

PRODUCT SPECIFICATION

Wi-Fi (11a/b/g/n/ac 2Tx2R)+BT (V4.1LE) USB Combo Module

WCBN4502B

BCM43569

Version 1.2

**Networking B.U.
Lite-on Technology Corporation
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Customer Approval: _____ (Signature)
_____ (Title)
_____ (Company)
_____ (Date)

(Please Sign Back by FAX. For Confirming the Spec Only, not an Official Agreement for OEM/ODM Business)

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PRODUCT FEATURES

BT FEATURE:

- Bluetooth V4.1 LE system
Backwards compatible with BT version of 1.1, 1.2, 2.0, 2.1, 3.0+HS and V4.0LE
- Bluetooth Class II transmission power
- Support for Adaptive Frequency Hopping(AFH), Secure Simple Pairing (SSP) and Extended Inquiry Response (EIR) function
- Scatternet operation with up to four active piconets with background scan and support for scatter mode
- Includes on-chip support for SBC encoding, and SBC and MP3 decoding
- Low power consumption for meeting worldwide energy standards
- Voice command and voice search for DTV/STB

WI-FI FEATURE:

- Operate at ISM frequency Band (2.4/5GHz)
- IEEE Standards Support, 802.11a ,802.11b, 802.11g 802.11n and 802.11ac
- Support for both 20 MHz/40 MHz channel width in 2.4GHz and 20 MHz/40 MHz/80MHz channel width in 5GHz
- Enterprise level security supporting: WPS2.0,WAPI, WPA, WPA2
- Dual-stream IEEE 802.11n support for 20MHz and 40MHz channels provides PHY layer rates up to 300Mbps
- Dual-stream IEEE 802.11ac support for 80MHz channels provides PHY layer rates up to 867Mbps
- Support for WI-Fi Direct
- Support Wake On WLAN

COMMON FEATURE:

- BCM43569 is a single chip integrated IEEE 802.11 a/b/g/n/ac and Bluetooth 4.1 LE with a single USB interface
- Fully compliance with USB v2.0 specification
- Support OS: Linux based
- RoHS compliance
- Low Halogen compliance

PRODUCT SPECIFICATIONS

MAIN CHIPSET

Broadcom BCM43569

FUNCTIONAL SPECIFICATIONS

BT Function	
Standard	Bluetooth V4.1LE
Bus Interface	USB2.0
Data Rate	1 Mbps, 2Mbps and Up to 3Mbps
Modulation Scheme	GFSK, $\pi/4$ -DQPSK and 8-DPSK
Frequency Range	2.402~2.480 GHz
Transmit Output Power	+4 ≤ Output Power ≤ +10dBm; Class I Device
Receiver Sensitivity	< 0.1% BER at -80dBm
Wi-Fi Function	
Standard	IEEE802.11a; IEEE802.11b; IEEE 802.11g; IEEE 802.11n; IEEE802.11ac
Bus Interface	USB2.0
Data Rate	<p>802.11a: 54, 48, 36, 24, 18, 12, 9, 6 Mbps</p> <p>802.11b: 11, 5.5, 2, 1 Mbps</p> <p>802.11g: 54, 48, 36, 24, 18, 12, 9, 6 Mbps</p> <p>802.11n: MCS 0 to 15 for HT20MHz MCS 0 to 15 for HT40MHz</p> <p>802.11ac: MCS 0 to 8 for HT20MHz MCS 0 to 9 for HT40MHz MCS 0 to 9 for HT80MHz</p>
Media Access Control	CSMA/CA with ACK
Modulation Technique	<p>802.11a: 64QAM, 16QAM, QPSK, BPSK</p> <p>802.11b: CCK, DQPSK, DBPSK</p> <p>802.11g: 64QAM, 16QAM, QPSK, BPSK</p> <p>802.11n: 64QAM, 16QAM, QPSK, BPSK</p> <p>802.11ac: 256QAM, 64QAM, 16QAM, QPSK, BPSK</p>

