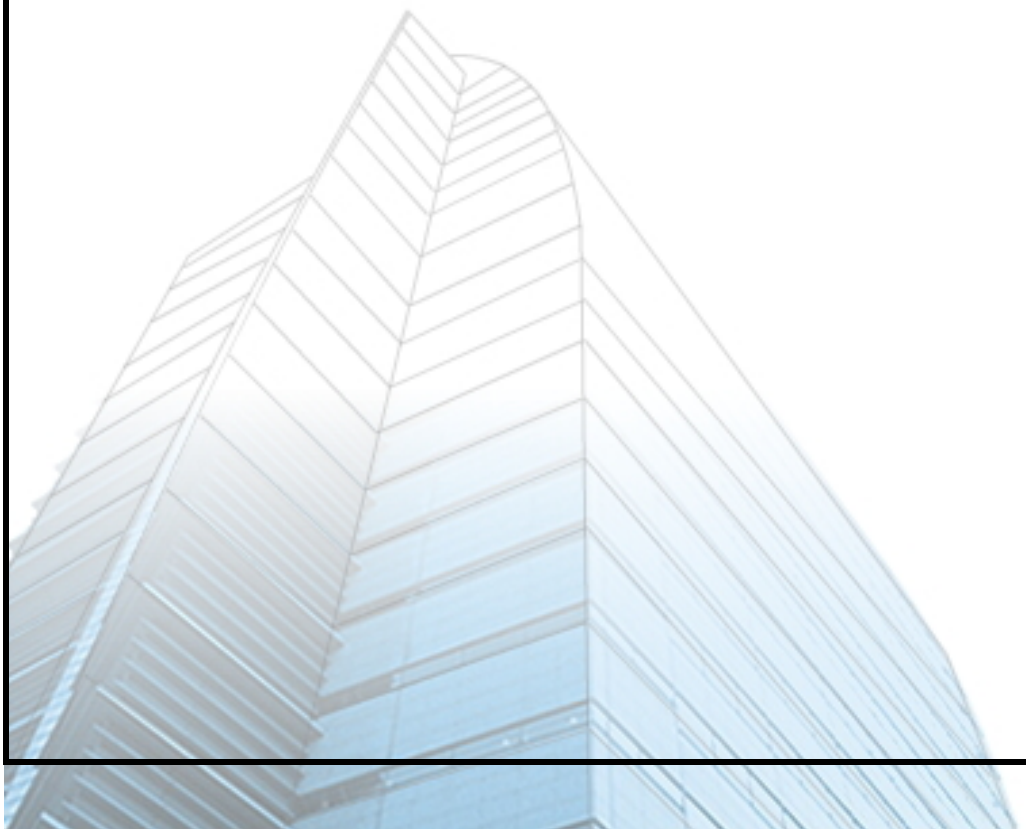
User MANUAL

802.11 b/g/n, 1T1R 2.4GHz WLAN Module

Model Name: WN4649L

Brand: LITE-ON



CONTENT

WARNING STATEMENTS

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

- CMOS MAC, Baseband PHY, and RF in a single chip for 802.11b/g/n compatible WLAN
- Complete 802.11n solution for 2.4GHz band and compatible with 802.11n specification
- 65Mbps receive PHY rate and 65Mbps transmit PHY rate using 20MHz bandwidth
- Bunch of UART/ SPI/ I2C interfaces for peripheral controllers
- One Transmit and Receive path (1T1R)
- Enterprise level security complying with WPA/WPA2 certification
- HF/RoHS compliance

PRODUCT SPECIFICATIONS

MAIN CHIPSET

MAC/ Baseband/ RTL8720CM-VH1

FUNCTIONAL SPECIFICATIONS

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	3.3V ±10% I/O supply voltage
Power Consumption (Average)	

Channel:2437MHz@2G, Voltage:3.3V 802.11b(17dBm)		
Operation Mode	Average (mA)	Peak (mA)
TX Mode	175	241
RX Mode	95	240
Channel:2437MHz@2G, Voltage:3.3V 802.11g(15dBm)		
Operation Mode	Average (mA)	Peak (mA)
TX Mode	96	226
RX Mode	65	225
Channel:2437MHz@2G, Voltage:3.3V 802.11n(14dBm)		
Operation Mode	Average (mA)	Peak (mA)
TX Mode	89	219
RX Mode	65	219
Channel:2437MHz@2G, Voltage:3.3V		
Operation Mode	Average (mA)	
Unassociated Idle	56	
Associated Idle	58	

