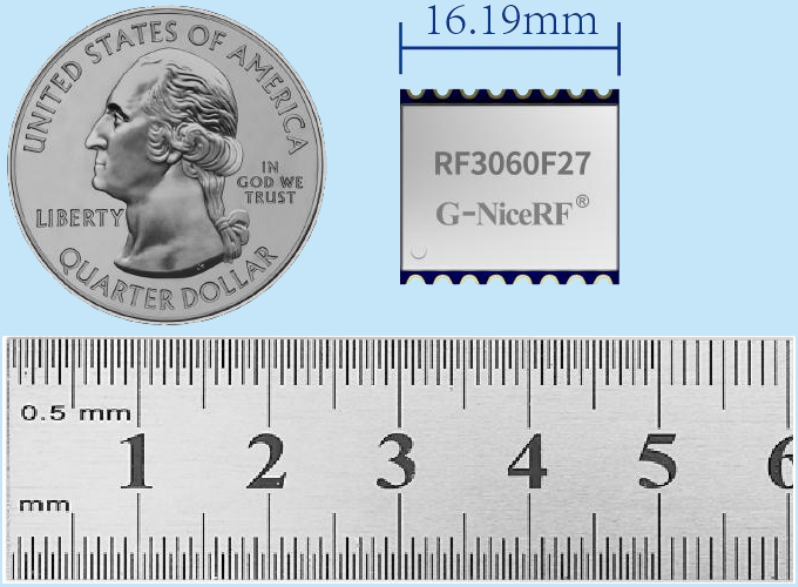
RF3060F27 wireless transceiver module

- TCXO Crystal Oscillator, with a frequency deviation stability of 0.5ppm
- Ultra-compact size, with the same dimensions as the RF3060, and over 500mW @5V
- communication range is twice that of the RF3060.

Product Specification



Catalogue

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Note: Revision History

Revision	Date	Comment
V1.0	2025-3	First release
V1.1	2025-5	Update Electrical Characteristics and add Function Demonstration Board
V1.2	2025-7	Update product frequency
V1.3	2025-8	Update Features,Electrical Characteristics

1. Descriptions

RF3060F27 is a high-power module made from a low-power, long-range wireless transceiver chip that uses DSSS modulation and demodulation technology. It supports half-duplex wireless communication and features high anti-interference capability, high sensitivity, low power consumption, compact size, and ultra-long transmission range. It offers a maximum sensitivity of -129dBm and a maximum output power of 27dBm, providing an industry-leading link budget, making it the best choice for long-distance transmission and applications with high reliability requirements.

RF3060F27 strictly uses lead-free technology for production and testing, complying with RoHS and Reach standards.

