

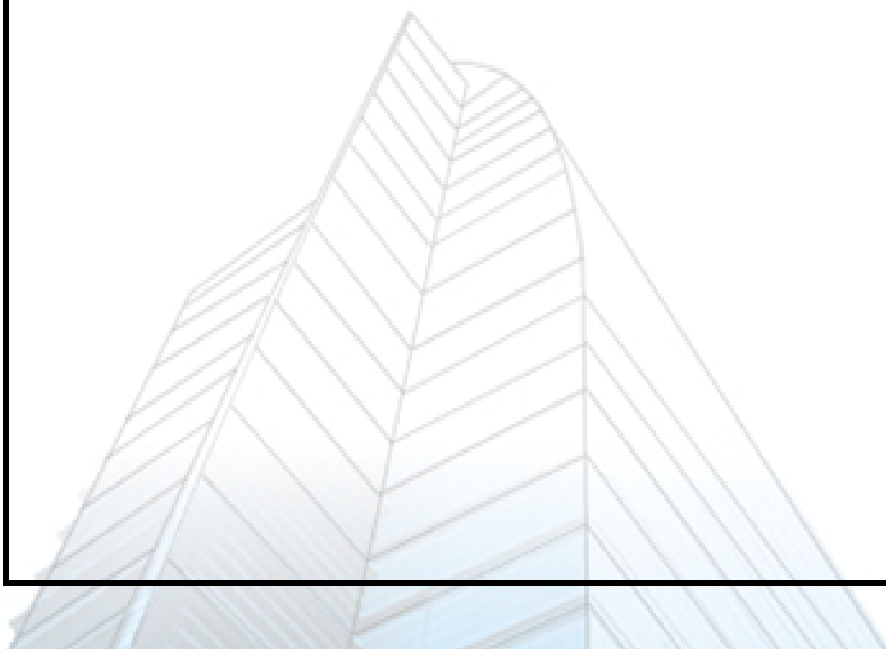
# **USER'S MANUAL**

**802.11 b/g/n, 1T1R 2.4GHz WLAN + Bluetooth 4.2 Module**

**WCBN4609L**

**Realtek 8720CM-VH2**

**Version 1.0**



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**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: BJI-GN4030". 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 will maintain 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

### WiFi

- Combines KM4 MCU, WLAN MAC, 1T1R capable WLAN baseband, RF in a single chip
- Highly integrated single-chip low power 802.11n WLAN network controller.
- Bunch of UART/ SPI/ I2C interfaces for peripheral controllers
- One Transmit and Receive path (1T1R)
- HF/RoHS compliance

### BLUETOOTH

- Bluetooth 4.2 Low Energy
- UART interface
- Combines BLE Protocol : PHY, LL, L2CAP, SM, ATT, GAP, GATT
- Supports BLE user GATT-based profile application

## PRODUCT SPECIFICATIONS

### MAIN CHIPSET

MAC/ Baseband/ RTL8720CM-VH2

### FUNCTIONAL SPECIFICATIONS

BT Function	
Standard	Bluetooth V4.2 with BLE (BT low energy)
Bus Interface	UART
Data Rate	1 Mbps
Modulation Scheme	GFSK
Frequency Range	2.402~2.480 GHz
Transmit Output Power	1dBm ≤ Output Power ≤ 7dBm
Receiver Sensitivity	LE : 1M at -87dBm
WiFi Function	
Standard	IEEE802.11b; IEEE 802.11g; IEEE 802.11n
Bus Interface	UART/SPI/ I2C

