RF-BM-ND02C

Hardware Specification

Shenzhen RF-star Electronics Co.,Ltd.

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● Overview

The Bluetooth module, which is offered by Shenzhen RF-star Technology Co.,Ltd., is based on low power Bluetooth RF technology (BLE) , and can be widely used in applications of short distance wireless communication, with the features of low power consumption, small size, long transmission distance, strong anti-jamming capability, and etc. The module is built in with high-performance inverted F antenna.

The module is helpful to develop consumer electronics products and smart phone peripheral products, which are based on Bluetooth 4.0 (or BLE). It will provide a quick BLE solution to the communication between customers' products and smart mobile devices.

● Module Parameters

MCU	nRF51802QFAA
Supply Voltage	1.8V ~ 3.6V，3. 3V will be recommended
Frequency	2402 MHz ～ 2480MHz
Tx Power	-20dBm ～ +4dBm
Sensitivity	-93 dBm
Frequency Error	±20 kHz
FLASH	256KB
RAM	16KB
Operating Temperature Range	-20℃ ～ +75℃ (Chip support -40 ℃ ~ +85 ℃， can adjust the working temperature by change the crystal)
Storage Temperature Range	-40℃ ～ +125℃
Module Size	13.5*16.2*1.3mm

● Pin Definition

Figure 1 shows the pin assignments of module, Table 1 shows the pin definition.

