

C-R3 WIFI Module Specification

V1.0

1、General

C-R3 wireless module is a fully functional, highly integrated and low-power dedicated Wi-Fi module for the Internet of Things. It supports IEEE802.11b/g/n + BLE5.1, and has embedded IPV4, TCP, UDP, DNS, HTTP and other complete network protocols.

C-R3 module uses BEKEN 7231N chip, which is highly integrated with CPU, PMU, RAM, T/R SW, LNA, PA and other main parts, thus greatly reducing the power consumption of the whole machine. The module adopts the built-in PCB antenna design, which can not only reduce the cost of antenna for customers, but also eliminate the need to consider the assembling space of antenna, greatly reduce the layout area, and the product is more competitive.

2、Features

- Support IEEE 802.11b/g/n compatible WLAN
- Support BLE 5.1 for WIFI pairing
- Single power supply
- UART communication (Input/Output High Voltage reference power supply)

3、WIFI RF

Wi-Fi 2.4GHz Band RF Specifications

TX Characteristics	Min.	Typ.	Max.	Unit	
1. Frequency range	2412	-	2484	MHz	
2. Output power					
11 Mbps CCK		17		dBm	

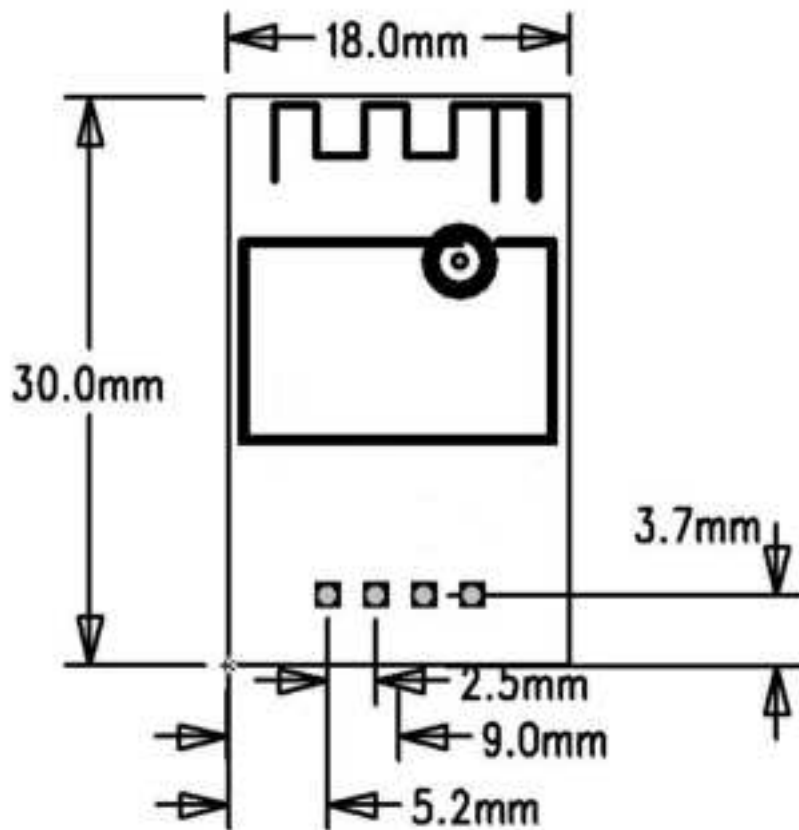
54 Mbps OFDM		14		dBm	
HT20, MCS7		13		dBm	
3. TX EVM					
11 Mbps CCK			-10	dB	
54 Mbps OFDM			-25	dB	
HT20, MCS 7			-27	dB	
RX Characteristics	Min.	Typ.	Max.	Unit	
1. Frequency range	2412	-	2484	MHz	
2. Minimum Input Level Sensitivity					
1) 11Mbps (FER \leq 8%) CCK		-85		dBm	
2) 64QAM rate 3/4 , 54 Mbps OFDM		-72		dBm	
3) MCS 7, 64QAM rate 5/6		-70		dBm	
3. RX Sensitivity BW=20MHz Mixed mode 800ns Guard Interval Non-STBC					
1)MCS 0, BPSK rate 1/2		-89		dBm	
2)MCS 1, QPSK rate 1/2		-86		dBm	
3)MCS 2, QPSK rate 3/4		-84		dBm	
4)MCS 3, 16QAM rate 1/2		-81		dBm	
5)MCS 4, 16QAM rate 3/4		-77		dBm	

6)MCS 5, 64QAM rate 2/3		-73		dBm	
7)MCS 6, 64QAM rate 3/4		-71		dBm	
8)MCS 7, 64QAM rate 5/6		-70		dBm	
5. Maximum Input Level (FER≤8%)					
6 Mbps OFDM		-10		dBm	
54 Mbps OFDM		-10		dBm	
MCS 0		-10		dBm	
MCS 7		-10		dBm	

BLE RF Specifications

Characteristic	Min (dBm)	Typical (dBm)	Max (dBm)
BLE Output Power	4	6	8
Sensitive @BER=0.1% FOR GFSK(1Mbps)		-86	
Sensitive @PER=30.8% FOR BLE			-85
Maximum input level	GFSK(1Mbps) -20dBm		

4、 Modules and Dimensions



Dimensions : 30X18mm

PCB Thickness : 1.0mm

Tolerance : $\pm 0.3\text{mm}$

5、 Pin Descriptions

Pin NO.	Pin Name	Description
1	GND	Ground
2	UART_TX	UART Transmit
3	UART_RX	UART Receive
4	VDD	Power Supply

6、 Electrical Characteristics

Symbol	Parameter	Minimum	Typical	Maximum	Unit
VDD	Power Supply (power ripple <100mV)	3.1	5	5.25	V
Current- AP(5V)	Average current in 2min(mA)	36	65	224	mA
Current -STA(5V)	Average current in 2min(mA)	32	40	240	mA
VIH	High Level Input Voltage	4.5	5	5.5	V
VIL	Low Level Input Voltage	-0.3	-	0.3	V

VOH	High Level Output Voltage	4.75	5.0	5.25	V
VOL	Low Level Output Voltage	0	-	0.4	V

7、 Compliance with standards and certification

ROHS、 REACH、 FCC-ID、 CE-RED。

8、 Environment Limit ratings

Operating temperature : -10~75°C

Storage temperature : -20~85°C

Operating humidity : 0~95 %RH

9、 Caution

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

List of applicable FCC rules

FCC Part 15.247

Specific operational use conditions

This 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.

Limited module procedures

not applicable

Trace antenna designs

not applicable

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.

Antennas

PCB antenna; 0dBi; 2.402 GHz ~ 2.480GHz ;

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: VG8MC-R3" .

Information on test modes and additional testing requirements

For more information on testing, please contact the manufacturer.

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 circuitry.

FCC Statements

(OEM) Integrator has to assure compliance of the entire end-product incl. the integrated RF Module. For 15 B (§15.107 and if applicable §15.109) 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 is integrated" has to be labeled with an auxiliary label stating the FCC ID of the RF Module, such as "Contains FCC ID: VG8MC-R3

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

the Integrator will be responsible to satisfy SAR/ RF Exposure requirements, when the module integrated into the host device.

RF Exposure Warning Statements:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

This equipment shall be installed and operated with minimum distance 20cm between the radiator & body.

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.

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

Co-location Warning:

This equipment could not be co-located or operating in conjunction with any other antenna or transmitter except in accordance with the FCC multi-transmitter product procedures.