LoRa 2W 470MHz RF MODULE

WENSHING announced the TRW-LORA12783X (LoRa) long-range wireless data transmission module in May 2024. Utilizing advanced LoRa spread spectrum technology, it is designed for remote wide-area IoT applications, compliant with the high-power FCC PART 90.205 33dBm specifications.
The TRW-LORA12783X boasts strong anti-interference capabilities, enhancing reliability and transmission efficiency. Its extensive coverage makes it particularly suitable for remote monitoring applications. Additionally, it offers a rich variety of interfaces and configuration options, ensuring flexibility in application.
The TRW-LORA12783X features a super high receiver sensitivity of -151dBm and a maximum power of up to 33dBm (almost 2W), enabling ultra-long-range wireless transmission. It is suitable for applications across various fields including IoT (Internet of Things), smart cities, transportation, industrial control, automated agriculture, healthcare, and military.

18mm * 35.2mm * 3.85mm

Application

- Remote-controlled aircraft
- Unmanned vehicles
- Smart homes
- Smart streetlights
- Logistics tracking
- Agricultural automated irrigation
- Digital intercom
- Remote-controlled cranes
- Equipment communication

Features

- Frequency 470MHz
- Receiver sensitivity -151dBm
- Utilizing SX1278 chip
- Automatic frequency control AFC
- FSK/OOK Mode
- SPI Serial port
- Transmit power 33dBm
- Operating voltage 3.8 ~ 5.5V
- Signal strength detection AGC
- 127dB RSSI Dynamic range

Version History

Version	Date	Changes
V1.01	May.10.2024	1st. Edition

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Specifications

Model：TRW-LORA12783X

Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
Frequency Range	420		500	MHz	470MHz (Center frequency)
Receiver Sensitivity	-151			dBm	0.03125bps
Transmit Power			33	dBm	near 2W
Data Rate	0.03125		8	Kbps	LoRa Protocol
Supply Voltage, VCC	3.8		5.5	V	DC
TX Current		1300		mA	33dBm(about 2W)
RX Current		23		mA	
Power down Current			0.1	uA	Power down Mode
Power up time	50			ms	Disable to Enable time
Operating Temperature	-40		+80	°C	

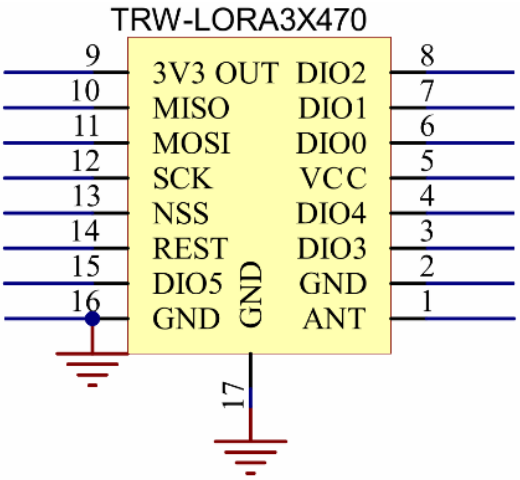
Data Rate/Sensitivity

Date Rate (kbps)	Spreading Factor	Bandwidth (kHz)	Coding Rate	Receiver Sensitivity (dBm)
0.03125	12	125kHz	4/5	-151
0.0625	12	250 kHz	4/5	-148
0.125	12	500 kHz	4/5	-146
0.125	11	125 kHz	4/5	-149
0.25	11	250 kHz	4/5	-146
0.5	11	500 kHz	4/5	-144
0.25	10	125 kHz	4/5	-150
0.5	10	250 kHz	4/5	-147
1	10	500 kHz	4/5	-145
0.5	9	125 kHz	4/5	-151
1	9	250 kHz	4/5	-148
2	9	500 kHz	4/5	-146
1	8	125 kHz	4/5	-152
2	8	250 kHz	4/5	-149
4	8	500 kHz	4/5	-147
2	7	125 kHz	4/5	-153
4	7	250 kHz	4/5	-150
8	7	500 kHz	4/5	-148

