

Wireless Module for Crowpanel Advanced Series-Meshtastic DataSheet (LoRa)

LoRa@ Wireless Module-Powered by Semtech

DataSheet

V1.1



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1 Overview

1.1 Product Description

The Meshtastic Wireless Module is a high-performance and low-power solution based on the Semtech SX1262 LoRa® wireless communication IC, which is optimally designed for long-distance and low-data-rate Internet of Things (IoT) scenarios. Its core is equipped with the next-generation LoRa™ spread - spectrum modulation technology, supporting the 868 - 915MHz frequency band and complying with the LoRaWAN 1.0.3 standard to ensure seamless compatibility with global LoRaWAN networks Semtech.

The module integrates a temperature - compensated crystal and a 4 - wire SPI communication interface, enabling quick connection with mainstream microcontrollers. In terms of functionality, it supports Mesh network formation and Peer - to - Peer (P2P) communication. Combined with the IPEX - 1 antenna interface to expand signal coverage, it achieves ultra - long - distance transmission.

The hardware design prioritizes user - friendliness. It is equipped with a RESET button and a PWR LED power indicator, with a supply voltage range of 1.8V - 3.7V that meets the requirements of low - power consumption devices. This module is suitable for scenarios such as smart city sensor networks, industrial equipment monitoring, environmental data collection, agricultural IoT, and emergency rescue communications. It provides underlying hardware support for decentralized and high - reliability wireless communications.

1.2 Core Features

- **Core Chip:** Equipped with the Semtech SX1262 LoRa® wireless communication IC, boasting both excellent performance and high reliability.
- **Frequency Bands and Modulation:** Supports the 868/915 MHz frequency bands, and is compatible with LoRa/LoRaWAN protocols as well as (G)FSK modulation.
- **Communication Capabilities:** Compliant with the LoRaWAN 1.0.3 standard, supporting Meshtastic networking and LoRa Peer-to-Peer (P2P) communication.
- **Technical Advantages:** Adopts the new-generation LoRa™ modulation technology to achieve long-distance communication with low power consumption; comes with a TCXO (Temperature Compensated Crystal Oscillator) to enhance operational stability.
- **Hardware Design:** Features a standard 4-wire SPI interface and an IPEX-1 antenna interface, facilitating easy connection of external devices and antennas.
- **Environmental Adaptability:** Operates within a temperature range of -40°C to +85°C and a supply voltage range of 1.8V to 3.7V, making it suitable for various application scenarios.
- **User Interaction:** Integrated with a RESET button and a PWR LED, enabling convenient reset operation and intuitive monitoring of the power status.

1.3 Application Scenarios

- **Outdoor Exploration & Sports**
- **Emergency Rescue & Contingency Communications**
- **Community & Daily Communications**
- **IoT & Remote Monitoring**
- **Large-Scale Events & Crowded Scenarios**

