



ED-GWL1010

A COST-EFFECTIVE LORAWAN INDOOR GATEWAY

Shanghai EDA Technology Co.,Ltd
2023-03-23

Copyright Statement

ED-GWL1010 and its related intellectual property rights are owned by Shanghai EDA Technology Co., Ltd. Shanghai EDA Technology Co., Ltd owns the copyright of this document and reserves all rights. Without the written permission of Shanghai EDA Technology Co., Ltd, no part of this document may be modified, distributed or copied in any way or form.

Disclaimers

Shanghai EDA Technology Co., Ltd does not guarantee that the information in this manual is up to date, correct, complete or of high quality. Shanghai EDA Technology Co., Ltd also does not guarantee the further use of this information. If the material or non-material related losses are caused by using or not using the information in this manual, or by using incorrect or incomplete information, as long as it is not proved that it is the intention or negligence of Shanghai EDA Technology Co., Ltd, the liability claim for Shanghai EDA Technology Co., Ltd can be exempted. Shanghai EDA Technology Co., Ltd expressly reserves the right to modify or supplement the contents or part of this manual without special notice.

Contents

1	Product Overview.....	4
1.1	Target Application.....	4
1.2	Specifications and Parameters.....	4
1.3	System Diagram.....	5
1.4	Functional Layout.....	5
1.5	Packing List.....	7
1.6	Order Code.....	7
2	Product Appearance and Structure.....	7
2.1	Product Appearance.....	7
2.2	Product Photo.....	8
2.3	Dimensions.....	9
3	Interfaces and Connectors.....	10
3.1	Front Panel.....	10
3.1.1	Power Input.....	10
3.1.2	Indicator Light.....	10
3.1.3	Button.....	10
3.1.4	Ethernet.....	11
3.1.5	USB2.0 and USB3.0.....	11
4	Internal Interface.....	11
4.1	Micro SD Card Slot.....	11
4.2	Debugging Serial Port.....	11
4.3	2x20Pin Header.....	12
4.4	mini-PCle.....	13
4.5	IPEX-1 Connector.....	14
5	Wireless Communication.....	15
5.1	WiFi.....	15
5.2	Bluetooth.....	16
5.3	Antennas.....	16
5.3.1	WiFi / BT Antenna.....	16
5.3.2	LoRa Antenna.....	16
6	Electrical Characteristics.....	17
6.1	Electrical Parameters.....	17
7	About Us.....	17
7.1	About EDATEC.....	17
7.2	Contact Us.....	17

1 Product Overview

ED-GWL1010 is a cost-effective LoRaWAN indoor gateway product launched by EDATEC. The ED-GWL1010 is based on EDATEC's brand-new 1(ED-REIME11) single-board computer platform, adopting the form of motherboard and expansion board, integrating Semtech's new generation SX1302/SX103 baseband chip and Microchip security encryption chip ATECC608, supporting DC Jack power supply and PoE power supply, and optional sheet metal casing.

