



C-3L specification

(WiFi & BLE module)

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1 Summary

C-3L is integrated with WIFI&,ARM9 32-bit MCU core,120MHz master frequency, 256Kbram built-in, Bluetooth BLE dual-mode module, C-chip CC8000_QFN32-- integrated MCU/WLAN MAC/ Baseband/RF integrated single-chip solution。

Support 802.11b /g/n WiFi standard.

- Support 802.11b/g/n standard, HT-20
- Supports Station, Soft AP, Station+Soft AP Maximum transmission rate of 72.2Mbps with 20MHz bandwidth Module built-in onboard antenna, external antenna is optional

operating voltage: DC 3.3-3.6V,

operating ambient temperature: -20℃ to +85℃

2 Features

- Support BT LE4.2 standard,
- Support 802.11b /g/n 1x1 protocol
- 802.11b: 1, 2, 5.5, 11
- 802.11g: 6, 9, 12, 18, 24, 36, 48, 54
- 802.11n HT20: MCS0~7
- Support 20 MHz bandwidth and STBC
- Support STA/AP/Direct/Repeater network model
- Support SGI、Green-Field Preamble and A-MPDU
- Support WPA,WPA2,WAPI security regime
- Support 50 MHz SDIO Interface
- 2M Flash, can be expanded to 4M, support transparent download
- Support for block replies
- Support for sharding and restructuring
- Support for infrastructural networks (Infrastructure BSS) Station model /SoftAP model

Interfaces and peripherals

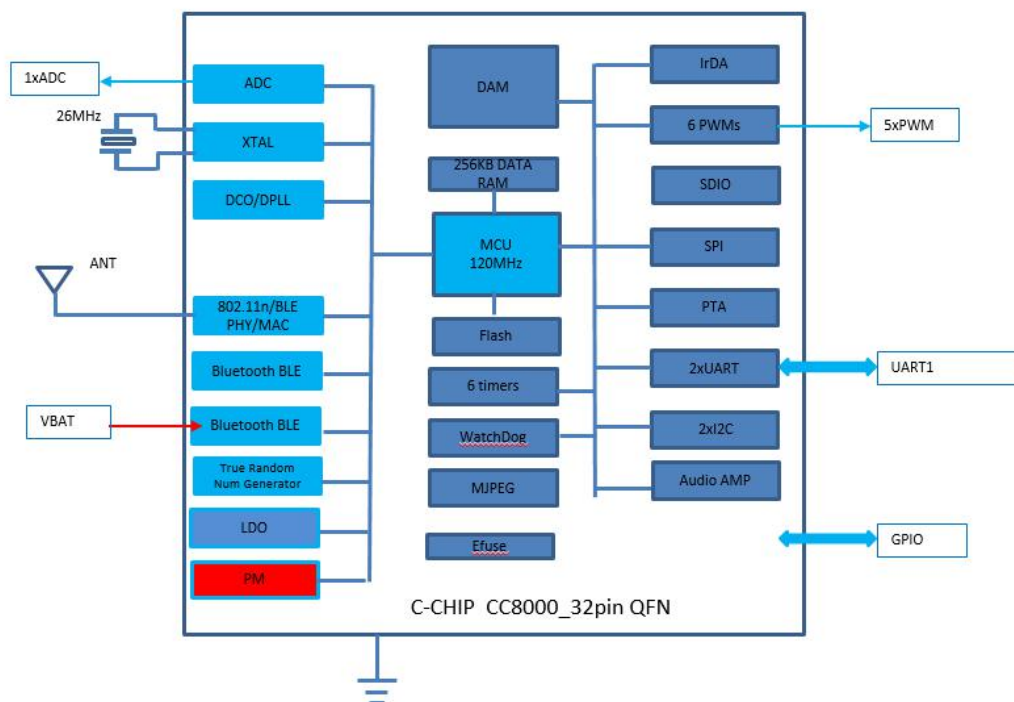
- 2 x UART Interface
- 2 x I2C (multiplex)
- 6 x PMW output
- 17 channels programmable GPIO (multiplex)
- 1 x ADC Interface