Front view

Bottom view

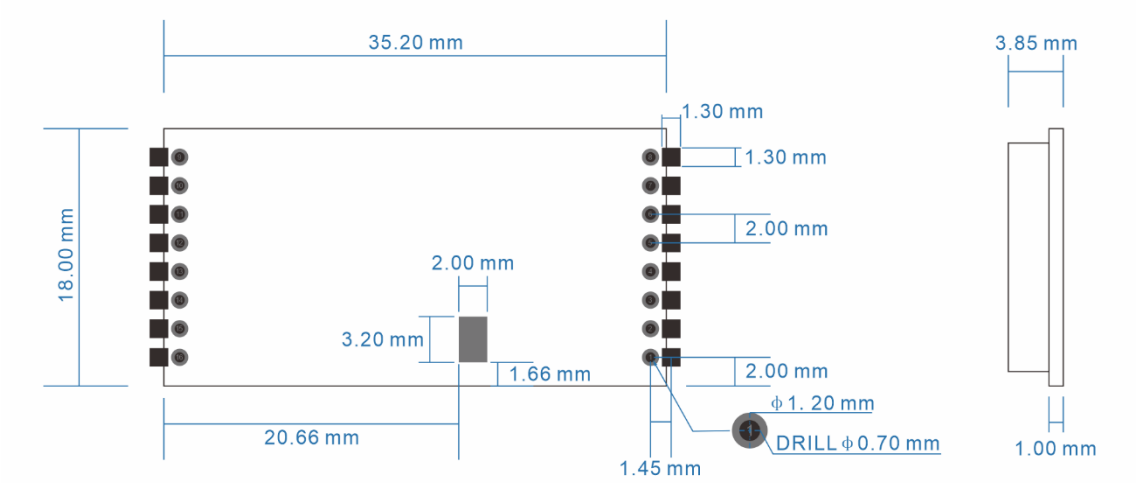
Pin Assignment



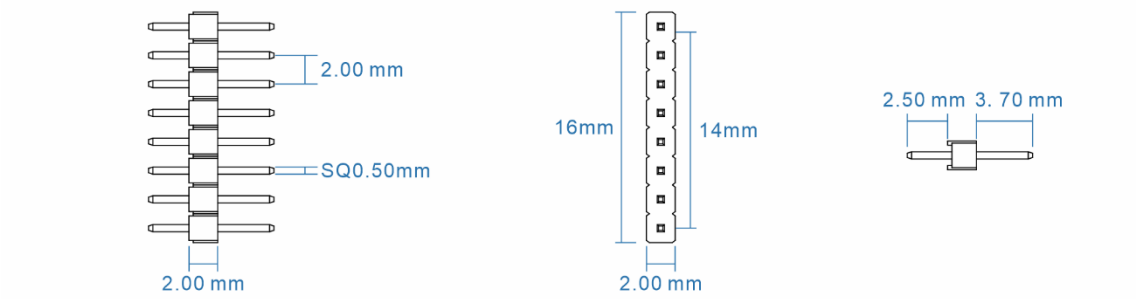
Pin	Name	I/O	Description
1	ANT	I/O	Antenna interface
2	GND	-	Ground
3	DIO3	I/O	Digital I/O, software configured
4	DIO4	I/O	Digital I/O, software configured
5	VCC	I	Supply voltage for RF 3.8~5.5V
6	DIO0	I/O	Digital I/O, software configured
7	DIO1	I/O	Digital I/O, software configured
8	DIO2	I/O	Digital I/O, software configured
9	3V3 OUT	O	LDO out 3.3V
10	MISO	O	SPI Data output
11	MOSI	I	SPI Data input
12	SCK	I	SPI Clock input
13	NSS	I	SPI Chip select input
14	NRESET	I/O	Reset trigger input
15	DIO5	I/O	Digital I/O, software configured
16	GND	-	Ground
17	GND	-	Exposed ground pad