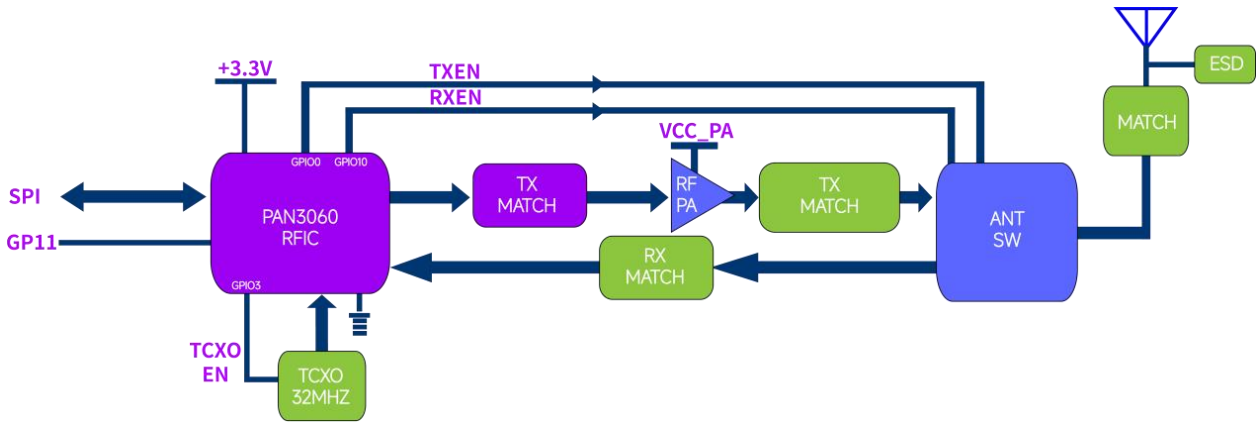
2. Features

- Frequency Range:433/470/868/915 MHz
- Built-in TCXO, frequency error 0.5ppm
- Sensitivity：-129dBm @125KHz,0.5Kbps
- Maximum output power：> 27dBm @ 5V
- Low receive current: 6mA@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