Network Architecture	Ad-hoc mode (Peer-to-Peer) Infrastructure mode
Operation Channel	<p>2.4GHz 11: (Ch. 1-11) – United States 13: (Ch. 1-13) – Europe 14: (Ch. 1-14) – Japan</p> <p>5GHz 21: USA 19: EU 8: Japan</p>
Frequency Range	<p>802.11bg 2.400 ~ 2.4835 GHz</p> <p>802.11a 5.15 ~ 5.85 GHz</p> <p>802.11a: 14 dBm@6Mbps 14 dBm@54Mbps</p> <p>802.11b: 15 dBm@1Mbps 15 dBm@11Mbps</p> <p>802.11g: 14 dBm@6Mbps 14 dBm@54Mbps</p> <p>802.11n(2.4GHz): 20MHz: 13 dBm@MCS0 13 dBm@MCS7 40MHz: 13 dBm@MCS0 13 dBm@MCS7</p> <p>802.11n(5GHz): 20MHz: 12 dBm@MCS0 12 dBm@MCS7 40MHz: 12 dBm@MCS0 12 dBm@MCS7</p> <p>802.11ac: 20MHz: 11 dBm@MCS0 11 dBm@MCS8 40MHz: 11 dBm@MCS0 11 dBm@MCS8 11 dBm@MCS9 80MHz: 11 dBm@MCS0 11 dBm@MCS8 11 dBm@MCS9</p>
Transmit Output Power – 2x2 (Tolerance: ±2dBm)	
Receiver Sensitivity	<p>802.11a: -86 dBm@6Mbps -70 dBm@54Mbps</p> <p>802.11b: -88 dBm@1Mbps -82 dBm@11Mbps</p> <p>802.11g: -86 dBm@6Mbps</p>

	-70 dBm@54Mbps
802.11n(2.4GHz):	
20MHz	-86 dBm@MCS0
	-69 dBm@MCS7
40MHz	-83 dBm@MCS0
	-66 dBm@MCS7
802.11n(5GHz):	
20MHz	-84 dBm@MCS0
	-67 dBm@MCS7
40MHz	-81 dBm@MCS0
	-64 dBm@MCS7
802.11ac:	
20MHz	-64 dBm@MCS8
40MHz	-62 dBm@MCS8
	-59 dBm@MCS9
80MHz	-59 dBm@MCS8
	-56 dBm@MCS9

Security	WPS, WPA, WPA2, WEP 64bit & 128bit, IEEE 802.1X, IEEE 802.11i
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Common Function

Operating Voltage	5.0 V ±5% I/O supply voltage
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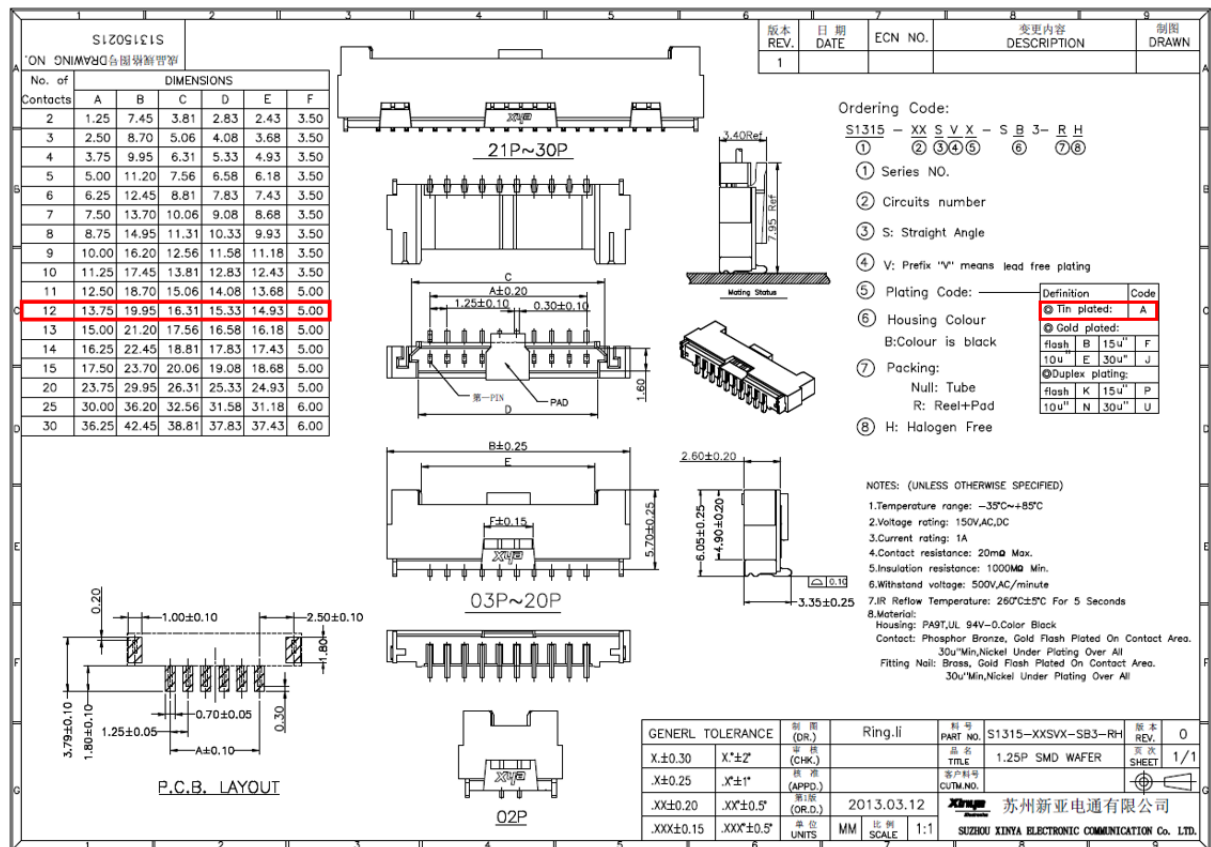
	<i>Mode</i>	<i>Average</i>		<i>Peak</i>	
		<i>2.4G</i>	<i>5G</i>	<i>2.4G</i>	<i>5G</i>
Power Consumption	<i>TX</i>	660mA	770mA	1A	1.2A
	<i>RX</i>	640mA	755mA		
	<i>Idle</i>	30mA			
	<i>Disable</i>	7mA			

