FCC statement

This module through the test data, as to meet the requirements of the FCC 15th chapter 2.47 part of the limit。If there is interference in use process problems Please try the method：

1、Increasing the distance of the interference equipment

2、Ask factory solution

JONE_BWL V0.1

Hardware Specification

Shenzhen RF-star Technology Co.,Ltd

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● Module Parameters

MCU	NRF52832、NRF52810、FS2404
Supply Voltage	1.7V ~ 3.6V，3. 0V will be recommended
Frequency	2400 MHz ～ 2483.5MHz
Tx Power	-20dBm ～ +4 dBm
Sensitivity	-96dBm
Frequency Error	±20 kHz
FLASH	512/256/192 KB
RAM	64/32/24 KB
Operating Temperature Range	-40℃ ～ +85℃
Storage Temperature Range	-40℃ ～ +125℃
Module Size	25 mm *16 mm *1.7mm
RX Current	5.4mA
TX Current	5.3mA (at 0dBm)
Deep Sleep Mode	1uA

● Pin Definition

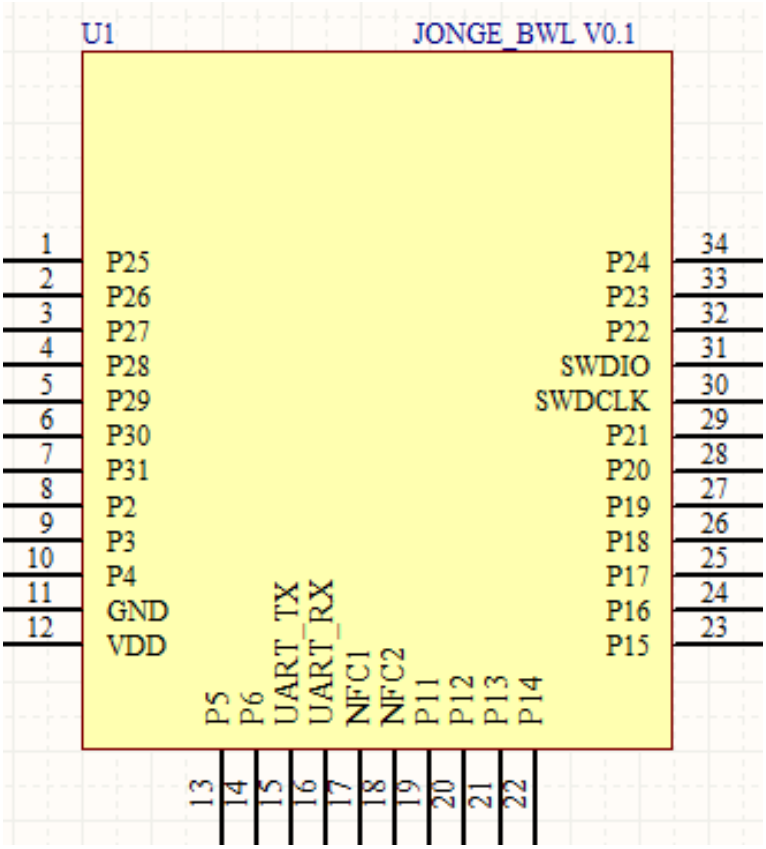

Figure 1 Pin Definition

Pin	Name	Type	Description
1	P0.25	Digital I/O	General purpose I/O
2	P0.26	Digital I/O	General purpose I/O
3	P0.27	Digital I/O	General purpose I/O
4	P0.28 AIN4	Digital I/O Analog input	General purpose I/O SAADC/COMP/LPCOMP input
5	P0.29 AIN5	Digital I/O Analog input	General purpose I/O SAADC/COMP/LPCOMP input
6	P0.30 AIN6	Digital I/O Analog input	General purpose I/O SAADC/COMP/LPCOMP input
7	P0.31 AIN7	Digital I/O Analog input	General purpose I/O pin SAADC/COMP/LPCOMP input
8	P0.02 AIN0	Digital I/O Analog input	General purpose I/O SAADC/COMP/LPCOMP input