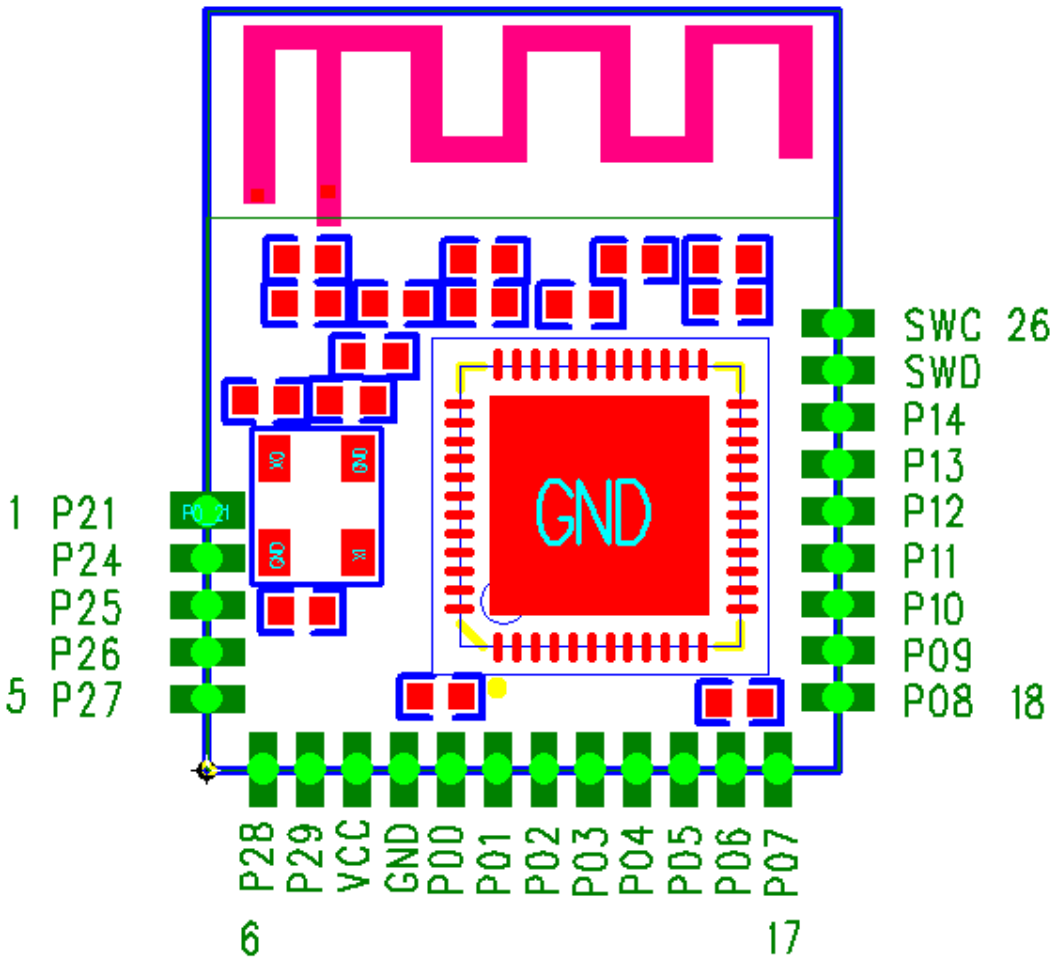

Figure 1 Pin Definition

Table 1 pin Definition

Pin	Name	Function	Note
Pin1	P21	I/O	
Pin2	P24	I/O	
Pin3	P25	I/O	
Pin4	P26	I/O	
Pin5	P27	I/O	
Pin6	P28	I/O	
Pin7	P29	I/O	
Pin8	VCC	Power supply	Power supply，3.3V
Pin9	GND	Ground	
Pin10	P00	I/O	
Pin11	P01	I/O	
Pin12	P02	I/O	
Pin13	P03	I/O	
Pin14	P04	I/O	
Pin15	P05	I/O	
Pin16	P06	I/O	
Pin17	P07	I/O	
Pin18	P08	I/O	
Pin19	P09	I/O	
Pin20	P10	I/O	
Pin21	P11	I/O	
Pin22	P12	I/O	
Pin23	P13	I/O	
Pin24	P14	I/O	
Pin25	SWDIO	—	
Pin26	SWCLK	—	

● PCB Package Size

Thickness of the module is 1.3 ± 0.1 mm.

