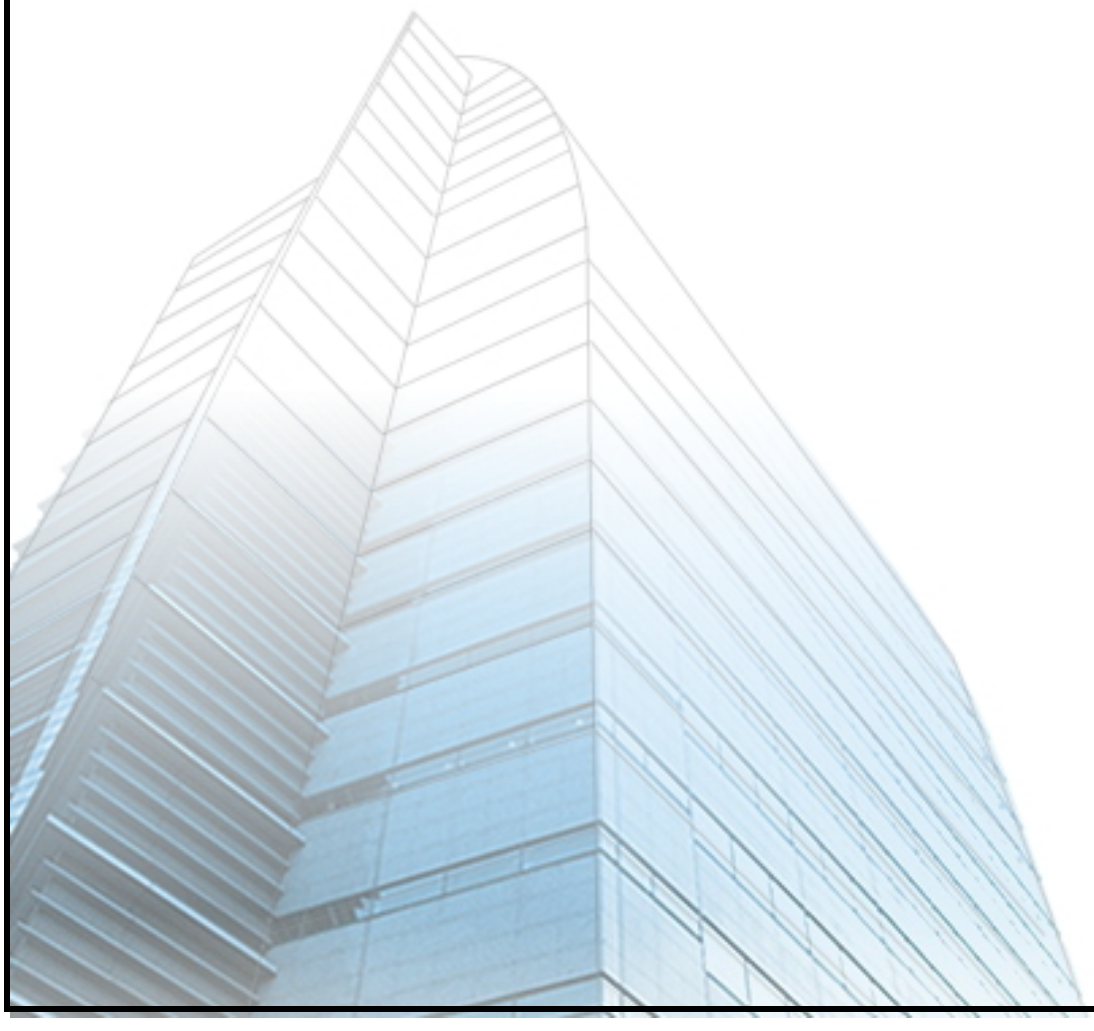
User MANUAL

802.11b/g/n 2Tx2R + BT5.0 USB WLAN Module

Model Name: WCBN4606L

Brand: LITE-ON



CONTENT

FCC Statement:

Federal Communication Commission Interference 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 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.

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.

For product available in the USA/Canada market, only channel 1~11 can be operated. Selection of other channels is not possible. 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.

