Product Specification

Product Name：WIFI Module

Product model：C-8031 V1.1

Document Number：

Version：V1.0

Effective Date：

Edit	Review	Approve

Revision History				
Version	Change Information	Page	Revision Date	Editor
V1.0	The first issue	/	2019-06-17	Wu Delong

Catalogue

1. Product overview：

C-8031S is an embedded low-power WIFI wireless communication module, which is suitable for Smart Home and can easily provide network services for home appliances. The module has simple hardware interface and clear protocol, which is convenient for customers to integrate modules into household appliances at the fastest speed. The chip used in the module is BK7231S_QFN32, which is currently the highest integrated IEEE 802.11n SoC in the industry, supports IEEE802.11b/g/n wireless standard, supports wireless working in STA/AP mode, and has internal Flash. This chip has the characteristics of low cost and low power consumption, and is very suitable for smart home, IOT, industrial control and other low flow control and data collection applications.

2. Application area：

※ IOT

※ Smart Home

※ Industrial Control

※ Smart Socket

※ Network Devices

3. Basic characteristics：

※Support 802.11b/g/n wireless network

--802.11b: 1, 2, 5.5, 11
--802.11g: 6, 9, 12, 18, 24, 36, 48, 54
--802.11n HT20: MCS0~7
--802.11n HT40: MCS0~7

