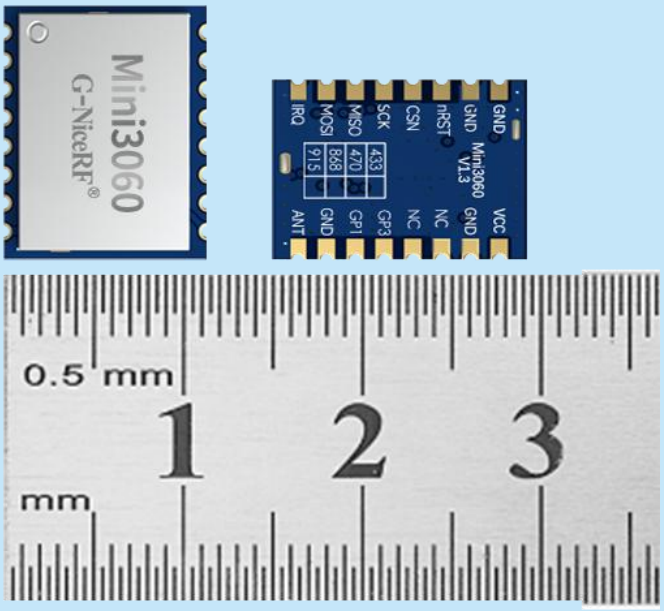
Mini3060 wireless transceiver module

- Ultra-compact size, high sensitivity, with an open-area range of 4-5 km

Product Specification



Catalogue

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Note: Revision History

Revision	Date	Comment
V1.0	2025-5	First release
V1.1	2025-5	Update Electrical Characteristics，Mechanism Dimension add Function Demonstration Board

1. Descriptions

Mini3060 is a module based on the low-power, long-range wireless transceiver chip that uses DSSS modulation and demodulation technology. It supports half-duplex wireless communication and utilizes a TCXO crystal oscillator, offering high anti-interference capability, high sensitivity, low power consumption, and ultra-long transmission range. It features a maximum sensitivity of -129dBm and a maximum output power of 20dBm, providing an industry-leading link budget, making it the best choice for long-distance transmission and applications with high reliability requirements.

Mini3060 strictly uses lead-free technology for production and testing, complying with RoHS and Reach standards.

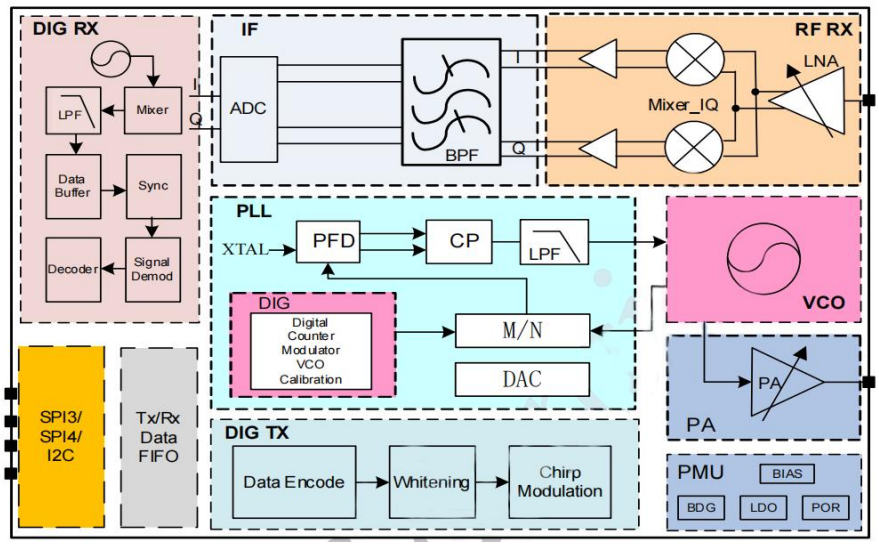
2. Features

- Operating Voltage Range: 2.0-3.6V
- Frequency Range:433/470/868/915 MHz
- Sensitivity：-129dBm @125KHz,0.5Kbps
- Maximum output power：20 dBm
- Low receive current: 4.5mA@DCDC
- Sleep current < 1.0uA
- Data transfer rate: 0.5-59.9Kbps @LoRa
- Supports bandwidth: 125/250/500KHz
- Supports SF factor: 5–9, automatic recognition
- Supports data rates: 4/5, 4/6, 4/7, 4/8
- Supports CAD function