1.1 Target Application

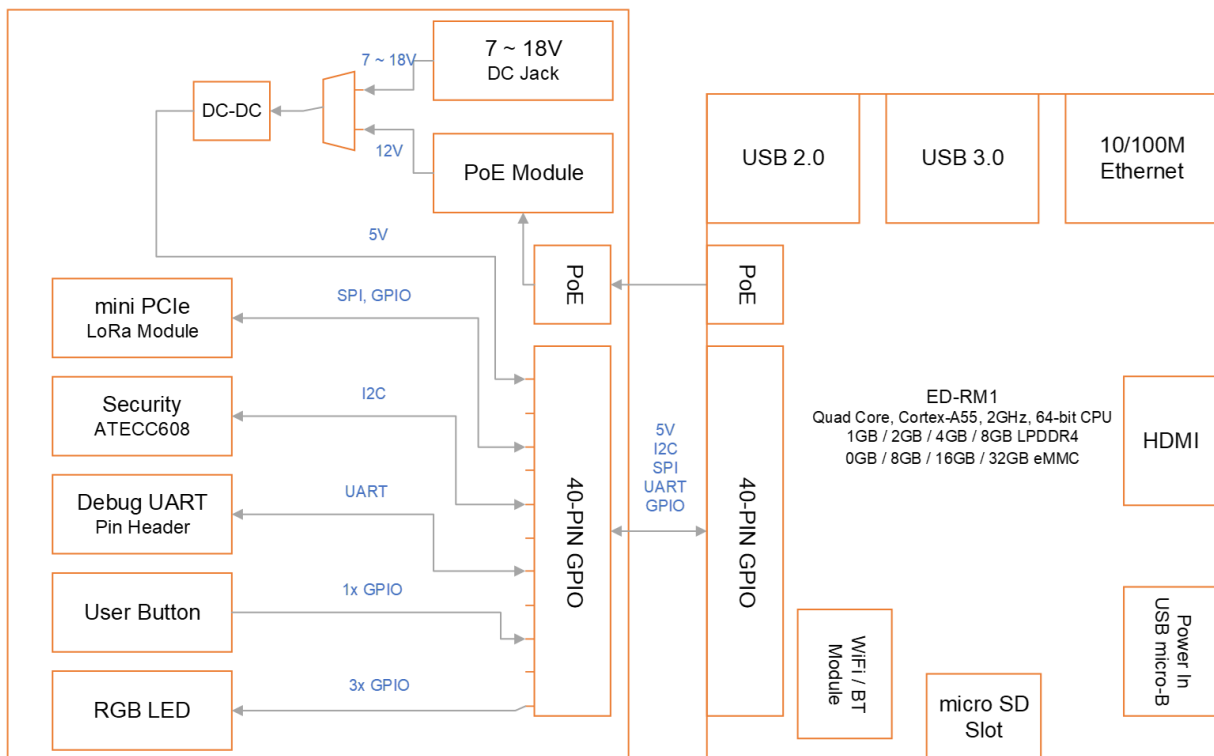
- LoRa intelligent gateway
- Industrial control
- Smart manufacturing
- Smart city
- Smart transportation

1.2 Specifications and Parameters

Function	Parameters
CPU	AMLogic S905X4 4 core, ARM Cortex-A55(ARM v8), 2GHz, 64bit CPU
Memory	Option 1GB / 2GB / 4GB / 8GB LPDDR-3200 SDARM
eMMC Flash	Option 0GB / 8GB / 16GB / 32GB
SD card	Can be used with eMMC at the same time, and can be started from SD card
Ethernet	1x 10/100M Ethernet, support PoE
WiFi / Bluetooth	2.4G / 5.8G dual WiFi, bluetooth 5.0
LoRa	LoRa gateway module based on Semtech SX1302+SX1250 has passed CE/FCC certification and can be selected from European version or American version
LoRa Frequency	American version: US915, AU915, AS923
	European version: EU868
USB Host	1x USB 3.0 Type A, 1x USB 2.0 Type A
mini PCIe	1x mini PCIe Slot, support SPI bus, used to extended LoRa gateway module
LED Indicator	1x RGB LED
Button	1x User Button

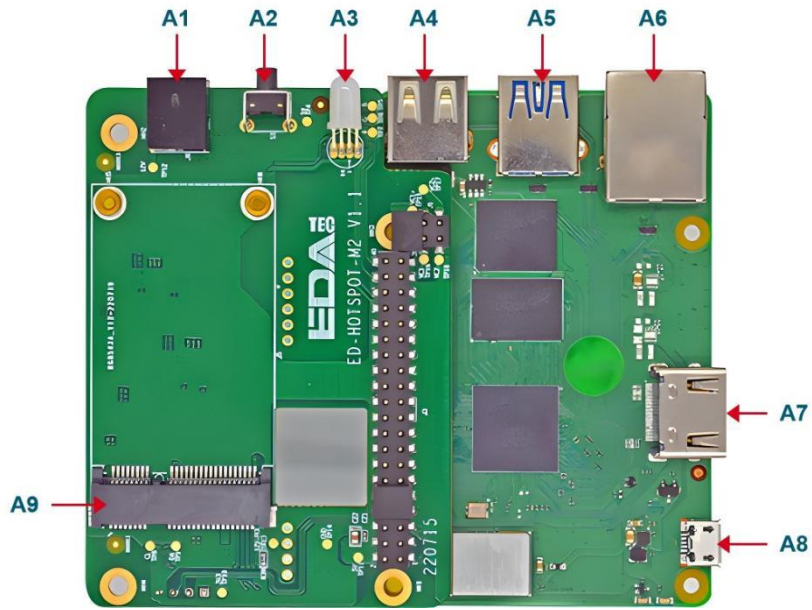
Function	Parameters
Power Input	7V ~ 18V
Dimensions	110 (L) x 90 (W) x 26 mm (H)
Case	Desktop type, sheet metal shell
Antenna Accessory	1x WiFi / BT External antenna, 1x LoRa External antenna
Working Environment Temperature	-25 ~ 50°C
OS	Debian 11, Lite, 64-bit OS
Software resources	Provide example guidance for LoRaWAN networks such as ChipStack

