



SX130x

LoRa Gateway module



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Documents

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Document version

Version	Time	Description
Rev. 1.0	2019-11-05	Preliminary version
Rev. 1.0	2021-05-17	Typographic modification

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1. Description

1.1 Overview

The SX130x LoRa gateway module includes two baseband models, SX1301 and SX1308. Their performance, drivers, interface packaging, and functions are completely the same. The difference is the operating temperature range. SX1301 is positioned as an outdoor type, and SX1308 is positioned as an indoor type. Cooperate with suitable driver hardware and Linux operating system (such as Raspberry Pi), then it can work as a LoRa gateway.

SX130x LoRa Gateway module are available in two product variants:

Table 1.1 Product model list

No.	Model	Description
1	SX130x LoRa Gateway module-LF	470~510MHz working LoRa frequency, used for China mainland (CN470) LPW band.
2	SX130x LoRa Gateway module-HF	For EU868, IN865, US915, AU915, AS923, KR920 and other LPW networks with operating frequencies between 863~928MHz.

1.2 Product features

- CE Certificate
- SX1301/SX1308 digital baseband chip
- Emulates 49x LoRa demodulators and 1x (G)FSK demodulator
- 10 programmable parallel demodulation paths
- Dynamic data-rate adaptation (ADR)
- Automatic adaptive spread spectrum factor, SF7 to SF12 for each channel is

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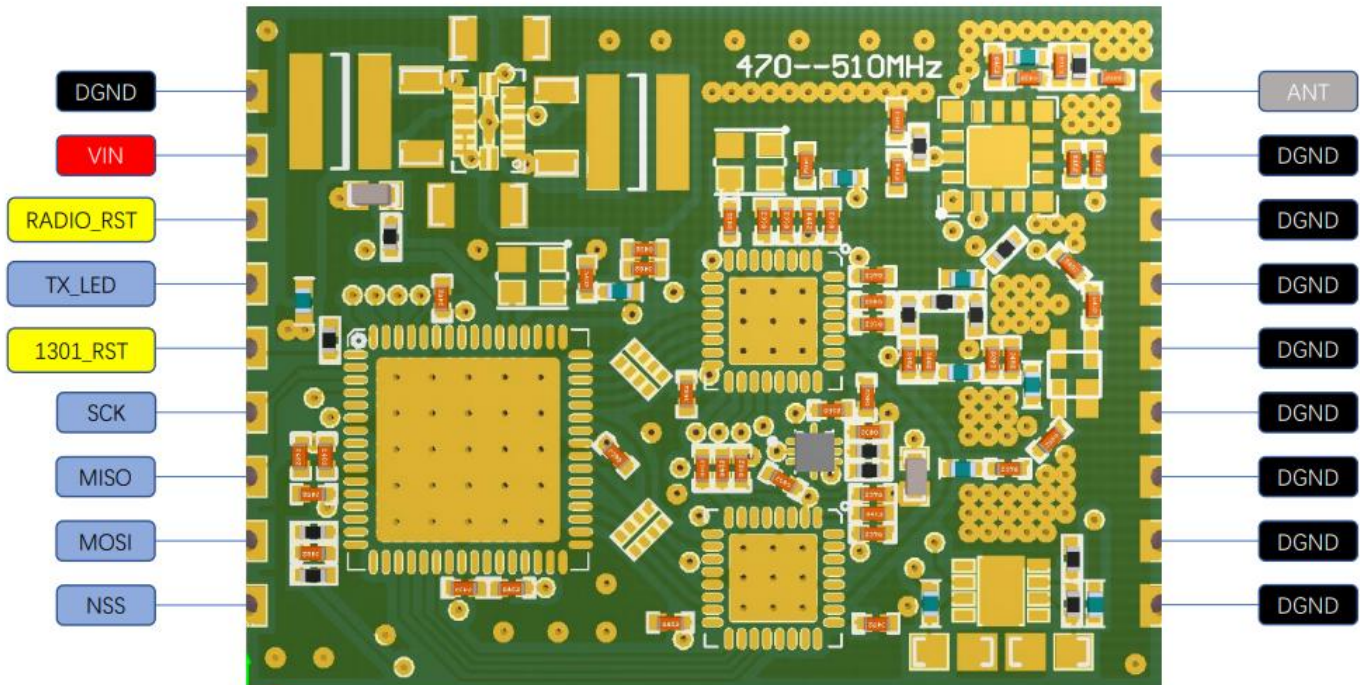
optional

