

**GSD**  
GSD LCWB-007  
WiFi BLE Combo  
Module



# GSD LCWB-007 WiFi BLE Combo Module User Manual

[Home](#) » [GSD](#) » GSD LCWB-007 WiFi BLE Combo Module User Manual 

## Contents

- [1 GSD LCWB-007 WiFi BLE Combo Module](#)
- [2 General Description](#)
- [3 Features](#)
- [4 Block Diagrams](#)
- [5 Mechanical Dimensions](#)
- [6 Pin Description](#)
- [7 Recommended Operating Conditions](#)
- [8 Mechanical Characteristics](#)
- [9 RF Characteristics](#)
- [10 FCC Statement](#)
- [11 Documents / Resources](#)
  - [11.1 References](#)
- [12 Related Posts](#)



**GSD LCWB-007 WiFi BLE Combo Module**



## 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.

## 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

## Block Diagrams



|       |       |
|-------|-------|
| (mm)  | (mm)  |
| 0-5   | ±0.15 |
| 5-10  | ±0.20 |
| 10-50 | ±0.30 |
| >50   | ±0.40 |

## 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              |



## 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   |

## Mechanical Characteristics

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

## RF Characteristics

### 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<br>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<br>-83 dBm for 11Mbps |

### 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<br>11 channels for FCC NCC  |
| Data Rate  | at most 54Mbps  |
| Media Access Protocol                            | CSMA/CA with ACK  |
| Transmitter Output<br>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<br>Connector     | Typical Sensitivity at each RF chain. @Frame(1000-byte PDUs) Error Rate<10% at room Temp 25°C<br>-71 dBm at Maximum data rate |

## 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<br>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<br><br>2.4GHz Band/HT20<br>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<br><br>2.4GHz Band/HT20<br>-68dBm at Maximum data rate |

## 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<br>@PER=30.8% FOR BLE |                      | -90         |         |

## 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](tel:201-470-2696)
- 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 20 cm 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.
- Mobile 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.

### **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](mailto:Seungbok.han@lge.com) +82-55-260-3966

#### **ISED Statement**

Licensed-exempt Statement

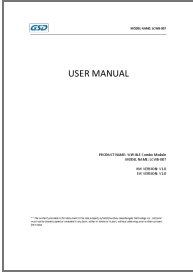
This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada’s licence-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

**RF Exposure Statement (MPE)**

The antenna(s) must be installed such that a minimum separation distance of at least 20 cm is maintained between the radiator (antenna) and all persons at all times.

**Documents / Resources**

|   |  |
|---|--|
|  | <p><a href="#">GSD LCWB-007 WiFi BLE Combo Module</a> [pdf] User Manual<br/>LCWB-007, LCWB-007 WiFi BLE Combo Module, LCWB-007, WiFi BLE Combo Module, Comb<br/>o Module, Module</p> |
|---|--|

**References**

- [User Manual](#)

[Manuals+](#), [Privacy Policy](#)

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