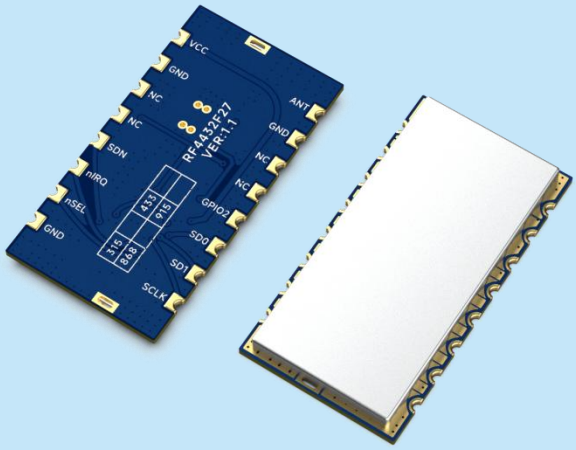
- 500mW High Power Industrial Embedded
- Wireless Transceiver Module

# Product Specification



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**Note: Revision History**

| Revision | Date | Comment |
|---|---|---|
| V1.0 | 2015-10-16 | First release |
| V2.0 | 2016-8-5 | Updated layout |
| V2.1 | 2017-06 | Logo updated |
| V2.2 | 2018-12-15 | Update the PIN photo |
| V2.3 | 2025-02 | Update frequency band and other information |
| V2.4 | 2025-9 | Update the PIN photo |

## 1. Description

RF4432F27 is 500mW RF module embedded with amplifier and LNA circuit. High quality of component, tightened inspection and long term test make this module reliable for long time, long distance communication in varies environment. RF4432F27 adopts Silicon Lab si4432 RF chip, which is a highly integrated wireless ISM band transceiver. The features of high sensitivity (-122 dBm), +27 dBm output power, 10PPM crystal, and good RF matching circuit make this module work well in hot/cold environment with reliable communication and long distance.

RF4432F27 is manufactured and tested strictly using lead-free process and complies with RoHS and Reach standards.

## 2. Features

- Frequency Range: 315/433/470/868/915 （Customizable 240-930 MHz）
- Sensitivity up to -122 dBm
- Data transfer rate：0.123-256 Kbps
- FSK and GFSK Modulation mode
- 3.3-6.0 V Power supply
- Ultra-low consumption shutdown mode
- Digital received signal strength indicator (RSSI)
- Time wake-up function
- Excellent antenna match circuit and bi-direction communication
- Configurable packet structure
- Preamble detection
- 64 bytes transmit and receive data FiFo
- Low battery detection
- Temperature sensor and 8-bit analog-to-digital converters
- 10PPM crystal with operating Temperature Range：-40～+ 85 °C
- Integrated voltage regulator
- Frequency hopping
- Power-on reset function
- Built-in crystal adjustment function

