

USER MANUAL

PRODUCT NAME: WiFi BLE Combo Module
MODEL NAME: LCWB-007

HW VERSION: V1.0
SW VERSION: V1.0

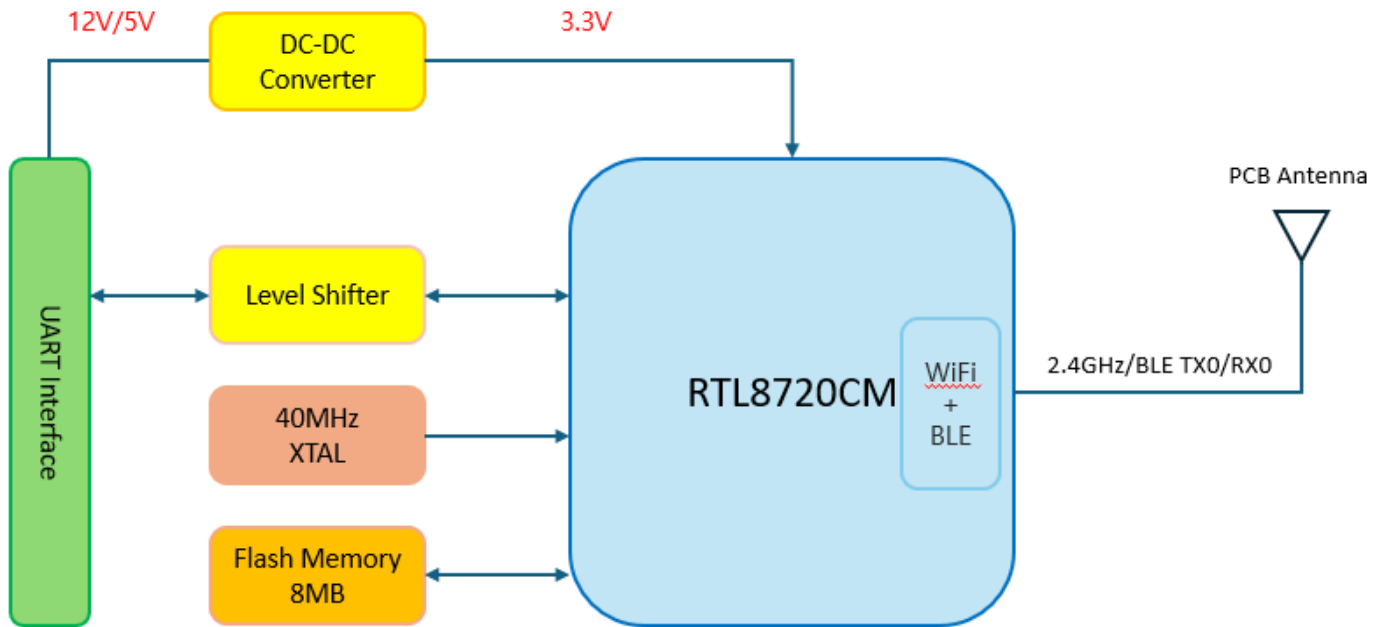
1. General Description

This document is to specify the product specification of LCWB-007, 1T1R 802.11b/g/n WiFi and Bluetooth combo module. This Module is based on Realtek RTL8720CM-VH2-CG low-power chipset that complied with IEEE 802.11b, IEEE 802.11g, IEEE 802.11n standard for 2.4~2.5GHz. It can be used to provide up to 11Mbps for IEEE 802.11b, 54Mbps for IEEE 802.11g, 72.2Mbps for 802.11n to connect your wireless LAN. The Bluetooth part supports latest 4.2 operation.