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 7					
Media Access Control	CSMA/CA with ACK					
Modulation Techniques	802.11b:					
	CCK, DQPSK, DBPSK					
	802.11g:					
	64QAM, 16QAM, QPSK, BPSK					
	802.11n:					
	BPSK, QPSK, 16QAM, 64QAM					
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 2.412 ~ 2.462 GHz					
Transmit Output Power – 1x1 (Tolerance: +-1.5dBm)	802.11b:					
	17dBm					
	802.11g:					
	15dBm					
	802.11n:					
	14dBm					
Receive Sensitivity	802.11b: (IEEE Standard <-76dBm) typical: -88dBm(1M)					
	802.11g: (IEEE Standard <-65dBm) Typical: -74dBm(54M)					
	802.11n:					
	20MHz (IEEE Standard <-64dBm) Typical: -71dBm					
Security	WPA, WPA2, WPS, WEP 64/128, IEEE 802.11x, IEEE 802.11i					
Operating Voltage	5V ±10% I/O supply voltage					
Power Consumption (Average)	Voltage: 5V					
	Item	Mode	TX Avg. (mA)	TX Peak (mA)	RX Avg. (mA)	RX Peak (mA)
	1	802.11b/CH6/17dBm	165.2	167.2	46.0	47.4
	2	802.11g/CH6/15dBm	113.2	113.9	45.8	48.1
	3	802.11n/CH6/14dBm	106.9	107.5	45.8	47.4
	4	BLE_1M/CH19/4dBm	66.4	67.3	39.5	39.8
Antenna Type	Printed Antenna or IPEX					

## PIN DEFINITION

### J4 : Header 1\*9 (Pitch=1.27mm)

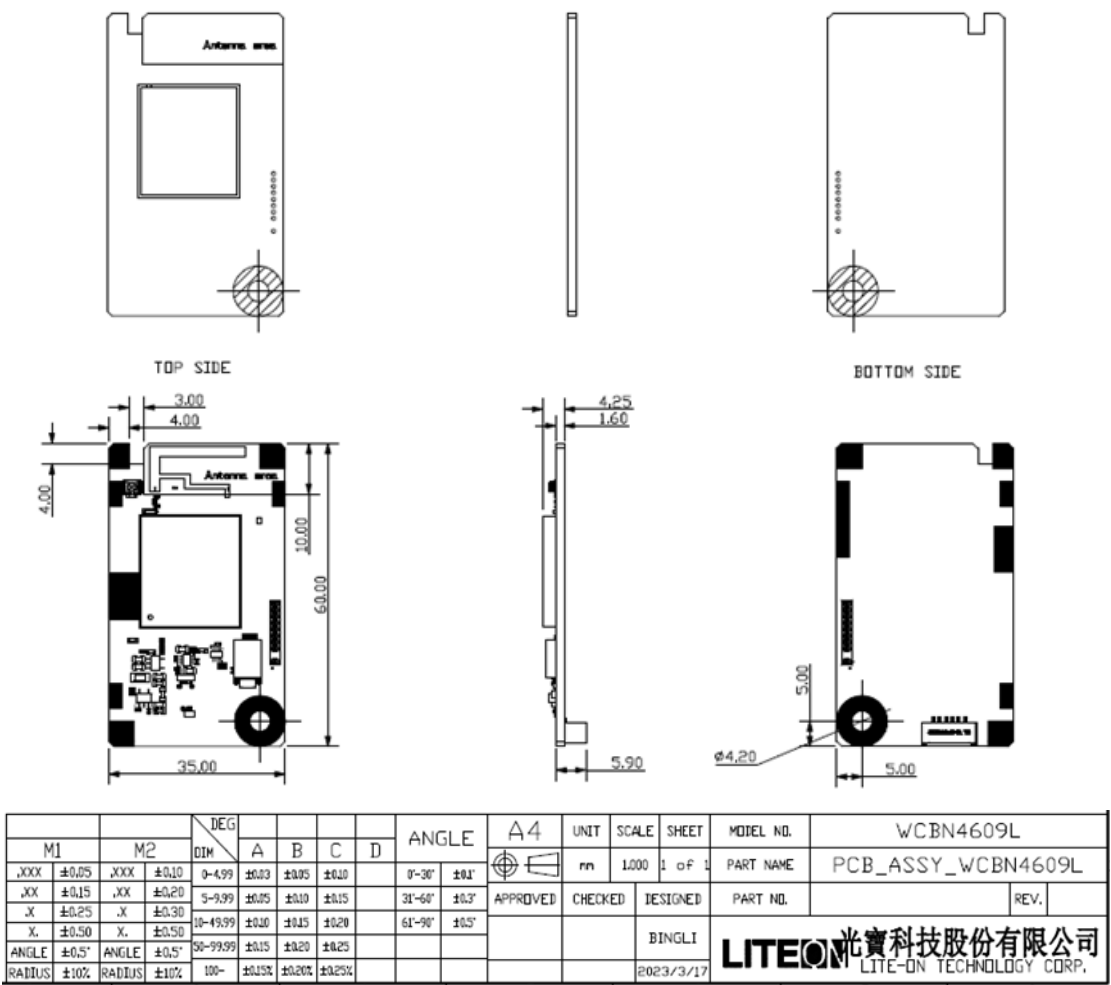
PIN	Name	Type	Details
1	VCC	P	5V
2	VDD	P	3V3
3	GND	-	
4	GPIOA_4	I/O	
5	GPIOA_16	I/O	
6	GPIOA_15	I/O	
7	CHIP_EN	P	3V3
8	GPIOA_1	I/O	
9	GPIOA_0	I/O	

