



# **BL-M7663BU1**

**802.11ac 2T2R 866Mbps WLAN + BT5.1  
USB Combo Module Specification**

**SHENZHEN BILIAN ELECTRONIC CO., LTD**

Add: 10~11/F, Building 1A, Huaqiang idea park, Guangming district, Shenzhen. Guangdong, China  
Web: [www.b-link.net.cn](http://www.b-link.net.cn)



TOP View

Module Name: BL-M7663BU1	
Module Type: 802.11a/b/g/n/ac 867Mbps WLAN + Bluetooth v5.1 USB Combo Module	
Revision: V1.0	
Customer Approval:	
Company:	
Title:	
Signature:	Date:
BL-link Approval:	
Title:	
Signature:	Date:

## Revision History

Revision	Summary	Release Date
0.1	Initial release	2021-07-30
1.0	Official version	2021-08-04

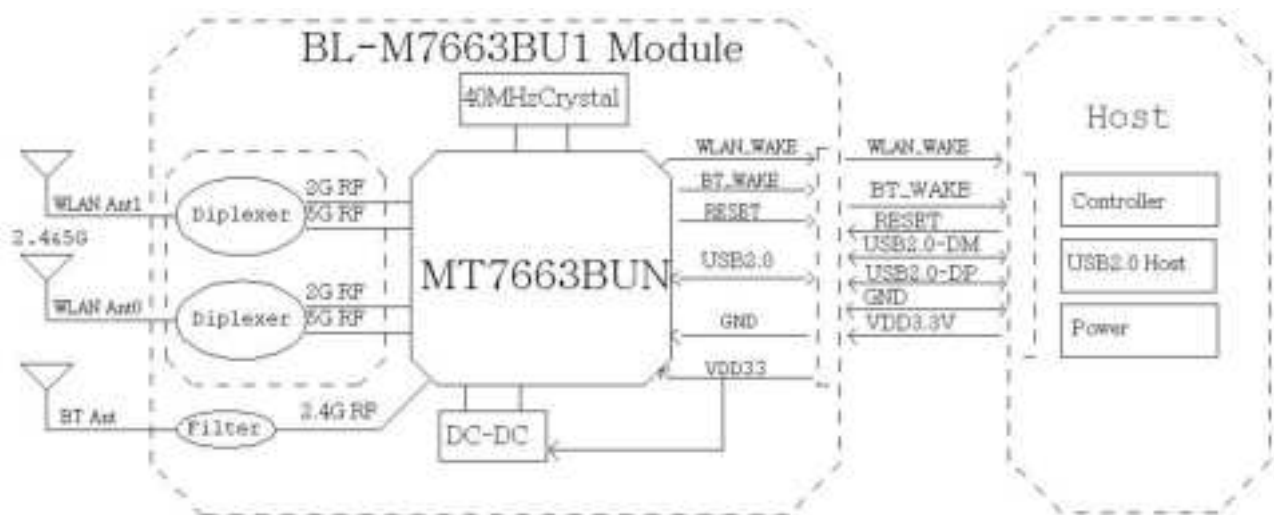
## 1. Introduction

The BL-M7663BU1 is a highly integrated 2T2R 802.11a/b/g/n/ac Wireless LAN (WLAN) network and bluetooth combo module. The module's interface is USB 1.0/1.1/2.0. It combines a WLAN MAC, a 2T2R capable WLAN base band. Bluetooth support 5.1 performance. The BL-M7663BU1 module provides a complete solution for a high throughput performance integrated wireless LAN and BT device.

### 1.1 Features

- Operating Frequencies: 2.4~2.4835GHz and 5.15~5.85GHz
- Host Interface is USB2.0
- IEEE Standards: IEEE 802.11a/b/g/n/ac
- Wireless data rate can reach up to 867Mbps
- Bluetooth v2.1/4.1/4.2 and supports Bluetooth 5.1 system
- Connect to external antenna through IPEX connectors
- Power Supply: VDD33 3.3V±0.2V