2 Dimensions Drawing



Figure 1:Dimensions Drawing

3 System Block Diagram

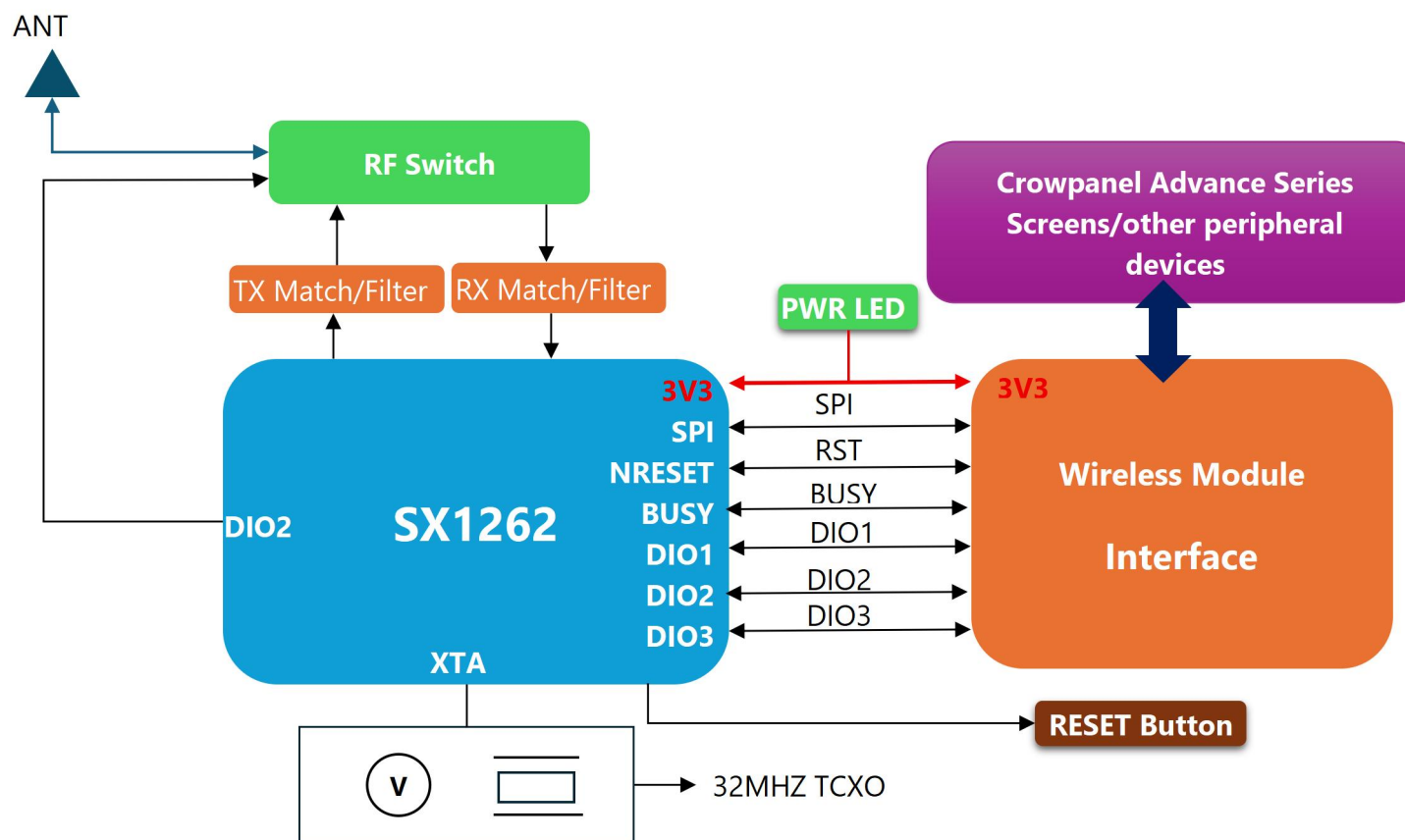


Figure 2: System Block Diagram

4 Hardware Overview

The hardware overview covers the Meshtastic module's interfaces, pin layout, and corresponding pin functions.