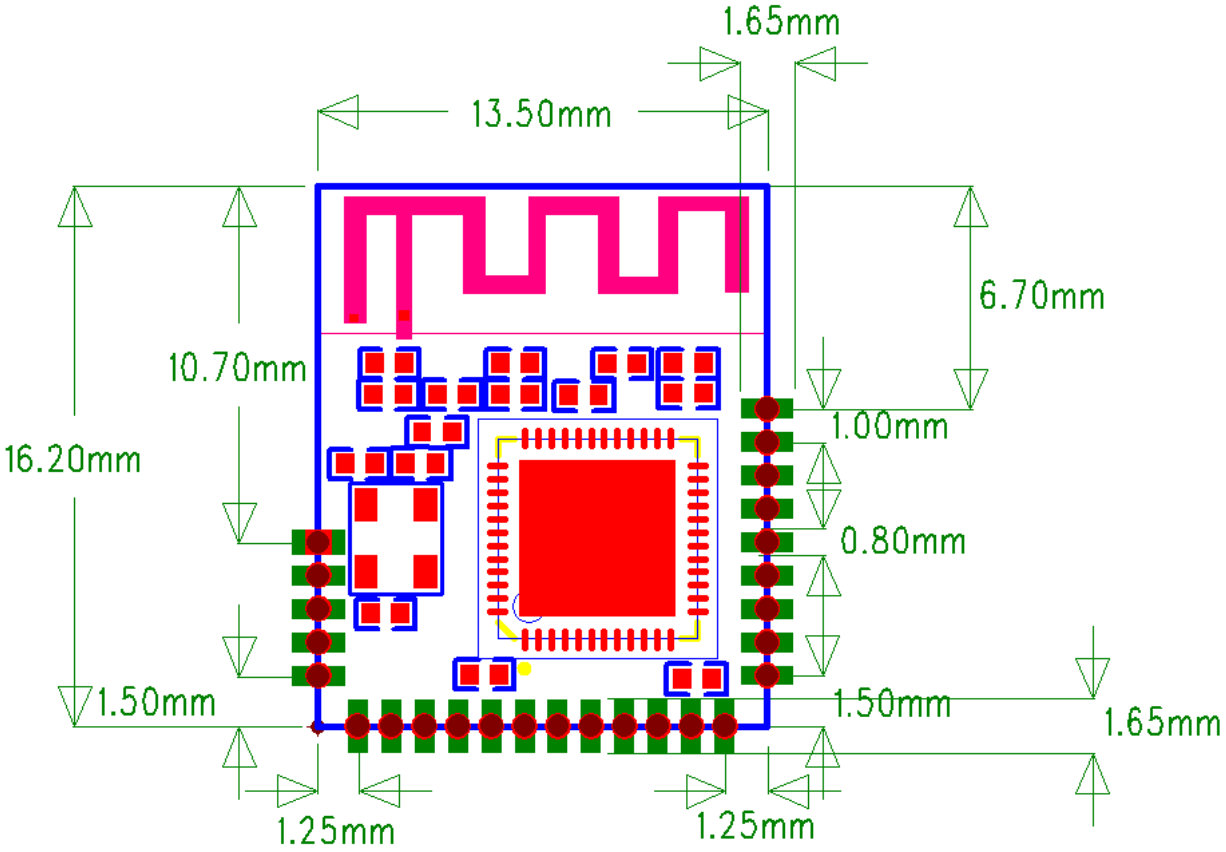

Figure 2 Module Size

● Layout Proposals

The serpentine antenna on PCB is free space electromagnetic radiation. The place and layout range are keys to enhance the data rate and transmit range.

Thus，Below are the layout proposals for antenna and route:

1. Place the antenna on the edge(corner) of the PCB backplane.
2. Make sure there is no signal or copper foil in each layer.
3. Hollowing out the black pane part (figure 3) to make less S11 interference.

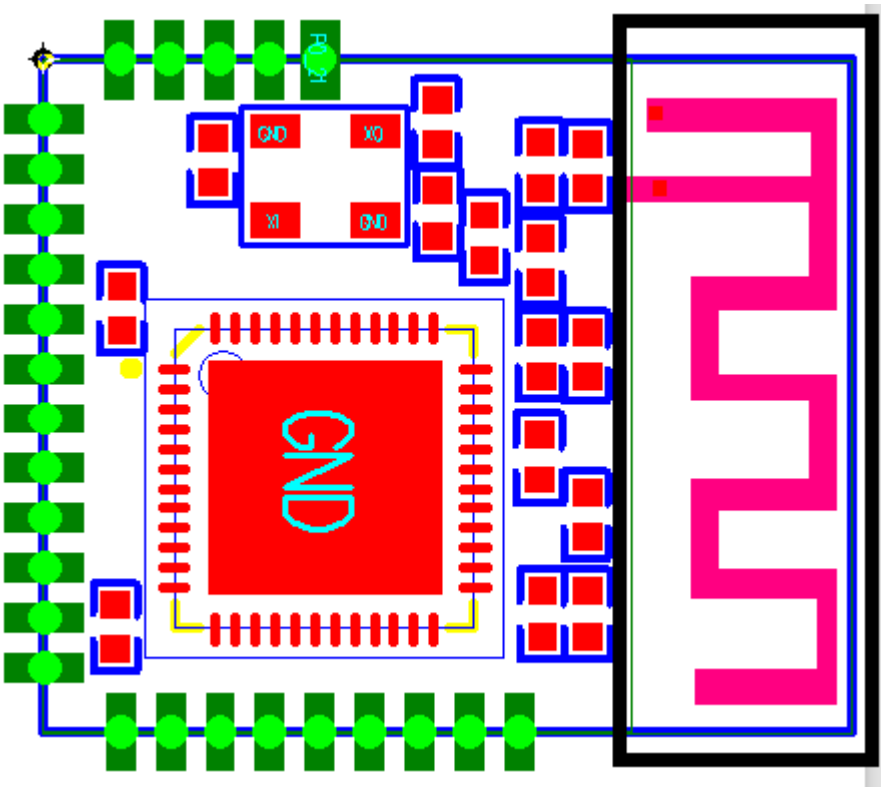

Figure 3

● Recommended Operating Conditions

Notes：

(1) The operating temperature is limited to the change of crystal's frequency;