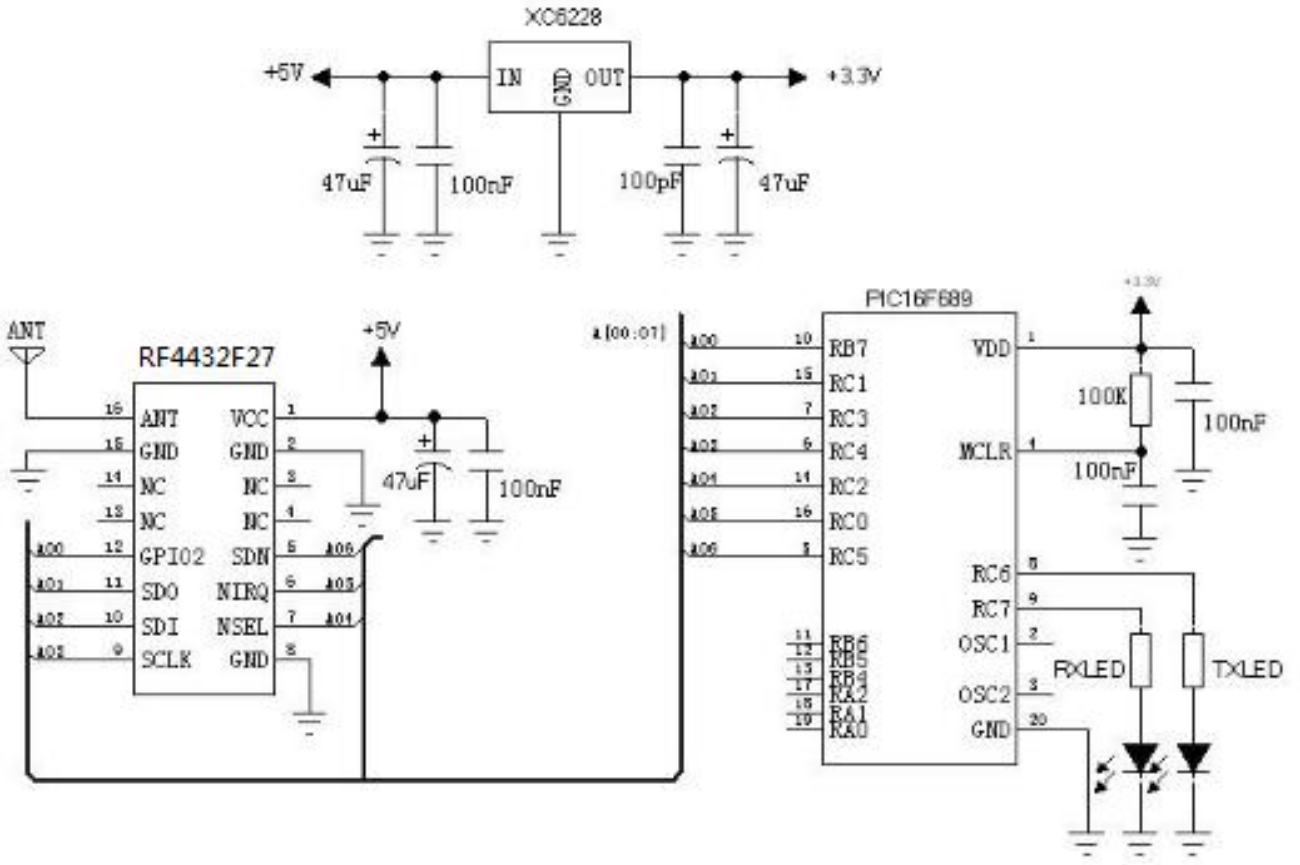
## 3. Application

- Remote control
- Remote meter reading
- Home security alarm and remote keyless entr
- Sensor networks
- Industrial control
- Tire Pressure Monitoring
- Home automation telemetry
- Health Monitoring
- Personal data records
- Wireless PC peripherals
- Toy control
- Tag reader

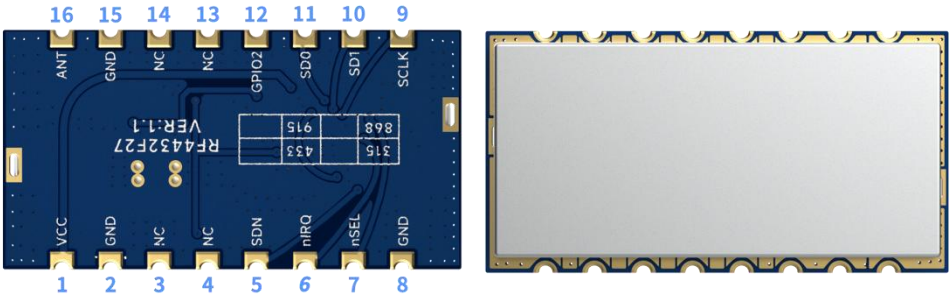
## 4. Electrical Specifications

| Parameter | Min | Typ | Max | Unit | Conditions |
|---|---|---|---|---|---|
| Supply Voltage Range | 3.3 | 5 | 6 | V | |
| Operating Temperature Range | -40 | | 85 | ℃ | |
| RX Current | | 21 | | mA | |
| TX Current | | 350 | | mA | @27dBm |
| Standby Current | | < 3 | | uA | Register values retained, Oscillator OFF |
| Frequency | 428 | 433 | 438 | MHz | @433MHz |
| | 863 | 868 | 873 | MHz | @868MHz |
| Air data rate | 0.123 | | 256 | Kbps | FSK |
| Output power | | | +27 | dBm | |
| Sensitivity | | -122 | | dBm | @Data rate=1.2Kbps |