4.1 Buttons & LEDs

LoRa

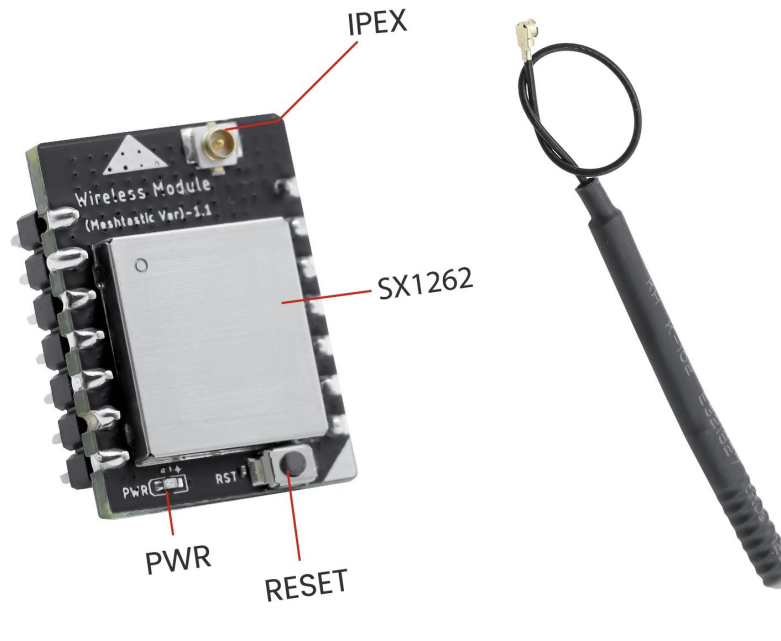


Figure 3:Module Interface Diagram

No.	Button Name	Silkscreen	Pin	MCU Pin	Description
1	RESET Button	RST	SX_NRESET	NRESET	Pressing the RESET button restarts the program or enables program flashing.

No.	Name	Silkscreen	Pin	Color	Description
1	Power Indicator	PWR	VDD_IN	Green	Power indicator: stays steadily lit in green when the module is powered on.

4.2 Antenna Interface

No.	Name	IO Type	Description
1	RF Port	I/O	Connects to the RF antenna, available only on the IPEX connector.

4.3 Pin Layout

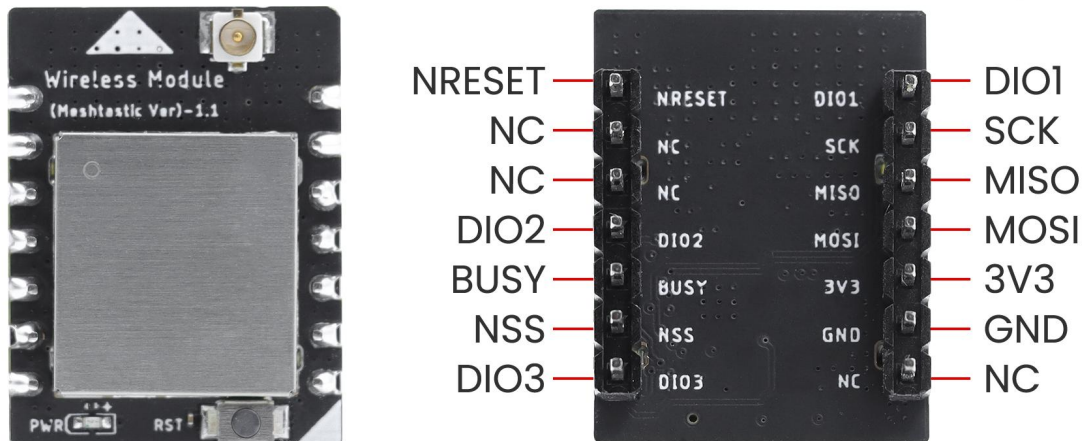


Figure 4:Module Pin Diagram

Pin Definition: The following table shows the pin definitions and descriptions of the Meshtastic wireless module:

Left Interface:

No.	Pin No.	Type	Pin	SX1262 Pin	Description
1	P\$1	I/O	SX_NRESET	NRESET	Resets and initializes the chip to enhance stability; active low reset.
2	P\$2	-	NC	-	Not Connected
3	P\$3	-	NC	-	Not Connected
4	P\$4	I/O	DIO2	DIO2	Multi-purpose digital I/O (DIO2 of SX1262 IC); DIO2 connects to the control pin of the RF SPDT switch.
5	P\$5	I/O	BUSY	BUSY	Chip internal status indicator pin
6	P\$6	I/O	NSS	NSS	SPI Chip Select Input
7	P\$7	I/O	DIO3	DIO3	Multi-purpose digital I/O

Right Interface:

No.	Pin No.	Type	Pin	SX1262 Pin	Description
1	P\$1	I/O	DIO1	DIO1	Multi-purpose digital I/O
2	P\$2	I/O	SCK	SCK	SPI Clock Input
3	P\$3	I/O	MISO	MISO	SPI Data Input
4	P\$4	I/O	MOSI	MOSI	SPI Data Output
5	P\$5	P	VDD_RADIO	VDD_IN	Power Input (3.3V)
6	P\$6	-	GND	-	Ground Pin
7	P\$7	-	NC	-	Not Connected