3 Application Field

- IOT
- smart home
- industrial control
- network equipment



4 Module block diagram



5 Performance Parameter

5.1 Module parameters

Module parameters	
WLAN STANDARD	WIFI 802.11b/g/n, 1T1R
ANTENNA	PCB antenna
frequency range	2.4G WIFI: 2412-2462 MHz BLE: 2402-2480 MHz
transmitted power	IEEE802.11b <17 dBm IEEE802.11g <14 dBm IEEE802.11n <13 dBm BLE <6dbm
receive sensitivity	11b <-90dB 11g <-73dB 11n <-71dB BLE<-95dB
Type of wireless network	STA/AP/AP+STA
WIFI distance	>100 米
expansion interface	UART, GPIO, ADC, PWM, I2C,
security regime	WEP, WPA-PSK/WPA 2_PSK, WPA/WPA2
Encryption Type	WEP64/WEP128/AES
online update	support
Module size	16±0.35mm (W)×24±0.35mm (L) ×2.8±0.15mm (H) SMD



authentication information	in authentication
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5.2 Recommended working conditions

opereating range	Min	Typical	Max	Unit
operating temperature range	-40	-	+125	° C
VCC	+3.1	+3.3	+3.6	V
I/O power supply (VDD_PIO)	3.1	+3.3	+3.6	V
AIO input	0	-	+3.6	V
frequency range	2400		2484	MHz

5.3 limit range

opereating range	Min	Max	Unit
storage temperature	-40	+125	° C
VCC operating voltage	0	+3.6	V
I/O power supply	0	+3.6	V

5.4 current characteristic

parameter	test mode	Min	typical	Max	unit
Fast connection Bluetooth distribution network	state of fast connection network ,WiFi Indicator light flash		87	380	mA
Fast connection (AP distribution network)	state of AP, Wi-Fi recording light		95	402	mA
Fast connection (EZ distribution network)	state of fast connection network ,WiFi Indicator light flash		106	386	mA
The network connection is idle	state of network outage, Wi-Fi Indicator light goes off		55	132	mA
Network connection operation state	state of network outage, Wi-Fi Indicator light goes off		38	206	mA
depth of the standby	MCU stop。 Can only be awakened by interrupts and RTC		2		mA
off mode	CEN=0		7		uA

annotation : The above test results were at room temperature of 25 degrees and 3.3V power supply mode

工作状态	模式	速率	发射功率/接收	平均值	峰值 (典型值)	单位
发射	11b	11Mbps	+17dBm	295	354	mA
发射	11g	54Mbps	+13.5dBm	266	300	mA
发射	11n	MCS7	+13dBm	260	290	mA
接收	11b	11Mbps	连续接收	98	100	mA
接收	11g	54Mbps	连续接收	98	100	mA
接收	11n	MCS7	连续接收	98	100	mA



5.5 RF Parameter

Parameter	Model	Min	typical	Max	unit
operating frequency		2412	–	2484	MHz
transmitted power	IEEE802.11b	–	17	–	dBm
	IEEE802.11g	–	14	–	dBm
	IEEE802.11n	–	13	–	dBm
	BLE	–	6	–	dBm
receive sensitivity	IEEE802.11b	–	–	–90	dBm
	IEEE802.11g	–	–	–73	dBm
	IEEE802.11n	–	–	–71	dBm
	BLE	–	–	–95	dBm

annotation : The above test results were at room temperature of 25 degrees and 3.3V power supply mode

Tx Verify Summary:

ItemNo.	ANT	Ch	Freq	Rate	EVM	Pwr	FeqErr	Mask	Result
15	ANT0	1	2412	11M	-17.12dB	17.87dBm	-0.57ppm	0.00%	PASS
16	ANT0	7	2442	11M	-16.35dB	17.63dBm	-0.40ppm	0.98%	PASS
17	ANT0	13	2472	11M	-16.43dB	17.24dBm	-0.01ppm	1.53%	PASS
18	ANT0	1	2412	54M	-31.08dB	14.92dBm	-0.38ppm	0.00%	PASS
19	ANT0	7	2442	54M	-30.93dB	14.82dBm	-0.32ppm	0.00%	PASS
20	ANT0	7	2442	HT20-7	-31.63dB	13.58dBm	-0.39ppm	0.00%	PASS
21	ANT0	7	2442	HT40-7	-28.86dB	14.42dBm	-0.08ppm	0.00%	PASS