Antenna Type	Printed Antenna or IPEX

PIN DEFINIITON

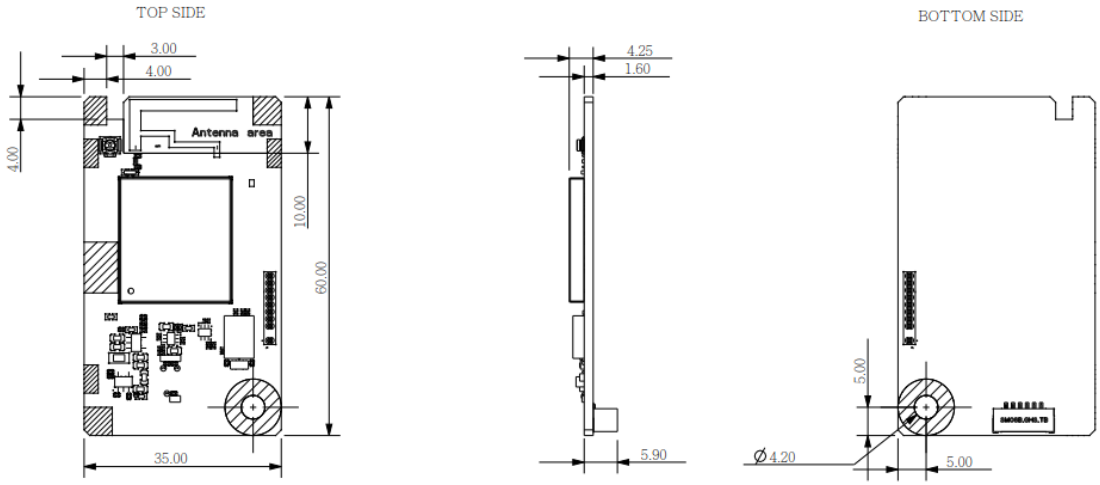
J4 : Header 1*9 (Pitch=1.27mm)

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	

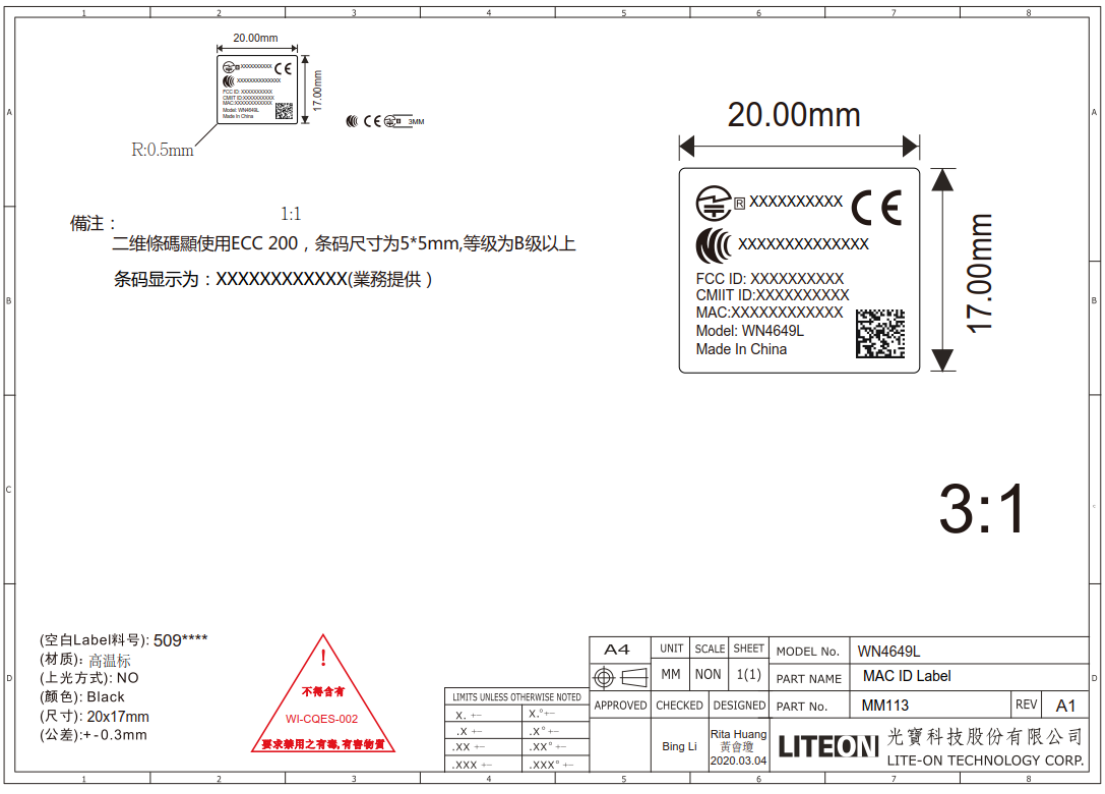
J1 : Connector (SM06B-GHS-TB(LF)(SN))

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)