9	P0.03 AIN1	Digital I/O Analog input	General purpose I/O SAADC/COMP/LPCOMP input
10	P0.04 AIN2	Digital I/O Analog input	General purpose I/O SAADC/COMP/LPCOMP input
11	GND	Power	Ground (Radio supply)
12	VDD	Power	Power supply
13	P0.05 AIN3	Digital I/O Analog input	General purpose I/O SAADC/COMP/LPCOMP input
14	P0.06	Digital I/O	General purpose I/O
15	P0.07	Digital I/O	General purpose I/O
16	P0.08	Digital I/O	General purpose I/O
17	NFC1 P0.09	NFC input Digital I/O	NFC antenna connection General purpose I/O
18	NFC2 P0.10	NFC input Digital I/O	NFC antenna connection General purpose I/O
19	P0.11	Digital I/O	General purpose I/O
20	P0.12	Digital I/O	General purpose I/O
21	P0.13	Digital I/O	General purpose I/O
22	P0.14 TRACEDATA[3]	Digital I/O	General purpose I/O Trace port output
23	P0.15 TRACEDATA[2]	Digital I/O	General purpose I/O Trace port output
24	P0.16 TRACEDATA[1]	Digital I/O	General purpose I/O Trace port output
25	P0.17	Digital I/O	General purpose I/O
26	P0.18 TRACEDATA[0] / SWO	Digital I/O	General purpose I/O Single wire output Trace port output
27	P0.19	Digital I/O	General purpose I/O
28	P0.20 TRACECLK	Digital I/O	General purpose I/O Trace port clock output
29	P0.21 nRESET	Digital I/O	General purpose I/O Configurable as pin reset
30	SWDCLK	Digital input	Serial wire debug clock input for debugand programming
31	SWDIO	Digital I/O	Serial wire debug I/O for debug andprogramming
32	P0.22	Digital I/O	General purpose I/O
33	P0.23	Digital I/O	General purpose I/O
34	P0.24	Digital I/O	General purpose I/O