5.6 Input/output characteristics

opereating specification	Min	typical	Max	unit
VIL Input logic low level	VSS-0.3	–	VSS+0.3	V
VIH Input logic high level	VCC-0.3	–	VCC+0.3	V
Tr/Tf	–	–	25	ns
output level				
VOL Input logic low level,	VSS	–	VSS+0.3	V
VOH Input logic high level,	VCC-0.3	–	VCC+0.3	V
Input and tri-state current	Min	Typical	Max	Unit
Pull-up resistance	3.5	4.7	6.0	KΩ
Weak pull up and down	8	40	50	uA
CI input capacitance	–	5	–	pF

5.7 Electrostatic Test

electrostatic discharge	condition	parameter	unit
Human Body Model	HBM , TAMB=25° C	+/- 2000	V

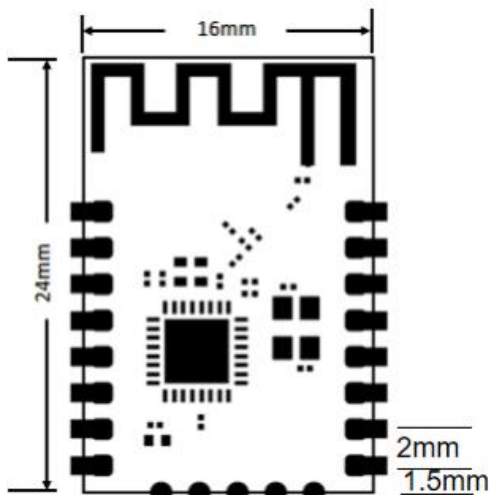


electrostatic discharge	condition	parameter	unit
machine mode	HBM ,TAMB=25° C	+/-200	V

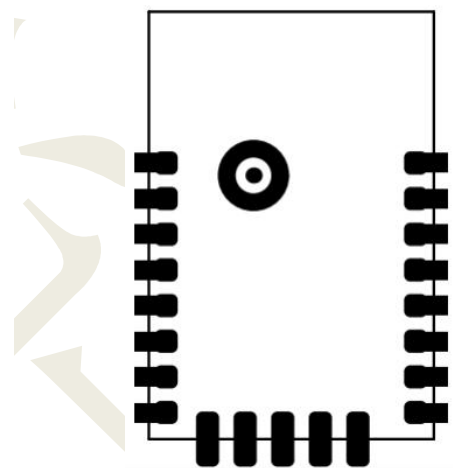
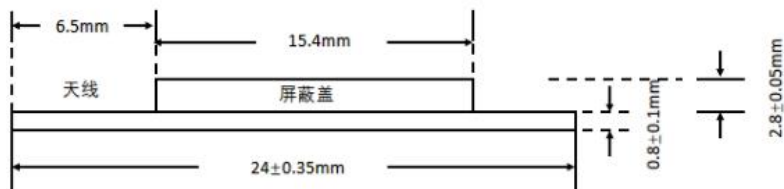
6 Mechanical Size and Pin Definition

6.1 Module size drawing

PCB 尺寸大小: $16\pm0.35\text{mm}$ (W) $\times 24\pm0.35\text{mm}$ (L) $\times 2.8\pm0.15\text{mm}$ (H)。

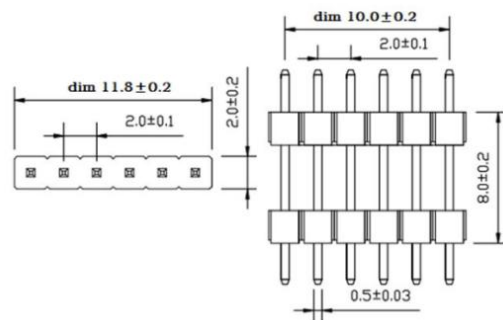


侧视图



PCB 封装图-插针

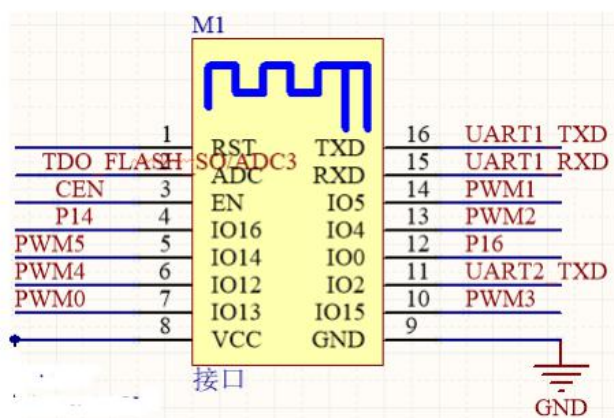
3L 可选用 SMT 贴片式或排针插件。插件尺寸如下图所示:



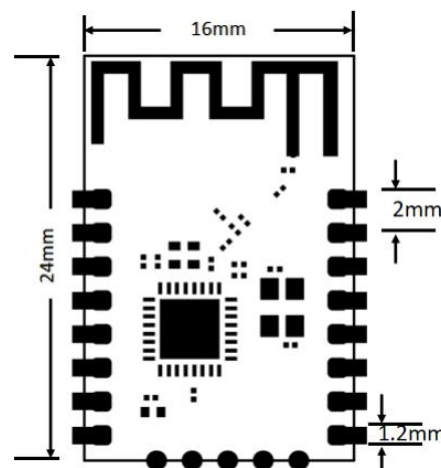
PCB 封装图-SMT

6.2 Module Pin Definition Diagram

原理图封装



地址:
公司





6.3 Pin function description

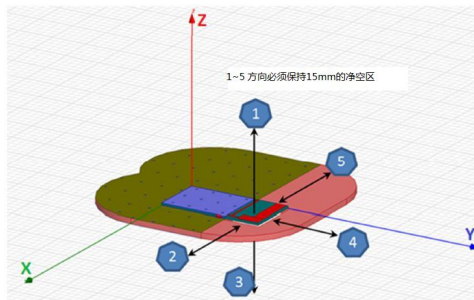
Pin	Name	Pin Type	Description
1	RST	I	reset, active low
2	P23_ADC/TDO	I/O	P23 or ADC or JTAG TDO
3	EN	I	Chip enable, active high
4	P14	I/O	P14
5	PWM5	I/O	PWM5
6	PWM4	I/O	PWM4
7	PWM0	I/O	PWM0
8	3V3	P	Power input(3.3V-3.6V)
9	GND	G	GND
10	PWM3	I/O	PWM3
11	UART2	I/O	UART2
12	P16	I/O	P16
13	PWM2	I/O	PWM2
14	PWM1	I/O	PWM1
15	1RX	I/O	1RX
16	1TX	I/O	1TX

Notes:

1. I: Input
2. O: Output
3. P: Power
4. G: Ground

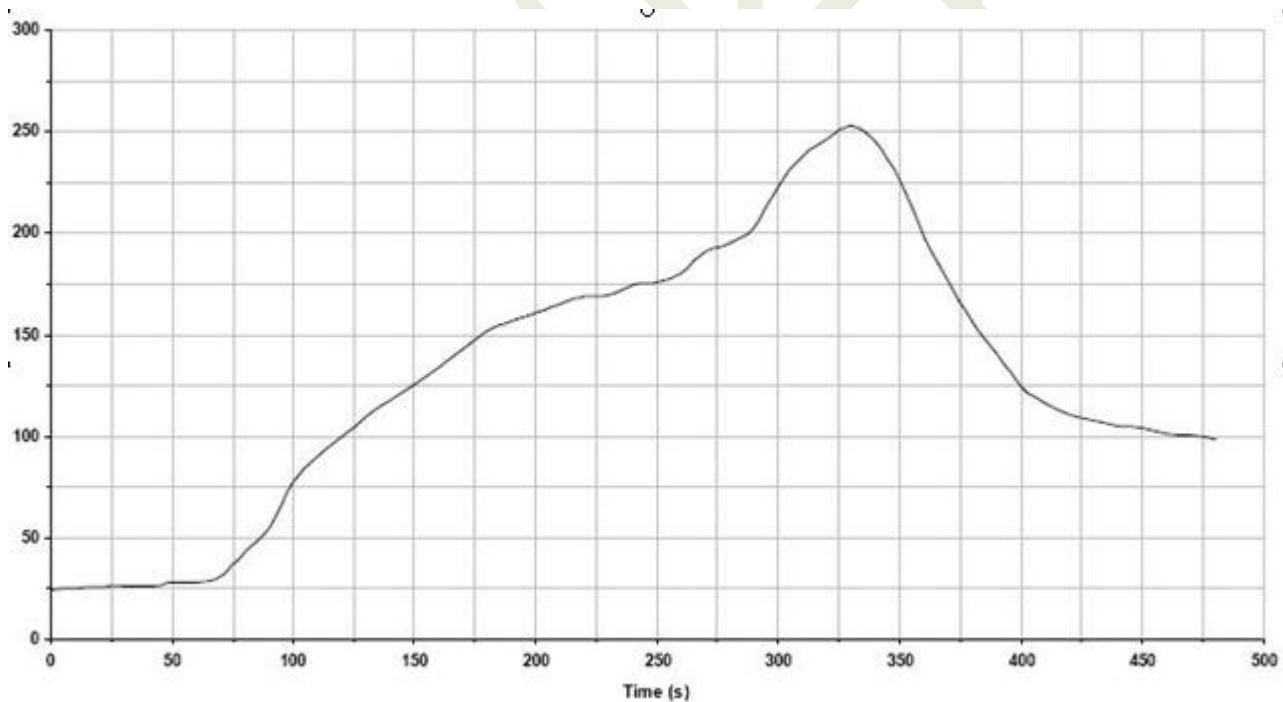
7 Application Note

- A. During the use of the module, please pay attention to avoid the influence of power amplifier, booster line, DC/DC circuit and other interference sources on the module, and avoid the formation of series circuit between the power supply loop of the module and the high-power circuit unit to reduce the interference
- B. If there are batteries, metal objects, LCD screens, speakers, etc. next to the module antenna, the distance from the antenna should be at least 15mm(as shown in the figure).



- C. Pcb cloth board: because the metal will weaken the function of the antenna, when the module cloth board, it is forbidden to lay the ground and walk the line under the module antenna, if it can be hollowed out better.
- D. Regarding the use environment of WIFI, wireless signals are easily influenced by the surrounding environment, such as trees, metals and other obstacles will absorb wireless signals to a certain extent, so in practical application, the distance of data transmission will be affected to a certain extent

8 Reflow Temperature Profile



Key features of the profile:

- Initial Ramp=1-2.5°C/sec to 175°C equilibrium
- Equilibrium time=60 to 80 seconds
- Ramp to Maximum temperature (250°C)=3°C/sec Max
- Time above liquidus temperature(217°C): 45 - 90 seconds
- Device absolute maximum reflow temperature: 250°C

FCC regulatory compliance statement

§15.19 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.

§15.21 Information to user

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

- List of applicable FCC rules:

47 CFR Part 15, Subpart C 15.203

47 CFR Part 15, Subpart C 15.205

47 CFR Part 15, Subpart C 15.207

47 CFR Part 15, Subpart C 15.209

47 CFR Part 15, Subpart C 15.247

47 CFR Part 2 2.1091

- Summarize the specific operational use conditions

This module can be used in IOT devices. For example, after installing the single module, the printer can be connected to the router through the wireless network. Within the WiFi coverage, the user can send various printing instructions from the smartphone or PC, which will be very convenient. The input voltage to the module is nominally 5V. Only the embedded integral antenna is allowed. Any other external antenna is prohibited.

- Limited module procedures

This module is not a limited module.

- Trace antenna designs

The antenna is not a trace antenna.

- RF exposure considerations

This Module complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

- **Antennas**

This module is tested with PCB antenna, and the Max. antenna gain is 0dBi.

If you desire to increase antenna gain and either change antenna type or use same antenna type certified, a Class II permissive change application is required to be filed by us, or you (host manufacturer) can take responsibility through the change in FCC ID (new application) procedure followed by a Class II permissive change application.

- **Label and compliance information**

Please notice that if the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: “Contains **FCC ID: 2AR7VC-3L**” any similar wording that expresses the same meaning may be used.

§ 15.19 Labelling requirements shall be complied on end user device.

Labelling rules for special device, please refer to §2.925, § 15.19 (a)(5) and relevant KDB publications. For E-label, please refer to §2.935.

