

1. Electrical Characteristics

1.1 WiFi Section:

Feature	Description
WLAN Standard	IEEE 802.11b/g/n WiFi compliant
Frequency Range	2.400 GHz ~ 2.497 GHz (2.4 GHz ISM Band)
Number of Channels	2.4GHz: Ch1~1313
Modulation	802.11b : DQPSK, DBPSK, CCK 802.11 g/n : OFDM /64-QAM,16-QAM, QPSK, BPSK
Output Power	802.11b /11Mbps : 17dBm $\pm$ 2 dB @ EVM $\leq$ -15dB
	802.11g /54Mbps : 15 dBm $\pm$ 2 dB @ EVM $\leq$ -27dB
	802.11n /MCS7 : 14 dBm $\pm$ 2 dB @ EVM $\leq$ -29dB
Receive Sensitivity (11b,20MHz) @8% PER	- 1Mbps PER @ -91 dBm, typical
	- 2Mbps PER @ -89 dBm, typical
	- 5.5Mbps PER @ -87 dBm, typical
	- 11Mbps PER @ -85 dBm, typical
Sensitivity (11g,20MHz) @10% PER	- 6Mbps PER @ -90 dBm, typical
	- 9Mbps PER @ -89 dBm, typical
	- 12Mbps PER @ -88 dBm, typical
	- 18Mbps PER @ -85 dBm, typical
	- 24Mbps PER @ -82 dBm, typical
	- 36Mbps PER @ -79 dBm, typical
	- 48Mbps PER @ -74 dBm, typical
	- 54Mbps PER @ -72 dBm, typical
Receive Sensitivity (11n,20MHz) @10% PER	- MCS=0 PER @ -90 dBm, typical
	- MCS=1 PER @ -87 dBm, typical
	- MCS=2 PER @ -85 dBm, typical
	- MCS=3 PER @ -81 dBm, typical
	- MCS=4 PER @ -78 dBm, typical
	- MCS=5 PER @ -73 dBm, typical
	- MCS=6 PER @ -72 dBm, typical
	- MCS=7 PER @ -70 dBm, typical
Receive Sensitivity (11n,40MHz) @10% PER	- MCS=0 PER @ -87 dBm, typical
	- MCS=1 PER @ -84 dBm, typical
	- MCS=2 PER @ -82 dBm, typical
	- MCS=3 PER @ -79 dBm, typical

	- MCS=4 PER @ -75 dBm, typical
	- MCS=5 PER @ -71 dBm, typical
	- MCS=6 PER @ -69 dBm, typical
	- MCS=7 PER @ -68 dBm, typical
Maximum Input Level	802.11b : -10 dBm
	802.11g/n : -20 dBm

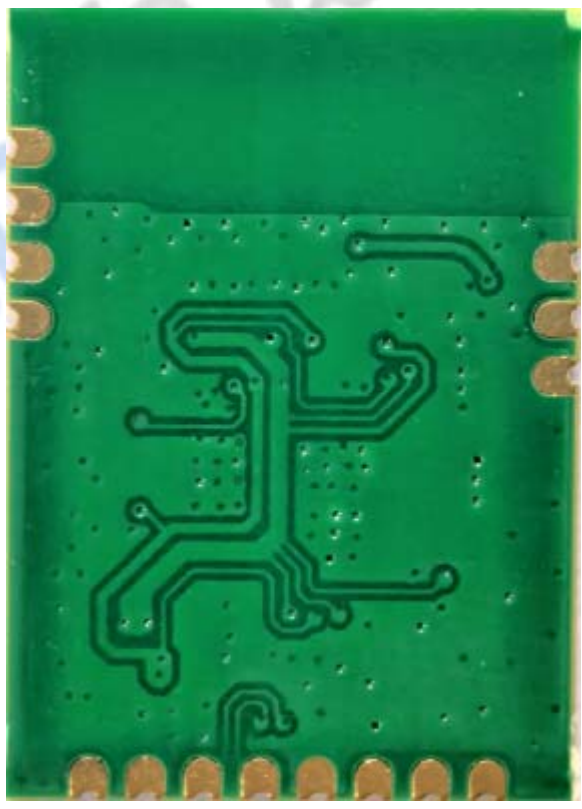
1.2 Bluetooth Section:

