LITEON®

USER MANUAL

802.11 b/g/n, 1T1R 2.4GHz Wireless IOT Module

Model Name: WCBN3610L

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PRODUCT FEATURES

- WiFi operate at ISM frequency bands (2.4GHz)
- Compact Form Factor: 18 x 20.5 x 3.2 mm ±0.1mm
- Bunch of UART/ SPI/ I2C interfaces for peripheral controllers
- Standards support: 802.11b, 802.11g, 802.11n, 802.11d, 802.11e, 802.11i
- Enterprise level security complying with WPA/WPA2 certification
- Light weight TCP/IP protocol suite
- One transmitter and one receiver 802.11n WLAN transceiver supports up to 150 Mbps downstream and 150 Mbps upstream PHY rates
- ARM Cortex-M development environment for customer applications
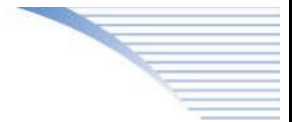- HF/RoHS compliance

PRODUCT SPECIFICATIONS

MAIN CHIPSET

MAC/ Baseband/ RF: RTL8720CM

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:* 18dBm *802.11g:* 16dBm *802.11n:* 15dBm
Receive Sensitivity	*802.11b:* (IEEE Standard <-76dBm) typical: -87dBM(1M) *802.11g:* (IEEE Standard <-65dBm) Typical: -73dBm(54M) *802.11n:* 20MHz (IEEE Standard <-64dBm) Typical : -70dBm
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)

No.	Mode	MCU State	Description	Ameba ZII LDO	Ameba ZII DC/DC
1	Deep Sleep			50 uA	30 uA
2	Standby(Sleep PG)			355 uA	195 uA
3	Sleep(Sleep CG)			810 uA	403 uA
4	MCU Active			18mA	8.7mA
5	Wlan beacon only mode	MCU Sleep		95mA	43mA
6	Wlan asoc Idle (2.4G), RF ON	MCU Sleep	DTIM=1	4.36mA	2.38mA
7	Wlan asoc Idle (2.4G), RF ON	MCU Sleep	DTIM=3	1.98mA	1.06mA

Antenna Type	Printed Antenna

Frequency Range	*802.11bg* 2.412 ~ 2.462 GHz

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)

WARNINGS

FCC 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.

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. For product available in the USA/Canada market, only channel 1~11 can be operated. Selection of other channels is not possible.
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 20cm between the radiator & your body.

ISED Statement
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.
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.

ISED Radiation Exposure Statement:
This equipment complies with IC RSS-102 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.
Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20cm de distance entre la source de rayonnement et votre corps.

The transmitter module may not be co-located with any other transmitter or antenna.
Le module émetteur peut ne pas être coïmplanté avec un autre émetteur ou antenne.
For product available in the USA/Canada market, only channel 1~11 can be operated. Selection of other channels is not possible.
Pour les produits disponibles aux États-Unis / Canada du marché, seul le canal 1 à 11 peuvent être exploités. Sélection d'autres canaux n'est pas possible.

This module is intended for OEM integrators under the following conditions:
1. Ensure that the end-user has no manual instructions to remove or install module.
2.This module is certified pursuant to Part 15 rules section 15.247 and RSS-247.
3.This module has been approved to operate with the antenna types listed below, with the maximum permissible gain indicated.

Antenna Number	Brand Name	Model Name	Ant. Type	Connector	Support	Max Peak Gain
Antenna 1	LITEON	WCBN3610L	Printed Ant	Murata	2.4G	0.5

4 Label and compliance information
Label of the end product:
FCC
The host product must be labeled in a visible area with the following " Contains FCC ID: PPQ-WCBN3610L".
The end product shall bear the following 15.19 statement: 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.
ISED
This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm
may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following:
"Contains transmitter module IC: 4491A-WCBN3610L" or "Contains IC: 4491A-WCBN3610L"
Contient le module d'émission IC: 4491A-WCBN3610L

5.Information on test modes and additional testing requirements
This module has been approved under stand-alone configuration.
OEM integrator has be limited the operation channels in channel 1-11 for 2.4GHz band.
The separate approval is required for all other operating configurations, including portable configurations with respect to Part 2.1093/RSS-102 and different antenna configurations
The information on how to configure test modes for host product evaluation for different operational conditions for a stand-alone modular transmitter in a host, versus with multiple, simultaneously transmitting modules or other transmitters in a host can be found at KDB Publication 996369 D04.
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.).
IMPORTANT NOTE: In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC/ISED authorization is no longer considered valid and the FCC/IC No. 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/ISED authorization.

6.Additional testing, Part 15 Subpart B and ICES-003 disclaimer
Appropriate measurements (e.g. Part 15 Subpart B compliance) and if applicable additional equipment authorizations (e.g. SDoC) of the host product to be addressed by the integrator/manufacturer.
This module is only FCC/ISED authorized for the specific rule parts 15.247, RSS-247 listed on the grant, and the host product manufacturer is responsible for compliance to any other FCC/ISED rules that apply to the host product as being Part 15 Subpart B/ICES-003 compliant.

7.The user manual of the end product should include:
FCC:
Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.
The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons.
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.
The antenna(s) used for this transmitter must not transmit simultaneously with any other antenna or transmitter.

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ISED:

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:

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2.This device must accept any interference, including interference that may cause undesired operation of the device.

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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.

ISED Radiation Exposure Statement:

This equipment complies with IC RSS-102 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.

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20cm de distance entre la source de rayonnement et votre corps.

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