## LoRa1276 Wireless Transceiver Module

1. Description

LoRa1276 adopts Semtech RF transceiver chip SX1276, which adopts LoRa TM Spread Spectrum modulation frequency hopping technique. The features of long distance and high sensitivity (-139 dBm) make this module perform better than FSK and GFSK module. Multi-signal won't affect each other even in crowd frequency environment; it comes with strong anti-interference performance.
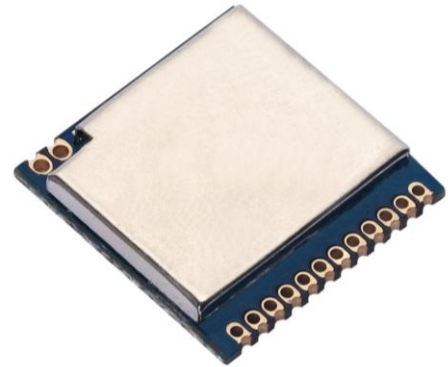
2. Features

- Frequency Range: 315/433/470/868/915 （Customizable 137-1020 MHZ）

- Sensitivity up to -139 dBm

- Maximum output power: 20dBm

- 10.3mA@receiver mode

- Sleep current <200nA

- Data transfer rate：@FSK,1.2-300kbps

- @Lora TM，0.018-37.5kbps

- Lora TM ,FSK，GFSK and OOK Modulation mode

- 1.8-3.7 V Power supply

- 127 dB Dynamic Range RSSI

- Packet engine up to 256 bytes with CRC

- Operating Temperature Range：-40 ~ + 85 ℃

- Built-in temperature sensor and low battery indicator

- Excellent blocking immunity

3. Application

- Remote control

- Remote meter reading

- Home security alarm and remote keyless entry

- industrial control

- home automation remote sensing

- individual data records

- toys control

- sensor network

- tire pressure monitoring

- health monitoring

- wireless PC peripherals

- tag reading and writing

4. Electrical Specifications

Parameter	Min	Typ	Max	Unite	Condition
Working condition					
Working voltage range	1.8	3.3	3.7	V	
Temperature voltage	-40		85	℃	
Current consumption					
RX current		10.8		mA	High performance mode
TX current		100		mA	@20dBm
Sleep current		<0.2		uA	
parameter					
Frequency range	403	433	463	MHZ	@433MHZ
	838	868	898	MHZ	@868MHZ
Modulation rate	1.2		300	Kbps	FSK
	0.018		37.5	Kbps	LoraTM
Output power range	-1		20	dBm	
Receiving sensitivity		-123		dBm	@FSK data=1.2kbps,Fdev=10kHZ
		-139		dBm	@Lora BW=125KHz_SF = 12_CR=4/5