Antenna Type	Dual Metal antennas for WiFi Single U.FL Antenna for BT
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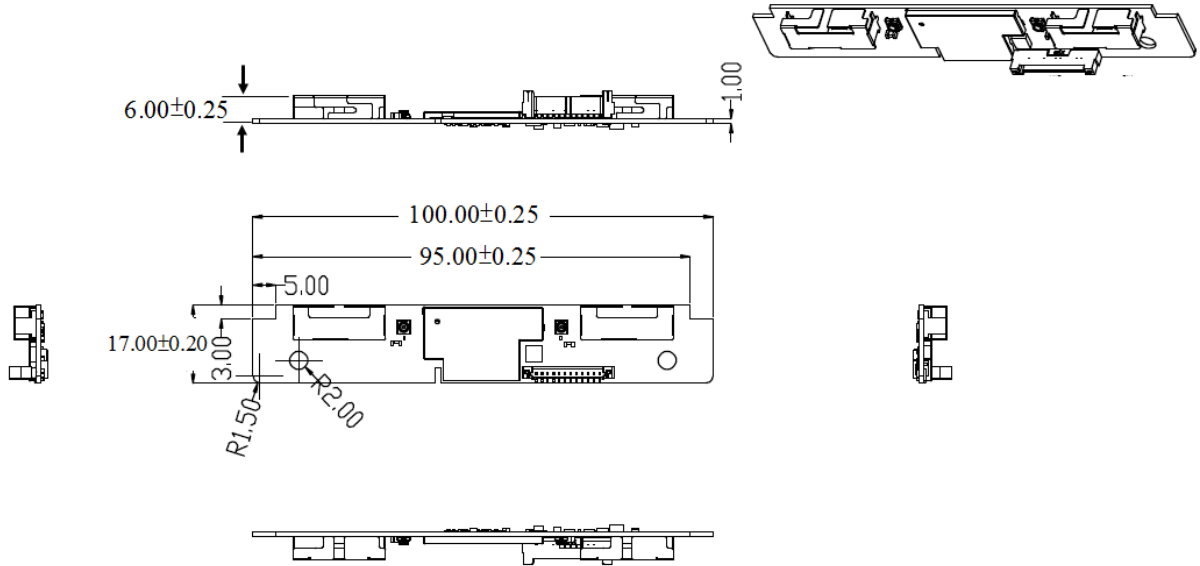
PIN ASSIGMENT

Pin.	Pin Define	Description	Status
1	+5V	5V source	YES
2	USB_D-	USB Data-	YES
3	USB_D+	USB Data+	YES
4	GND	Ground	YES
5	BT_REG_ON#	Active Low to Reset Bluetooth	YES
6	BT_HOST_WAKE#	Bluetooth wake up Host, Low Active	YES
7	BT_DEV_WAKE#	Host wake up Bluetooth, Low Active	YES
8	NC	NC	YES
9	WL_REG_ON#	Active Low to Reset WLAN	YES
10	WL_HOST_WAKE#	WLAN wake up Host, Low Active	YES
11	WL_DEV_WAKE#	Host wake up WLAN, Low Active	YES
12	GND	Ground	YES