5 Module Specifications

No.	Item	Parameter	Specification	Unit
1	RF Characteristics	Main Chip	Semtech SX1262 Chip	
2		Frequency Range	150-960	MHz
3		Modulation Signals	LoRa®、(G) FSK	
4		LoRaWAN Protocol	Class A/B/C (Compliant with LoRaWAN 1.0.3 Standard)	
5		Air Data Rate (LoRa)	0.018-62.5	Kbps
6		Transmit Power	+22 (MAX)	dBm
7		Receive Sensitivity	-125 (TYP)	dBm
8	Electrical Characteristics	Module Supply Voltage	3.3V@typical	V
9		TCXO Supply Voltage	1.8-3.3	V
10	Module Package Type	Dimensions	18*23.7*1.6	mm
11	Others	DIO1、DIO2、DIO3	Multi-purpose Digital I/O	
12		Button	RESET Button	
13		Indicator Light	PWR LED	
14		Antenna Interface	IPEX-1	

6 Electrical Characteristics

6.1 Power Consumption Parameters

No.	Mode	Current	Power
1	TX	82mA	270.6mW
2	RX	6.2mA	20.46mW

6.2 Absolute Maximum Ratings

No.	Item	Description	Min	Max	Unit
1	V _{CC}	Supply Voltage	-0.5	3.9	V

6.3 Recommended Operating Conditions

No.	Item	Description	Min	Typ	Max	Unit
1	V _{CC}	Supply Voltage	1.8	3.3	3.7	V
2	Top	Operating Temperature	-30	-	+85	°C
3	Tst	Storage Temperature	-40	-	+85	°C

7 Mechanical Characteristics

7.1 Module Dimensions

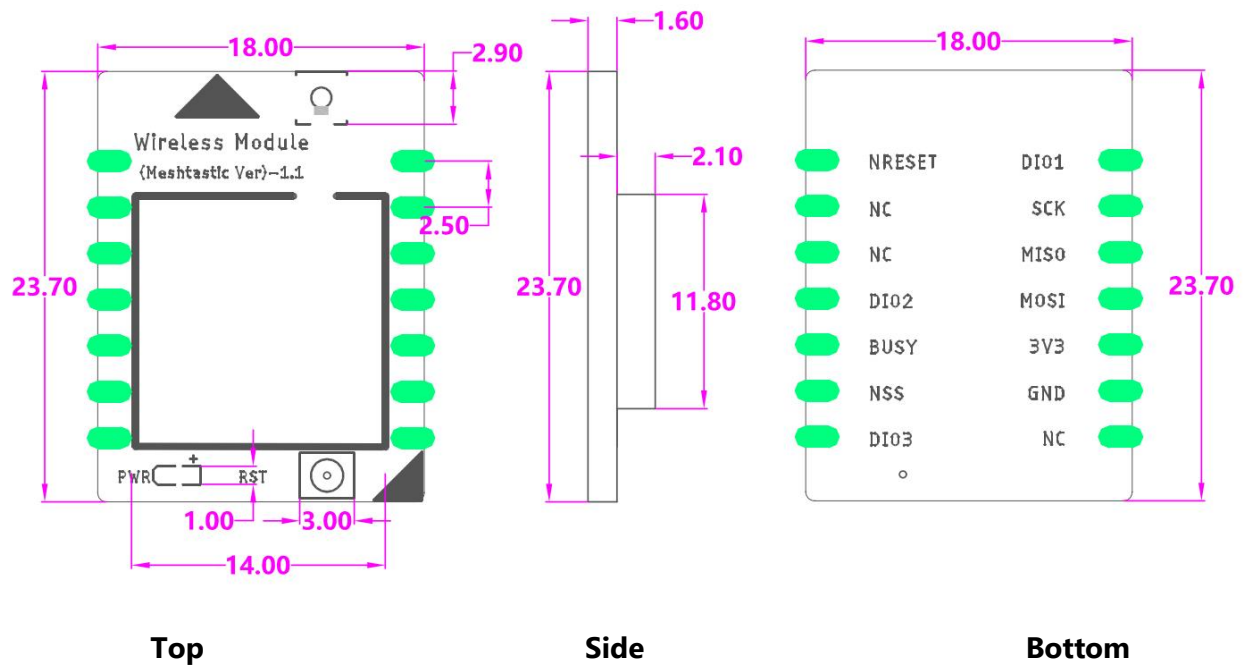


Figure 5:Outline Dimensions (Unit: mm)

