $\mu$ m MIN. |
| 1   | HOUSING        | LCP             | UL94V-0, WHITE  |
| NO. | DISCRIPTION    | MATERIAL        | FINISH, REMARKS   |

|      |         |     |            |      |  |            |            |               |
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| 27   | Z210232 | S.T | 2021/03/08 | M.T  | ANGLE $\pm 2^\circ$ 6 OVER 30 MAX. $\pm 0.3$ | PROJECTION | SERIES No. | CUSTOMER COPY |
| 26   | Z200434 | TOI | 2020/04/20 | Y.H  | 6 MAX. $\pm 0.2$ 30 OVER 120 MAX. $\pm 0.5$  |            | R9         |               |
| 25   | Z200262 | TOI | 2020/03/05 | Y.H  | GENERAL TOLERANCE                            |            |            |               |
| 24   | Z181405 | Y.F | 2019/10/23 | Y.S  | DWG. DATE                                    |            |            |               |
| 23   | Z181523 | M.N | 2018/11/20 | Ken  | K.Oobayashi 2001/06/07                       |            |            |               |
| 22   | Z180765 | M.N | 2018/10/30 | Ken  | E.Kawabe 2001/06/07                          |            |            |               |
| REV. | ECN     | BY  | DATE       | APP. | 2001/06/07                                   |            |            |               |

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| 22   | Z180765 | M.N | 2018/10/30 | Ken  | E.Kawabe 2001/06/07                          |            |            |               |
| REV. | ECN     | BY  | DATE       | APP. | 2001/06/07                                   |            |            |               |

|      |         |     |            |      |  |            |            |               |
|------|---------|-----|------------|------|--|------------|------------|---------------|
| 27   | Z210232 | S.T | 2021/03/08 | M.T  | ANGLE $\pm 2^\circ$ 6 OVER 30 MAX. $\pm 0.3$ | PROJECTION | SERIES No. | CUSTOMER COPY |
| 26   | Z200434 | TOI | 2020/04/20 | Y.H  | 6 MAX. $\pm 0.2$ 30 OVER 120 MAX. $\pm 0.5$  |            | R9         |               |
| 25   | Z200262 | TOI | 2020/03/05 | Y.H  | GENERAL TOLERANCE                            |            |            |               |
| 24   | Z181405 | Y.F | 2019/10/23 | Y.S  | DWG. DATE                                    |            |            |               |
| 23   | Z181523 | M.N | 2018/11/20 | Ken  | K.Oobayashi 2001/06/07                       |            |            |               |
| 22   | Z180765 | M.N | 2018/10/30 | Ken  | E.Kawabe 2001/06/07                          |            |            |               |
| REV. | ECN     | BY  | DATE       | APP. | 2001/06/07                                   |            |            |               |

|      |         |     |            |      |  |            |            |               |
|------|---------|-----|------------|------|--|------------|------------|---------------|
| 27   | Z210232 | S.T | 2021/03/08 | M.T  | ANGLE $\pm 2^\circ$ 6 OVER 30 MAX. $\pm 0.3$ | PROJECTION | SERIES No. | CUSTOMER COPY |
| 26   | Z200434 | TOI | 2020/04/20 | Y.H  | 6 MAX. $\pm 0.2$ 30 OVER 120 MAX. $\pm 0.5$  |            | R9         |               |
| 25   | Z200262 | TOI | 2020/03/05 | Y.H  | GENERAL TOLERANCE                            |            |            |               |
| 24   | Z181405 | Y.F | 2019/10/23 | Y.S  | DWG. DATE                                    |            |            |               |
| 23   | Z181523 | M.N | 2018/11/20 | Ken  | K.Oobayashi 2001/06/07                       |            |            |               |
| 22   | Z180765 | M.N | 2018/10/30 | Ken  | E.Kawabe 2001/06/07                          |            |            |               |
| REV. | ECN     | BY  | DATE       | APP. | 2001/06/07                                   |            |            |               |