USB CONNECTOR SPEC

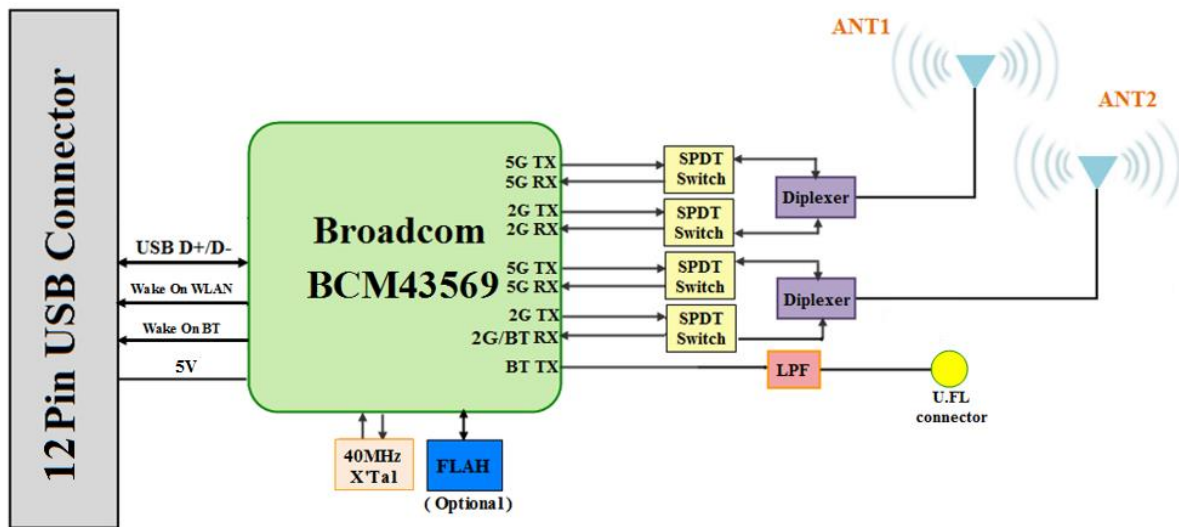


MECHANICAL



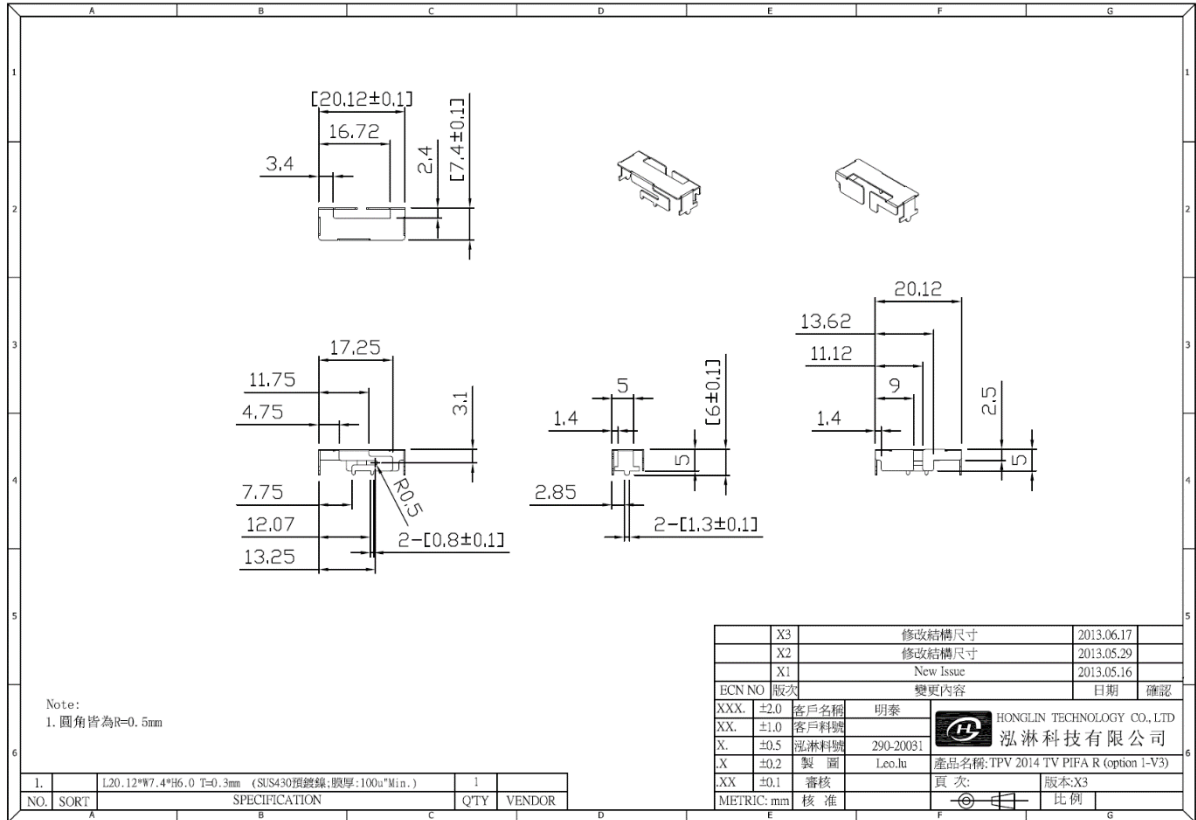
Unit:mm
Tolerance: ± 0.10 mm

BLOCK DIAGRAM



ANTENNA SPEC

On Board Antenna for Wi-Fi



1.1 Electrical Properties

- 1.1.1 Frequency Range----- 2.4GHz~2.5GHz
- 1.1.1.1 4.9GHz~5.85GHz
- 1.1.2 Impedance----- 50Ω
- 1.1.3 VSWR----- 1.92:1
- 1.1.4 Return Loss----- -10dB
- 1.1.5 Peak Gain----- 2.2 dBi(2G)
- 1.1.5.1 4.6 dBi(5G)
- 1.1.6 Admitted Power----- 1W
- 1.1.7 Antenna type----- PIFA type

1.2 Physical Properties

- 1.2.1 Antenna Body-----SUS430 Plated Ni
- 1.2.2 Operating Temp----- -10°C~+60°C
- 1.2.3 Storage Temp----- -10°C~+70°C