● PCB Package Size

Thickness of the module is 17 ± 0.2 mm。

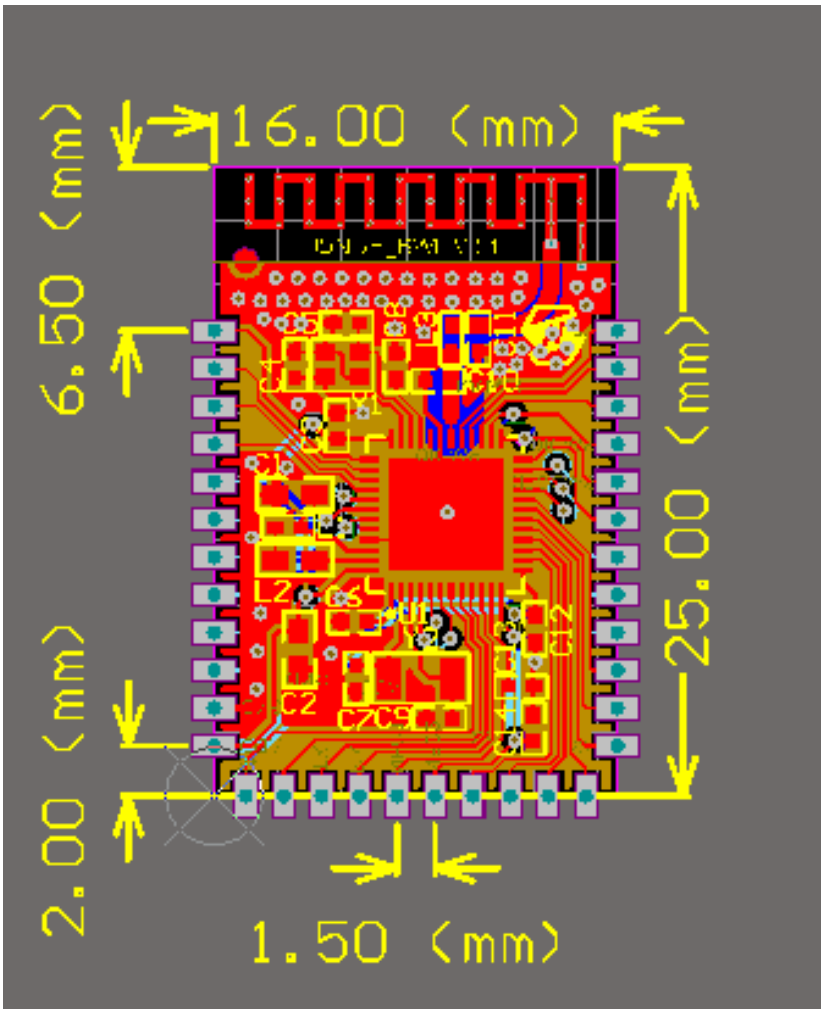

Figure 2 Module Size

● Schematic Diagram

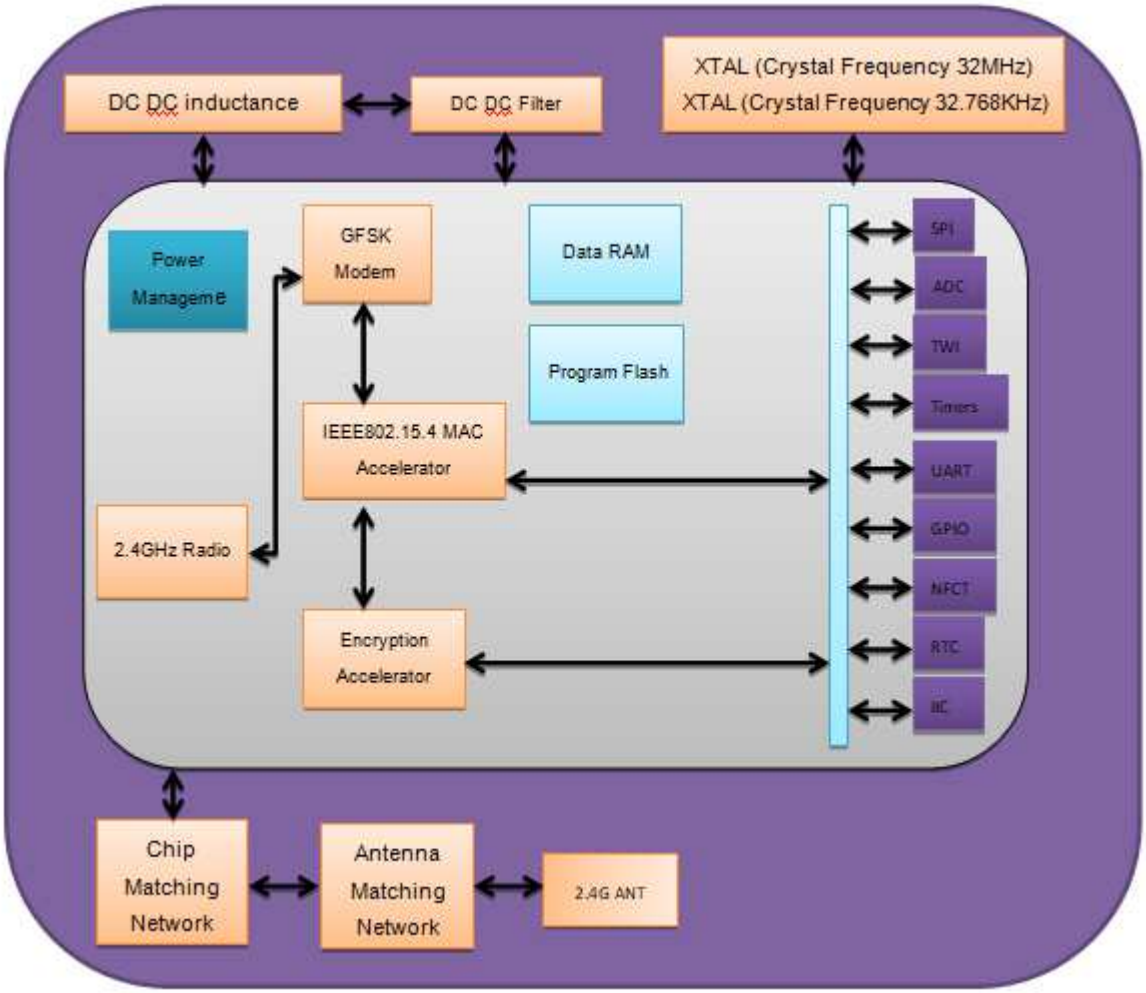

Figure 3 Schematic Diagram

● 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 yellow pane part (figure 4) to make less S11 interference.