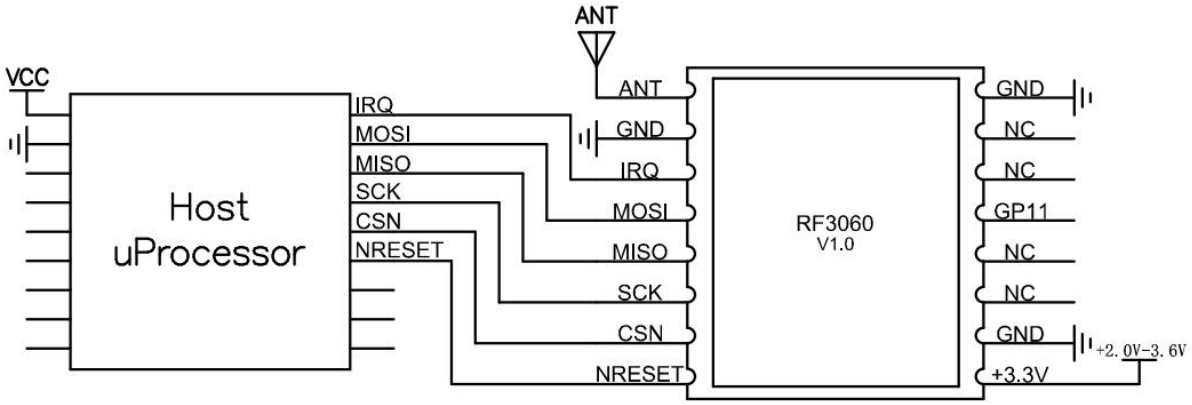
4. Block Diagram



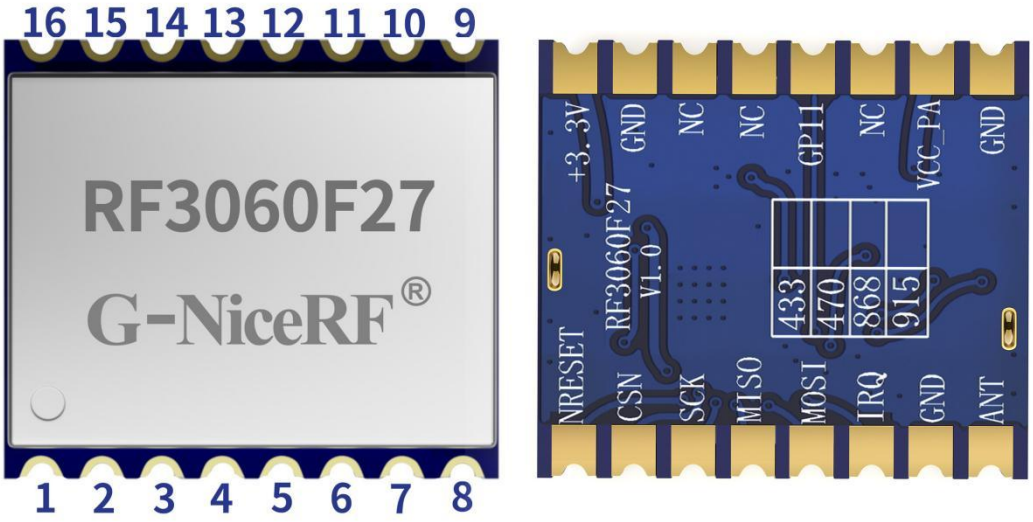
5. Electrical Characteristics

Parameter	Min	Typ	Max	Unit	Condition
Operation Condition					
Working voltage	2	3.3	3.6	V	Module +3.3V pin
	3.3	4.0	5.0	V	Module VCC_PA pin
Temperature range	-40		85	℃	
Current Consumption					
RX current		6.2		mA	@DCDC Mode
		8.9		mA	@LDO Mode
TX current		450		mA	@5v,27dBm
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	@890MHz
Modulation Rate	0.5		59.9	Kbps	LoRa
Output power	-8		27	dBm	
Receiving sensitivity		-129		dBm	@LoRa BW=62.5KHz_SF = 9_CR=4/5

6. Typical application circuit



7. Pin definition



Pin NO	Pin name	IO Level	Description
1	+3.3V		Internal chip power supply pin, voltage range: 2.0-3.6V
2,8,10	GND		External Power Supply Negative Terminal
3,4,6,	NC		
5	GP11	0-3.3V	Connect to the chip's GPIO11 pin; refer to the chip datasheet for specific functions
7	VCC_PA		Internal power amplifier circuit power supply pin, recommended voltage: 3.7-5.0V. The higher the voltage, the higher the power.
9	ANT		External 50Ω antenna connection
11	IRQ	0-3.3V	Interrupt signal
12	MOSI	0-3.3V	SPI Data Input Signal
13	MISO	0-3.3V	SPI Data Output Signal
14	SCK	0-3.3V	SPI Serial Clock
15	CSN	0-3.3V	SPI Chip Select Signal
16	NRESET	0-3.3V	Reset Pin

8. Performance Parameters

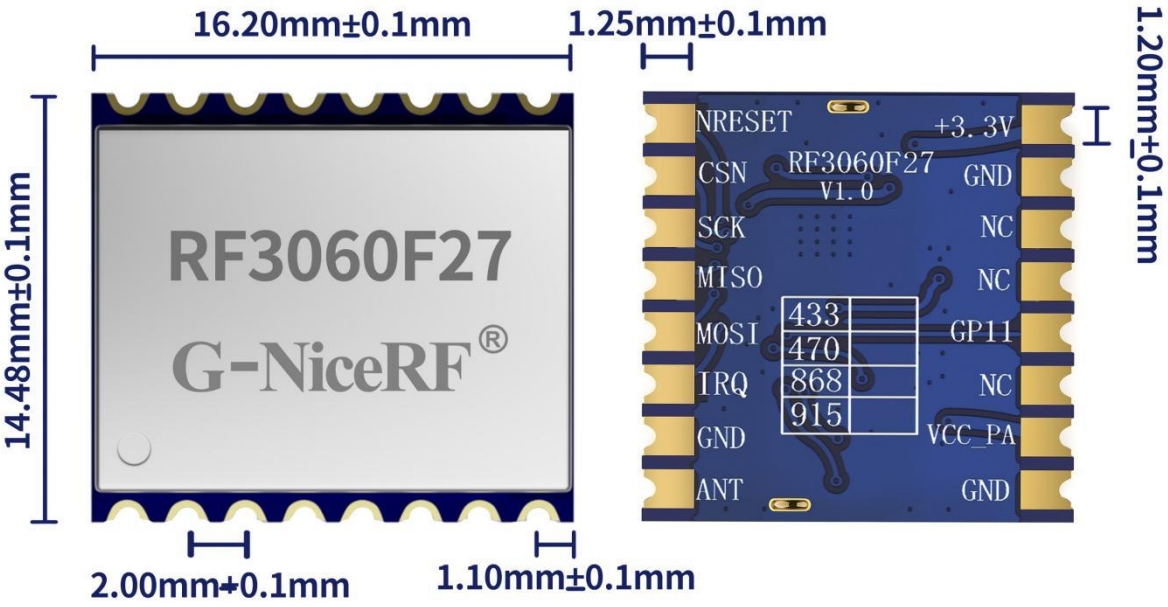
Output Power Relationship Diagram (dBm) @ 4V

Chip Output Level	Module Output Power (dBm)	Operating Current (mA)
10	20.8	261
12	22.3	299
14	23.0	324
16	24.4	365
18	25.5	411
20	26.0	438