Feature	Description		
General Specification			
Bluetooth Standard	BT2.1/3.0/4.2/5.0		
Host Interface	USB2.0		
Frequency Band	2402 MHz ~ 2480 MHz		
Modulation	FHSS, GFSK, DPSK, DQPSK		
RF Specification			
	Min.	Typical.	Max.
Output Power	4dBm		7dBm
Sensitivity @ BER=0.1% for GFSK (1Mbps)		-86 dBm	
Sensitivity @ BER=0.01% for π/4-DQPSK (2Mbps)		-86 dBm	
Sensitivity @ BER=0.01% for 8DPSK (3Mbps)		-80 dBm	
Maximum Input Level	GFSK (1Mbps):-20dBm		
	π/4-DQPSK (2Mbps) :-20dBm		
	8DPSK (3Mbps) :-20dBm		

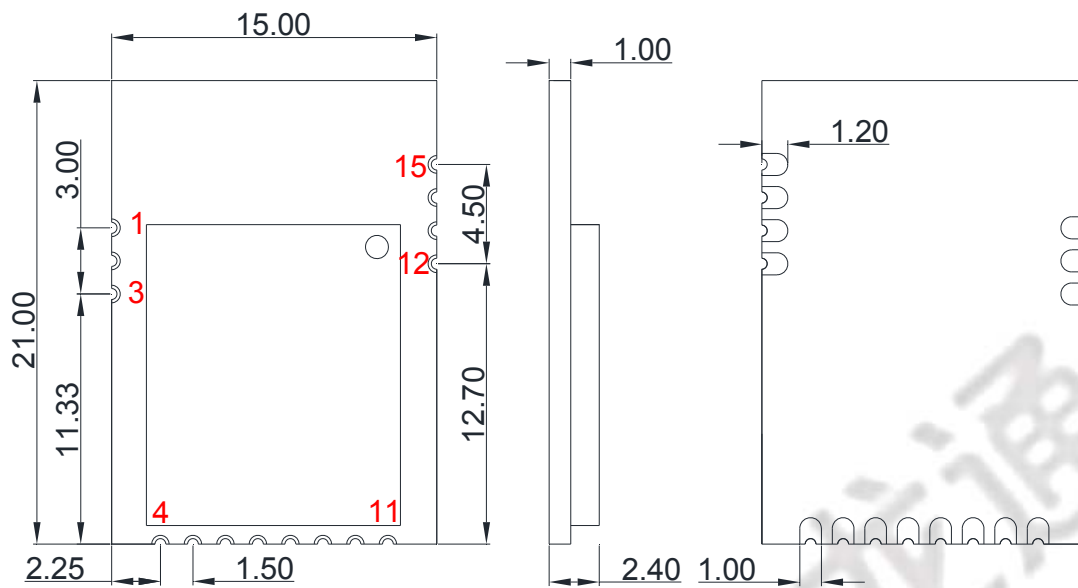
2. Supplier

Supplier list	
Name of Material	Supplier brand
Main chip	RTL
Crystal	FK/TKD/TXC/JWT
PCB	Bomin/Kexiang/E-Tech/Yigetong
Inductor	Sunlord/CHILISIN/SAMWHA/TDK
Capacitance	SAMSUNG /EYANG/ WALSIN/ muRata/TAIYO/ Darfon
Resistor	UniOhm /YAGEO/ WALSIN