### 1.2 Block Diagram

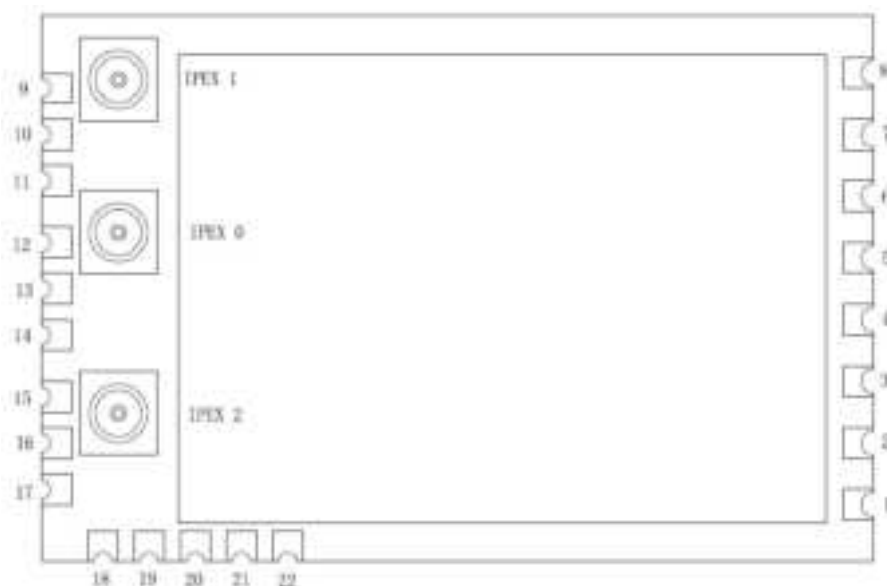


### 1.3 General Specifications

Module Name	BL-M7663BU1 WiFi + BT Combo Module
Chipset	MT7663BUN
WLAN Standard	IEEE 802.11 a/b/g/n/ac

BT Specification	Bluetooth Core Specification v5.1/4.2/4.1/2.1
Host Interface	USB2.0 for WiFi and Bluetooth
Antenna	Connect to the external antennas through IPEX connectors
Dimension	SMD 22Pins --27.0*17.7*3.1mm (L*W*H), Tolerance: +/-0.15mm
Power Supply	DC 3.3V±0.2V @ 1500 mA (Max)
Operation Temperature	-20°C to +70°C
Operation Humidity	10% to 95% RH (Non-Condensing)

## 2. Pin Assignments



(TOP View)

### 2.1 Pin Definition

No.	Pin Name	Type	Level	Module Pin Description
1	BT_WAKE	O	3.3V	BT wake up host
2	GND	P		GND
3	USB_DP	I/O		USB differential data line
4	USB_DM	I/O		USB differential data line
5	RESET	I	3.3V	System reset Input(active low)

6	VDD33	P		Main Power supply
7	WLAN_WAKE	O	3.3V	WLAN wake up host
8	NC			NC
9	GND	RF		GND
10	NC	RF		NC ( Reserved 2.4G / 5G RF PAD for WLAN_ANT1 )
11	GND	RF		GND
12	GND	RF		GND
13	NC	RF		NC ( Reserved 2.4G / 5G RF PAD for WLAN_ANT0 )
14	GND	RF		GND
15	GND	RF		GND
16	NC	RF		NC ( Reserved BT RF PAD )
17	GND	RF		GND
18	NC			NC
19	NC			NC
20	NC			NC
21	NC			NC
22	GND	P		GND
IPEX 0	WLAN_RF0	RF		IPEX connector for 2.4G / 5G RF to WLAN_ANT0
IPEX 1	WLAN_RF1	RF		IPEX connector for 2.4G / 5G RF to WLAN_ANT1
IPEX 2	BT_RF	RF		IPEX connector for BT RF to BT_ANT

P: Power or Ground; I/O: In/Output; I: Input; O:Output; RF: Analog RF Port or RF Ground;

## 3. Electrical and Thermal Specifications

### 3.1 Recommended Operating Conditions

Parameters		Min	Typ	Max	Units
Ambient Operating Temperature		-20	25	70	°C
External Antenna VSWR			1.92		/
Supply Voltage	VDD33	3.1	3.3	3.5	V