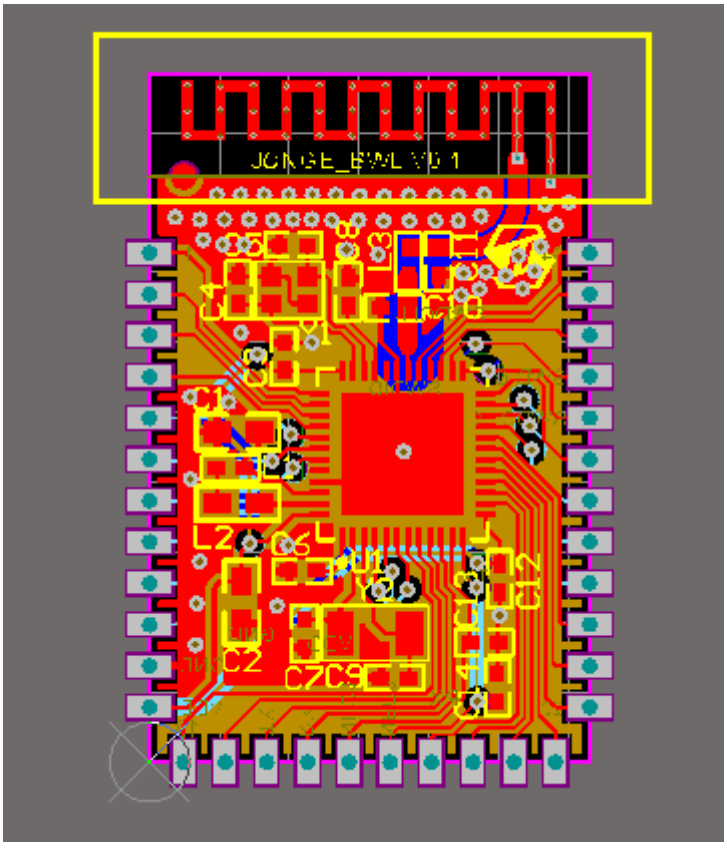

Figure 4

● 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	1.7	3.0	3.6	V
Operating Temperature	/	-40	25	85	℃
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 5）；
3. Temperature curve: the reflow should be in accordance with the temperature curve shown below (figure 5)；
4. Highest：245°C。

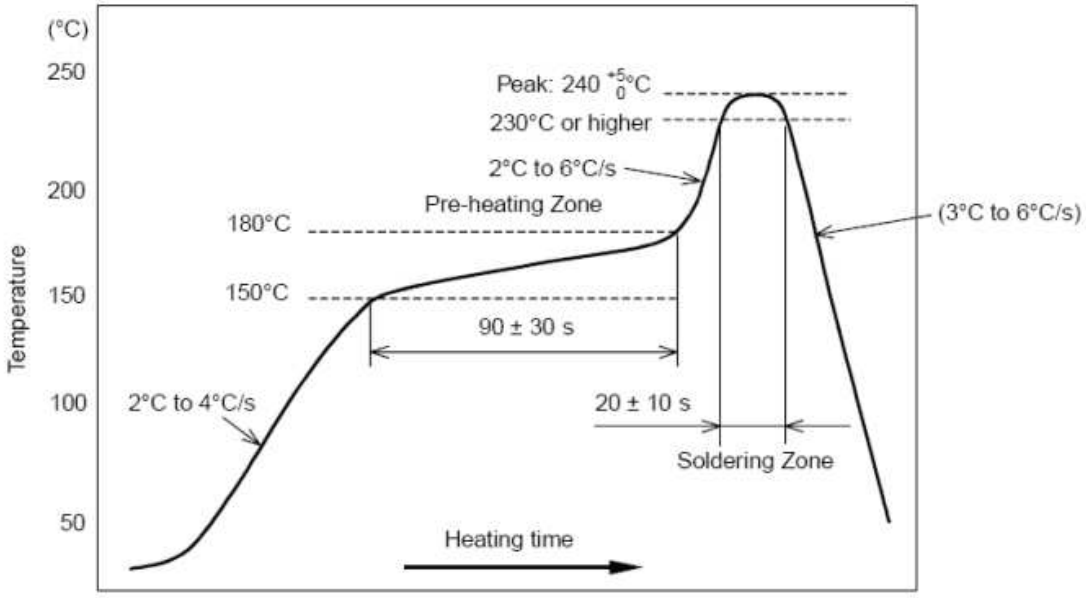

Figure 5 Parts' heat-resistance temperature curve for welding(welding point)

● Restrictions

1.Modules are not designed for life support applications. If use or sell in this field, customers need to agree and bear the risk themselves.

2.Do not responsible for user’s product or App.

3.We have carefully checked this manual, but there is no guarantee that the manual is completely free of errors and omissions.

● 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.

FCC statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.