3. Module photo

	
TOP VIEW	BOTTOM VIEW
Dimension:21.0*15.0*2.40mm (LxWxH) ±0.3mm	

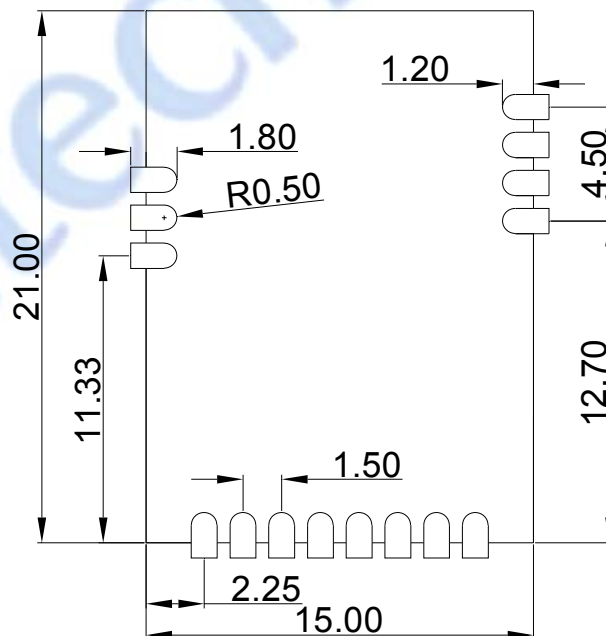
4. Module size



5. Pin Description

No.	Symbol	Description
1	GND	Ground connections
2	BT_RF	Bluetooth RF output
3	GND	Ground connections
4	NC	NC
5	WOW	Wake up system via wifi, low active
6	BT_WAKE_HOST	Wake up system via BT, low active
7	GND	Ground connections
8	DM	USB negative differential data lines
9	DP	USB positive differential data lines
10	GND	Ground connections
11	VCC	Power supply 3.3V
12	NC	NC
13	GND	Ground connections
14	NC	NC
15	GND	Ground connections