## 3.2 Current Consumption

Conditions : VDD33=3.3V ; Ta:25°C ;			
Use Case	VDD33 Current (average)		
	Typ	Max	Units
WLAN Unassociated (Linux Driver, BT_Disable)	68	75	mA
2.4G 11b 1Mbps TX @ 19dBm (1TX RF test)	368	398	mA
2.4G 11b 1Mbps RX (1RX RF test)	98	128	mA
2.4G 11g 6Mbps TX@18dBm (1TX RF test)	331	361	mA
2.4G 11g 6Mbps RX (1RX RF test)	96	126	mA
2.4G 11n HT20 MCS8 TX@14dBm (2TX RF test)	591	621	mA
2.4G 11n HT20 MCS8 RX (2RX RF test)	125	155	mA
2.4G 11n HT40 MCS15 TX@14dBm (2TX RF test)	384	414	mA
2.4G 11n HT40 MCS15 RX (2RX RF test)	119	149	mA
5G 11a 6Mbps TX @ 18dBm (1TX RF test)	456	506	mA
5G 11a 6Mbps RX (1RX RF test)	127	177	mA
5G 11n HT20 MCS8 TX@15.5dBm (2TX RF test)	703	753	mA
5G 11n HT20 MCS8 RX (2RX RF test)	144	194	mA
5G 11n HT40 MCS15 TX@14dBm (2TX RF test)	508	558	mA
5G 11n HT40 MCS15 RX (2RX RF test)	146	196	mA
5G 11ac VHT80 MCS9 TX@14dBm (2TX RF test)	476	526	mA
5G 11ac VHT80 MCS9 RX (2RX RF test)	156	206	mA

## 4. WLAN & Bluetooth RF Specifications

### 4.1 2.4G WLAN RF Specification

Conditions : VDD33=3.3V ; Ta:25°C

Features	Description		
WLAN Standard	IEEE 802.11b/g/n/ac, CSMA/CA		
Frequency Range	2.4~2.4835GHz (2.4GHz ISM Band)		
Channels	Ch1~Ch13 (For 20MHz Channels)		
Modulation	802.11b (DSSS): CCK, DQPSK, DBPSK; 802.11g (OFDM): BPSK, QPSK, QAM16, QAM64; 802.11n (OFDM): BPSK, QPSK, QAM16, QAM64; 802.11ac (OFDM): BPSK, QPSK, QAM16, QAM64, QAM256;		
Date Rate	802.11b: 1, 2, 5.5, 11Mbps; 802.11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps; 802.11n (HT20): MCS0~MCS7(1T1R_SISO) 6.5~72.2Mbps; 802.11n (HT20): MCS8~MCS15(2T2R_MIMO) 13~144.4Mbps; 802.11n (HT40): MCS0~MCS7(1T1R) 13.5~150Mbps; 802.11n (HT40): MCS8~MCS15(2T2R) 27~300Mbps; 802.11ac (VHT20): MCS0~MCS8(1T1R) 6.5~86.7Mbps; 802.11ac (VHT20): MCS0~MCS8(2T2R) 13~173.3Mbps; 802.11ac (VHT40): MCS0~MCS9(1T1R)13.5~200Mbps; 802.11ac (VHT40): MCS0~MCS9(2T2R)27~400Mbps;		
Frequency Tolerance	≤±15ppm		
2.4G Transmitter Specifications (WLAN_ANT0 & WLAN_ANT1)			
TX Rate	TX Power ( dBm )	TX Power Tolerance ( dB )	EVM ( dB )
802.11b@1~11Mbps	19dBm	±2dBm	≤-10dB
802.11g@6Mbps	18dBm	±2dBm	≤-10dB
802.11g@54Mbps	16dBm	±2dBm	≤-25dB
802.11n@HT20_MCS0	17dBm	±2dBm	≤-10dB
802.11n@HT20_MCS7	15.5dBm	±2dBm	≤-28dB
802.11n@HT40_MCS0	17dBm	±2dBm	≤-10dB
802.11n@HT40_MCS7	15dBm	±2dBm	≤-28dB
802.11ac@VHT40_MCS9	13dBm	±2dBm	≤-32dB
2.4G Receiver Specifications (WLAN_ANT0 & WLAN_ANT1)			
RX Rate	Min Input Level ( dBm )	Max Input Level ( dBm )	PER
802.11b@1Mbps	-92dBm	-5	< 8%
802.11b@11Mbps	-86dBm	-5	< 8%
802.11g@6Mbps	-90dBm	-5	< 10%
802.11g@54Mbps	-74dBm	-5	< 10%
802.11n@HT20_MCS0	-88dBm	-5	< 10%
802.11n@HT20_MCS7	-70dBm	-5	< 10%