## 5. Schematic



## 6. Pin Configuration

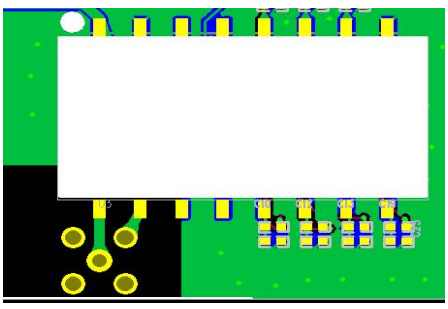



The GPIO0, GPIO1 of the Si4432 is connected to the antenna switch on the module.

GPIO0=TX EN,GPIO1=RX EN

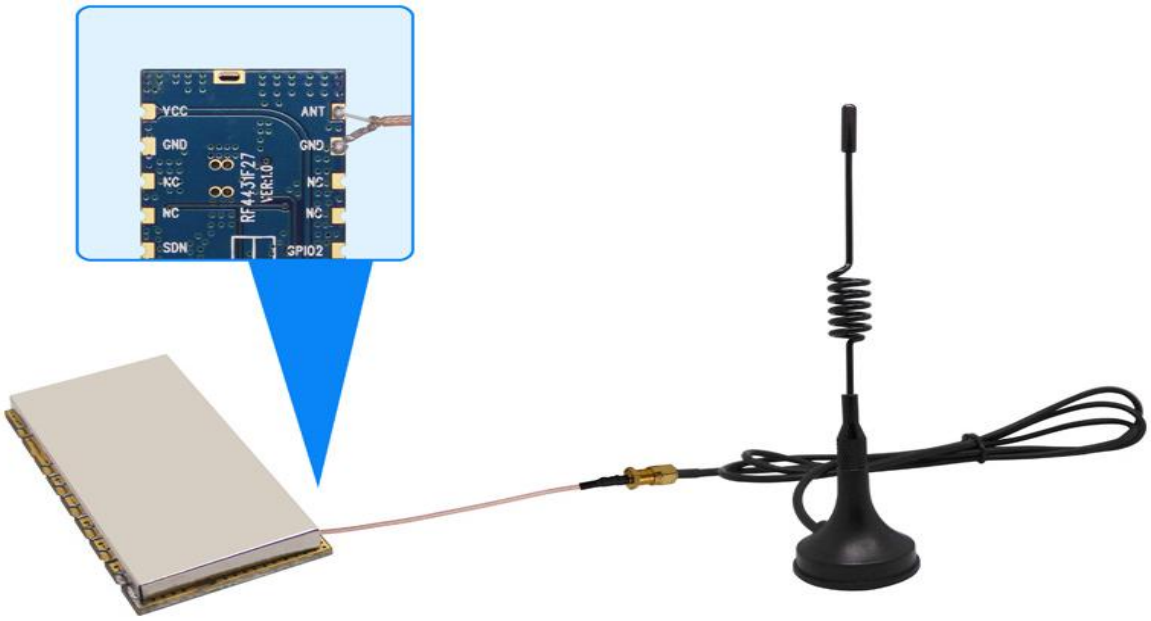
| Pin Number | Pin Definitions | Description |
|---|---|---|
| 1 | VCC | Positive power supply |
| 2 | GND | Connected to power ground |
| 3,4 | NC | Vacant, not connected |
| 5 | SDN | Power down control. |
| | | SDN = 1, power down |
| | | SDN = 0, normal working. |
| 6 | nIRQ | Interrupt output |
| 7 | nSEL | Serial data selection for SPI interfaces. |
| 8 | GND | Connected to power ground |
| 9 | SCLK | Serial data clock for SPI interface |
| 10 | SDI | Serial data out for SPI interface. |
| 11 | SDO | Serial data out for SPI interface |
| 12 | GPIO2 | GPIO2 of Si4432 |
| 13,14 | NC | Not connected |
| 15 | GND | Connected to power ground |
| 16 | ANT | From 50 ohm coaxial antenna |