External Antenna for BT

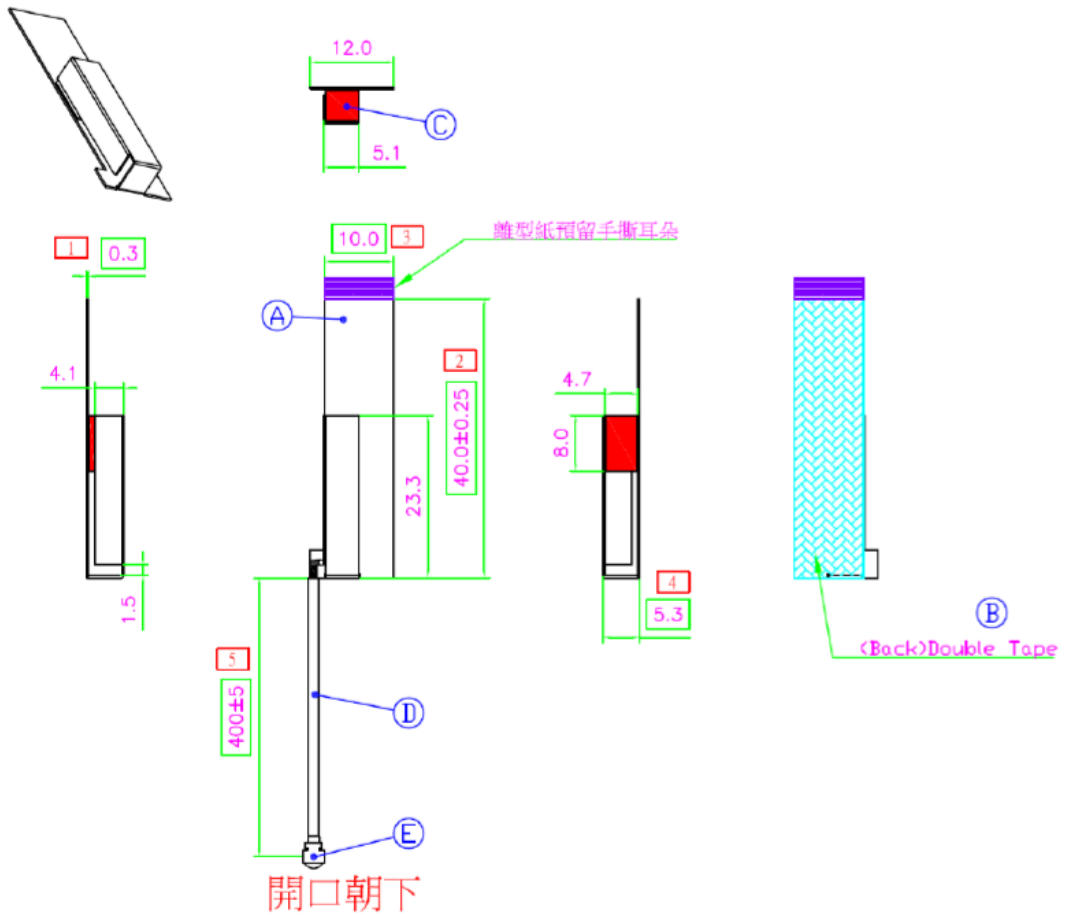
ELECTRICAL

Frequency : 2.4~2.5 GHz

注意：

CABLE+IPEX拉力需≥1.5kg

NO	DESCRIPTION		QTY	REMARK
A	Antenna	SUS430(鍍線) T=0.3mm	1	
B	Double Tape	3M 9448(L40*W10mm)	1	
C	Sponge(EPDM L8*W4.8 Black)+Double Tape(G9000) : T4.7mm		1	
D	Coaxial cable	Ø1.37 Cable(Gray)	1	
E	Connector	IPEX	1	



EEPROM INFORMATION**BT**

Vendor ID	0x0A5C
Product ID	0xBD27

Wi-Fi

ccode	0xTBD
regrev	0xTBD
Vendor ID	0x0A5C
Device ID	0xBD27

ENVIRONMENTAL**OPERATING**

Operating Temperature: 0 to 70 °C (32 to 158 °F)

Relative Humidity: 5-90% (non-condensing)

STORAGE

Temperature: -40 to 80 °C (-40 to 176 °F)

Relative Humidity: 5-95% (non-condensing)

FCC WARNING STATEMENT

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.

You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the 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.

FCC RF Radiation Exposure Statement:

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

According to FCC 15.407(e), the device is intended to operate in the frequency band of 5.15GHz to 5.25GHz under all conditions of normal operation. Normal operation of this device is restricted to indoor use only to reduce any potential for harmful interference to co-channel MSS operations.

Information to OEM integrator

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user manual of the end product. The user manual which is provided by OEM integrators for end users must include the following information in a prominent location.

1. To comply with FCC RF exposure compliance requirements, the antenna used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter, except in accordance with FCC multi-transmitter product transmitter product procedures.
2. Only those antennas with same type and lesser gain filed under this FCC ID number can be used with this device.
3. The regulatory label on the final system must include the statement: “Contains FCC ID: PPQ-WCBN4502B”.