|      |         |     |            |      |  |            |            |               |
|------|---------|-----|------------|------|--|------------|------------|---------------|
| 27   | Z210232 | S.T | 2021/03/08 | M.T  | ANGLE $\pm 2^\circ$ 6 OVER 30 MAX. $\pm 0.3$ | PROJECTION | SERIES No. | CUSTOMER COPY |
| 26   | Z200434 | TOI | 2020/04/20 | Y.H  | 6 MAX. $\pm 0.2$ 30 OVER 120 MAX. $\pm 0.5$  |            | R9         |               |
| 25   | Z200262 | TOI | 2020/03/05 | Y.H  | GENERAL TOLERANCE                            |            |            |               |
| 24   | Z181405 | Y.F | 2019/10/23 | Y.S  | DWG. DATE                                    |            |            |               |
| 23   | Z181523 | M.N | 2018/11/20 | Ken  | K.Oobayashi 2001/06/07                       |            |            |               |
| 22   | Z180765 | M.N | 2018/10/30 | Ken  | E.Kawabe 2001/06/07                          |            |            |               |
| REV. | ECN     | BY  | DATE       | APP. | 2001/06/07                                   |            |            |               |

|      |         |     |            |      |  |            |            |               |
|------|---------|-----|------------|------|--|------------|------------|---------------|
| 27   | Z210232 | S.T | 2021/03/08 | M.T  | ANGLE $\pm 2^\circ$ 6 OVER 30 MAX. $\pm 0.3$ | PROJECTION | SERIES No. | CUSTOMER COPY |
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| 25   | Z200262 | TOI | 2020/03/05 | Y.H  | GENERAL TOLERANCE                            |            |            |               |
| 24   | Z181405 | Y.F | 2019/10/23 | Y.S  | DWG. DATE                                    |            |            |               |
| 23   | Z181523 | M.N | 2018/11/20 | Ken  | K.Oobayashi 2001/06/07                       |            |            |               |
| 22   | Z180765 | M.N | 2018/10/30 | Ken  | E.Kawabe 2001/06/07                          |            |            |               |
| REV. | ECN     | BY  | DATE       | APP. | 2001/06/07                                   |            |            |               |

|    |         |     |            |     |  |
|----|---------|-----|------------|-----|--|
| 27 | Z210232 | S.T | 2021/03/08 | M.T | ANGLE $\pm 2^\circ$ 6 OVER 30 MAX. $\pm 0.3$ |
|----|---------|-----|------------|-----|--|



## 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

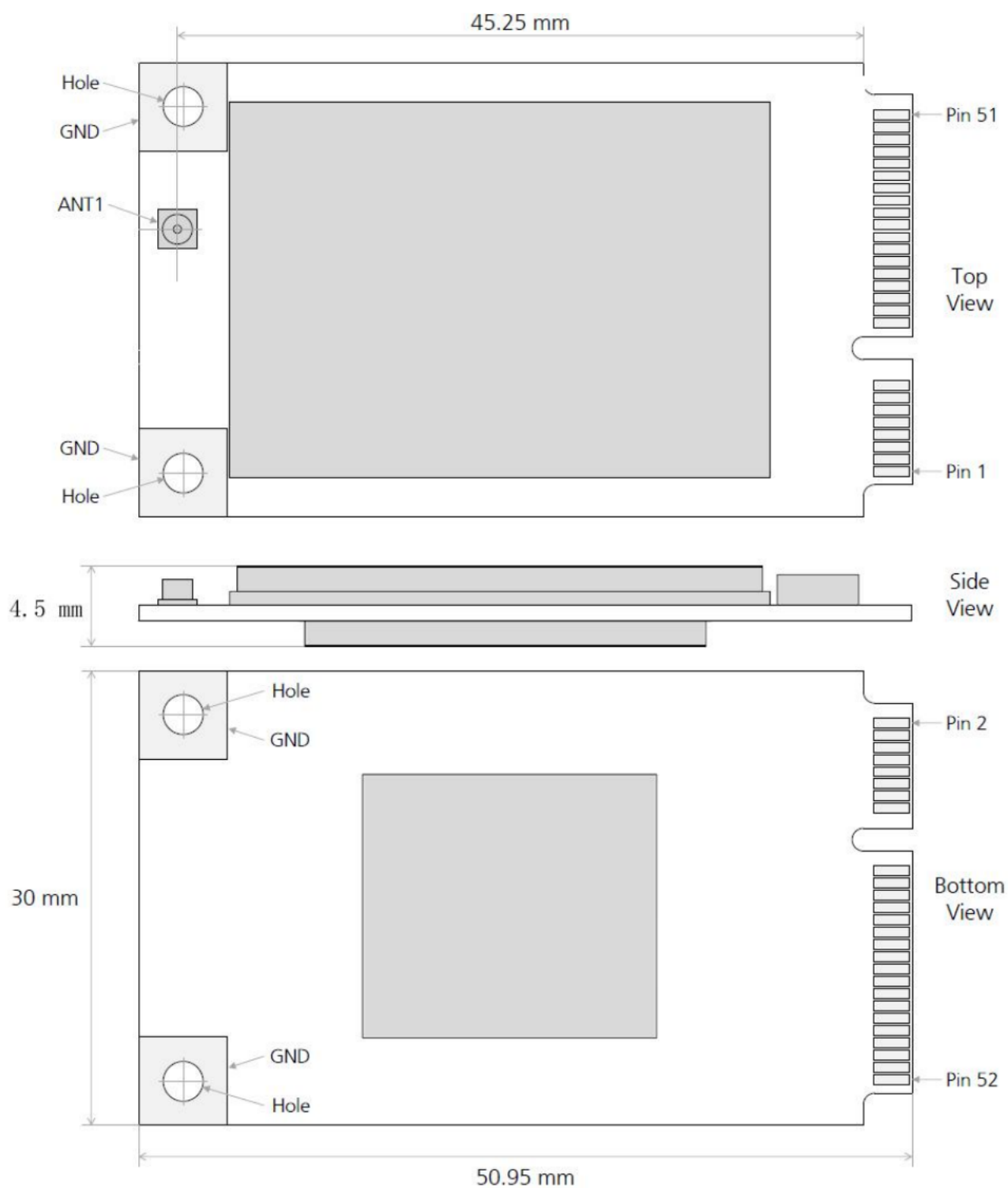
| Parameter | Description         | Min         | Max         | Unit |
|-----------|---------------------|-------------|-------------|------|
| VIH       | Input High Voltage  | $0.7 * VCC$ | $VCC + 0.3$ | V    |
| VIL       | Input Low Voltage   | -0.3        | $0.3 * VCC$ | V    |
| VOH       | Output 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