### J1 : Connector (SM06B-GHS-TB(LF)(SN))

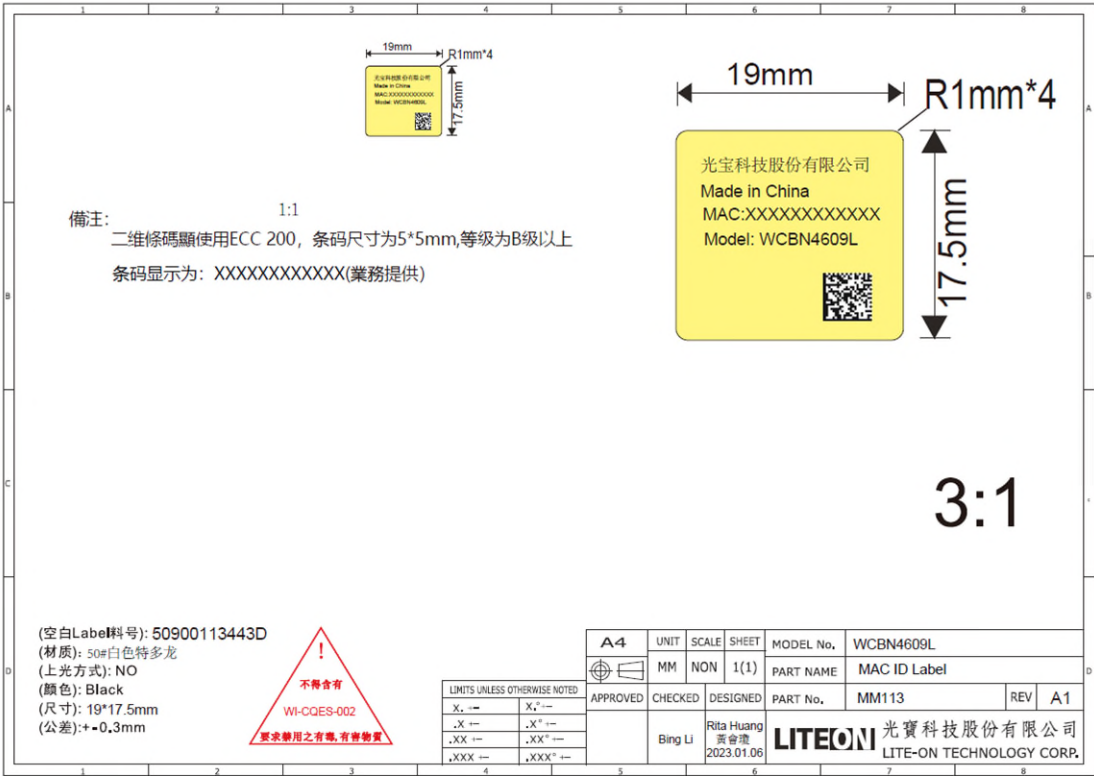
PIN	Name	Type	Details
1	GND	-	
2	NC	-	
3	RST	I	0V : Resets WLAN module 5V : Release reset WLAN module
4	RXD	I	UART_RXD (0V-5V / 19.2kbps)
5	TXD	O	UART_TXD (0V-5V / 19.2kbps)
6	5V	P	WALN Power supply



MECHANICAL



MAC Label



ENVIRONMENTAL

Operating

Operating Temperature: -20 to 85 °C  
Relevant Humidity: 5-90% (non-condensing)

Storage

Temperature: -40 to 85 °C  
Relevant Humidity: 5-95% (non-condensing)