4. The final system integrator must ensure there is no instruction provided in the user manual or customer documentation indicating how to install or remove the transmitter module except such device has implemented two-way authentication between module and the host system.
5. If the end product integrating this module is going to be operated in 5.15 ~5.25GHz frequency range, the warning statement in the user manual of the end product should include the restriction of operating this device in indoor could void the user’s authority to operate the equipment.

IC WARING STATEMENT

Canada, Industry Canada (IC) Notices

This Class B digital apparatus complies with Canadian ICES-003 and RSS-247.

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Canada, avis d'Industry Canada (IC)

Cet appareil numerique de classe B est conforme aux normes canadiennes ICES-003 et RSS-247.IC

Son fonctionnement est soumis aux deux conditions suivantes : (1) cet appareil ne doit pas causer d'interference et (2) cet appareil doit accepter toute interference, notamment les interferences qui peuvent affecter son fonctionnement.

Radio Frequency (RF) Exposure Information

The radiated output power of the Wireless Device is below the Industry Canada (IC) radio frequency exposure limits. The Wireless Device should be used in such a manner such that the potential for human contact during normal operation is minimized.

This device has also been evaluated and shown compliant with the IC RF Exposure limits under mobile exposure conditions. (antennas are greater than 20cm from a person's body).

Informations concernant l'exposition aux frequences radio (RF)

La puissance de sortie emise par l'appareil de sans fil est inferieure a la limite d'exposition aux frequences radio d'Industry Canada (IC). Utilisez l'appareil de sans fil de facon a minimiser les contacts humains lors du fonctionnement normal.

Ce peripherique a egalement ete evalue et demontre conforme aux limites d'exposition aux RF d'IC dans des conditions d'exposition a des appareils mobiles (les antennes se situent a moins de 20 cm du corps d'une personne).