3. Applications

- Smart Factory
- Smart Water Management
- Smart Agriculture
- Smart Healthcare
- Smart Community
- Smart Firefighting

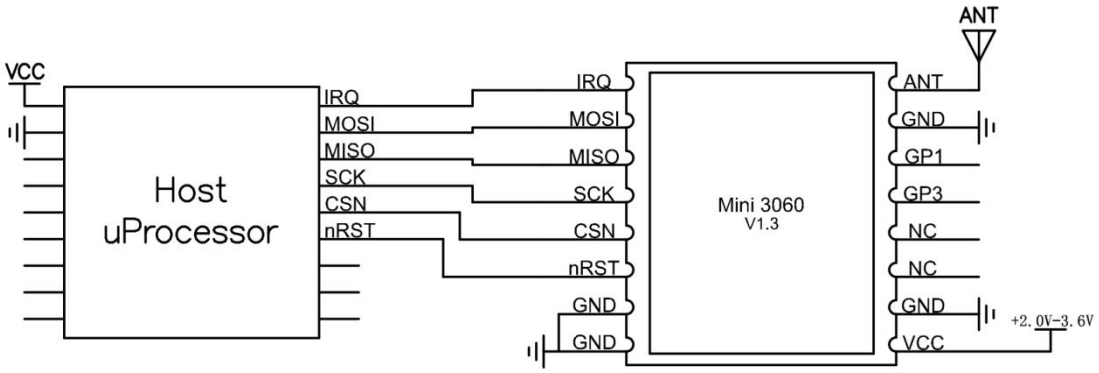
4. Block Diagram



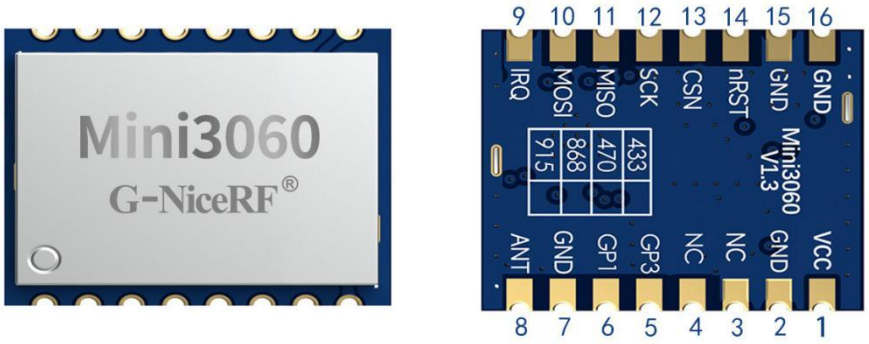
5. Electrical Characteristics

Parameter	Min	Typ	Max	Unit	Condition
Operation Condition					
Working voltage	2	3.3	3.6	V	
Temperature range	-40		85	℃	
Current Consumption					
RX current		4.5		mA	@DCDC Mode
		7.4		mA	@LDO Mode
TX current		<110		mA	@20dBm
Sleep current		<1		uA	
RF Parameter					
Frequency range	408	433	450	MHz	@433MHz
	470	490	510	MHz	@470MHz
	850	868	890	MHz	@868MHz
	900	915	930	MHz	@915MHz
Modulation Rate	0.5		59.9	Kbps	LoRa
Output power	-30		20	dBm	
Receiving sensitivity		-129		dBm	@LoRa BW=125KHz_SF = 9_CR=4/5