802.11n@HT40_MCS0	-86dBm	-5	< 10%
802.11n@HT40_MCS7	-68dBm	-5	< 10%
802.11ac@VHT40_MCS9	-63dBm	-5	< 10%

## 4.2 5G WLAN RF Specification

Conditions: VDD33=3.3V ; Ta:25°C				
Features		Description		
WLAN Standard		IEEE 802.11a/n/ac, CSMA/CA		
Frequency Range		5.15~5.25GHz; 5.25~5.35GHz; 5.47~5.73GHz; 5.735~5.835GHz (5GHz ISM Band)		
Channels		Ch36, Ch40, Ch44, Ch48; Ch52~Ch64; Ch100~Ch140; Ch149~Ch165 (For 20MHz Channels)		
Modulation		802.11a (OFDM): BPSK, QPSK, QAM16, QAM64; 802.11n (OFDM): BPSK, QPSK, QAM16, QAM64; 802.11ac (OFDM): BPSK, QPSK, QAM16, QAM64, QAM256;		
Data Rate		802.11a: 6, 9, 12, 18, 24, 36, 48, 54Mbps; 802.11n (HT20): MCS0~MCS7(1T1R_SISO) 6.5~72.2Mbps; 802.11n (HT20): MCS8~MCS15(2T2R_MIMO) 13~144.4Mbps; 802.11n (HT40): MCS0~MCS7(1T1R) 13.5~150Mbps; 802.11n (HT40): MCS8~MCS15(2T2R) 27~300Mbps; 802.11ac (VHT20): MCS0~MCS8(1T1R) 6.5~86.7Mbps; 802.11ac (VHT20): MCS0~MCS8(2T2R) 13~173.3Mbps; 802.11ac (VHT40): MCS0~MCS9(1T1R)13.5~200Mbps; 802.11ac (VHT40): MCS0~MCS9(2T2R)27~400Mbps; 802.11ac (VHT80): MCS0~MCS9(1T1R)29.3~433.3Mbps; 802.11ac (VHT80): MCS0~MCS9(2T2R)58.5~866.7Mbps;		
Frequency Tolerance		≤ ±15ppm		
5G Transmitter Specifications (WLAN_ANT0 & WLAN_ANT1)				
TX Rate		TX Power ( dBm )	TX Power Tolerance ( dB )	EVM ( dB )
802.11a@6Mbps		18.5dBm	±2	≤-10dB
802.11a@54Mbps		16dBm	±2	≤-25dB
802.11n@HT20_MCS0		17.5dBm	±2	≤-10dB



802.11ac@VHT20_MCS0			
802.11n@HT20_MCS7 802.11ac@VHT20_MCS7	15dBm	±2	≤-28dB
802.11n@HT40_MCS0 802.11ac@VHT40_MCS0	17.5dBm	±2	≤-10dB
802.11n@HT40_MCS7 802.11ac@VHT80_MCS0	15dBm 17.5dBm	±2 ±2	≤-28dB ≤-10dB
802.11ac@VHT80_MCS9	14dBm	±2	≤-32dB

#### 5G Receiver Specifications (WLAN\_ANT0 & WLAN\_ANT1)

RX Rate	Min Input Level ( dBm )	Max Input Level ( dBm )	PER
802.11a@6Mbps	-91	-5	< 10%
802.11a@54Mbps	-74	-5	< 10%
802.11n@HT20_MCS0	-90	-5	< 10%
802.11n@HT20_MCS7	-72	-5	< 10%
802.11n@HT40_MCS0	-86	-5	< 10%
802.11n@HT40_MCS7	-71	-5	< 10%
802.11ac@VHT80_MCS0	-86	-5	< 10%
802.11ac@VHT80_MCS9	-60	-5	< 10%

