Specification

Product name : Bluetooth module

Product model：F-9788

Document No：

Document Version：V1.1

Edit	Review	Approve

1. **Product overview：**

F-9788 V2.0 is a cost-effective Bluetooth module using BK3432_QFN32 chip to support Bluetooth V5.0, with ARM968E built-in kernel and 20K RAM. It can support Bluetooth long distance, big data features and SIGmesh.The module provides all bluetooth ® low power features 5.0: broadcast, stack, customer application profile, and application space, so no external processor is required.The module also provides a flexible hardware interface to connect the sensors.The module can be directly powered by a standard 3V coin battery or a pair of AAA batteries.In the lowest power sleep mode, it consumes only 1.6uA(no RAM reserved and external interrupts enabled) and wakes up in hundreds of microseconds.After purchasing bluetooth ® module, we provide free technical support for Android application iOS system or application system.

2. Application area：

The module is mainly used for wireless network communication, the main applications include: location tags, asset tracking, sports and fitness sensors, medical sensors, smart watches, remote controls, toys, light etc.

※ Mobile phone accessories

※ Sports and health equipment

※ Health care and medical equipment

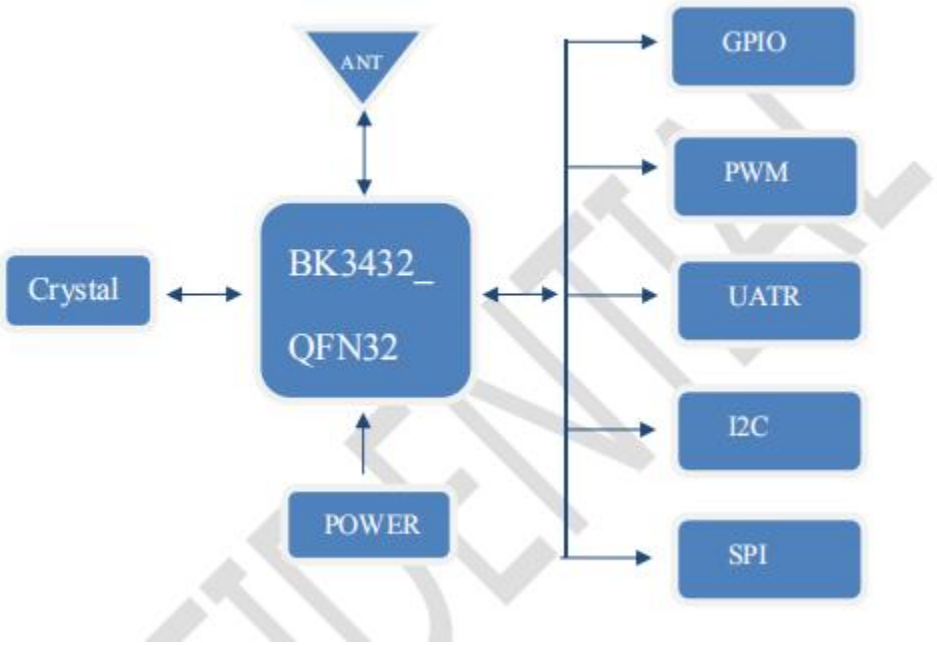
※ Family and building automation

※ Consumer electronics

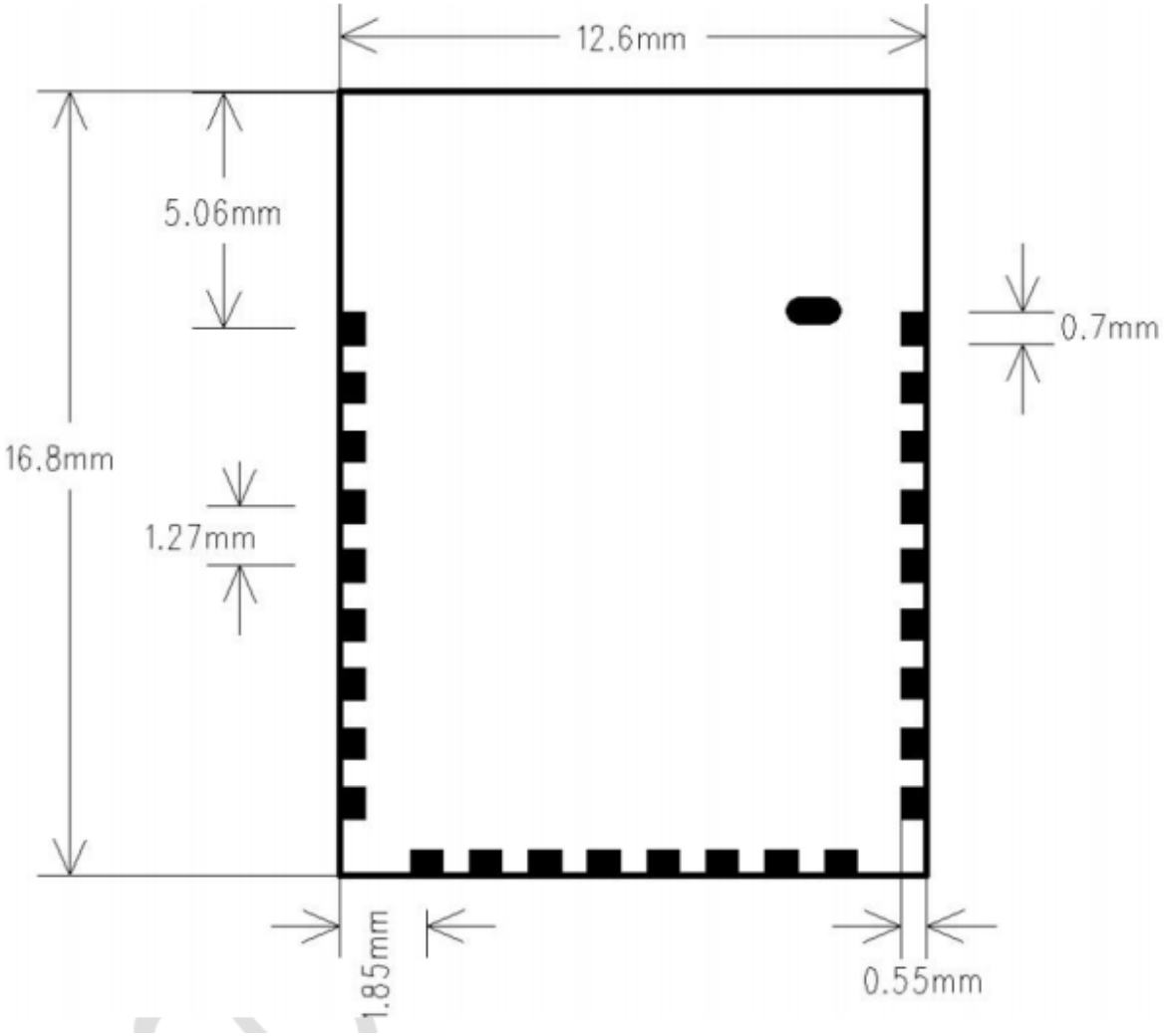
4.performance parameter：

Model	F-9788
Bluetooth specification	Bluetooth V5.0
Service voltage	DC1.2V-3.6V
Bluetooth Profile	ATT,GATT,SMP,L2CAP,GAP
Supply voltage	≤10mA
Standby current	<500uA
Temperature range	-20℃ to +105℃
The wireless transmission range	0~100(meter)
Frequency range	2.402GHz-2.480GHz
The external interface	SPI, UART, GPIO,I2C
Module size	26.0*14.5 *2mm

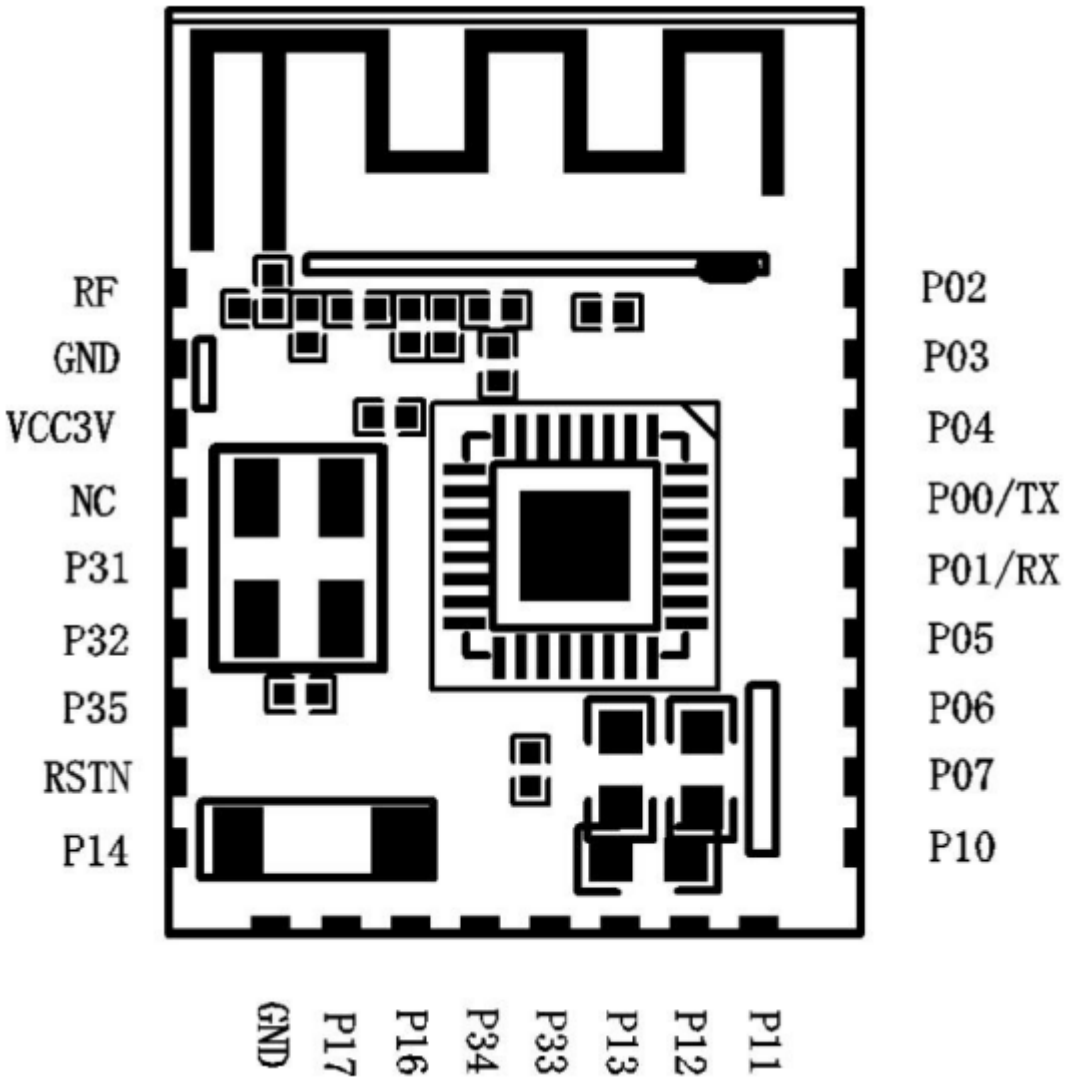
5.Module block diagram:



6.The size of the module graph：



7.Device pin out diagram：


RF
GND
VCC3V
NC
P31
P32
P35
RSTN
P14
P02
P03
P04
P00/TX
P01/RX
P05
P06
P07
P10
GND
P17
P16
P34
P33
P13
P12
P11

8.Pin definition：

Pin	Symb	I/O	Description
1	RF	RF	RF signal port
2	GND	GND	GND
3	VCC3V	Analog	Power, 3 V
4	NC	NC	NC
5	P31	Digital I/O	General purpose IO/ADC1
6	P32	Digital I/O	General purpose IO/ADC2
7	P35	Digital I/O	General purpose IO/ADC5
8	RSTN	Analog	Active low pin reset
9	P14	Digital I/O	General purpose IO/PMW4
10	GND	GND	GND
11	P17	Digital I/O	General purpose IO
12	P16	Digital I/O	General purpose IO
13	P34	Digital I/O	General purpose IO/ADC4
14	P33	Digital I/O	General purpose IO
15	P13	Digital I/O	General purpose IO
16	P12	Digital I/O	General purpose IO
17	P11	Digital I/O	General purpose IO
18	P10	Digital I/O	General purpose IO
19	P07	Digital I/O	General purpose IO
20	P06	Digital I/O	General purpose IO
21	P05	Digital I/O	General purpose IO
22	P01/RX	Digital I/O	GPIO1/UART1_RXD
23	P00/TX	Digital I/O	GPIO0/UART1_TXD
24	P04	Digital I/O	General purpose IO
25	P03	Digital I/O	General purpose IO/SDA
26	P02	Digital I/O	General purpose IO/SCL

9.Design notes：

In order to better SNR, please pay attention to the hardware design of PA, DC booster, DC/DC circuit and the module power circuit to avoid influencing module.

10.Note：

A. The signal strength is depending on the environment of Bluetooth application, such as wood and metal will block the transmission signal to get the shorter transmission distance.

B. Because of metal will block the signal transmission, it is recommend not to using the metal housing.

C. PCB layout guideline: no any copper existed in the antenna area of the module is the PCB antenna, the metal will weaken the function of the antenna when the antenna module to the module board, following

prohibited paving and walk the line.

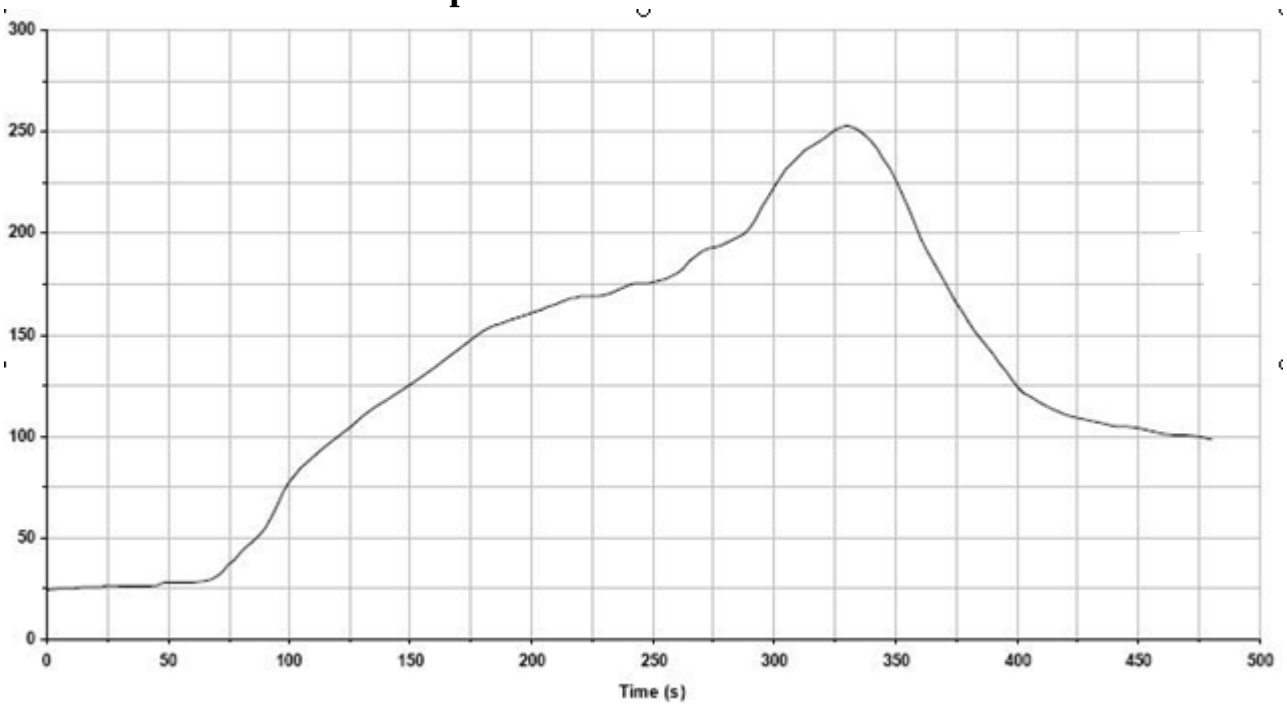
D. If the module antenna next to the battery、 metal, liquid crystal screen, loudspeaker, at least keep them away from antenna distance 15mm