1.3 System Diagram

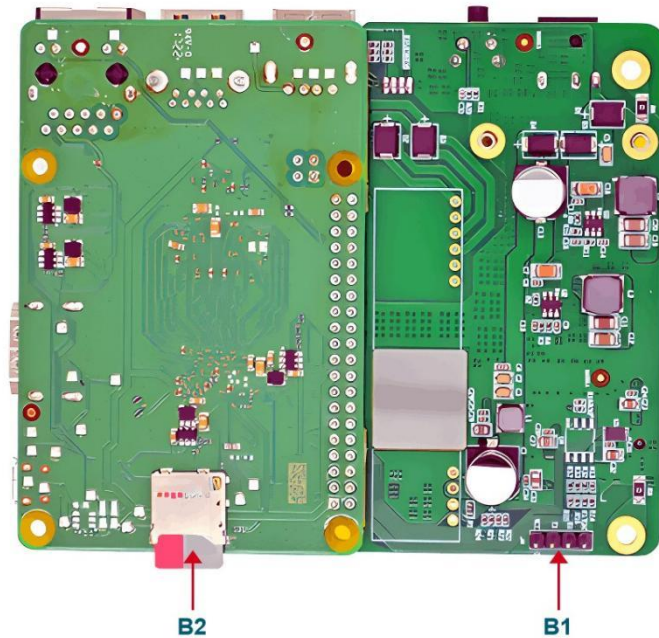


ED-GWL1010 Block Diagram

1.4 Functional Layout



Item	Function Description	Item	Function Description
A1	12V DC power socket	A6	Ethernet RJ45 port
A2	Key	A7	HDMI type A port
A3	RGB LED	A8	Micro USB Power supply port
A4	USB 2.0 port	A9	LoRa mini-PCle port
A5	USB 3.0 port		

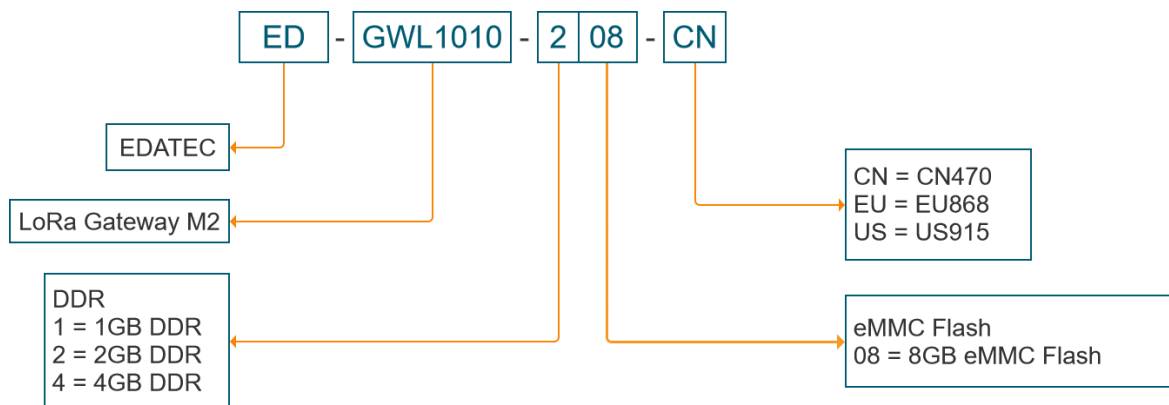


Item	Function Description
B1	Debug serial port
B2	Micro SD card slot

1.5 Packing List

- 1x ED-GWL1010 host
- [option]1x LoRa antenna
- [option]1x 2.4GHz/5GHz WiFi/BT antenna