5. Schematic
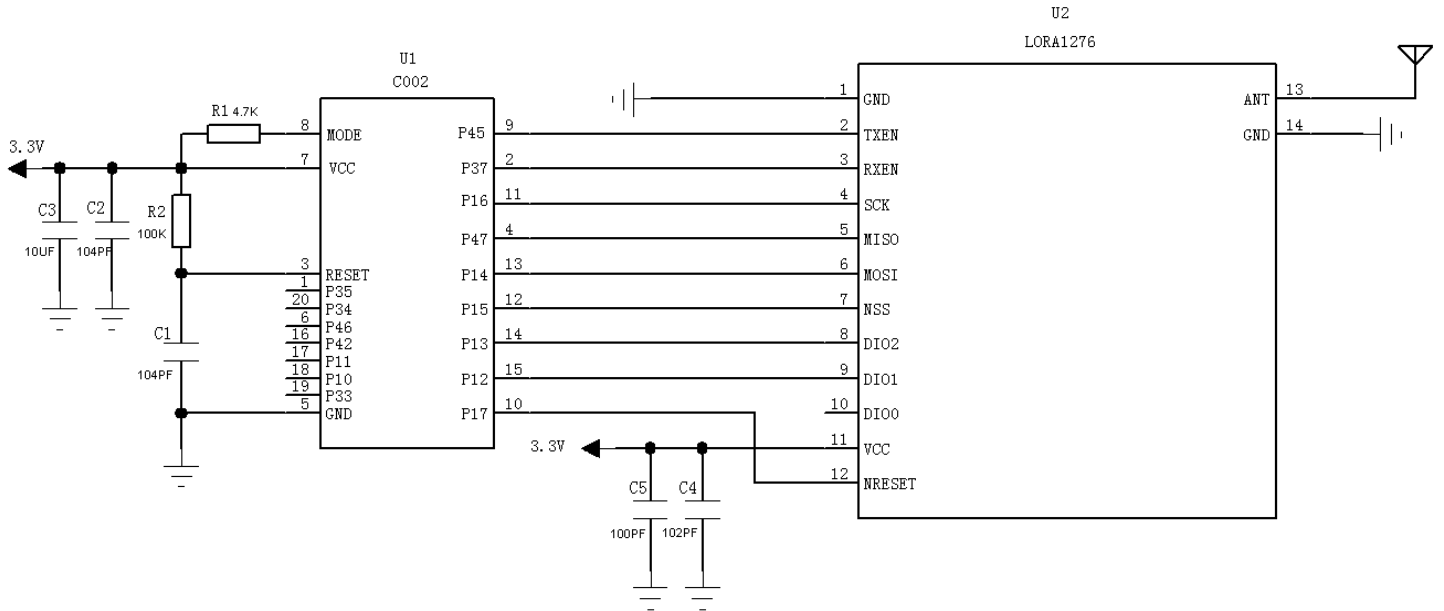
6. Pin Configuration
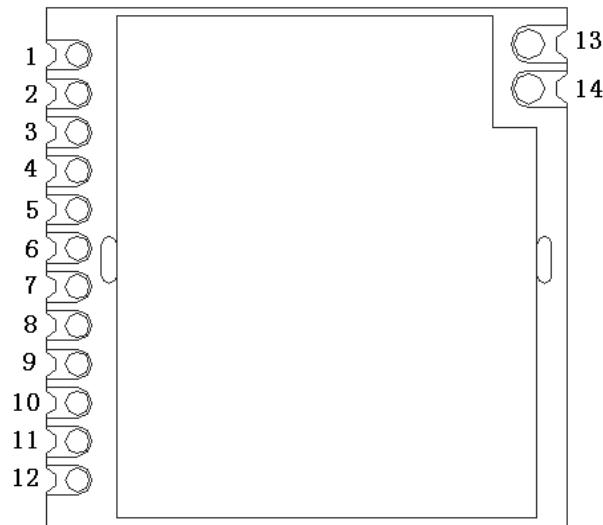
Pin NO.	Pin name	Description
1	GND	power ground
2	TXEN	Antenna switch control, Tx: Txen =1, Rxen =0;
3	RXEN	Rx: Txen = 0, Rxen = 1; Sleep : Txen = Rxen = 0
4	SCK	Serial clock for SPI interface
5	MISO	Serial MISO for SPI interface
6	MOSI	Serial MOSI for SPI interface
7	NSS	SPI enable
8	DIO2	Digital I/O
9	DIO1	Digital I/O
10	DIO0	Digital I/O
11	VCC	Positive power supply 3.3V
12	NRESET	Reset input
13	ANT	Connect with 50 ohm coaxial antenna
14	GND	power ground

7. Machanism dimensions
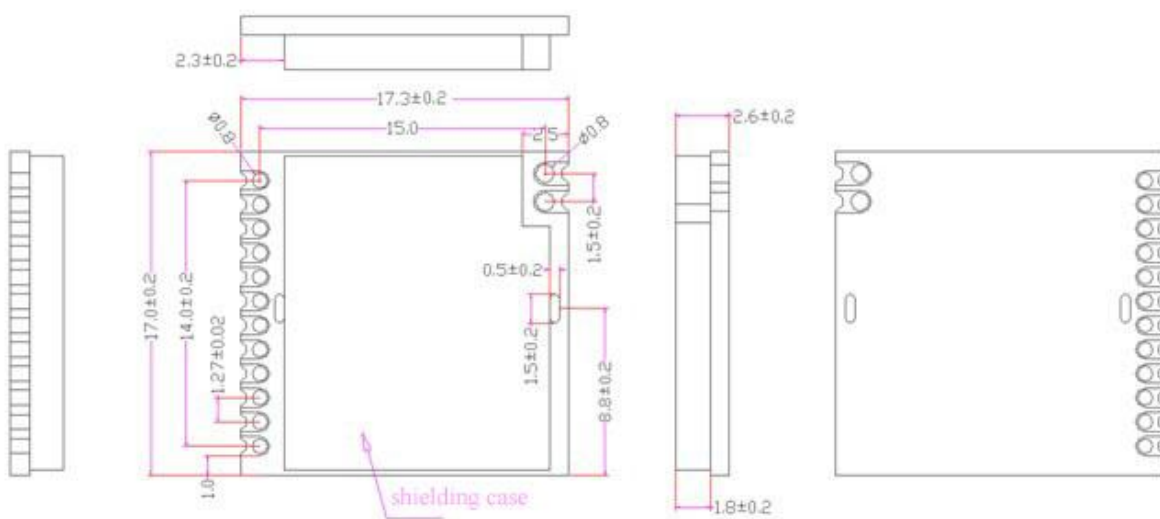
8. Products Ordering Information
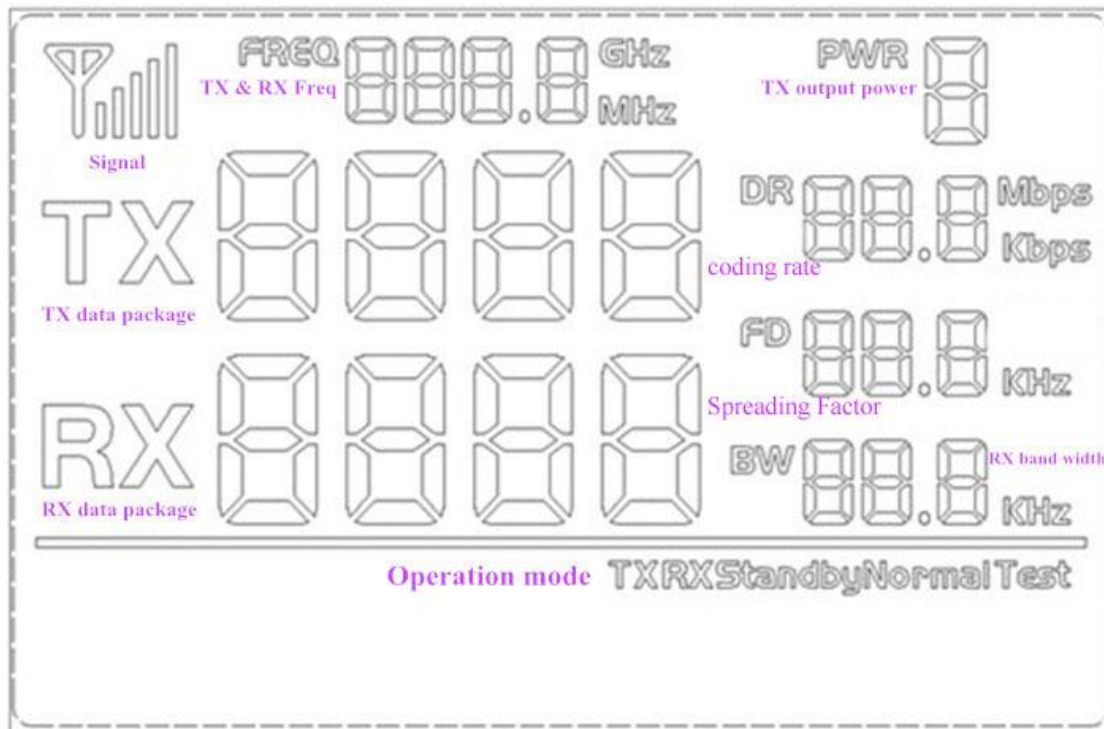
LoRa1276-433