E. When layout the power supply line recommended star line, and to ensure that the Bluetooth module Power supply lines is better , and BT should be with the amplifier, power amplifier, MCU, separately, and the underside of the BT has no other interference.

F. suggests the module antenna part floating on the floor, do not go around the antenna control line, power line, audio line, MIC interference lines;

G. If the module antenna near the row seats, Because of metal will block the signal transmission, it is recommended to use professional high-gain antenna.

11.Recommended reflow temperature：



Key features of the profile:

-Initial Ramp=1-2.5℃/sec to 175℃ equilibrium

-Equilibrium time=60 to 80 seconds

-Ramp to Maximum temperature (250℃)=3℃/sec Max

-Time above liquidus temperature(217℃): 45 - 90 seconds

-Device absolute maximum reflow temperature: 250℃

12. Application schematic diagram：

Reference schematic diagram for reference purposes only!

(OEM) Integrator has to assure compliance of the entire end-product incl. the integrated RF Module. For 15 B (§15.107 and if applicable §15.107) compliance, the host manufacturer is required to show compliance with 15 while the module is installed and operating.

Furthermore the module should be transmitting and the evaluation should confirm that the module's intentional emissions (15C) are compliant (fundamental / out-of-band). Finally the integrator has to apply the appropriate equipment authorization (e.g. Verification) for the new host device per definition in §15.101.

Integrator is reminded to assure that these installation instructions will not be made available to the end user of the final host device.

The final host device, into which this R¯F Module isintegrated" hasto be labelled with an auxilliary lable stating the FCC IDofthe RF Module, such as "Contains FCC ID:

"This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:
(1) this devicemay not cause harmful interference, and
(2) this devicemust accept any interference received, including interference thatmay cause undesired operation."

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection
against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
--Reorient or relocate the receiving antenna.
--Increase the separation between the equipment and receiver.
--Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
--Consult the dealer or an experienced radio/TV technician for help.

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

Module statement

The single-modular transmitter is a self-contained, physically delineated, component for which compliance can be demonstrated independent of the host operating conditions, and which complies with all eight requirements of § 15.212(a)(1) as summarized below.

1) The radio elements have the radio frequency circuitry shielded.

2) The module has buffered modulation/data inputs to ensure that the device will comply with Part 15 requirements with any type of input signal.

3) The module contains power supply regulation on the module.

4) The module contains a permanently attached antenna.

5) The module demonstrates compliance in a stand-alone configuration.

6) The module is labeled with its permanently affixed FCC ID label

7) The module complies with all specific rules applicable to the transmitter, including all the conditions provided in the integration instructions by the grantee.

8) The module complies with RF exposure requirements.

This transmitter/module must not be collocated or operating in conjunction with any other antenna or transmitter.

Integration instructions for host product manufacturers according to KDB 996369 D03 OEM Manual v01

2.2 List of applicable FCC rules

FCC Part 15.247

2.3 Specific operational use conditions

his transmitter/module and its antenna(s) must not be co-located or operating in conjunction with any transmitter. This information also extends to the host manufacturer's instruction manual.

2.4 Limited module procedures

not applicable

2.5 Trace antenna designs

It is "not applicable" as trace antenna which is not used on the module.

2.6 RF exposure considerations

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This compliance to FCC radiation exposure limits for an uncontrolled environment, and minimum of 50mm separation between antenna and body.

The host product manufacturer would provide the above information to end users in their end-product manuals.

2.7 Antennas

PCB antenna; 0dBi; 2.402 GHz～2.480GHz

2.8 Label and compliance information

The end product must carry a physical label or shall use e-labeling followed KDB784748D01 and KDB 784748 stating "Contains Transmitter Module FCC ID: 2AR7VF-9788".

