



成都亿佰特电子科技有限公司

Chengdu Ebyte Electronic Technology Co.,Ltd.

E28-2G4M12S Datasheet v1.0

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1. Introduction



E28-2G4M12S is a 2.4GHz bluetooth module designed by Chengdu Ebyte. With built-in PCB antenna, it adopts the original RFIC SX1280 of Semtech, it works at 2.400 ~ 2.500GHz with ultra-low power consumption.

The IC SX1280 features multiple physical layers and various modulating methods such as LoRa, FLRC and GFSK, the special modulating methods and processing ways enable longer operating range under LoRa and FLRC modulating methods, and the GFSK method covers BLE protocol. The outstanding ultra-low power consumption and the DC-DC and Time-of-Flight on chip make the chip much more capable for smart home, security system, tracking and locating, wireless distance measuring, wearable electronics, smart bracelet and health management & etc.

E28-2G4M12S is a hardware platform without firmware, so users need to conduct secondary development.

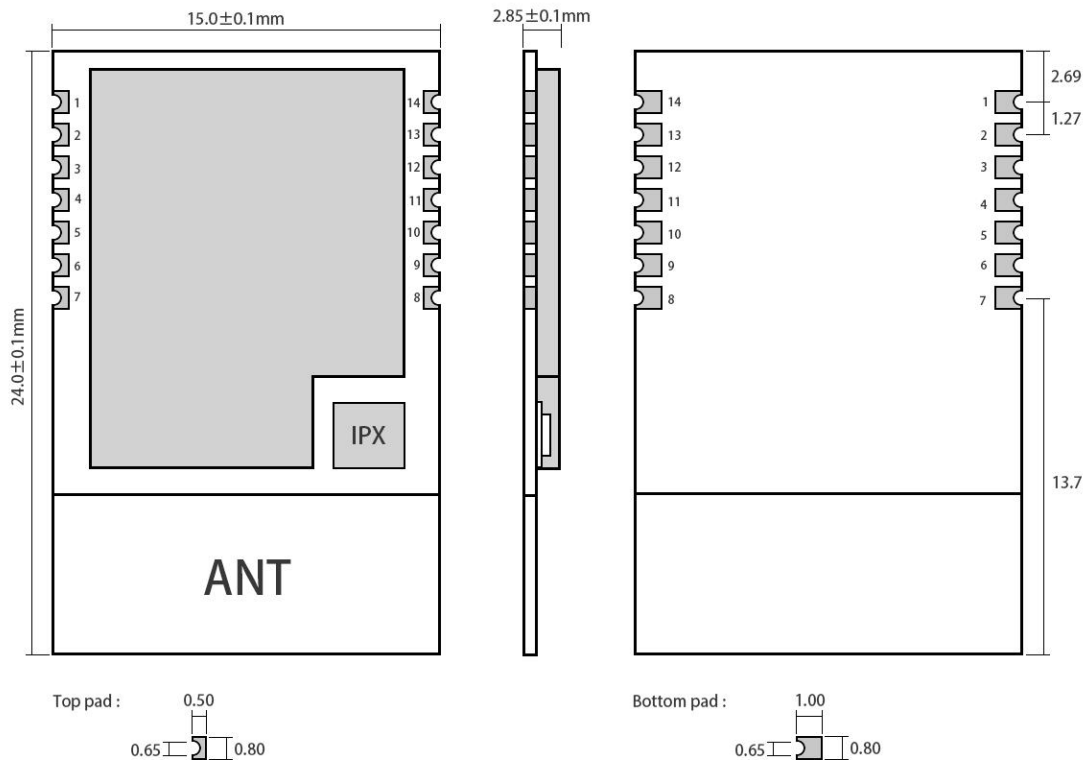
2. E28 Series

Model	RFIC	Frequency Hz	Power dBm	Range km	Packing	Antenna
E28-2G4M12S	SX1280	2.4G	12.5	3	SMD	PCB/IPEX
Other products of E28 series will come soon.						