※Support 802.11 b/g/n 1x1 protocol

※Support 20/40MHz broadband and STBC

※Support STA/AP/Direct/Repeater network mode

※Support SGI,Green-Field Preamble and A-MPDU

※Support WEP, WPA, WPA2, WAPI security mechanism

※Support UART

※Have internal FLASH, support transparent download

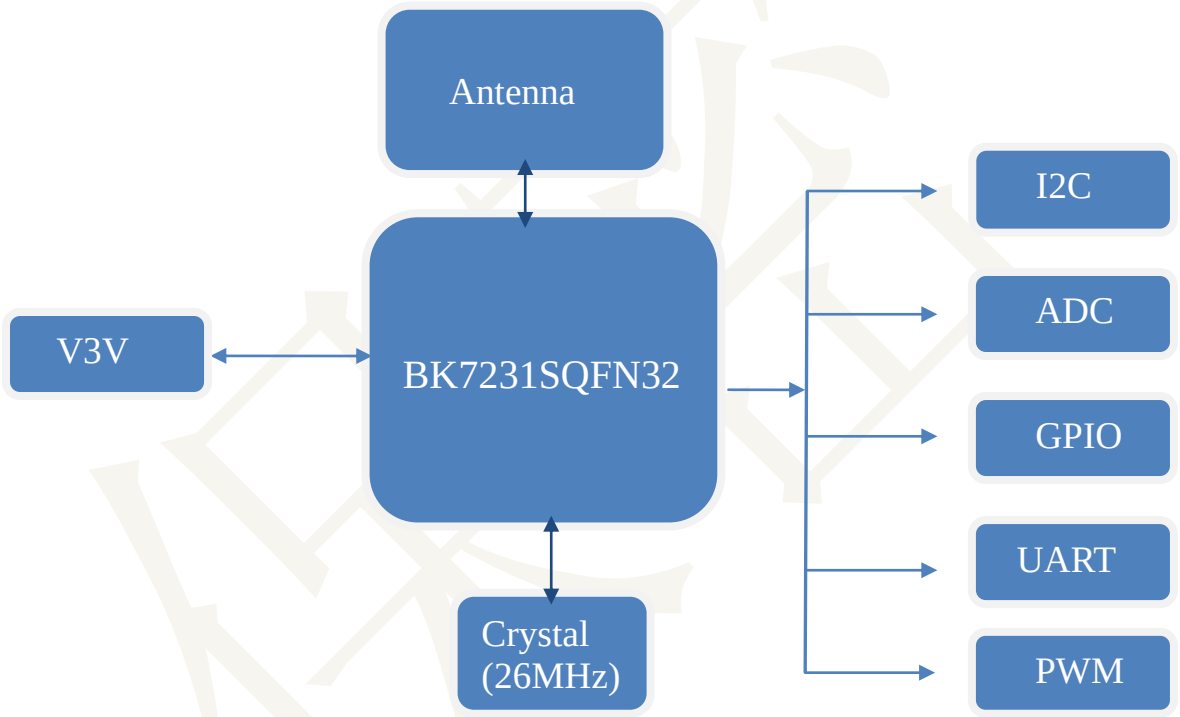
※Support block response

※Support splitting apart and reorganization

※Support Infrastructure BSS Station mode/SoftAP mode

※Support free download

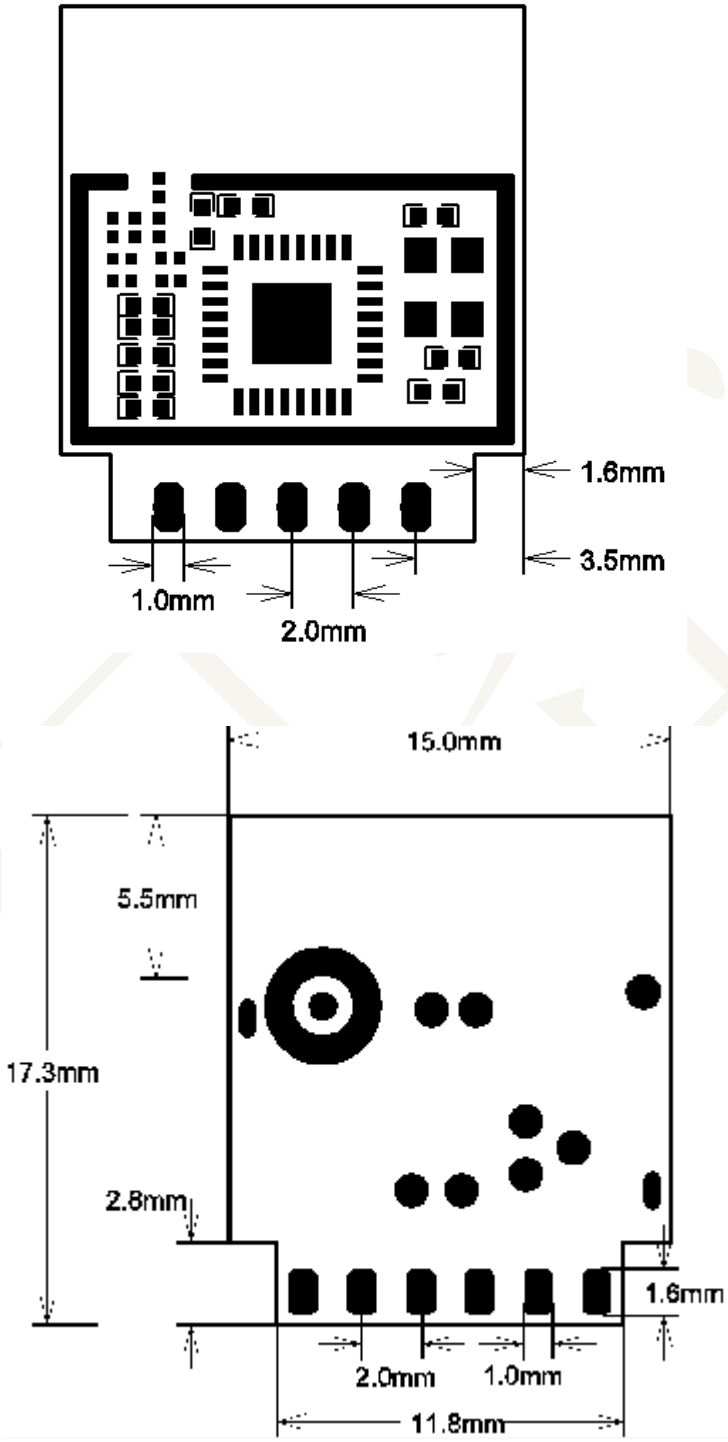
4.Block diagram:



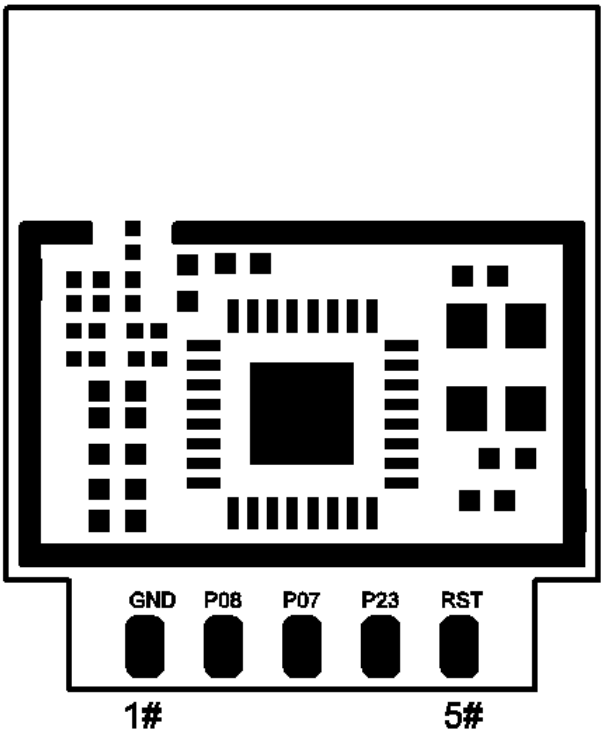
5.Performance parameter：

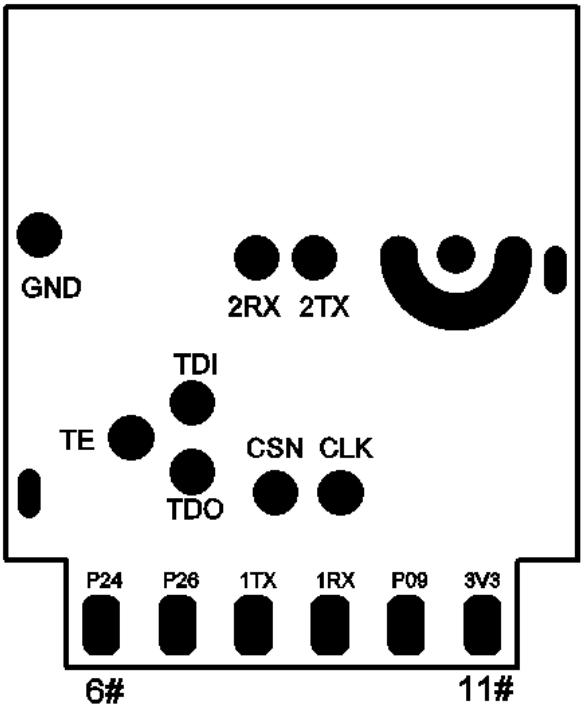
Wireless parameter	Model	C-8031S
	Standard certification	FCC/CE/SRRC
	Wireless Standard	802.11b/g/n,1T1R
	Frequency range	2.412GHz - 2.484GHz
	Emission power	HT40 MCS7 (Tpy): 13dBm
		HT20 MCS7 (Tpy): 13dBm
		54 Mbps OFDM(Tpy) : 14dBm
		11 Mbps DSSS(Tpy) : 18dBm
	Adjacent channel rejection ratio	54 Mbps OFDM(Tpy): 17dB
		11 Mbps DSSS(Tpy): 41dB
	Reception sensitivity	HT40 MCS7 (Tpy):< -69dBm
		HT20 MCS7(Tpy): < -71dBm
		54 Mbps OFDM(Tpy): < -74dBm
		2 Mbps DSSS(Tpy): < -93dBm
	Antenna	Internal Antenna
Hardware parameter	Working voltage	3.3V
	Maximum starting current	<3.3V 250MA
	Emission working current	90mA(output power 15dBm)
	Reception working current	70mA(Reception sensitivity test)
	Working temperature	-10℃～85℃
	Storage temperature	-20℃～90℃
	WiFi transmission range	<100 meters
	Expansion interface	UART，GPIO, PWM, I2C, ADC
	Size	17.3*15*2.2MM
Software parameter	Wireless network type	AP Client mode
	Security mechanism	WPA/WPA2/WAPI
	Encryption type	WEP64/WEP128
	Online update	Support

6.Module size graph：



7. Module pin definition diagram:





8. Pin function description：

Pin	Symb	I/O	Description
1	GND	GND	GND
2	P08	I/O	P8 or PWM 2
3	P07	I/O	P7 or PWM 1
4	P23	I/O	P23 or ADC
5	RST	I/O	Chip enable, active high
6	P24	I/O	P24 or PWM 4
7	P26	I/O	P26 or PWM 5
8	1TX	I/O	P11/UART1_TXD used to debug UART emission
9	1RX	I/O	P10/UART1_RXD used to debug UART reception
10	P09	I/O	P9 or PWM 3
11	3V3	PW	Power input(3.3V)