1.6 Order Code

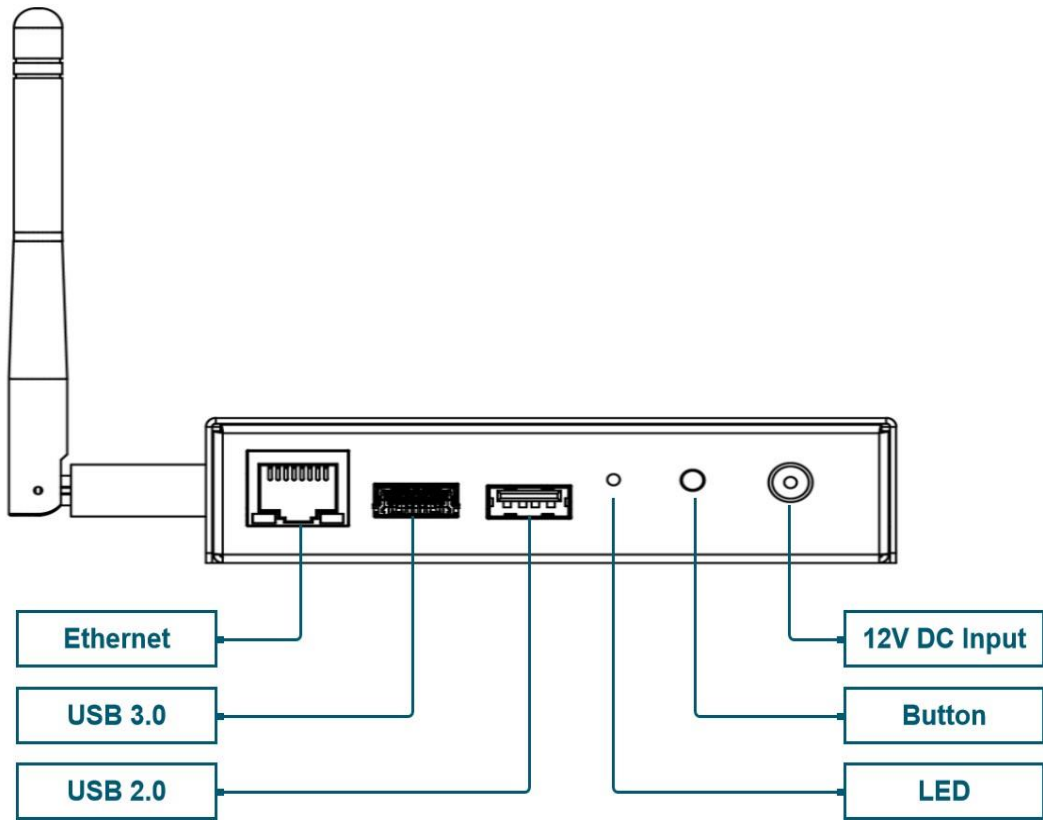


Example

Part# : ED-GWL1010-208-CN
Configuration : GWL1010 LoRa Gateway
 1pcs REIMEI1 Computer
 2GB DDR and 8GB eMMC Flash
 CN470 LoRa Module