IMPORTANT NOTE: FCC Radiation Exposure Statement: This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator & your body.

IMPORTANT NOTE: This module is intended for OEM integrator. The OEM integrator is responsible for the compliance to all the rules that apply to the product into which this certified RF module is integrated. Additional testing and certification may be necessary when multiple modules are used.

20 cm minimum distance has to be able to be maintained between the antenna and the users for the host this module is integrated into. Under such configuration, the FCC radiation exposure limits set forth for an population/uncontrolled environment can be satisfied.

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

USERS MANUAL OF THE END PRODUCT:

In the user's manual of the end product, the end user has to be informed to keep at least 20 cm 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. If the size of the end product is smaller than 8x10cm, then additional FCC part 15.19 statement is required to be available in the user's manual: This device complies with Part 15 of 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.

LABEL OF THE END PRODUCT:

The final end product must be labeled in a visible area with the following " Contains FCC ID: PPQ-WCBN4606L ". If the size of the end product is larger than 8x10cm, then the following FCC part 15.19 statement has to also be available on the label: This device complies with Part 15 of 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.

OEM Integrator Checklist

The party below will implement the LITE-ON Module in host systems in accordance with the instructions specified in this document and the documents referenced herein.

1.The OEM integrator will ensure the Module is integrated in a host systems using only the approved antenna model(s) described in this document.

2.The OEM integrator will ensure the antenna placement inside the host system willmaintain the required spacing to end user for RF Exposure compliance, as specified in this document. 3.If other radios are integrated inside the host with the LITE-ON Module, the OEM integrator will contact its test lab, TCB or LITE-ON to determine if additional FCC compliance evaluation is required to meet FCC collocation rules.

4.The OEM integrator will ensure end user documentation will contain the specified regulatory wording and ensure the host system and the Module itself are labeled as specified in this document.

5. The OEM integrator will ensure the Module is programmed in the factory with compliant transmit power not exceeding the levels specified in this document. LITE-ON requests that the OEM integrator acknowledge its receipt of this document and the above instructions. You may contact LITE-ON with any questions concerning this document or the responsibilities of the OEM integrator

PRODUCT FEATURES

BT FEATURE:

- Bluetooth V5.0 system
  Backwards compatible with BT version of 1.1, 1.2, 2.0, 2.1, 3.0+HS and 4.0LE
- Bluetooth Class I transmission power
- Support all packet types in basic rate and enhance data rate
- Support Secure Simple Pairing
- Support multiple low energy states
- Fast AGC control to improve receiving dynamic range
- Support Wake On Bluetooth

WI-FI FEATURE:

- Operate at ISM frequency Band (2.4GHz)
- IEEE Standards Support, 802.11b, 802.11g, 802.11n
- Support for both 20 MHz, 40MHz channel width in 2.4GHz band
- Enterprise level security supporting: WAPI, WPA, WPA2
- Support 2 transmission and 2 receiving, transmission rate can up to 300Mbps (Physical Rate) in downstream and upstream
- QoS support of WFA WMM, WMMPS
- Wi-Fi Direct support wireless peer to peer application
- Channel management and co-existene
- Support Wake On WLAN via Magic packets and wake-up frame

- RTL8725A is a single chip integrated IEEE 802.11 b/g/n and Bluetooth 5.0 with a single USB interface
- Enhanced BT/WI-FI coexistence control to improve transmission quality in different profiles
- Fully compliance with USB v2.0 specification
- RoHS compliance
- Low Halogen compliance

PRODUCT SPECIFICATIONS

MAIN CHIPSET

Realtek RTL8725A

FUNCTIONAL SPECIFICATIONS

BT Function	
Standard	Bluetooth V5.0LE
Bus Interface	USB2.0
Data Rate	1 Mbps, 2Mbps and Up to 3Mbps
Modulation Scheme	GFSK, π/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 -88dBm