- Maximum output: 20 ± 1 dBm
- Up to -135dBm sensitivity with SX1257 or SX1255 Tx/Rx front-end
- The power supply voltage: 5V
- Support for LoRaWAN Class A, Class B, Class C protocols
- Operating temperature range:
 - SX1301 version: $-20 \sim 75$ ° C
 - SX1308 version: $0 \sim 70$ ° C
- Frequency range:
 - Europe – 868MHz ISM band (863MHz to 870MHz range)
 - Europe – 433MHz ISM band
 - USA/Australia – 915MHz ISM band (902MHz to 928MHz range)
 - China – 470MHz ISM band (470MHz to 510MHz range)



2. Pin Definition

2.1 Pin assignment



2.2 Pin description

Table 2.2 Pin description

No.	Name	Function
1	VIN	+5V power input
2	GND	Power source ground
3	RADIO_RST	SX1255/57 analog front end chip reset, ≥200ms HIGH signal reset
4	130x_set	SX130x baseband chip reset, ≥200ms HIGH signal reset
5	SCK	SPI bus clock for SX130x baseband chip
6	MISO	SPI bus MISO for SX130x baseband chip
7	MOSI	SPI bus MOSI for SX130x baseband chip
8	NSS	Chip select for SX130x baseband chip, LOW signal select
9	GND	Power source ground
10	GIPO4	LoRa signal transmit indicator
11	GIPO3	Reserved
12	GIPO2	Reserved

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13	GIPO1	LoRa signal receive indicator
14	GIPO0	Reserved
15	GND	Power source ground
16	ANT	LoRa signal output, connected to the onboard IPEX socket

3. Specifications

3.1 General specifications

Table 3.1: General specifications

Parameters	Description
LoRa Chip	SX1301/SX1308
Frequency	470~510 MHz, 863~928 MHz
Max. TX Power	20 ± 1 dBm
Max. Receiving sensitivity	-135 dBm
Drive bus	SPI
Interface	LGA, IPEX(V1)
Operating temperature	-20 ~ 70 °C / 0~70°C

3.2 Electrical characteristics

3.2.1 Power supply

Table 3.2 Power supply

Power supply mode	Minimum	Typical	Maximum
5V pin DC power supply(≥400mA)	4.8V	5V	6V



3.2.2 Power characteristics

Table3.2 Power characteristics

Mode	Condition	Min.	Typical	Max.
Power consumption(mA)	8 Channel Listening (receive mode)		153mA	
	LoRa 10dB Output	254mA		
	LoRa 12dB Output	258mA		
	LoRa 15dB Output	259mA		
	LoRa 18dB Output	284mA		

3.3 RF characteristics

3.3.1 Transmit power

Table3.3.1 Transmit power

Operating frequency band (MHz)	Maximum power value/[dBm]
470~510	20 ± 1
863~870	20 ± 1
902~928	20 ± 1

3.3.2 Receiving sensitivity

The following table gives typically sensitivity level of the SX130x LoRa Gateway module.

Table3.3.2 Receiving sensitivity

Signal Bandwidth/[KHz]	Spreading Factor	Sensitivity/[dBm]
125	SF12	-135
125	SF10	-130
125	SF7	-124



3.4 Operation frequencies

SX130x LoRa Gateway module supports LoRaWAN frequency channels and models corresponding table.

Table3.4 Operation frequencies

Region	Frequency (MHz)	Model
EU433	433.175~434.665	SX130x LoRa Gateway module-LF
CN470	470~510	SX130x LoRa Gateway module-LF
IN868	865~867	SX130x LoRa Gateway module-HF
EU868	863~870	SX130x LoRa Gateway module-HF
US915	902~928	SX130x LoRa Gateway module-HF
AU915	915~928	SX130x LoRa Gateway module-HF
KR920	920~923	SX130x LoRa Gateway module-HF
AS923	920~925	SX130x LoRa Gateway module-HF



4. Resource

4.1 Relevant Resource

- [Recommend hardware design](#)
- [Pin map](#)
- [Downloadable resource](#)

4.2 Contact Information

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