3. Electrical Parameter

No.	Item	Parameter details	Description
1	RFIC	SX1280	SEMTECH
2	Size	25* 14* 2.8mm	-
3	Weight	0.9g	Average weight
4	Frequency band	2400MHz ~ 2500MHz	Adjustable via software
5	PCB	4-layer	Impedance-matching, lead-free
6	Connector	2 * 7 * 1.27mm	SMD
7	Operation voltage	1.8 ~ 3.6V DC	3.3V is recommended (Note: The voltage higher than 3.6 is forbidden)
8	Communication level	3.3V	-
9	Operation Range	3000m	Test condition: clear and open area & 12.5dBm, PCB antenna, height: 2m, coding rate 4/5, air data rate: 595bps, spectrum factor: 12.
10	Transmitting power	Maximum 12.5dBm	16mW
11	Air data rate	0.125Mbps ~ 2Mbps 0.26Mbps ~ 1.3Mbps 0.595bps ~ 253.9kbps	GFSK Mode FLRC Mode LoRa Mode, refer to Datasheet of IC
12	Standby current	2uA (max)	Current under sleep mode
13	Transmitting current	45mA@12dBm	≥200mA (recommended)
14	Receiving current	10mA	-
15	Communication interface	SPI	See more details in datasheet.
16	Transmitting length	GFSK(0 - 255 bytes) BLE(2 - 39 bytes) FLRC(6-127 bytes) LORA(1 – 255 bytes)	FIFO
17	Receiving length	GFSK(0 - 255 bytes) BLE(2 - 39 bytes) FLRC(6-127 bytes) LORA(1 – 255 bytes)	FIFO
18	RSSI	Support	-
19	Antenna type	IPX base/PCB antenna	50 Ω characteristic impedance, choose antenna interface accordingly
20	Operating temperature	-40 ~ +85°C	-
21	Operating humidity	10% ~ 90%	Relative humidity, no condensation
22	Storage temperature	-40 ~ +125°C	-
23	Receiving sensitivity	-98dBm@125Kbps	GFSK Mode, please refer to SX1280 Datasheet