★ Note: Pin 15 (ANT GND ) is connected to the ground of antenna, do not connect to the ground of power supply. The routing between antenna pad and antenna shall be as short as possible, and thickness larger than 1mm,shown as below:



## 7. Antenna

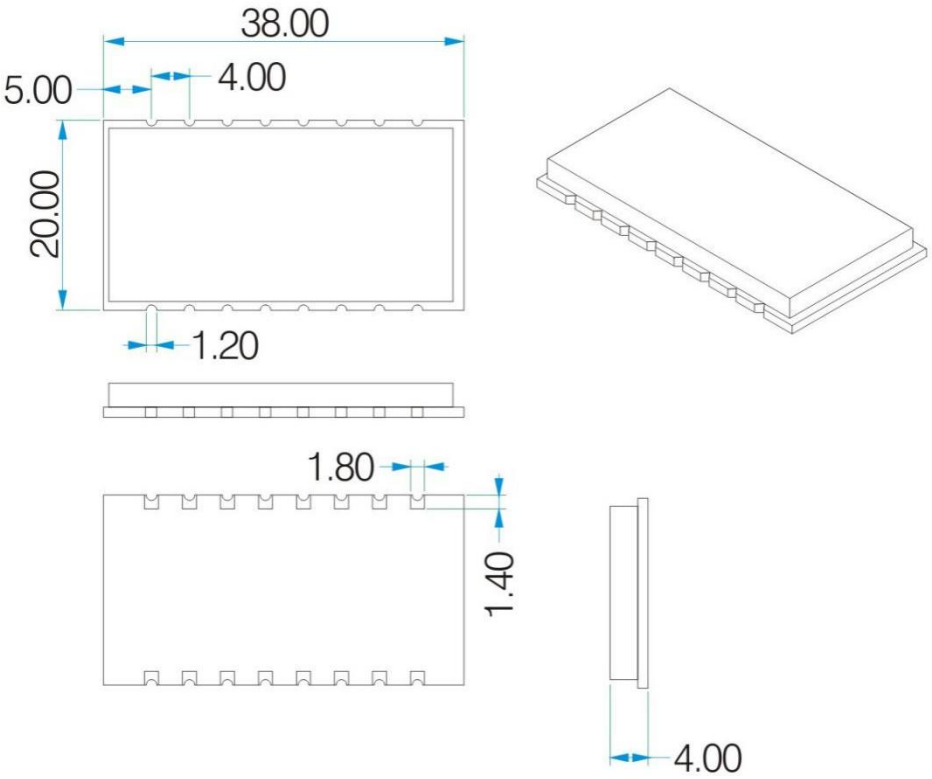
Antenna is very important for RF communication, its performance will affect the communication directly. Module needs antenna in 50ohm. Common antenna has rubber straight/ elbow/ foldable rod and sucker antenna and etc. Users can order accordingly. To ensure module in the best performance, we suggest to use the our antennas




★ To ensure modules get the best performance, user must obey the following principles when using the antennas：

- Put the antenna away from the ground and obstacles as possible as you could；
- If you choose the sucker antenna, pull straight the lead wire as possible as it can be, the sucker under arches should be attached on the metal object.

## 8. Mechanical dimensions(Unit: mm)




## 9. Products Ordering Information

RF4432F27 - 433

Module Model  Frequency

For example：

If the customer needs the patch module small crystal 433MHz band module that order Model：RF4432F27 - 433