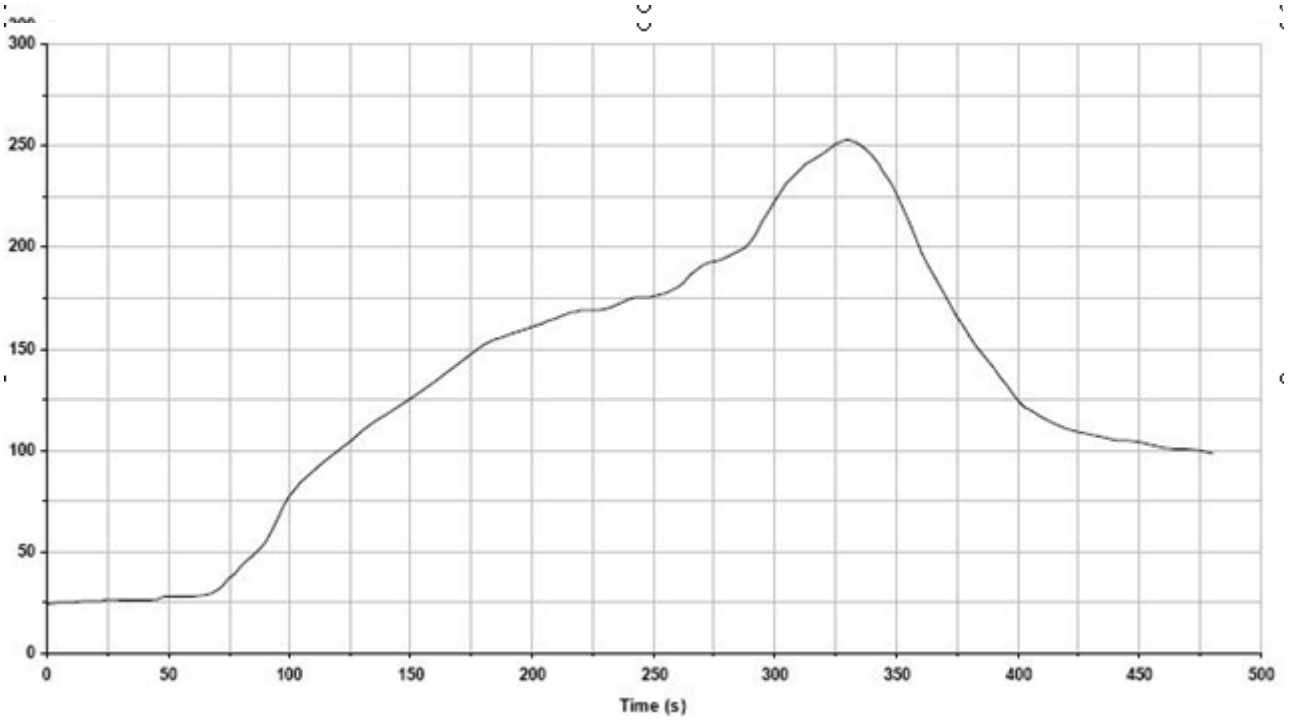
9.Considerations：

A. About the WIFI application environment, wireless signals are easily influenced by the surrounding environment, such as trees and metal will absorb wireless signals, so in practical applications, the distance of data transmission will be affected to a certain extent.

B. Because of the shielding effect of metal shell on radio frequency signal, it is recommended not to install in metal shell.

C. PCB Layout：Because the metal will weaken the function of the antenna, it is strictly forbidden to paving and wiring under the module antenna when the module is laid out, it’s better if empty.

10. 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℃

十一、Application circuit：

Please refer to the application schematic diagram, for reference 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 RF 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 20cm 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; 2.412 GHz～2.462GHz

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: 2AR7VC-8031".

2.9 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.

2.10 Information on test modes and additional testing requirements

Information on test modes:

The host manufacturer can use software for access to the test modes. Connected to the device through the serial port of the host product and control the module. If it does not work, then the host product manufacturer should coordinate with the module manufacturer for access to test mode software.

The following provides guidance to host product when installing this module on how they may verify the end product:

A. If the modular transmitter has been fully tested by the module grantee on the required number of channels, modulation types, and modes, it should not be necessary for the host installer to re-test all the available transmitter modes or settings. It is recommended that the host product manufacturer, installing the modular transmitter, perform some investigative measurements to confirm that the resulting composite system does not exceed the spurious emissions limits or band edge limits (e.g., where a different antenna may be causing additional emissions).

B. The testing should check for emissions that may occur due to the intermixing of emissions with the other transmitters, digital circuitry, or due to physical properties of the host product (enclosure). This investigation is especially important when integrating multiple modular transmitters where the certification is based on testing each of them in a stand-alone configuration. It is important to note that host product manufacturers should not assume that because the modular transmitter is certified that they do not have any responsibility for final product compliance.

C. If the investigation indicates a compliance concern the host product manufacturer is obligated to mitigate the issue. Host products using a modular transmitter are subject to all the applicable individual technical rules as well as to the general conditions of operation in Sections 15.5, 15.15, and 15.29 to not cause interference. The operator of the host product will be obligated to stop operating the device until the interference has been corrected.