### 4.3 Bluetooth RF Specification

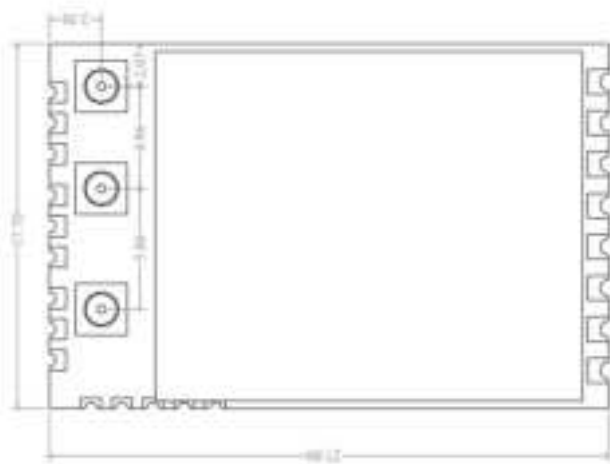
Conditions: VDD33=3.3V ; Ta:25°C	
Features	Description
Bluetooth Specification	Bluetooth Core Specification v5.1/4.2/4.1/2.1
Frequency Range	2.4~2.4835GHz (2.4GHz ISM Band)
Channels	Bluetooth Classic: Ch0~Ch78 (For 1MHz Channels); Bluetooth Low Energy: Ch0~Ch39 (For 2MHz Channels);
Power Classes	Bluetooth Classic: Class1; Bluetooth Low Energy: Class1.5;

Date Rate & Modulation	BR_1Mbps: GFSK; EDR_2Mbps: $\pi/4$ -DQPSK; EDR_3Mbps: 8DPSK; LE_125Kbps: GFSK (Coded_S=8); LE_500Kbps: GFSK (Coded_S=2); LE_1Mbps: GFSK (Uncoded); LE_2Mbps: GFSK (Uncoded);		
Bluetooth Transmitter Specifications(BT_ANT)			
Items	Min ( dBm )	Typ ( dBm )	Max ( dBm )
TX Power			
BR_1M	5	9	12
EDR_2/3M (Target Power:6dBm)	5	9	12
LE_125K/500K/1M/2M(Target Power:4dBm)	2	5	8
Items	Min	Typ	Max
BR_1M (DH1) Modulation Characteristics			
$\Delta f_{1avg}$	140KHz	158.9.kHz	175KHz
$\Delta f_{2avg}$	/	159.15.kHz	/
$\Delta f_{2max}$	115KHz	154.3kHz	/
$\Delta f_{2avg}/\Delta f_{1avg}$	0.8	0.89	/
Items	Min	Typ	Max
EDR_3M(3DH5) EDR Carrier Frequency Stability and Modulation Accuracy			
$\omega_i$	-75KHz	-8.16kHz	+75KHz
$\omega_i+\omega_o$	-75KHz	-9.03kHz	+75KHz
$\omega_o$	-10KHz	-0.9kHz	+10KHz
8DPSK RMS DEVM	/	0.026	0.13
8DPSK DEVM	/	0.059	0.25
Items	Min	Typ	Max
LE_1M Modulation Characteristics			
$\Delta f_{1avg}$	225KHz	250KHz	275KHz
$\Delta f_{2avg}$	/	234.4KHz	/

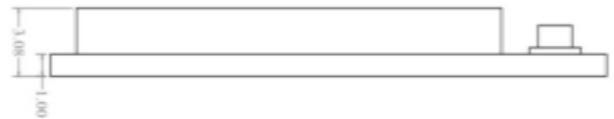
Δf2max	185KHz	225KHz	/	
Δf2avg/Δf1avg	0.8	0.93	/	
Items	Min	Typ	Max	
LE_2M Modulation Characteristics				
Δf1avg	450KHz	501.3KHz	550KHz	
Δf2avg	/	234.2KHz	/	
Δf2max	370KHz	502.5KHz	/	
Δf2avg/Δf1avg	0.8	0.99	/	
Bluetooth Receiver Specifications(BT_ANT)				
Items	Sensitivity		Maximum Input Level	
	Input Level(Typ )	BER	Input Level(Typ )	BER
BR_1M (DH1)	-91 dBm	≤ 0.1%	-5 dBm	≤ 0.1%
EDR_3M (3DH5)	-80 dBm	≤ 0.01%	-5 dBm	≤ 0.1%
	Input Level (Typ)	PER	Input Level (Typ)	PER
LE_125K	-90 dBm	≤ 5%	-5 dBm	≤ 5%
LE_1M	-91 dBm	≤ 5%	-5 dBm	≤ 5%
LE_2M	-89 dBm	≤ 5%	-5 dBm	≤ 5%