Wi-Fi Function	
Standard	IEEE802.11b; IEEE 802.11g; IEEE 802.11n.
Bus Interface	USB2.0
Data Rate	***802.11b:*** 11, 5.5, 2, 1 Mbps ***802.11g:*** 54, 48, 36, 24, 18, 12, 9, 6 Mbps ***802.11n:*** MCS 0 to 15 for HT20MHz MCS 0 to 15 for HT40MHz
Media Access Control	CSMA/CA with ACK
Modulation Technique	***802.11b***: CCK, DQPSK, DBPSK ***802.11g***: 64QAM, 16QAM, QPSK, BPSK ***802.11n***: 64QAM, 16QAM, QPSK, BPSK
Network Architecture	Ad-hoc mode (Peer-to-Peer) Infrastructure mode
Operation Channel	***2.4GHz*** 11: (Ch. 1-11) – United States 13: (Ch. 1-13) – Europe 14: (Ch. 1-14) – Japan
Frequency Range	***802.11bg*** 2.400 ~ 2.4835 GHz
EVM	CCK < 35% OFDM < -25dB MCS0(HT20/40MHz) < -5dB

	MCS7(HT20/40MHz) < -28dB MCS0(VHT20/40/80MHz) < -5dB MCS7(VHT 20/40/80MHz) < -27dB
Frequency Offset	**2.4GHz** -20ppm < Center Frequency < +20ppm

Transmit Output Power - single chain @ant;
Tolerance: ±1.5dBm@2.4GHz

802.11b	***1Mbps***	***2Mbps***	***5.5Mbps***	***11Mbps***
Tgtpwr (dBm)	17	17	17	17

802.11g	***6~24Mbps***	***36Mbps***	***48Mbps***	***54Mbps***
Tgtpwr (dBm)	17	16	16	16

802.11n HT20	***MCS0***	***MCS1***	***MCS2***	***MCS3***	***MCS4***
Tgtpwr (dBm)	16	16	16	15	15
	MCS5	***MCS6***	***MCS7***	***MCS8***	***MCS9***
	14	14	14		

802.11n HT40	***MCS0***	***MCS1***	***MCS2***	***MCS3***	***MCS4***
Tgtpwr (dBm)	16	16	16	15	15
	MCS5	***MCS6***	***MCS7***	***MCS8***	***MCS9***
	14	14	14		

Receiver Sensitivity

Frequency Band	***Rate***	***Condition***	***Typical (1SS) (dBm)***
2.4G	11b-1M	PER < 8%	-94
	11b-11M	PER < 8%	-86
	11g-6M	PER < 10%	-90
	11g-54M	PER < 10%	-71
	11n-HT20MCS0	PER < 10%	-87
	11n-HT20MCS7	PER < 10%	-70
	11n-HT40MCS0	PER < 10%	-84
	11n-HT40MCS7	PER < 10%	-67

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

Common Function	
Operating Voltage	5V ±10% I/O supply voltage

Power Consumption	***Mode***	***Average***	***Peak***
	TX	*442mA*	*829mA*
	RX	*185mA*	*796mA*
	Unassociated Idle	*31mA*	
	Standby for Wake up mode	*37mA*	
Antenna Type	2x Metal Antennas for WiF; 1x U.FL connectors for BT		