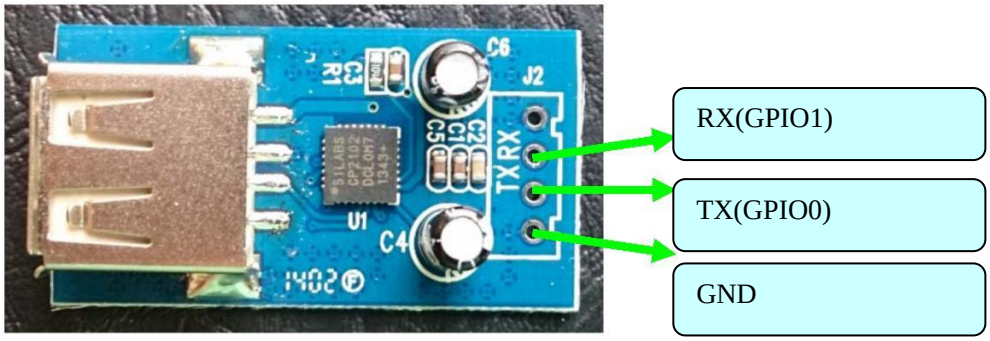
2.9 Information on test modes and additional testing requirements

No. 1.Preparatory work；

1；Certified machines that have been burned fcc, software。

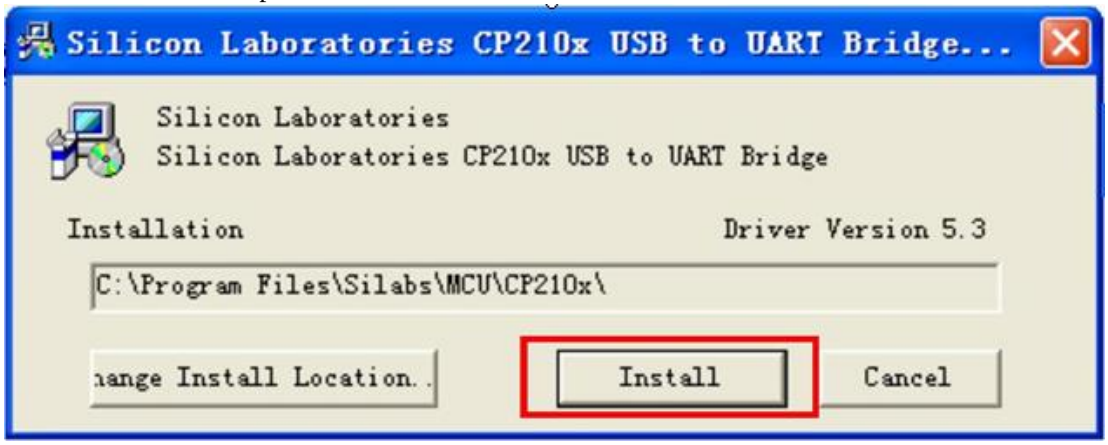
2；Serial port usb board。
3；Computer (xp above)。
4；2 g above 4 g below spectrum analyzer。