## 5. Mechanical Specifications

## 5.1 Module Outline Drawing



(TOP View)



(Side View)

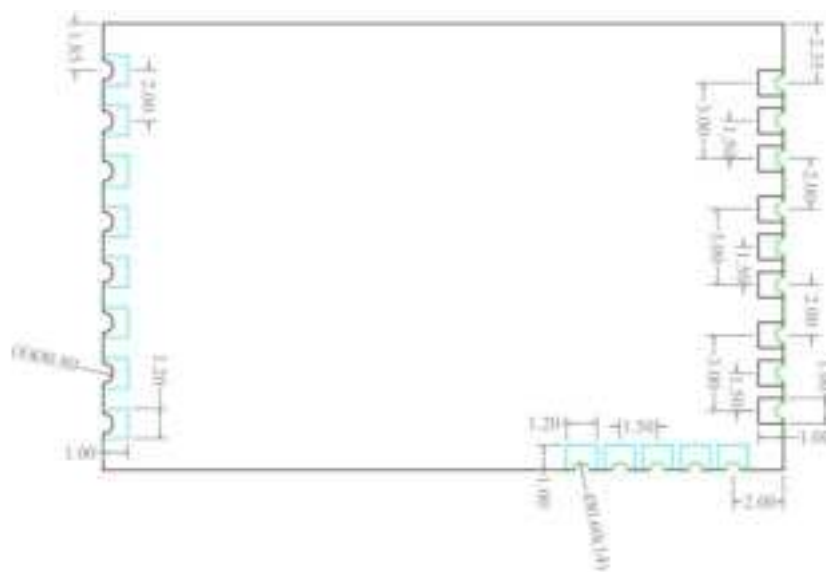
Module dimension: 27.0mm\*17.7mm\*3.1mm (L\*W\*H ; Tolerance:  $\pm 0.15\text{mm}$ )

IPEX / MHF-1 connector dimension: 2.6\*3.0\*1.2mm (L\*W\*H,  $\varnothing 2.0\text{mm}$ )