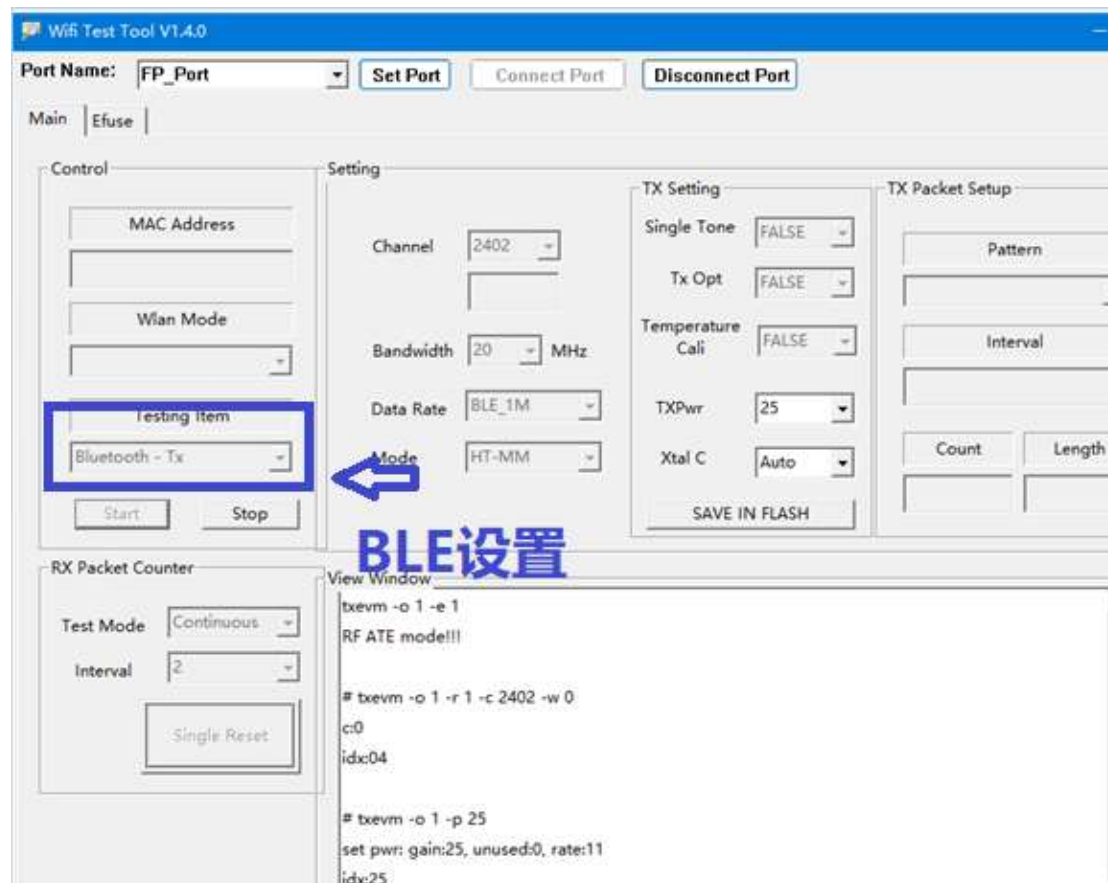
- **Information on test modes and additional testing requirements**

The OEM integrator is responsible for ensuring that the end-user has no manual instruction to remove or install module.

The module is limited to installation in mobile application, a separate approval is required for all other operating configurations, including portable configurations with respect to §2.1093 and difference antenna configurations.

Test software access to different test modes: Wifi Test Tool v1.4.0

Testing item, Frequencies, Transmit Power, Modulation Type, test Antennas can be selected on the test script instructions.



- Additional testing, Part 15 Subpart B disclaimer

This modular transmitter is only FCC authorized for the specific rule parts listed on our grant, 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.

Host manufacturer in any case shall ensure host product which is installed and operating with the module is in compliant with Part 15B requirements.

Please note that For a Class B or Class A digital device or peripheral, the instructions furnished the user manual of the end-user product shall include statement set out in §15.105 Information to the user or such similar statement and place it in a prominent location in the text of host product manual. Original texts as following:

For Class B

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.