6. Typical application circuit

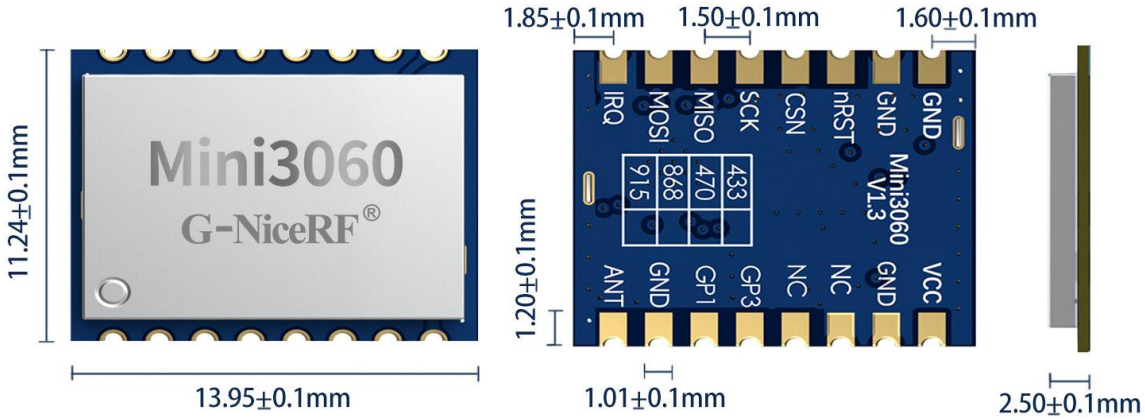


7. Pin definition



Pin NO	Pin name	IO	Description
1	VCC		External Power Supply Positive Terminal
2,7,15,16	GND		External Power Supply Negative Terminal
3,4,	NC		
5	GP3	0-3.3V	Connect to the chip's GPI003 pin; refer to the chip datasheet for specific functions
6	GP1	0-3.3V	Connect to the chip's GPI001 pin; refer to the chip datasheet for specific functions
8	ANT		Connect to an external 50Ω antenna
9	IRQ	0-3.3V	Interrupt Signal
10	MOSI	0-3.3V	SPI Data Input Signal
11	MISO	0-3.3V	SPI Data Output Signal
12	SCK	0-3.3V	SPI Serial Clock
13	CSN	0-3.3V	SPI Chip Select Signal
14	nRST	0-3.3V	Reset Pin

8. Mechanism Dimension(Unit:mm)



9. Product order information

Product Name	Description
Mini3060-433	Working frequency 433MHz
Mini3060-470	Working frequency 470MHz
Mini3060-868	Working frequency 868MHz
Mini3060-915	Working frequency 915MHz

10. Function Demonstration Board



1. Function Description

The Mini3060 wireless module demo board primarily implements bidirectional communication (Master and Slave) in LoRa mode, along with sleep (Sleep), transmit power (TxTest), and receiver sensitivity (RxTest) testing functions.

Note: Transmit power and receiver sensitivity must be tested with instruments.

2. Key Functions

The demo board has three buttons: SET, UP, and DOWN. Their functions are as follows:

Buttons	Functions
SET Key Short Press	Confirm or enter the next level of the interface
SET Key Long Press	Return to the previous interface
UP Key Short Press	Move cursor up or increase parameter by 1
UP Key Long Press	Increase parameter

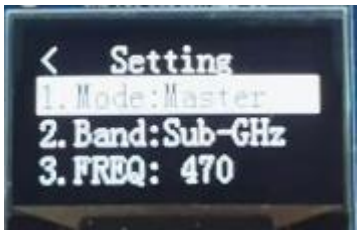
DOWN Key Short Press	Move cursor down or decrease parameter by 1
DOWN Key Long Press	Decrease parameter

Operation Method:

With normal power supply, toggle the power switch to turn on the device. The LCD screen on the demo board will display the "Setting" interface. Briefly press the UP or DOWN key to move the cursor. When the cursor is on the parameter you wish to modify, press the SET key briefly to make the cursor flash. Then, use the UP or DOWN key to adjust the parameter. Press the SET key again to confirm the modification.

To enter the test function corresponding to the "Mode" parameter, long-press the SET key. Briefly press the SET key to return to the "Setting" interface.