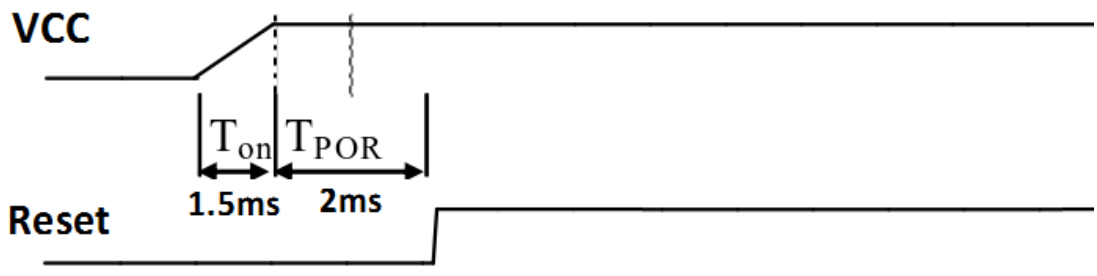
RECOMMENDED OPERATION CONDITIONS

Symbol	Rating	Min	Typ	Max	Units
+5VCC	5V Supply Voltage	4.5	5	5.5	V
VDD33_USB VA33X VR33_SYN VR33_RTX_S0 VR33_RTX_S1 BT_BD33PA VD33_SPS	3.3V Supply Voltage	3.0	3.3	3.6	V
VA10_AFE VA10_SYN VR10_RTX_S0 VR10_RTX_S1 VD10D VA10_USB	1.05V Core Supply Voltage	1.15	1.25	1.37	V
VDD12BT BT_VD12RTXBB BT_BD12RTXFE BT_VD12SYN	1.2V Supply Voltage	1.08	1.2	1.32	V

DC CHARACTERISTICS

Symbol	Parameter	Min	Typ	Max	Units
V_{IL}	Input Low Voltage	-	0	0.9	V
V_{IH}	Input High Voltage	2.0	3.3	3.63	V
V_{OL}	Output Low Voltage	0	-	0.33	
V_{OH}	Output High Voltage	2.97	-	3.3	V