2 Product Appearance and Structure

2.1 Product Appearance



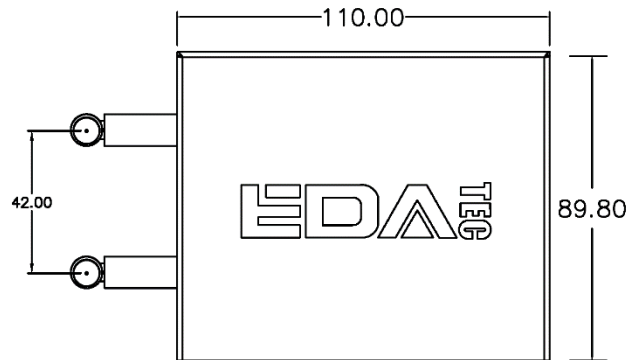
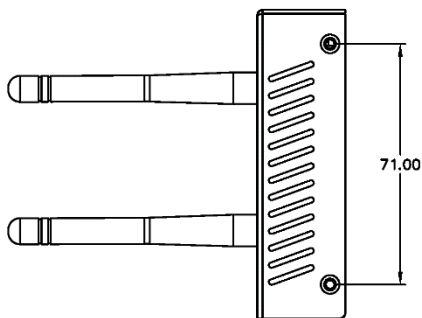
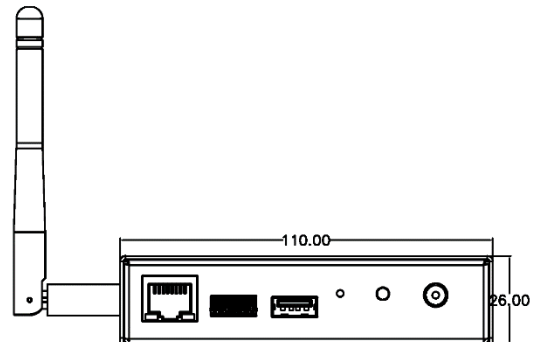
2.2 Product Photo





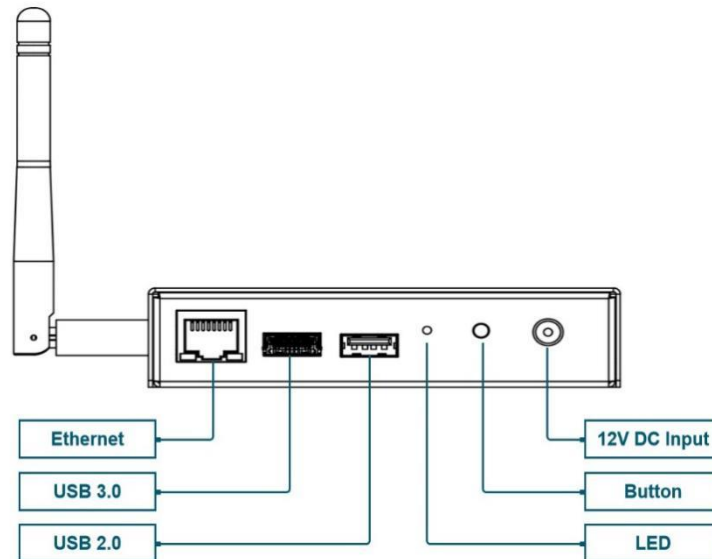
2.3 Dimensions

unit: mm, tolerance: $\pm 0.1\text{mm}$



3 Interfaces and Connectors

3.1 Front Panel



3.1.1 Power Input

ED-GWL1010 has a DC Jack as the power input interface of the whole system. The standard input voltage is 12V.

3.1.2 Indicator Light

ED-GWL1010 has an RGB three-color LED indicator, which is controlled by three GPIO, and can display eight different colors according to different configuration states. The control pins are GPIO16 to control blue, GPIO20 to control green, GPIO21 to control red, and GPIO is active at low level.

#	RGB LED	Pin
1	Blue	GPIO16
2	Green	GPIO20
3	Red	GPIO21

3.1.3 Button

The ED-GWL1010 has a user button, which is connected with GPIO23 of the CPU. When the key is pressed, the GPIO23 pin will be pulled low.

#	Signal	Pin
1	Button	GPIO23

3.1.4 Ethernet

ED-GWL1010 has a standard RJ-45 interface, which not only supports the Ethernet with 10M/100M communication rate, but also supports PoE input. The ED-GWL1010 is internally integrated with a PoE HAT module, through which the function of PoE power supply is realized.

Pin ID	Pin Name
1	Tx+
2	Tx-
3	Rx+
4	-
5	-
6	Rx-
7	-
8	-

3.1.5 USB2.0 and USB3.0

ED-GWL1010 has a USB2.0 A interface and a USB3.0 A interface, and the device can provide a total output capacity of 5V 1.1A for the peripherals of these two interfaces at the same time.

The USB2.0 interface can provide a data transmission rate of up to 480Mbps, and the USB3.0 interface can provide a data transmission rate of up to 5Gbps.