Dimension

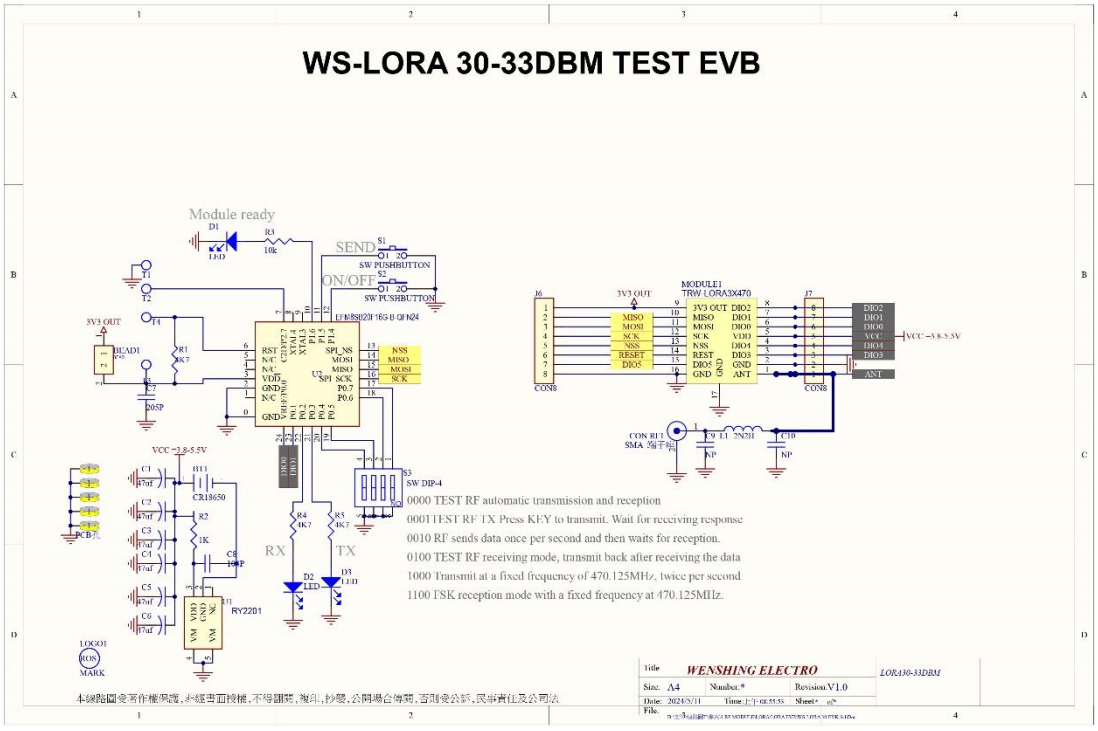
TRW-LORA12783X

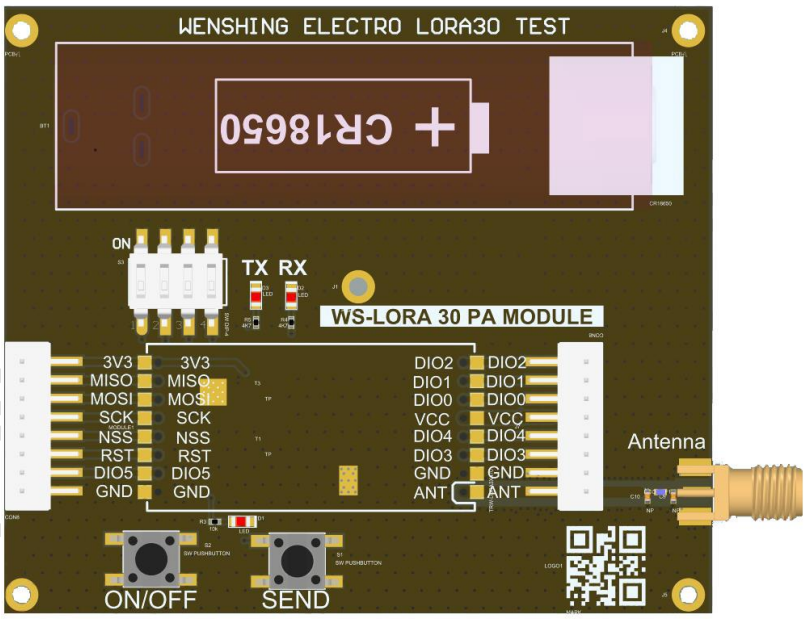


Pin Header



TEST EVB





- LoRa distance calculation reference：
  https://www.rfwireless-world.com/calculators/LoRaWAN-Range-calculator.html
- Antenna length calculation reference：
  https://rf.net.tw/Design_tools/ant_design.html