Module Bow and Twist :  $\leq 0.1\text{mm}$

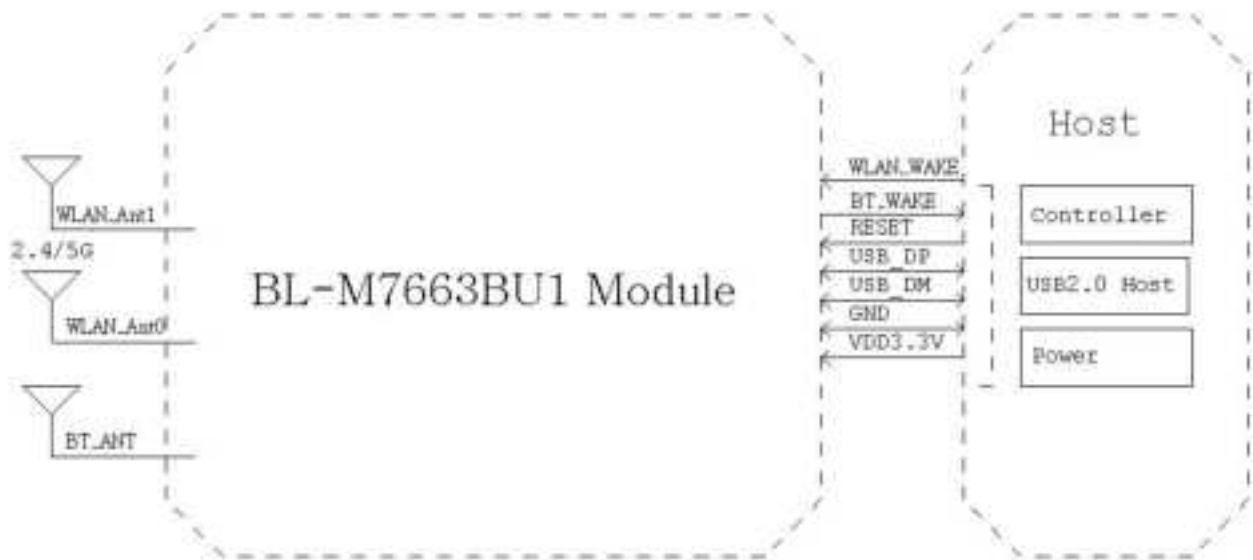
## 5.2 Mechanical Dimensions



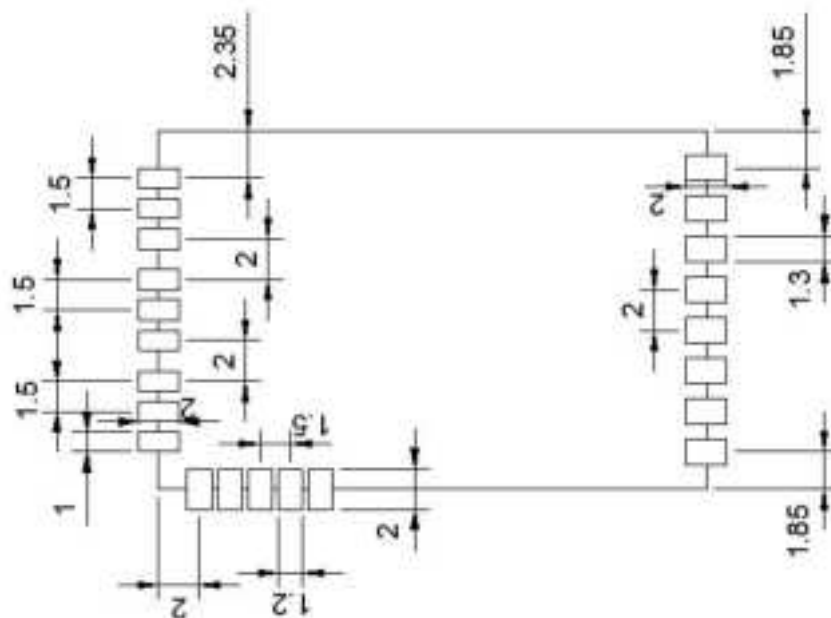
(Bottom View)

## 6. Application Information

### 6.1 Typical Application Circuit

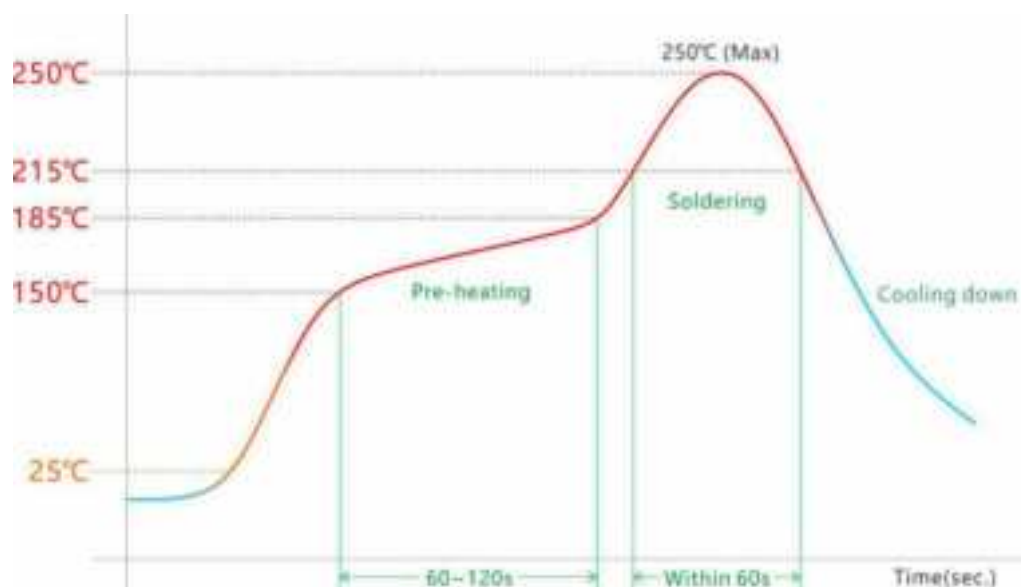


## 6.2 Recommend PCB Layout Footprint



(TOP View)