2. Features

- Compatible with IEEE 802.11b standard to provide wireless 11Mbps data rate
 - Compatible with IEEE 802.11g standard to provide wireless 54Mbps data rate
 - Compatible with IEEE 802.11n standard to provide wireless 72.2Mbps data rate
 - Support 20MHz bandwidth in 2.4GHz band
 - DSSS with DBPSK and DQPSK, CCK modulation with long and short preamble
 - OFDM with BPSK, QPSK, 16QAM, and 64QAM modulation
 - One Transmit and Receive path (1T1R)
 - 802.11i (WPA, WPA2). Open, shared key, and pair-wise key authentication services
 - 802.11e QoS Enhancement (WMM)
 - Support maximum 3 x UART with 40 MHz clock source (maximum baud rate 4M Hz)
 - Bluetooth 4.2 Low Energy (LE)
 - HSF compliant
 - Security S/W: ARM Trust zone
-

3. Block Diagrams



5. Pin Description

Pin No	Pin name	Remark
1	VDD	5V/12V Power Supply
2	RX0	UART0 RX
3	IO4	GPIO4_OUT
4	IO3	GPIO3_OUT
5	TX0	UART0_TX
6	GND	Ground



6. Recommended Operating Conditions

Parameter	Min	Max	Unit
Power Supply Voltage : VDD	4.5	13.2	V
Storage Temperature	-55	+125	°C
operating temperature	-20	+85	°C

7. Mechanical Characteristics

Feature	Detailed Description
Length	● 48mm
Width	● 20mm
PCB Height	● 1.0 mm
Module Height	● 3.7mm

8. RF Characteristics

8.1 IEEE 802.11b Section

Feature	Detailed Description
Standard	IEEE 802.11b
Radio and Modulation Schemes	DQPSK , DBPSK and CCK with DSSS
Operating Frequency	2400 ~ 2483.5 MHz ISM band
Channel Numbers	13 channels for Worldwide 11 channels for FCC NCC
Data Rate	at most 11Mbps
Media Access Protocol	CSMA/CA with ACK
Transmitter Output Power at Antenna Connector	- Typical RF Output Power at each RF chain, at room Temp 25°C 17±1.5dBm at 11Mbps
Receiver Sensitivity at Antenna Connector	- Typical Sensitivity at each RF chain. @Frame (1000-byte PDUs) Error Rate<8% at room Temp 25°C -83 dBm for 11Mbps

8.2 IEEE 802.11g Section

Feature	Detailed Description
Standard	IEEE 802.11g
Radio and Modulation Type	QPSK , BPSK , 16QAM ,64QAM with OFDM
Operating Frequency	2400 ~ 2483.5MHz ISM band
Channel Numbers	13 channels for Worldwide 11 channels for FCC NCC
Data Rate	at most 54Mbps
Media Access Protocol	CSMA/CA with ACK
Transmitter Output Power at Antenna Connector	- Typical RF Output Power at each RF chain, at room Temp 25°C 15±1.5 dBm at Maximum data rate
Receiver Sensitivity at Antenna Connector	- Typical Sensitivity at each RF chain. @Frame(1000-byte PDUs) Error Rate<10% at room Temp 25°C -71 dBm at Maximum data rate

8.3 IEEE 802.11n Section

Feature	Detailed Description
Standard	IEEE 802.11n
Radio and Modulation Type	BPSK , QPSK , 16QAM ,64QAM with OFDM
Operating Frequency	2.4GHz :2400 ~ 2483.5MHz ISM band
Channel Numbers	13 channels for Worldwide 11 channels for FCC NCC
Data Rate	at most MCS7
Media Access Protocol	CSMA/CA with ACK
Transmitter Output Power at Antenna Connector	Typical RF Output Power at each RF chain, at room Temp 25°C
	2.4GHz Band/HT20
	14±1.5 dBm at Maximum data rate
Receiver Sensitivity at Antenna Connector	Typical Sensitivity at each RF chain. @Frame (1000-byte PDUs) Error Rate=10% and at room Temp 25°C
	2.4GHz Band/HT20
	-68dBm at Maximum data rate

8.4 Bluetooth Section

Feature	Detailed Description		
Bluetooth standard	Bluetooth V4.2		
Modulation	GFSK		
Operating Frequency	2402MHz-2480MHz		
Channel Numbers	40 channels for BLE		
	Min (dBm)	Typical (dBm)	Max (dBm)
BLE Output Power	2.5	4.5	6.5
Sensitivity @PER=30.8% FOR BLE		-90	

1. FCC Statement

FCC Part 15.19 Statements:

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 Part 15.21 statement

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

FCC Part 15.105 statement (Class B)

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.