7.2 Layout Recommendations

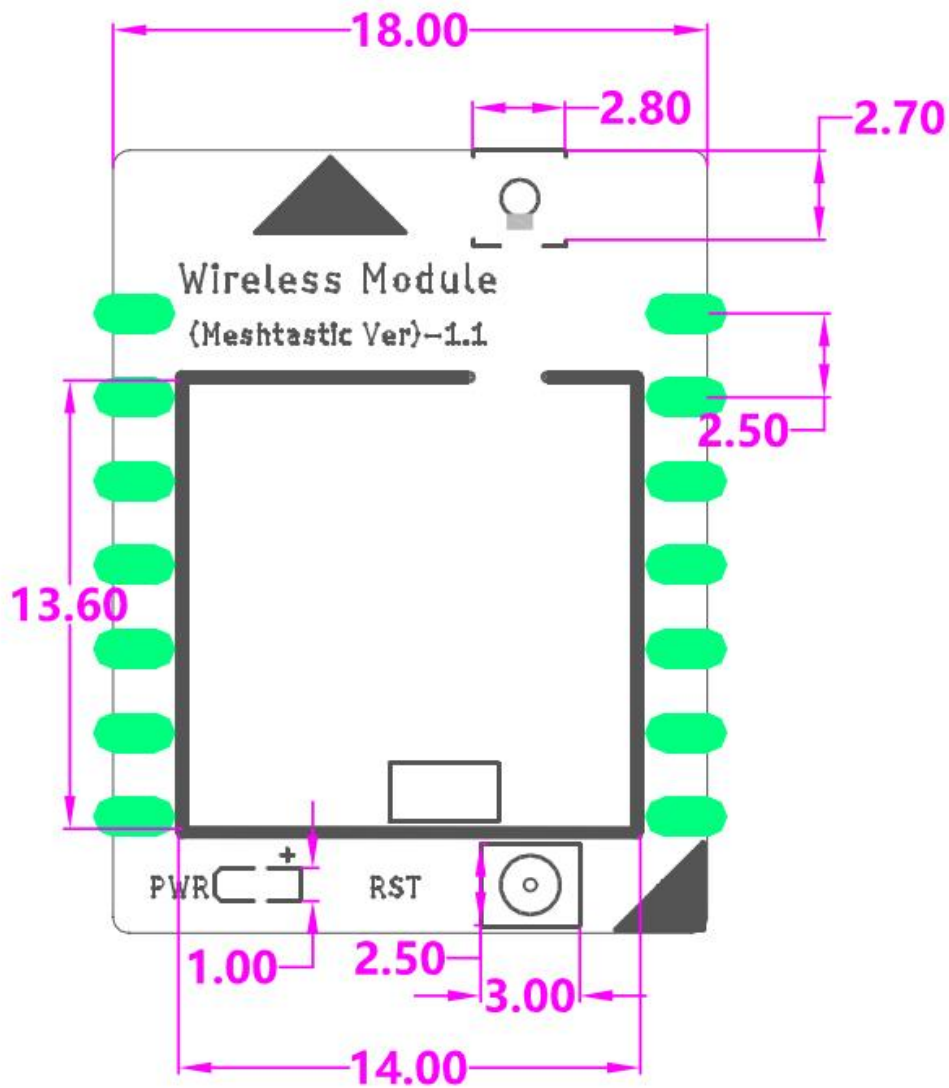


Figure 6:PCB Layout (Unit:mm)

8 Related Documents & Resources

- [SX1261/2 Datasheet](#)
- [Wireless module for Crowpanel Advanced Series](#)

9 Revision History

Date	Version	Release Notes
2026/1/2	V1.0	Initial Release