No.2.Description of serial plate connection；

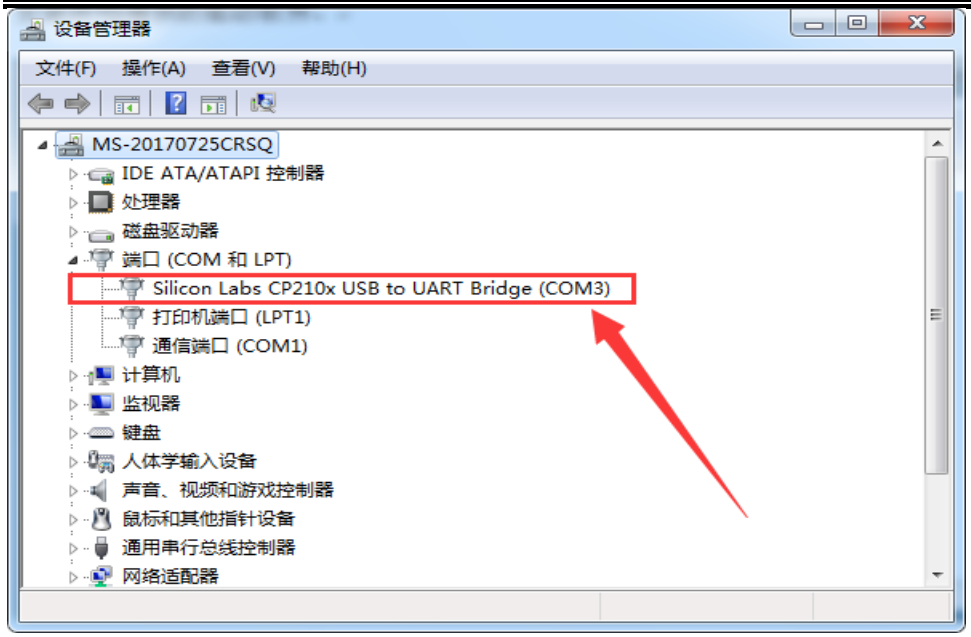


No.3.Connect computer test；

1Install usb uart serial port drive ；

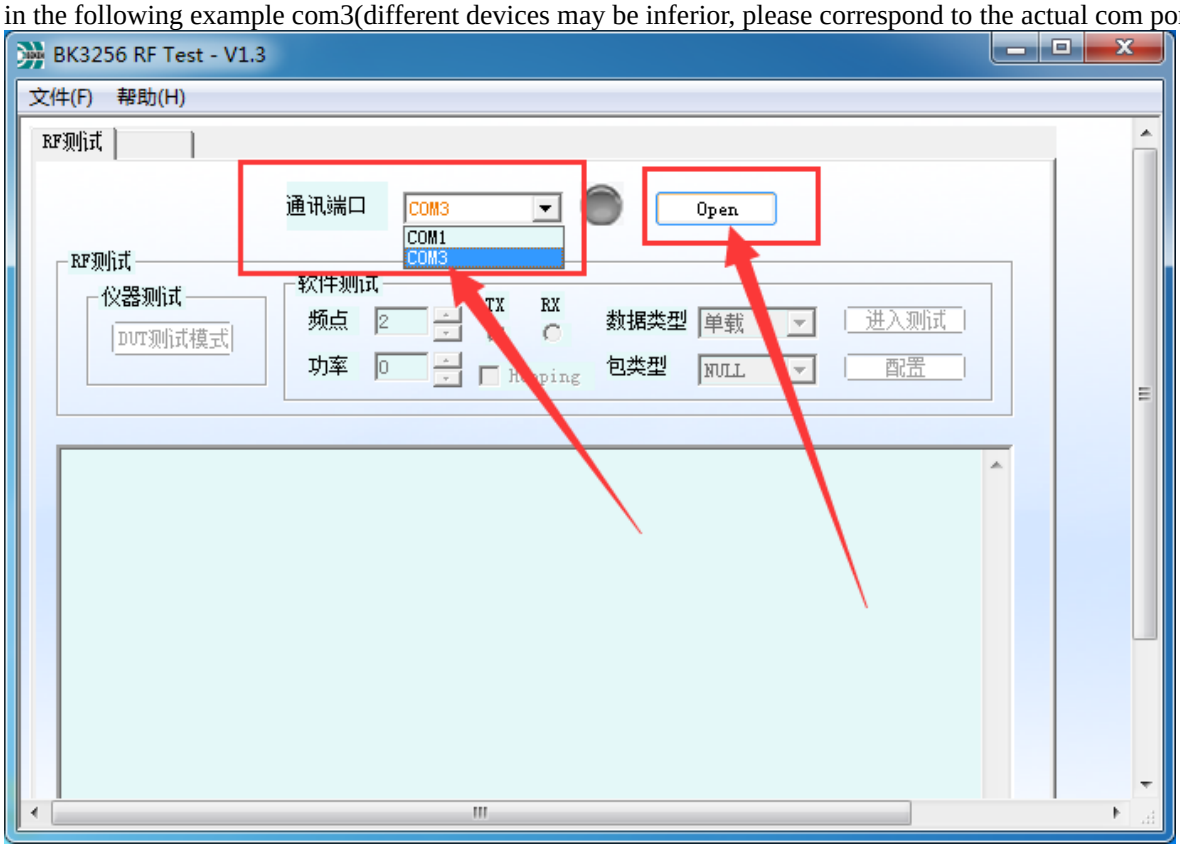


2. pc connect the adapter board, pop up the prompt to install the driver window, please keep the driver software provided uart the interface board and pc connection state。

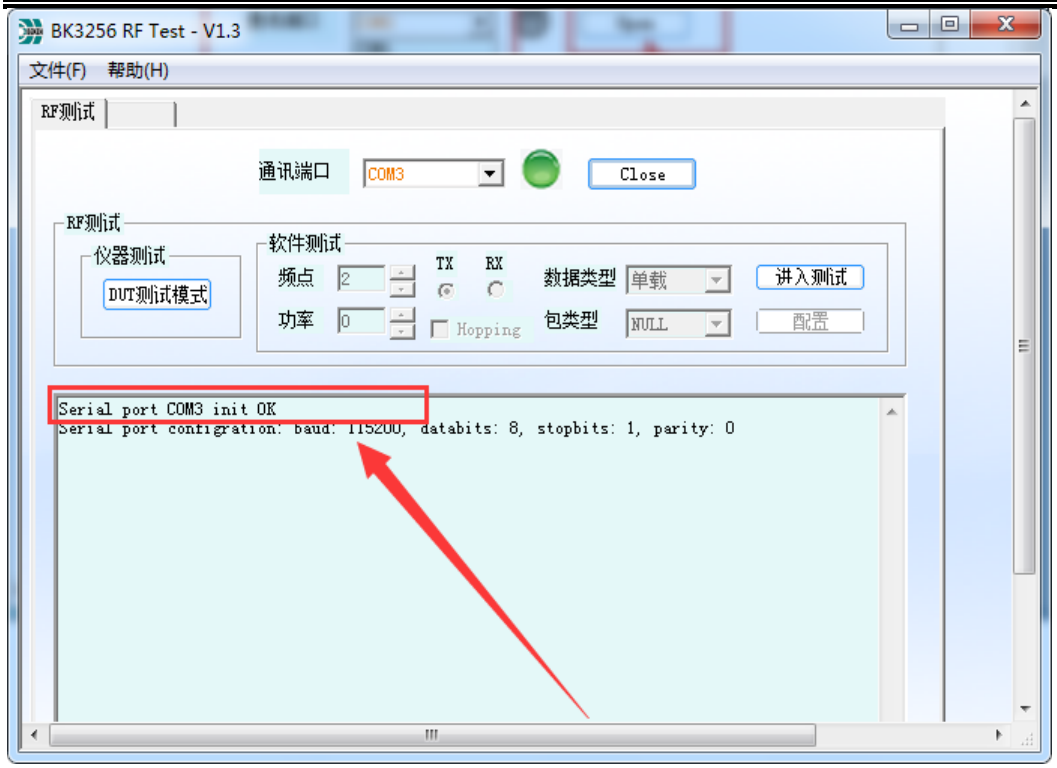


Note :(Certified machines must be shutdown and power off)