RESET TIMING SPEC



Symbol	Min	Typ	Max	Units
T_{on}	0.2	1.5	5	ms
T_{POR}	-	2	10	ms

Noted: Reset time 不需要特別定義時間, 只要確定有拉起來即可

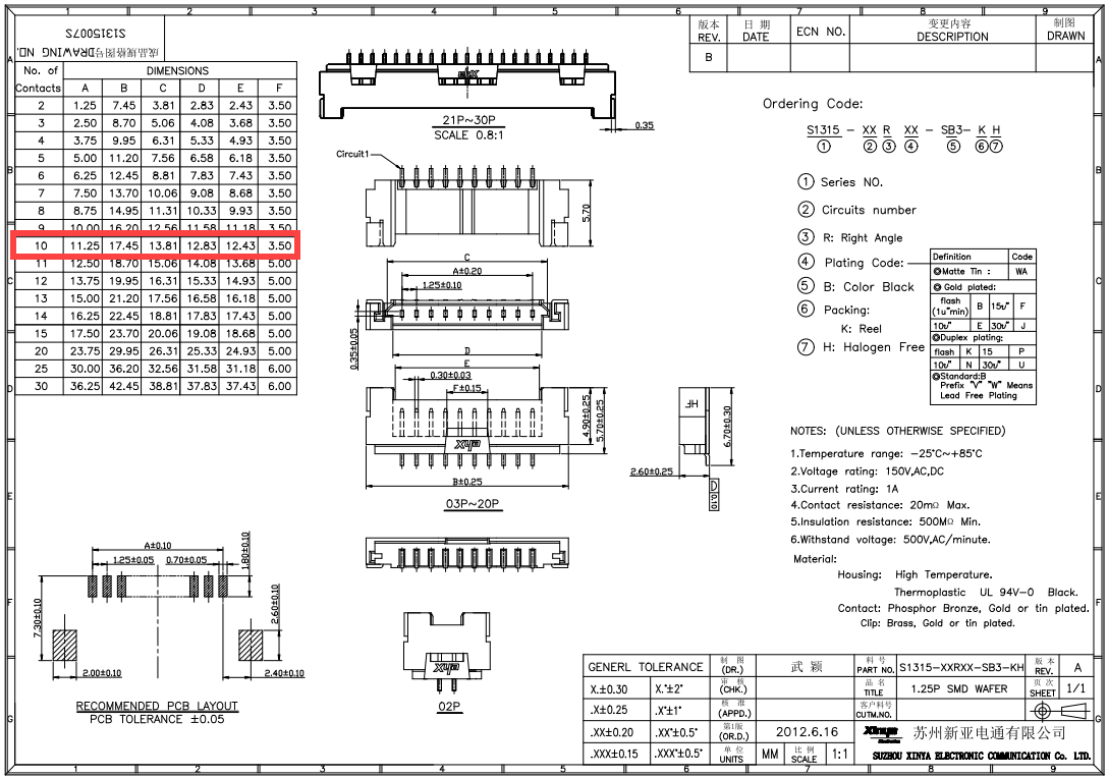
PIN ASSIGMENT

Pin.	Pin Define	Description	Status
1	+5V	5V source	YES
2	+5V	5V source	YES
3	USB_D-	USB Data-	YES
4	USB_D+	USB Data+	YES
5	GND	Ground	YES
6	RESET#	System reset RTL8192FC, low active	YES
7	WoWLAN#	Wake up system via wifi, low active	YES
8	GND	Ground	YES
9	WoBT	Wake up system via BT, high active	YES
10	GND	Ground	YES

USB CONNECTOR SPEC

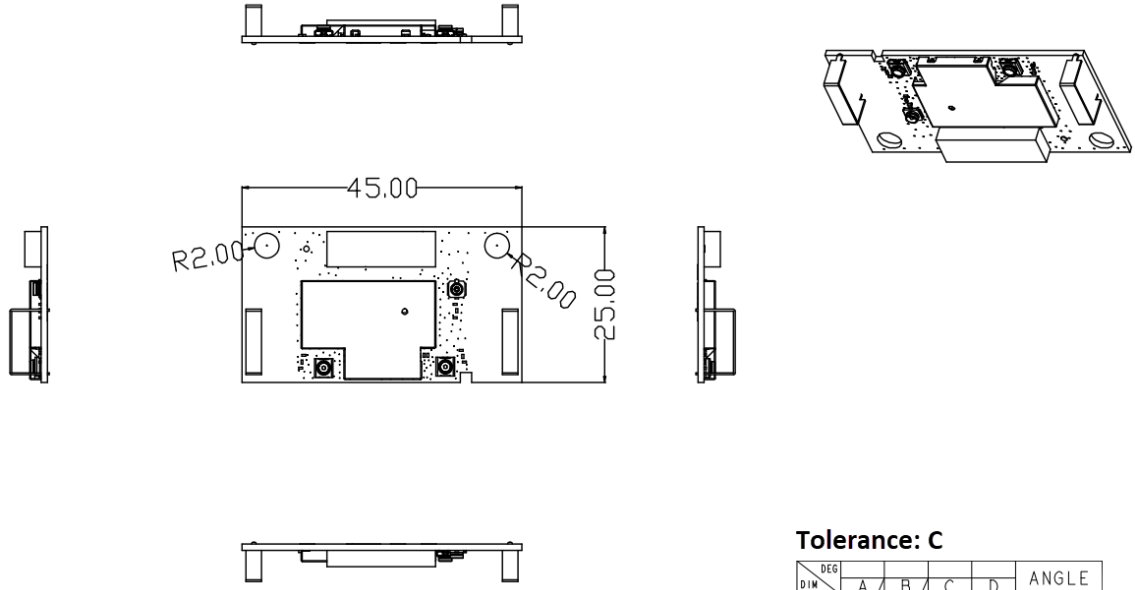
Manufacture P/N: S1315-10RVB-SB3-KH

Thickness of gold flash printed: ≥1u"