6. Package Size

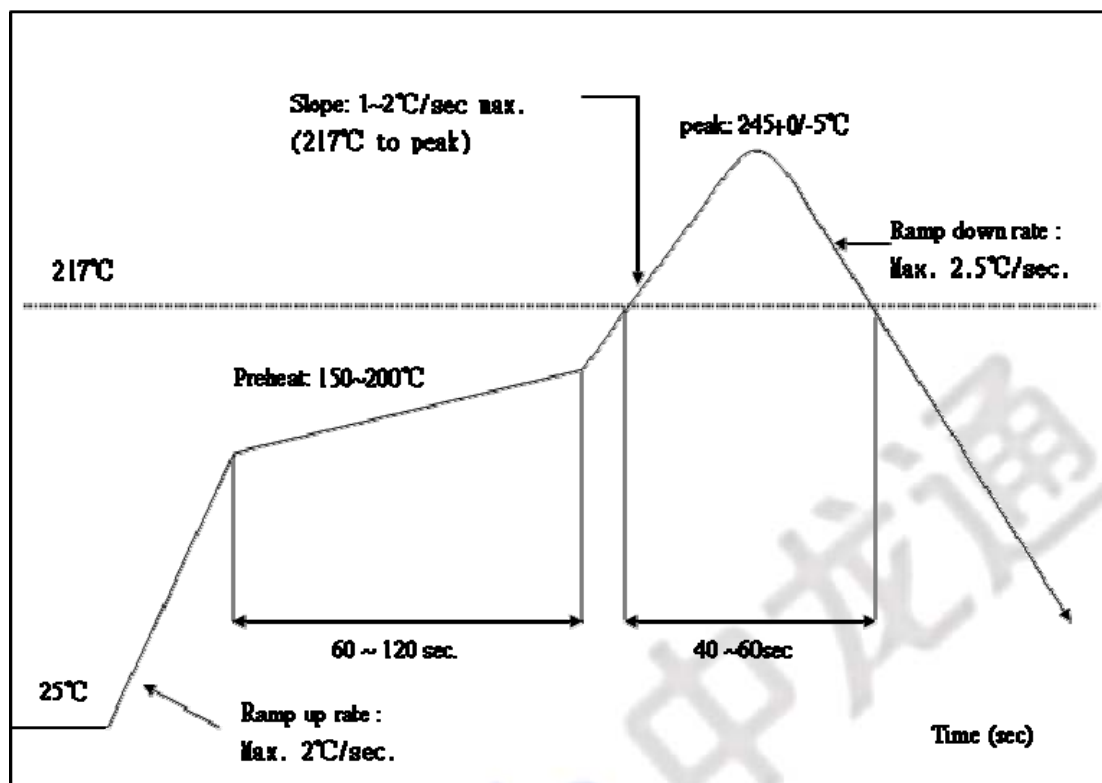


7. Recommended Reflow Profile

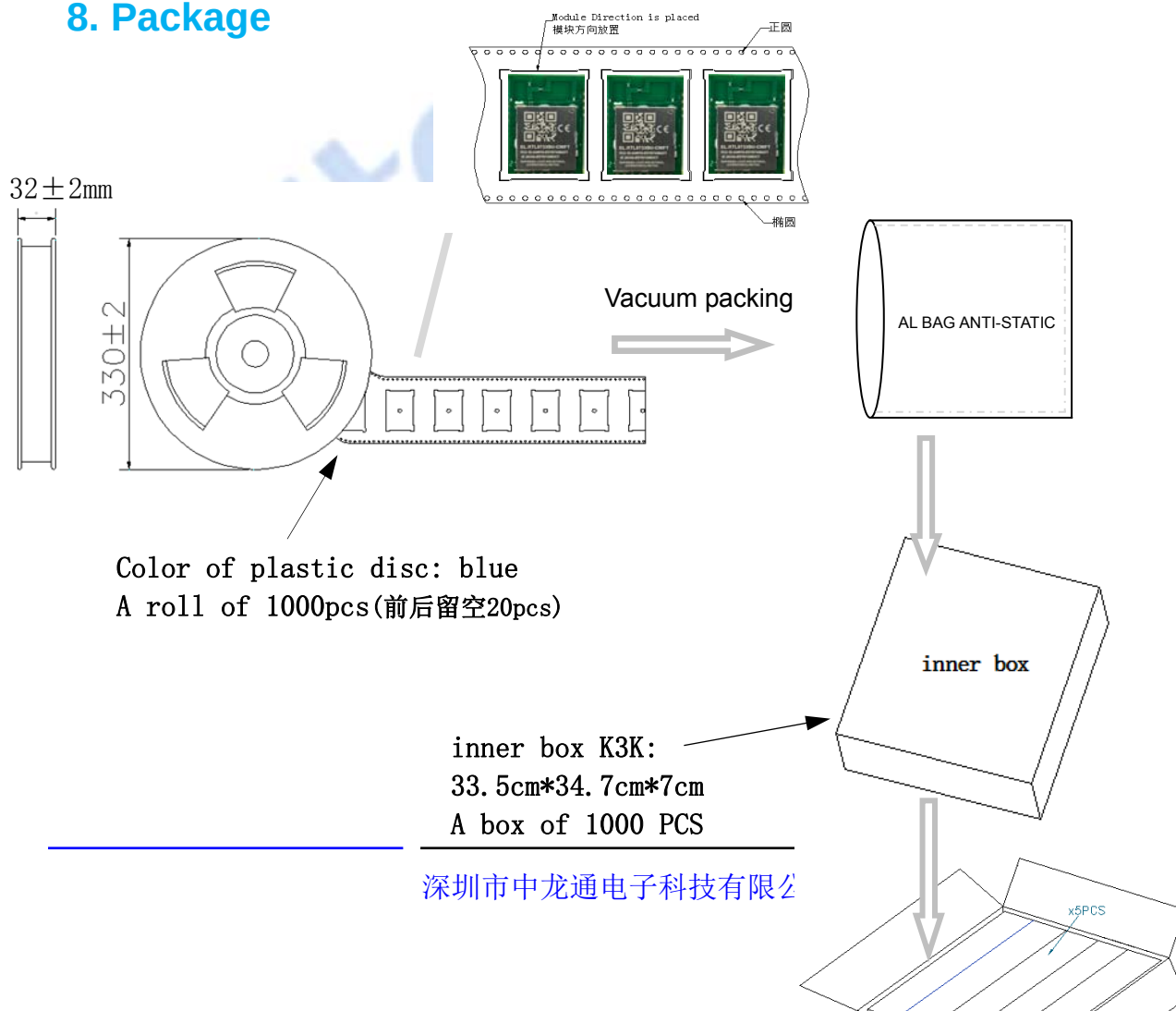
Referred IPC/JEDEC standard.