RF4432F27 products following models：

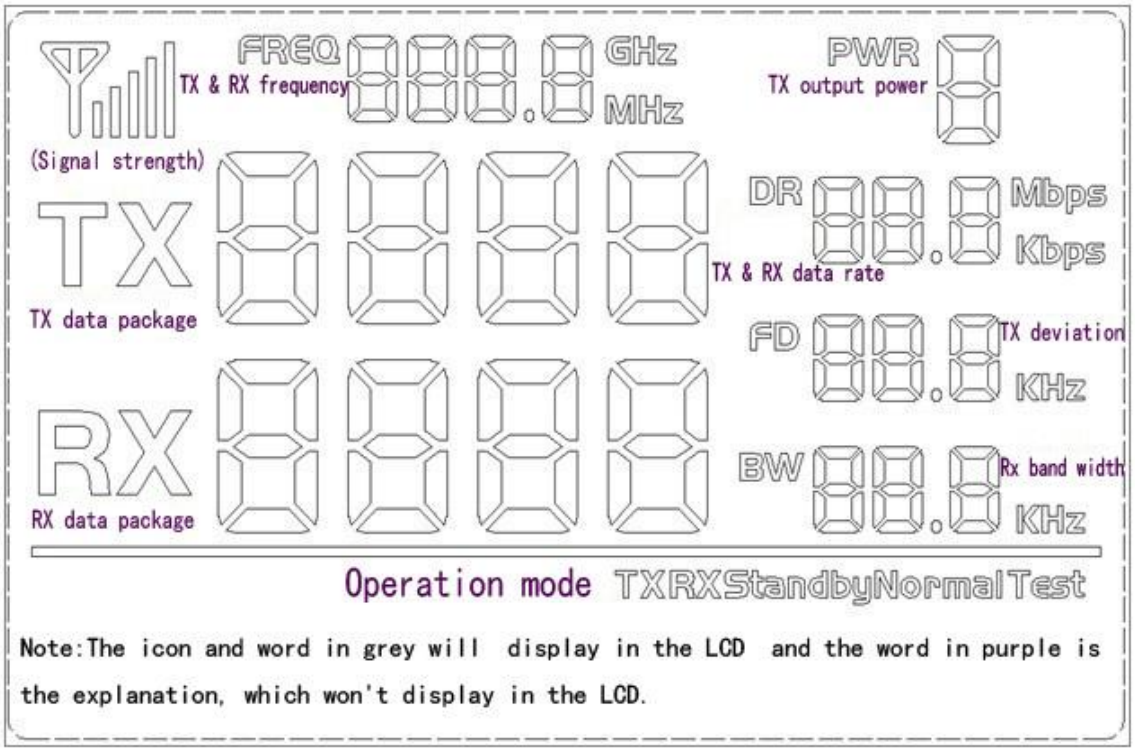
| Product Name | Description |
|---|---|
| RF4432F27-433 | Working frequency is 433MHz |
| RF4432F27-470 | Working frequency is 470MHz |
| RF4432F27-868 | Working frequency is 868MHz |
| RF4432F27--915 | Working frequency is 915MHz |

## Appendix：

The module is equipped with a standard DEMO board for customer to debug the program and test distance. It shows as below:




## The LCD Full Segment is as below:



Users can set the parameters of the RF module such as frequency / transmitter power / transmission data rate / working mode through the buttons, and measure the wireless communication distance. Also, all the connection Pins of the module are extended to the demo board, user can use oscilloscope, multi-meter to monitor the operation of the RF module, which is very useful for software programming.

➢ **Working Mode**

There are 5 working modes in the DEMO. They are: Master mode, Slave mode, Tx Test mode, Rx test mode, Standby mode, accordingly, they are displayed on the LCD as: Tx normal / Rx normal / Tx Test / Rx test / Standby. When one packet is transmitted, the Red LED will blink once, the number of Tx packets will increase; when one packet is received, the Blue LED will blink once, the number of Rx packets will increase.

1) Master Mode: Send 1 packet per second, and waiting for the acknowledge;
2) Slave Mode: Stay in Rx mode to wait for the data from the master, it will send back the acknowledged signal after receiving the data from the master.
3) Tx Test Mode: RF module continuously transmit signal;
4) Rx Test Mode: RF module is always in Rx mode;
5) Standby Mode: RF module is always in standby state.

➢ **Button Operation**

1) [SET] Button

   Press the [SET] button to enter setting mode if not in setting mode. In setting mode, press [SET] button to toggle between the set parameters: frequency /output power / data rate / working mode. The related LCD ICON will flash to indicate.

2) [UP] Button

   In setting mode, press the [UP] button to increase the value of flash icon.

3) [Down] Button

   In setting mode, press the [Down] button to decrease the value of flash icon.

Note: The DEMO board has FLASH memory inside, all the setting parameters will be saved automatically and keep unchanged even power-off.