Output Power vs. Voltage Chart (dBm)

VCC_PA Voltage (V)	Module Output Power (dBm)	Operating Current (mA)
3.3	24.0	376
3.6	24.9	404
4.0	25.6	427
4.3	26.2	436
4.6	26.7	444
5.0	27.0	451

9. Mechanism Dimension(Unit:mm)



Module Thickness: 2.1mm

10. Product order information

Product Name	Description
RF3060F27-433	Working frequency 433MHz
RF3060F27-470	Working frequency 470MHz
RF3060F27-868	Working frequency 868MHz
RF3060F27-915	Working frequency 915MHz

11. Function Demonstration Board



1. Function Description

The RF3060F27 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

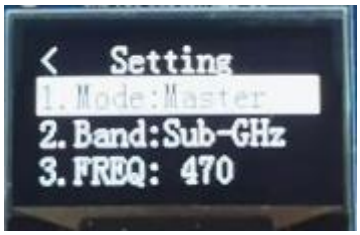
Operation Method:

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 RF3060F27 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.)

12. FAQ

a) Why module can not communicate properly?

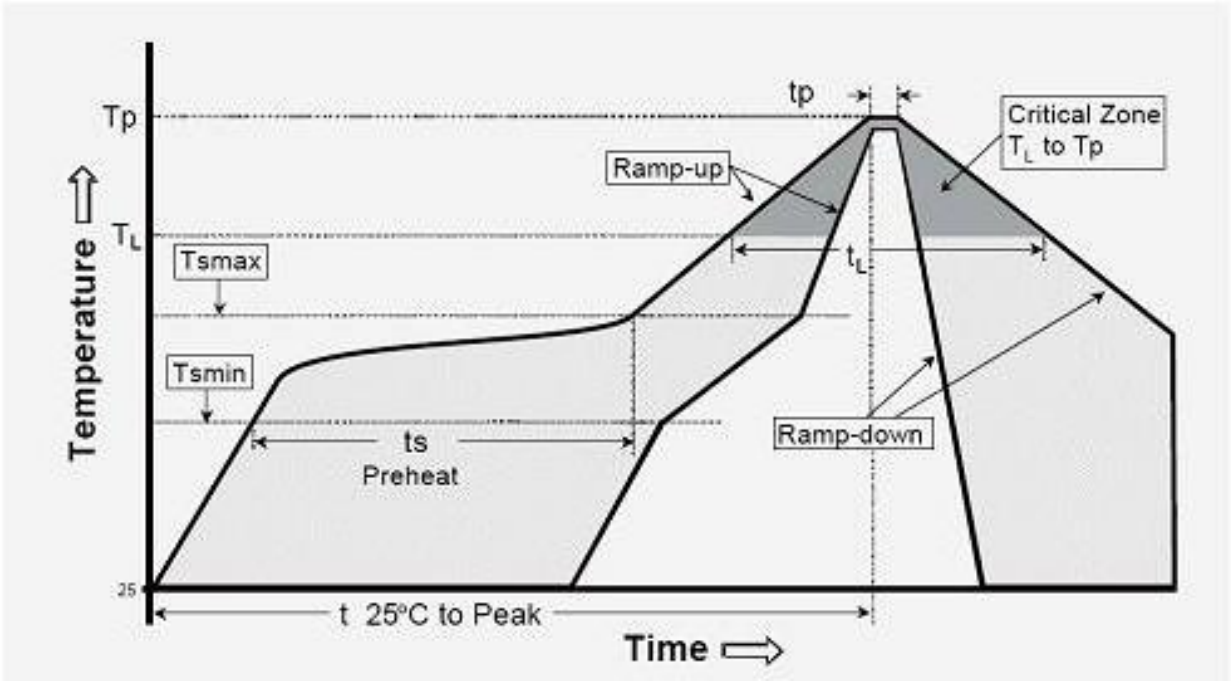
1) Check if there is power connection error;
2) Check if Module is in normal communication mode;
3) Check if frequency, channel, and mute are same;
4) Check if module is damaged;

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℃