Peak Temperature : <250°C

Number of Times : 2 times



8. Package



**ESD CAUTION**

The EL.RTL8723DU-CWFT is ESD (electrostatic discharge) sensitive device and may be damaged with ESD or spike voltage. Although EL.RTL8723DU-CWFT is with built-in ESD protection circuitry, please handle with care to avoid the permanent malfunction or the performance degradation.

CE Statements:

Manufacturer's Name: EXPRESS LUCK INDUSTRIAL (SHENZHEN) LIMITED

Address: Floor1, Workshop1, No.88, South Baotong Road, Xikeng Community, Yuanshan Street, Longgang District, Shenzhen, GuangDong, China

Product name : WiFi Module

Model number: EL.RTL8723DU-CWFT

This device in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU. All essential radio test suites have been carried out.

2. The device complies with RF specifications when the device used at 20cm from your body

4. EXPRESS LUCK INDUSTRIAL (SHENZHEN) LIMITED hereby declares that this Tablet is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU.

5. According to Article 10(2) of Directive 2014/53/EU, the Product can be used in Europe without restriction.

6. Operation temperature --20~70 C

**ISED Statement:**

EN

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

FR

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1. L'appareil ne doit pas produire de brouillage;
2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Radiation Exposure Statement~

This equipment complies with Canada radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

Déclaration d'exposition aux radiations

Cet équipement est conforme Canada limites d'exposition aux radiations dans un environnement non contrôlé. Cet équipement doit être installé et utilisé à distance minimum de 20cm entre le radiateur et votre corps.

FCC Caution:

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

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.

This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

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.

To maintain compliance with FCC's RF Exposure guidelines, This equipment should be installed and operated with minimum distance between 20cm the radiator your body: Use only the supplied antenna.

FCC Certification

Integration instructions for host product manufacturers according to KDB 996369 D03 OEM Manual v01r01

2.2 List of applicable FCC rules

The **EL.RTL8723DU-CWFT** is an 802.11b/g/n 150Mbps WLAN + BT v4.2 Combo USB Module. It is within U.S. FCC part 15.247 standard

2.3 Specific operational use conditions

The EUT is a 802.11b/g/n 150Mbps WLAN + BT v4.2 Combo USB Operation Frequency: 2402-2480MHz for BT; 2412-2462MHz for WIFI 2.4G,

Modulation Type: GFSK, $\pi/4$ -DQPSK, 8-DPSK for BT, GFSK for BLE, WLAN(DSSS/OFDM)