- Email – [sales@edatec.cn](mailto:sales@edatec.cn) / [support@edatec.cn](mailto:support@edatec.cn)
- Mobile – +86-18621560183
- Website – <https://www.edatec.cn>
- Address – Room 301, Building 24, No. 1661, Jialuo Road, Jiading District, Shanghai

### 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.



FCC Statement

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. 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 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 or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help

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 and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. Country Code selection feature to be disabled for products marketed to the US/Canada.

This device is intended only for OEM integrators under the following conditions:

1. The antenna must be installed such that 20 cm is maintained between the antenna and users, and
  2. The transmitter module may not be co-located with any other transmitter or antenna,
- As long as the three conditions above are met, further transmitter testing 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.

Important Note:

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID 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

End Product Labeling

The final end product must be labeled in a visible area with the following" Contains FCC ID: 2A3GI-EDGW1302S".

Manual Information to the End User

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.

Integration instructions for host product manufacturers according to KDB 996369 D03 OEM Manual v01

2.2 List of applicable FCC rules

CFR 47 FCC PART 15 SUBPART C has been investigated. It is applicable to the modular transmitter

2.3 Specific operational use conditions

This module is stand-alone modular. If the end product will involve the Multiple simultaneously transmitting condition or different operational conditions for a stand-alone modular transmitter in a host, host manufacturer have to consult with module manufacturer for the installation method in end system.

2.4 Limited module procedures

Not applicable

2.5 Trace antenna designs

Not applicable

2.6 RF exposure considerations

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.

2.7 Antennas

This radio transmitter FCC ID:2A3GI-EDGW1302S has been approved by Federal Communications Commission to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

| Frequency<br>(MHz) | Type           | Peak Gain<br>(dBi) |
|--------------------|----------------|--------------------|
| 902-928MHz         | Dipole Antenna | 5.8dBi             |

2.8 Label and compliance information

The final end product must be labeled in a visible area with the following" Contains FCC ID:2A3GI-EDGW1302S".

2.9 Information on test modes and additional testing requirements

Host manufacturer is strongly recommended to confirm compliance with FCC requirements for the transmitter when the module is installed in the host.

2.10 Additional testing, Part 15 Subpart B disclaimer

Host manufacturer is responsible for compliance of the host system with module installed with all other applicable requirements for the system such as Part 15 B.