Module Model   Frequency

For example：If the customer needs a patch module small crystal 433MHZ band module that order model: LoRa1276-433

Appendix：

The module is equipped with a standard DEMO board for customer to debug the program and test distance. It shows as below:

The LCD Full Segment is as below:

Users can set the parameters of the RF module such as working mode /frequency / transmitter power / transmission data rate through the buttons, and measure the wireless communication distance.

➢ **Working Mode**

There are 5 working modes in the DEMO. They are: Master mode, Slave mode, Tx Test mode, Rx test mode and Standby mode. Accordingly, they are displayed on the LCD as: Tx normal / Rx normal / Tx Test / Rx test / Standby. In Tx normal and Rx normal mode, the RF module works in Lora mode, the digital close to DR is Coding rate and the digital close to FD is the spreading factor; In Tx test and Rx test mode, the RF module works in FSK mode, the digital close to DR is data rate and the digital close to FD is frequency deviation.

In Tx normal and Rx normal mode, when one packet is transmitted, the Red LED will reverse, the number of Tx packets will increase; when one packet is received, the Blue LED will reverse, the number of Rx packets will increase.

1) Master Mode: Send 1 packet per second, and waiting for the acknowledge;
2) Slave Mode: Stay in Rx mode to wait for the data from the master, it will send back the acknowledged signal after received the data from the master.
3) Tx Test Mode: RF module continuously transmit signal;
4) Rx Test Mode: RF module is always in Rx mode;
5) Standby Mode: RF module is always in standby state.

➢ **Button Operation**
1) [SET] Button

Press the [SET] button to enter setting mode if not in setting mode. In setting mode,press[SET]button to toggle between the set parameters: working mode /frequency/ output power / data rate / spreading factor/ Bandwidth. The related LCD ICON will flash to indicate.

2) [UP] Button
In setting mode, press the [UP] button to increase the value of flash icon.

> **Operation:**

Press [set] button into setting mode, press [up]button to change the flashing working mode (TX Normal, RX Normal, TX test, RX test, standby)

Press [set] button to change frequency, press [up] button to change the value , and press [Set] button to turn to next digital .Frequency range is:400MHz-510MHz

Press [set] button, the digital close to PWR start to flash, press [up]button to change the value of output power (from 0-7)

Press [set] button, the digital close to DR start to flash ,press [up]button to change the vale of coding rate (4/5,4/6,4/7,4/8)

Press [set] button, the digital close to FD start to flash,press [up]button to change Spreading Factor (6-12)

Press [set] button, the digital close to BW start to flash, press [up]button to change baud width (62.5kHz,125kHz,250kHz,500kHz)

Note: The DEMO board has FLASH memory inside, all the setting parameters will besavedautomatically and keep unchanged even power-off.