



# ultra-low power consumption LoRa transceiver module with TCXO crystal

FCC ID:2AD66-1262

# **Product Specification**





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Revision	Date	Comment				
V1.0	2018-10-31	First release				
V1.1	2019-7-5	Update picture				
NiceBE	NiceBH	ALCON DE LA	Alconton a	NiceBH	HIGHT	NiceRE
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#### 1. Overview

2. The LoRa1262 wireless module uses Semtech's SX1262 device, which uses a high-precision TCXO crystal oscillator, ultra-low receive current and sleep current, and sensitivity of -148dBm. Built-in 64KHz crystal oscillator can wake up the microcontroller periodically under low power consumption. The module antenna switch is integrated and controlled by the chip, which saves

the resources of the external  $\ensuremath{\mathsf{MCU}}$ 

## 3. Features

- Frequency Range:902.8-927.3 MHz
- Sensitivity up to -148dBm @Lora
- Data transfer rate:0.018-62.5 Kbps

## 4. Applications

- Smart meters
- Supply chain and logistics
- Building automation
- Agricultural sensor
- Smart cities
- Retail store sensors
- Asset tracking

## 5. Typical application circuit

- Packet engine up to 256 bytes with FIFO and CRC
- With TCXO, accuracy 1.5ppm
- Street lights
- Parking sensors
- Environmental sensors
- Healthcare
- Safety and security sensors
- Remote control applications





## 6. Performance parameters (@Vcc=3.3v ANT connected to 50 ohm load)

Note: Our default shipment is TCXO crystal version, please contact the related sales engineer if you want to use 10ppm industrial crystal.

(Receive current: <5 mA @passive crystal oscillator)

Parameter	Min	Тур.	Max.	Unit	Condition		
			Opera	ation con	dition		
Operating voltage range	1.8	3.3	3.7	V	ter ster ster		
range of working temperature	-40		روتیمی 85	°C			
Current consumption							
BV autrant	III THE PT	< 6.5	UL NICE BI	mA	@TCXO		
		< 5	w and the second	mA	10ppm crystal		
TX current		< 130		mA			
Callenter .	Ctiles are	0.9	Citiente	uA	OFF mode (SLEEP mode with cold start)		
		1.3		uA	SLEEP mode (SLEEP mode with warm start) Configuration retained		
Sleep current	Cliffennin	1.9	Clical a	uA	SLEEP mode (SLEEP mode with warm start) Configuration retained + RC64k		
CTURES OF	C Heart	0.56	Cliente	mA	STDBY_RC mode		
		2.35		mA	STDBY_XOSC mode XOSC ON		
	·		RI	F parame	ter		
Frequency range	902.8	915	927.3	MHZ	@915MHZ		
	-	-					

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	Transmit power range	-15	10		dBm	
	Receiving sensitivity	25	-133	28	dBm	@Lora BW=500KHz_SF = 10_CR=4/5
Chicent .	Chier te	Chicon Pa		Clicon Fa	Chice	in claim claim claim

## 7. Module performance index

Frequency band	Power level	Current (mA)	Power (dBm)	Register value
(( Tights	9 stie	123.5	21.2	22
e	8	110.5	18.03	19
	7	102.2	14.67	16
	6	88.7	11.79	13
Charles Inter	5 and the company	74.2	9. 15	10
915MHZ	4	62.9	8.52	9
	3	53.6	3.5	4
	2	44.2	0.53	1
Cliente Charles	Least Charles	36.8	-2. 15	-2
	0	31.7	-4.8	-5

**NOTE:** The product can be set with a power rating of 0-9. The actual output power refers to the table. Currently, the product is certified by FCC with a rating of 4







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# 8. Pin definition

	1	16	BUSY, COO,	GND 💽
C	2	15	DI01, 150	MISO 🥌
	3	14	MC 433	MOSI 💽
	4	13	SVCC 470	SCK 🤕
	5	12	DNC 915	NSS 💽
	6	11	DI03	NRESET
C	7	10	GND LORCI26	
	8	9	SANT S	GND 📀

Pin		Description			
1	GND	Power ground			
2	MISO	SPI data output			
3	MOSI	SPI data input	and the second second		
4	SCK	SPI clock input	(C*** (C***)		
5	NSS	SPI chip select input			

6	NRESET	Reset trigger input
7、12、14	NC	Empty foot
8	GND	Power ground
9	ANT	50 ohm coaxial antenna
10	GND	Power ground
11	DIO3	Digital I/O, customizable
13	VCC	Power input (default 3.3V)
<b>15</b>	DIO1	Digital I/O, customizable
16	BUSY	Used for status indication, depending on the chip data.