(2) To ensure the RF performance, the ripple wave on the source must be less than ±300mV。

Identification	Test Condition	Min	Typ	Max	Unit
Source & IO	Battery mode	1.8	3.3	3.6	V
Operating Temperature	/	-25	25	75	℃
Environmental Hot Pendulum		-20		20	℃/Min

● Reflow Conditions

1. Heating mode：conventional convection or IR convection；
2. Times allowed to reflow: 2 times, for the below reflow (conditions)（figure 4）；
3. Temperature curve: the reflow should be in accordance with the temperature curve shown below (figure 4)；
4. Highest：245°C。

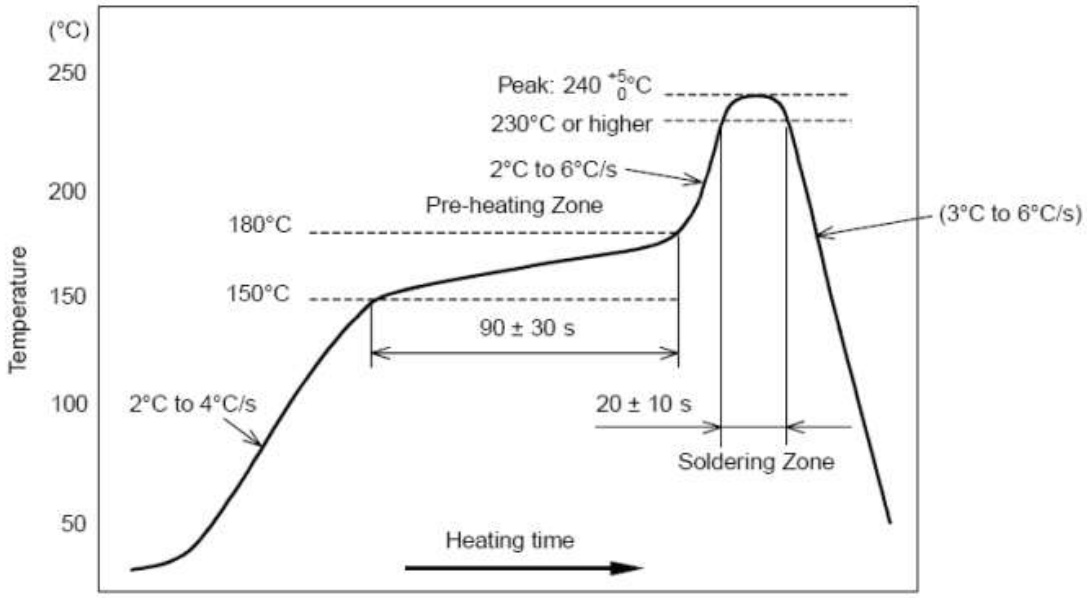

Figure 4 Parts' heat-resistance temperature curve for welding(welding point）

● Electrostatic Discharge Warnings

Module will be damaged for the discharge of static, RF star suggest that all modules should follow the 3 precautions below.:

1. According to the anti-static measures, bare hands are not allowed to touch modules.
2. Modules must be placed in anti- static areas.
3. Take the anti-static circuitry(when inputting HV or VHF) into consideration in product design. Static may result in the degradation in performance of module, even causing the failure.

● Version History

Version No.	Date	Update
V1.0	2017/08/04	✓ First Release
V1.1	2017/12/27	✓ Update the parameters

Contact us

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