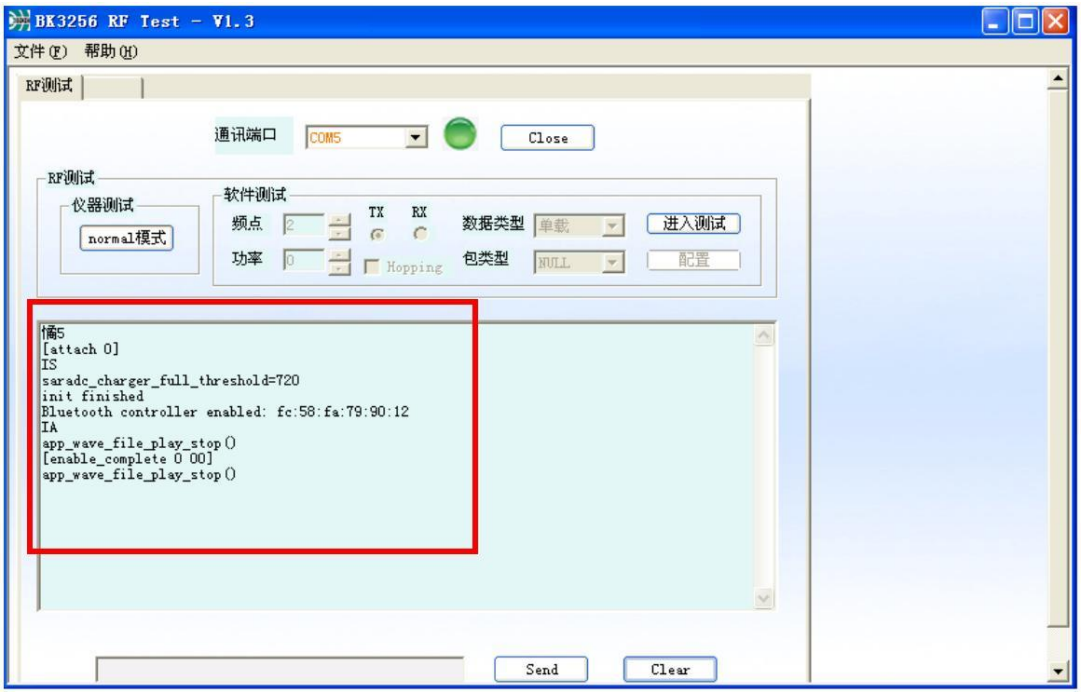
3. Prompt for successful installation, see the current interface occupancy status in com device manager as shown in the following example com3(different devices may be inferior, please correspond to the actual com port)



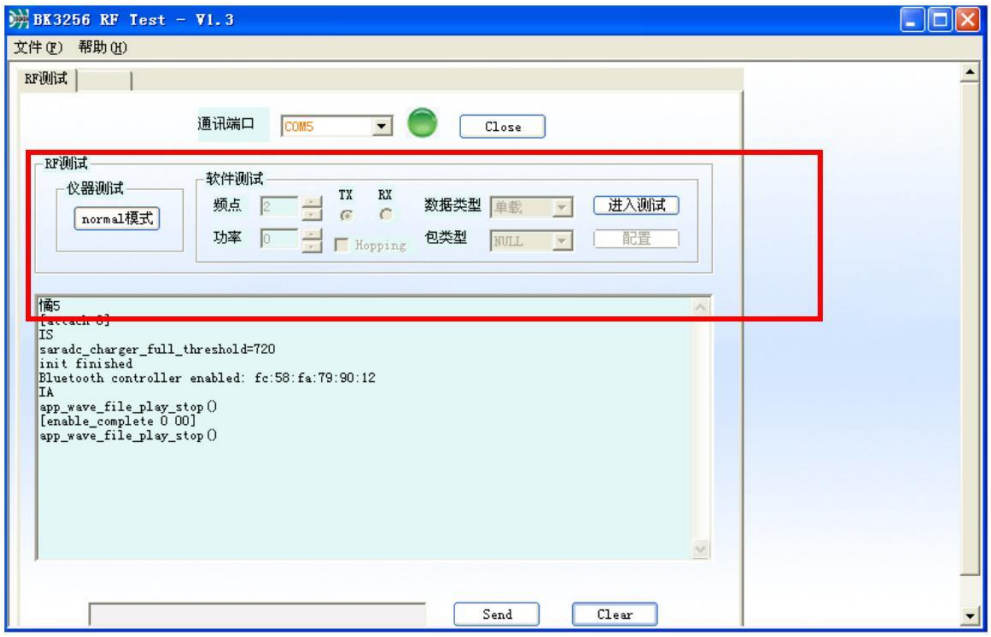
4.Click on the open to prompt the serial port connection to succeed。



5. Maintain the state of connection between the certification machine and the test equipment, turn on the power to turn on the working state of the certification machine, the connection is normal as shown below。