Responsible Part Information

Supplier's Declaration of Conformity

47 CFR § 2.1077 Compliance Information

Unique Identifier: [LCWB-007](#)

Responsible Party – U.S. Contact Information

[LG Electronics USA Inc.](#)

[Street Address 111 Sylvan Avenue North Building](#)

[City, State Englewood Cliffs New Jersey, United States](#)

[Zip Code 07632](#)

[201-470-2696](#)

1) Regulatory notice to host manufacturer according to KDB 996369 D03 OEM Manual v01>

List of applicable FCC rules

This module has been granted modular approval as below listed FCC rule parts.

[-FCC Rule parts 15.247](#)

Summarize the specific operational use conditions

-The OEM integrator should use equivalent antennas which is the same type and equal or less gain than an antenna listed below in this instruction manual.

RF exposure considerations

The module has been certified for integration into products only by OEM integrators under the following condition:

- The antenna(s) must be installed such that a minimum separation distance of at least [40](#) mm is maintained between the radiator (antenna) and all persons at all times.
- The transmitter module must not be co-located or operating in conjunction with any other antenna or transmitter except in accordance with FCC multi-transmitter product procedures.
- [Portable use](#)

As long as the three conditions above are met, further transmitter testing will not be required.

OEM integrators should provide the minimum separation distance to end users in their end-product manuals.

Antennas list

The host manufacturer must not use an antenna with a gain that exceeds the values listed for each respective band.

[-. PCB Printed antenna / 1.7 dBi](#)

Label and compliance information

End Product Labeling

The module is labeled with its own FCC ID and ISED Certificate number. If the FCC ID and ISED Certificate number are not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. In that case, the final end product must be labeled in a visible area with the following:

"Contains FCC ID: [BEJ-LCWB007](#)

Contains IC: [2703N-LCWB007](#)

Information on test modes and additional testing requirements

-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, additional transmitter in the host, etc.).

Additional testing, Part 15 Subpart B disclaimer

-The final host product also requires Part 15 subpart B compliance testing with the modular transmitter installed to be properly authorized for operation as a Part 15 digital device.

Note EMI Considerations

Note that a host manufacture is recommended to use D04 Module Integration Guide recommending as "best practice" RF design engineering testing and evaluation in case non-linear interactions generate additional non-compliant limits due to module placement to host components or properties

For standalone mode, reference the guidance in D04 Module Integration Guide and for simultaneous mode; see D02 Module Q&A Question 12, which permits the host manufacturer to confirm compliance.

How to make changes

Since only Grantees are permitted to make permissive changes, when the module will be used differently than granted, please contact the module manufacture on below contact information.

-. Contact information: Seungbok.han@lge.com/ +82-55-260-3966

2. ISED Statement

Licensed-exempt 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.

Le présent appareil est conforme aux CNR d'Industrie 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, et
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est d'en compromettre le fonctionnement.

RF Exposure Statement (MPE)

The antenna(s) must be installed such that a minimum separation distance of at least **40** mm is maintained between the radiator (antenna) and all persons at all times.

l'exposition aux RF L'antenne (ou les antennes) doit être installée de façon à maintenir à tout instant une distance minimum de au moins **40** mm entre la source de radiation (l'antenne) et toute personne physique.

Étiquetage du Produit Final

Le module est étiqueté avec son propre numéro de certificat ISED. Si le numéro de certificat ISED n'est pas visible lorsque le module est installé à l'intérieur d'un autre appareil, alors l'extérieur de l'appareil dans lequel le module est installé doit également afficher une étiquette faisant référence au module inclus. Dans ce cas, le produit final doit être étiqueté dans une zone visible avec la mention suivante :

Contient IC: [2703N-LCWB007](#)