MECHANICAL

Weight: 3.6g

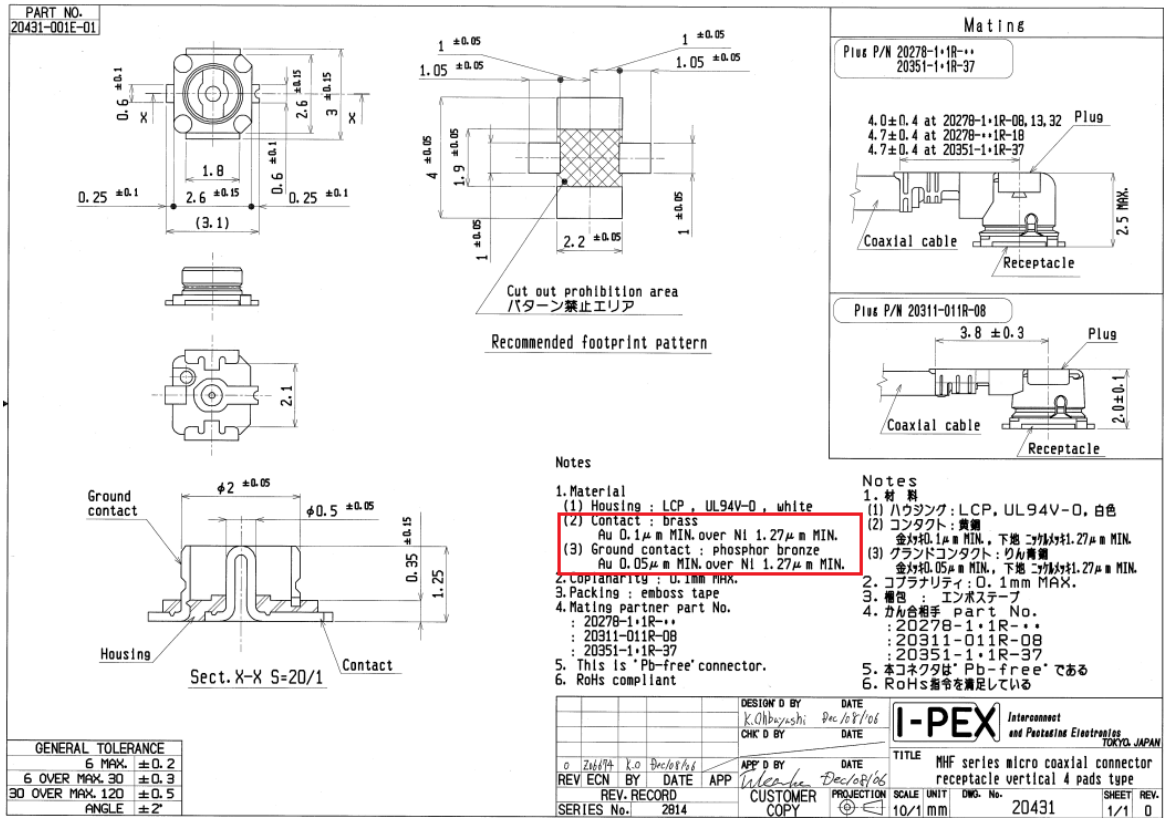


Tolerance: C

DEG / DIM	A	B	C	D	ANGLE	
0-5	±0.02	±0.05	±0.10		0°-30°	±0.1°
5-10	±0.05	±0.10	±0.15		31°-60°	±0.3°
10-50	±0.10	±0.15	±0.20		61°-90°	±0.5°
50-100	±0.15	±0.20	±0.25			
100-	±0.15%	±0.20%	±0.25%			

Unit: mm

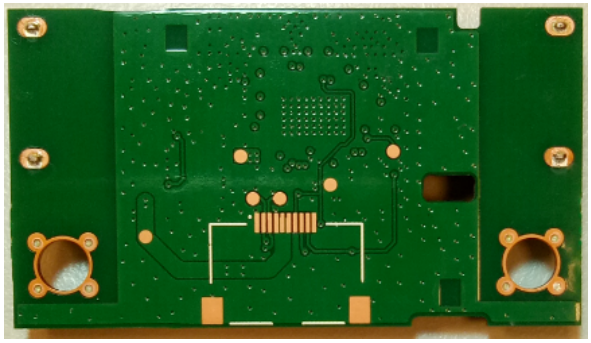
I-PEX CONNECTOR SPEC



MODULE PHOTO

Front Side

Bottom Side



EEPROM INFORMATION

WI-FI/BT

Reg Domain	World Wide **2.4G** Read from registry; Control by driver
	0x7F
Vendor ID	0x0BDA
Device ID	0xA725

ENVIRONMENTAL

OPERATING

Ambient Operating Temperature: 0 to 70 °C (32 to 158 °F)
Ambient Relative Humidity: 5-90% (non-condensing)

STORAGE

Ambient Temperature: -40 to 80 °C (-40 to 176 °F)
Ambient Relative Humidity: 5-95% (non-condensing