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## 9. Pin comparison table

The LoRa1262 module are pin compatible withLoRa1278/1276-C1. Below is the difference between this 2 modules:

a B	est.	and the second	a de la calencia de la	- SiceBi
Мос	lule	LoRa1278/1276-C1	LoRa1262	Ceres.
1		GND	GND	
2	2	MISO	MISO	a stra
3	C and	MOSI	MOSI	Canal Canal
4	ŀ	SCK	SCK	
5		NSS	NSS	- Stra
6	C Manna	NRESET	NRESET	C anter
7	,	DIO5	NC	
8	3	GND	GND	al.
C S	C Andrews	ANT	ANT	C C C C C C C C C C C C C C C C C C C

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	10		GND			GND	
	11		DIO3			NC	
NiceBE	12	NiceBH	DIO4	NICE	Allenger .	NC	
	13		VCC			VCC	
	14		DIO0			NC	
NICE BE	15	ViceRf.	DIO1	N. C. L.	ALCONT OF	DIO1	-41 14
C	16	C	DIO2	(C.*.)	(Core	BUSY	C

#### 10. Communication antenna

#### 1)Antenna

Antenna is an important part of communication system. Its performance directly affects the parameters of the communication system. The module requires an antenna impedance of 50 ohms. General purpose antenna has spring antenna and wire antenna. It is recommended to use this module in order to make it work at its best. The antenna is provided by the company

Note: The OEM integrator is still responsible for the FCC compliance requirement of the end product, which integrates this module. Appropriate measurements (e.g. 15 B compliance) and if applicable additional equipment authorizations (e.g. SDoc) of the host device to be addressed by the integrator/manufacturer.

 $\star$  The following principles should be followed during antenna use to ensure the best communication distance of the module:

- Try not to be close to the ground surface of the antenna, and it is best to stay away from obstacles;
- If the suction cup antenna is purchased, the lead wire should be straightened as much as possible, and the suction cup base should be attached to the metal object.

## 11. Mechanical Dimensions(Unit: mm)



#### 12. Order information

#### LoRa1262-915

Frequency Frequency Frequency For example: If the customer needs 915MHz Frequency, the order no. shall be LoRa1262-915.

At present, LoRa1262 products have the following models:

Order model	product type		
LoRa1262-915	Sx1262 chip, module working center frequency band is 915MHZ	Enn	

## 13. FAQ:

- a) Why module can not communicate properly?
  - 1) The power supply is connected incorrectly and the module is not working properly;
  - 2) Check whether the frequency band of each module and other RF parameters are consistent;
  - 3) Is the module damaged?
- b) Why transmission distance is not far as it should be?

- 1) Power supply ripple is too large;
- 2) The antenna types do not match, or not properly installed;
- 3) The surrounding environment is harsh, strong interference sources;
- 4) Surrounding co-channel interference;

#### FCC statements:

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.

NOTE: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications or changes to this equipment. Such modifications or changes 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.

## Appendix 1: SMD Reflow Chart

We recommend you should obey the IPC related standards in setting the reflow profile:







IPC/JEDEC J-STD-020B the condition	big size components
for lead-free reflow soldering	(thickness >=2.5mm)
The ramp-up rate (T1 to Tp)	3°C/s (max.)
preheat temperature	
- Temperature minimum (Tsmin)	150℃
- Temperature maximum (Tsmax)	200°C
- preheat time (ts)	60~180s
Average ramp-up rate(Tsmax to Tp)	3℃/s (Max.)
- Liquidous temperature(TL)	217℃
- Time at liquidous(tL)	60~150 second
peak temperature(Tp)	245+/−5°C