2.4 Limited module procedures

Not applicable; Single Modular Approval Request

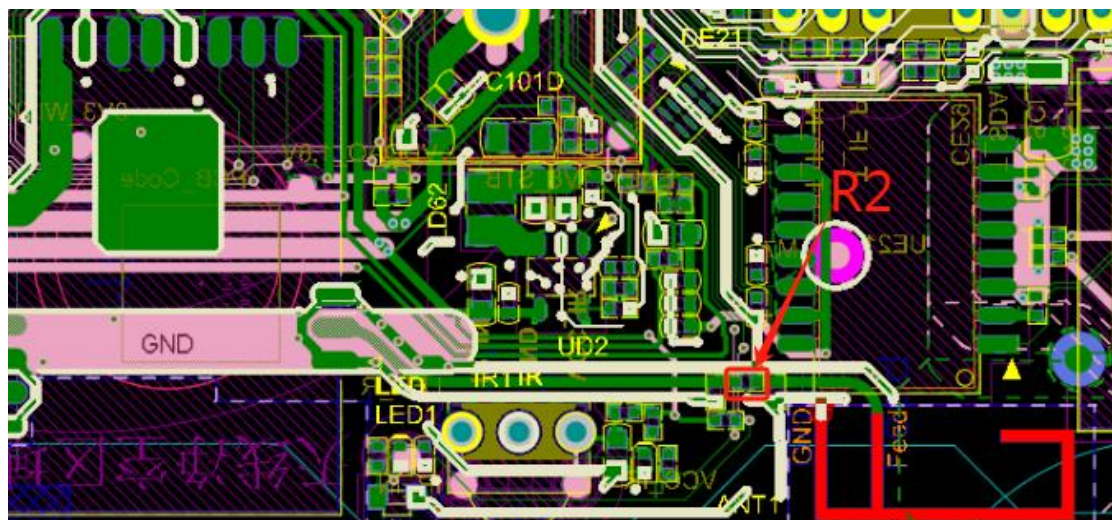
2.5 Trace antenna designs

The 802.11b/g/n 150Mbps WLAN + BT v4.2 Combo USB Module beams signals and communicates with its antenna, which is PCB Antenna

Users should connect antennas to half hole pad through FP types of RF trace and the trace impedance must be controlled in 50 Ω . recommends that the total insertion loss between the antenna pads and antennas should meet the following requirements:

Trace loss Frequency	Loss
2400MHz-2500MHz	<0.6dB

To facilitate the antenna tuning and certification test, a RF connector and an antenna matching circuit should be added. The following figure is the recommended circuit.



The module needs to be attached to the PCB board and connected to the external antenna through the solder joint of the circuit on the PCB. A resistance of 0R is added between the module and the antenna at R2 to ensure that the impedance of the connection between the module and the antenna reaches 50 Ω .

2.6 RF exposure considerations

To maintain compliance with FCC's RF Exposure guidelines, This equipment should be installed and operated with minimum distance between 20cm the radiator your body: Use only the supplied antenna.

2.7 Antennas

The 802.11b/g/n 150Mbps WLAN + BT v4.2 Combo USB Module beams signals and communicates with its antenna, which have two PCB Antenna

The antenna pads and antennas should meet the following requirements: Antenna Type	Antenna Supplier	cable loss	cable length	Connector
WIFI: PCB	SHENZHEN ZHUOCHUANGT ONG ELECTRONIC CO.,LTD	2.4G: 0.6dB	$12.95 \pm 0.2\text{mm}$	N/A
BT: PCB	SHENZHEN ZHUOCHUANGT ONG ELECTRONIC CO.,LTD	2.4G:0.5dB	$11.5 \pm 0.2\text{mm}$	N/A

BT Antenna:-2.27dBi, WiFi Antenna:1.09dBi

2.8 Label and compliance information

The final end product must be label in a visible area , the Host must Contains FCC ID: 2AWY6-ERT8723DUCT

2.9 Information on test modes and additional testing requirements

Data transfer module demo board can control the EUT work in RF test mode at specified test channel.

2.10 Additional testing, Part 15 Subpart B disclaimer

The module without unintentional-radiator digital circuit, so the module does not required an evaluation by FCC Part 15 Subpart B. The host should be evaluated by the FCC Subpart B

2.11 OEM integration instructions:

This device is intended only for OEM integrators under the following conditions: The transmitter module may not be co-located with any other transmitter or antenna. The module shall be only used with the external antenna(s) that has been originally tested and certified with this module. As long as the conditions above are met, further transmitter test will not be required.

However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

2.12 Validity of using the module certification:

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization for this module in combination with the host equipment is no longer considered valid and the FCC ID of the module cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

ATTENTION

This device is intended only for OEM integrators under the following conditions:

- 1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and
- 2) This device and its antenna(s) must not be co - located with any other transmitters except in accordance with FCC multi - transmitter product procedures. Referring to the multi - transmitter policy, multiple transmitter(s) and module(s) can be operated simultaneously without C2PC.
- 3) For all products market in US, OEM has to limit the Operating Frequency: 2402-2480MHz for BT;

2412-2462MHz for WIFI 2.4G, by supplied firmware programming tool. OEM shall not supply any tool or info to the end - user regarding to Regulatory Domain change.

USERS MANUAL OF THE END PRODUCT:

In the user manual of the end product, the end user has to be informed to keep at least 20cm separation with the antenna while this end product is installed and operated. The end user has to be informed that the FCC radio - frequency exposure guidelines for an uncontrolled environment can be satisfied. The end user has to also be informed that any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.