4. Pin Definition

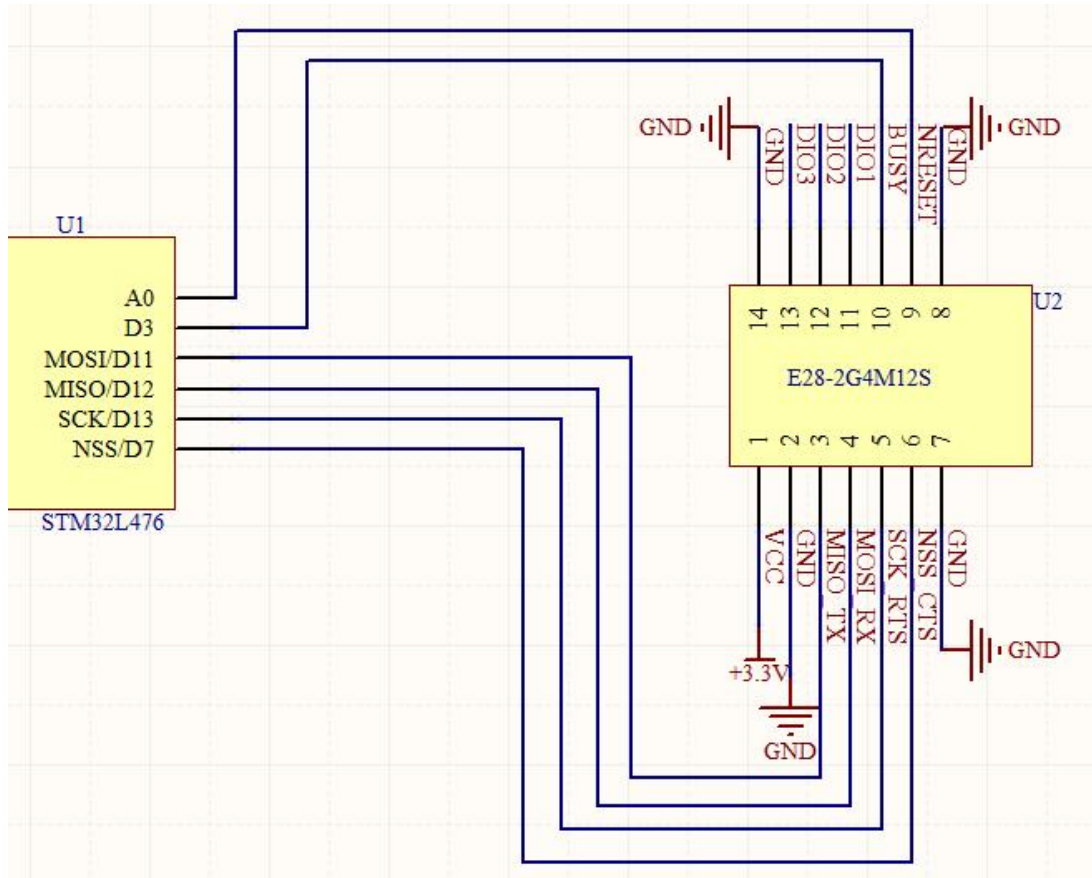


Pad quantity : 14
 Unit: mm

No.	Pin item	Pin direction	Application
1	VCC	-	Power supply, 1.8V ~ 3.6V (recommend to add external ceramic filter capacitor)
2	GND	-	Ground, connecting to power source reference ground
3	MISO_TX	Output	SPI data output pin, can be used as UART transmitting pin
4	MOSI_RX	Input	SPI data input pin, can be used as UART receiving pin
5	SCK_RTSN	Input	SPI clock input pin, can be used as UART request transmitting pin
6	NSS_CTS	Input	Module chip selection pin, used to start a SPI communication; and can be used as UART clearing transmitting pin
7	GND	-	Ground, connecting to power source reference ground
8	GND	-	Ground, connecting to power source reference ground
9	NRESET	Input	Chip reset initiation input pin, valid under low level, built-in 50k pull-up resistor
10	BUSY	Output	Status indication (refer to SX1280 Datasheet)

11	DIO1	Input/Output	Configurable general IO interface (refer to SX1280 Datasheet)
12	DIO2	Input/Output	Configurable general IO interface (refer to SX1280 Datasheet)
13	DIO3	Input/Output	Configurable general IO interface (refer to SX1280 Datasheet)
14	GND	-	Ground, connecting to power source reference ground
Please see SX1280 Datasheet of SEMTECH for more details			

5. Usage

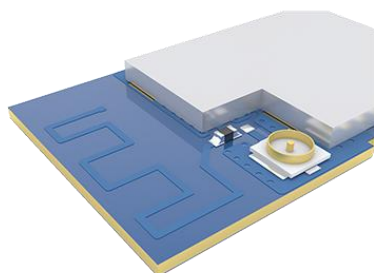


No.	Connection between module and MCU (STM32L476RG as example)
1	DIO1, DIO2, DIO3 are general I/O interfaces, can be configured for multiple functions, refer to SX1280 Datasheet, can be floated.
2	Ground must be in good condition with large area of paving with little ripple, filter capacitor shall be added close to the VCC and GND pins.

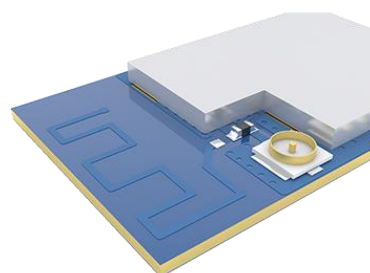
6. Antenna Type

The default 0R resistance showed as below(left), it is PCB antenna..

If users need the IPEX as antenna interface, just change the 0R resistance as below(right).



Choose PCB antenna (default)



Choose IPEX

7. Programming

No	Remarks
1	SPI communication speed rate shall not be too high, 1Mbps is recommended.
2	Operations shall be set according to the specific format in the official Datasheet
3	The parameters under different modulation mode shall be set according to the official Datasheet.

8. Customization

★Please contact us for customization.

★Ebyte has established profound cooperation with various well-known enterprises.



9. About us



Chengdu Ebyte Electronic Technology Co., Ltd. (Ebyte) is specialized in wireless solutions and products.

- ◆We research and develop various products with diversified firmware;
- ◆Our catalogue covers WiFi, Bluetooth, Zigbee, PKE, wireless data transceivers & etc.;
- ◆With about one hundred staffs, we have won tens of thousands customers and sold millions of products;
- ◆Our products are being applied in over 30 countries and regions globally;
- ◆We have obtained ISO9001 QMS and ISO14001 EMS certifications;
- ◆We have obtained various of patents and software copyrights, and have acquired FCC, CE, RoHs & etc.