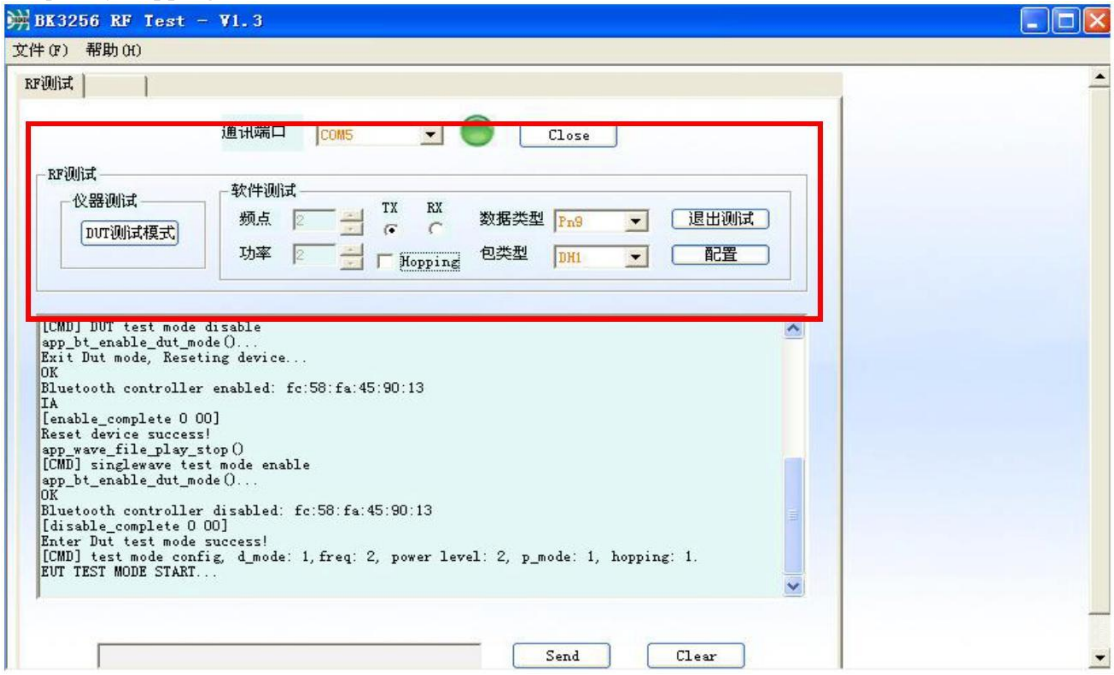


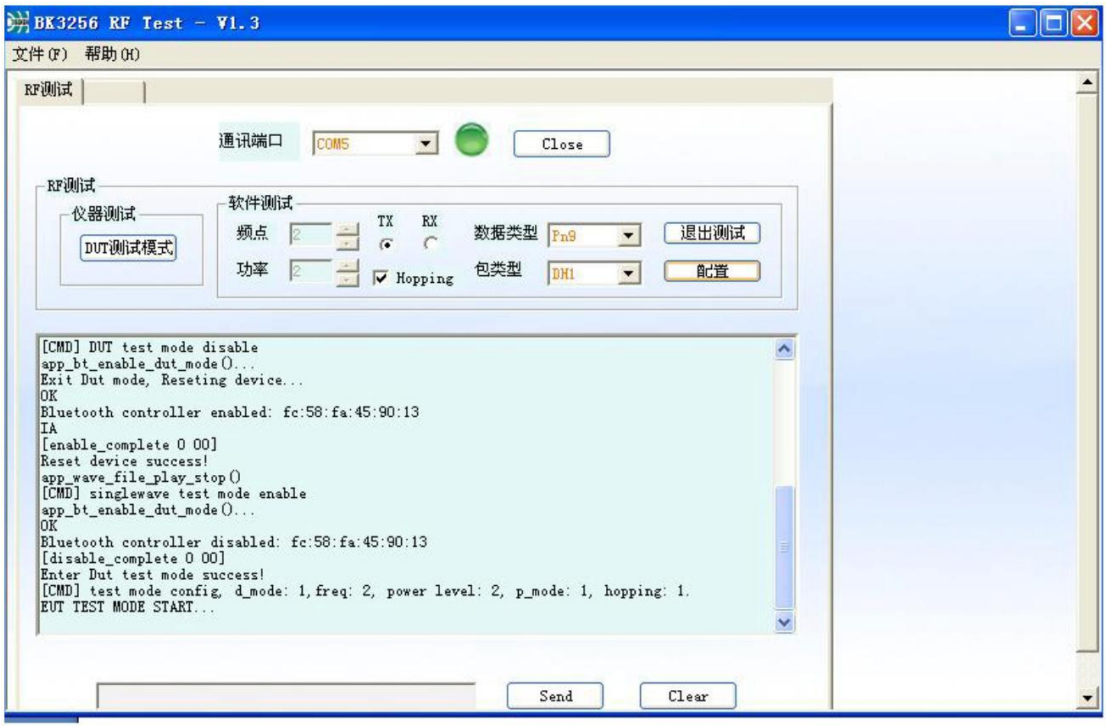
6. Project testing as required



B. Fixed frequency single carrier test, as shown below a. frequency point modification: low, medium, high frequency points are set to 2/41/80 b. power is adjustable, then click on the configuration to enter the fixed frequency test mode

B Full frequency hopping, as follows





2.10 Additional testing, Part 15 Subpart B disclaimer

The modular transmitter is only FCC authorized for the specific rule parts (FCC Part 15.247) listed on the grant, and that the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. The final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed when contains digital circuity.