3. Setting Interface Description





- Mode: Function
- Band: Frequency Band
- FREQ: Frequency
- SF: Spreading Factor
- BW: Bandwidth
- POWER: Power
- CR: Coding Rate

4. Communication Test

Prepare two Mini3060 demo boards. Set one to Master mode as the communication host, and the other to Slave mode as the communication slave. (Set the LoRa communication parameters: FREQ, SF, BW, and CR to be the same; otherwise, communication will fail.)

On the LoRa communication interface screen, the Tx_cnt and Rx_cnt values will keep increasing. (The red indicator light represents a successful transmission, and the blue indicator light represents a successful reception.)

11. FAQ

a) Why module can not communicate properly?

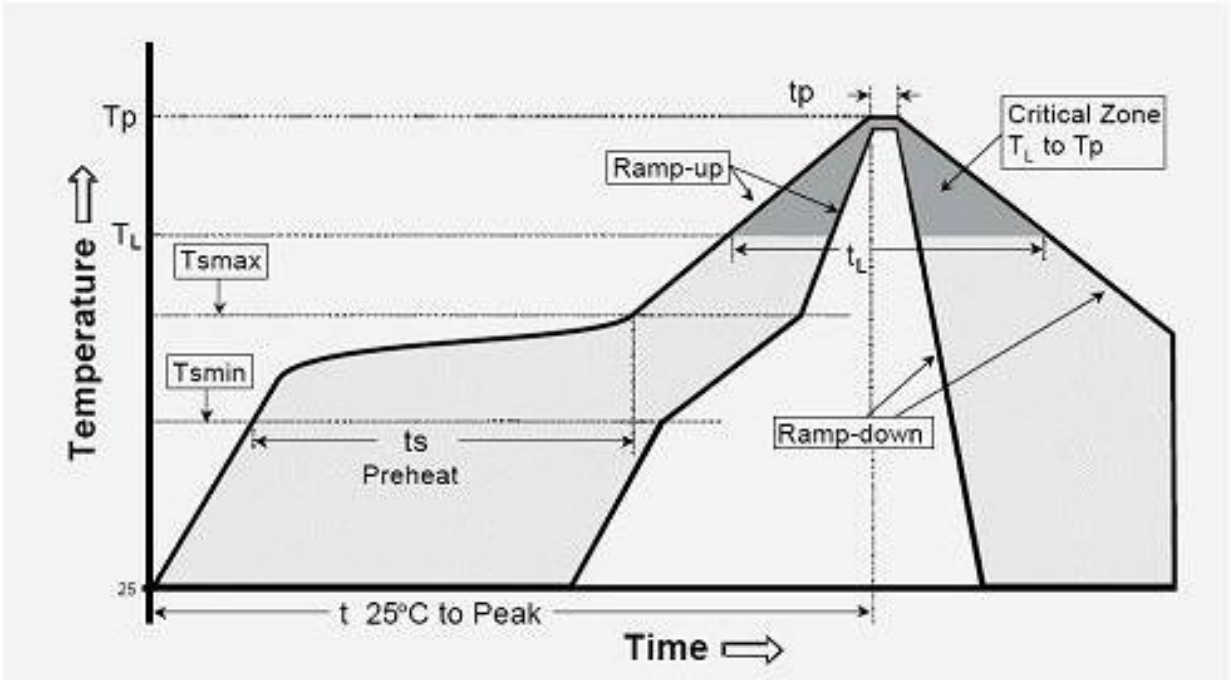
1) Check if there is power connection error;
2) Check if Module is in normal communication mode;
3) Check if frequency, channel, and mute are same;
4) Check if module is damaged;

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 installed properly;
3) The same frequency interference;
4) The surrounding environment is harsh, strong interference sources.

Appendix : SMD Reflow Chart

Below reflow profile is recommended for SMT technology:



IPC/JEDEC J-STD-020B the condition for lead-free reflow soldering	big size components (thickness >=2.5mm)
The ramp-up rate (Tl to Tp)	3℃/s (max.)
preheat temperature - Temperature minimum (Tsmin) - Temperature maximum (Tsmax) - preheat time (ts)	 150℃ 200℃ 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℃