4 Internal Interface

4.1 Micro SD Card Slot

ED-GWL1010 has a micro SD card slot, and after the micro SD card of the burned system is inserted, the system can be started from the micro SD card.

Note: ED-GWL1010 has two system startup modes:

- I) startup via onboard eMMC;
- II) starting through micro SD card;

4.2 Debugging Serial Port

ED-GWL1010 has a TTL level serial port, and the port name is J4, which is used as the debugging serial

port by default.

PIN	Function
1	+3.3V
2	TXD0
3	RXD0
4	GND

4.3 2x20Pin Header

ED-GWL1010 is internally connected with the interface board of the LoRa module through a Pin Header with a distance of 2X20P of 2.54 mm.

The following is a list of pin definitions and functional reuse of pin arrangement:

Pin	Name	I/O	Function
1	3V3	O	
2	5V	I/O ¹⁾	
3	PIN3	I/O	I2C1_SDA
4	5V	I/O ¹⁾	
5	PIN5	I/O	I2C1_SCL
6	GND		
7	PIN7	I/O	GPIO4
8	PIN8	I/O	TXD
9	GND		
10	PIN10	I/O	RXD
11	PIN11	I/O	GPIO17
12	PIN12	I/O	GPIO18
13	PIN13	I/O	GPIO27
14	GND		
15	PIN15	I/O	GPIO22
16	PIN16	I/O	GPIO23
17	3V3	O	
18	PIN18	I/O	GPIO24
19	PIN19	I/O	SPI_MOSI
20	GND		

Pin	Name	I/O	Function
21	PIN21	I/O	SPI_MISO
22	PIN22	I/O	GPIO25
23	PIN23	I/O	SPI_CLK
24	PIN24	I/O	SPI_CE0_N
25	GND		
26	PIN26	I/O	SPI_CE1_N
27	PIN27	I/O	I2C0_SDA
28	PIN28	I/O	I2C0_SCL
29	PIN29	I/O	GPIO5
30	GND		
31	PIN31	I/O	GPIO6
32	PIN32	I/O	GPIO12
33	PIN33	I/O	GPIO13
34	GND		
35	PIN35	I/O	GPIO19
36	PIN36	I/O	GPIO16
37	PIN37	I/O	GPIO26
38	PIN38	I/O	GPIO20
39	GND		
40	PIN40	I/O	GPIO21

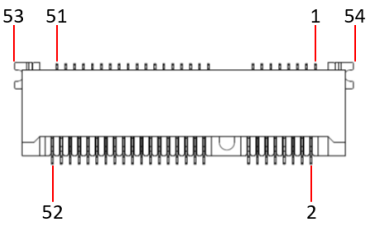
4.4 mini-PCle

ED-GWL1010 has a Mini PCIe expansion interface for connecting with LoRa module.

LoRa module is mounted on SPI bus. Before using it, you need to confirm that the device has enabled SPI. By default, the device mapped by LoRa module in the system is `/dev/spidev0.0`.

The reset pin of LoRa module is connected to GPIO18 of CPU, which is low by default. When the output of GPIO18 is high, LoRa module performs reset.

LoRa mini-PCle pins are defined as follows:



Pin ID	Pin Name	Pin ID	Pin Name	Pin ID	Pin Name
1	NC	21	GND	41	3V3
2	3V3	22	LoRa_Reset	42	NC
3	NC	23	NC	43	GND
4	GND	24	3V3	44	NC
5	NC	25	NC	45	LoRa_SCK
6	NC	26	GND	46	NC
7	NC	27	GND	47	LoRa_MISO
8	NC	28	NC	48	NC
9	GND	29	GND	49	LoRa_MOSI
10	NC	30	NC	50	GND
11	NC	31	NC	51	LoRa_CSN
12	NC	32	NC	52	3V3
13	NC	33	NC	53	GND
14	NC	34	GND	54	GND
15	GND	35	GND		
16	NC	36	NC		
17	NC	37	GND		
18	GND	38	NC		
19	NC	39	3V3		
20	NC	40	GND		

LoRa module reset pin definition:

#	Signal	PIN
1	LoRa_Reset	GPIO18

4.5 IPEX-1 Connector

The onboard IPEX-1 connector is used for external connection of 2.4GHz/5GHz antenna. The specifications of the connector are as follows:

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-03	PLASTIC REEL	5,000
20279-001E-05	PLASTIC REEL	10,000

NOTES

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

NO.	DISCRIPTION	MATERIAL	FINISH, REMARKS
3	GROUND CONTACT	PHOSPHOR BRONZE	ALL OVER Ni 1.00 μm MIN. CONTACT PART Au 0.05 μm MIN. SOLDERING PART Au 0.05 μm MIN.
2	CONTACT	BRASS	ALL OVER Ni 1.00 μm MIN. CONTACT PART Au 0.10 μm MIN. SOLDERING PART Au 0.03 μm MIN.
1	HOUSING	LCP	UL94V-0, WHITE

*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

REV.	ECN	BY	DATE	APP.	REVISION RECORD	ANGLE	±2°	6 OVER 30 MAX	±0.3	PROJECTION	SERIES No.	CUSTOMER COPY
27	Z210232	S.T	2021/03/08	M.T		6 MAX	±0.2	30 OVER 120 MAX	±0.5		R9	
26	Z200434	TOI	2020/04/20	Y.H		GENERAL TOLERANCE						
25	Z200262	TOI	2020/03/05	Y.H								
24	Z191405	Y.F	2019/10/23	Y.S								
23	Z181523	M.N	2018/11/20	Ken								
22	Z180765	M.N	2018/10/30	Ken								
REV.	ECN	BY	DATE	APP.	REVISION RECORD	DWG.	DATE			TITLE	SCALE	
						CHK				MHF® I/II RECEPTACLE	10:1	
											UNIT	
											mm	
											SHEET	
											1/8	
											REV	
											27	

5 Wireless Communication

5.1 WiFi

ED-GWL1010 support 2.4G WiFi

2.4G frequency band

Parameter	Feature
Frequency range	802.11b/g/n(HT20): 2412-2472MHz 802.11n(HT40): 2422-2462MHz
Modulation system	802.11b:DSSS 802.11g/n:OFDM
Frequency Step	5M

5G frequency band

Parameter	Feature
Frequency range	802.11a/n/ac: 5150-5350MHz 5470-5725MHz

	5725-5850MHz
Modulation system	BPSK
Frequency Step	5M

5.2 Bluetooth

ED-GWL1010 support Bluetooth 5.0.

Parameter	Feature
Frequency range	2402-2480MHz
Modulation system	GFSK,DPSK
Frequency Step	2M

5.3 Antennas

5.3.1 WiFi / BT Antenna

Parameter	Feature
Antenna type	External antenna
Frequency band	2400-2500MHz, 5150-5850 MHz
Antenna gain	2 dBi
Impedance	50 OHM

5.3.2 LoRa Antenna

868MHz Antenna

Parameter	Feature
Antenna type	External antenna
Frequency band	863-870MHz
Bandwidth	125KHz / 250KHz / 500KHz
Antenna gain	2 dBi
Impedance	50 OHM

915MHz Antenna

Parameter	Feature
Antenna type	External antenna
Frequency band	902-928MHz
Bandwidth	125KHz / 250KHz / 500KHz
Antenna gain	2 dBi
Impedance	50 OHM

6 Electrical Characteristics

6.1 Electrical Parameters

Parameters	Minimum	Typical	Max	Unit
System power input	7	12	18	V
Working temperature	-25	25	50	°C
Storage temperature	-25	25	50	°C
Working environment humidity	0		90	%

7 About Us

7.1 About EDATEC

EDATEC, located in Shanghai, is one of Raspberry Pi's global design partners. Our vision is to provide hardware solutions for Internet of Things, industrial control, automation, green energy and artificial intelligence based on Raspberry Pi technology platform.

We provide standard hardware solutions, customized design and manufacturing services to speed up the development and time to market of electronic products.

7.2 Contact Us

Mail - sales@edatec.cn / support@edatec.cn

Phone - +86-18621560183

Website - <https://www.edatec.cn>

Address - Room 301, Building 24, No.1661 Jialuo Highway, Jiading District, Shanghai