### 6.3 Reflow Soldering Standard Conditions



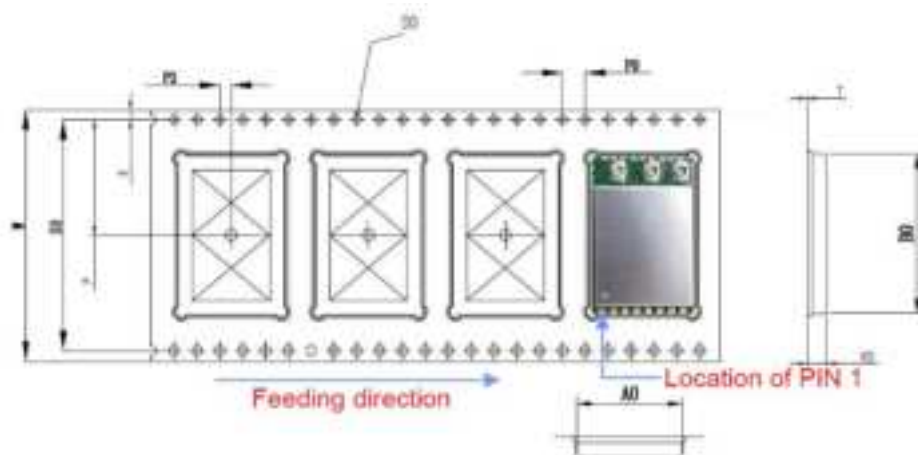
Please use the reflow within 2 times.  
Set up the highest temperature within 250°C.

## 7. Key Components Of Module

No.	Parts	Specification	Manufacturer	Note
1	Chipset	MT7663BUN	MediaTek Inc.	
2	PCB	BL-M7663BU1 V1.0	Shenzhen Tie Fa Technology CO. LTD	
			Guangdong KINGSHINE ELECTRONICS CO., LTD	
			Quzhou Sunlord Electronics CO., LTD	
3	Crystal	40MHz-12pF-10ppm-3225	Lucki Electronics Co., Ltd	
			Shenzhen Kaiyuexiang Electronics Co., Ltd	
			Chengde Oscillator Electronic Technology Co., Ltd.	
4	Diplexer	DP1608-A2455DTB2	Advanced Ceramic X Corp.	
		RFDIP160806ELM6T63	Walsin Technology CORP.	

## 8. Package and Storage Information

### 8.1 Package Dimensions



ITEM	W	A0	B0	K0	E	F	P	P0	P2	D0	T
DIM	44.00±0.3	18.10±0.1	27.40±0.1	3.50±0.1	1.75±0.1	20.2±0.1	24.00±0.1	4.00±0.1	2.00±0.1	Ø1.5±0.1	0.30±0.05



#### Package specification:

1. 1000 modules per roll and 5,000 modules per box.
2. Outer box size: 37.5\*36\*29cm.
3. The diameter of the blue environment-friendly rubber plate is 13 inches, with a total thickness of 48mm (with a width of 44mm carrying belt).
4. Put 1 package of dry agent (20g) and humidity card in each anti-static vacuum bag.

## 8.2 Storage Conditions

#### Absolute Maximum Ratings:

Storage temperature: -40°C to +85°C,  
Storage humidity: 10% to 95 ( Non-Condensing )

#### Recommended Storage Conditions:

Storage temperature: 5°C to +40°C,  
Storage humidity: 20% to 90% RH

Please use this Module within 12month after vacuum-packaged.

The Module shall be stored without opening the packing.

After the packing opened, the Module shall be used within 72hours.

When the color of the humidity indicator in the packing changed,

The Module shall be baked before soldering.

Baking condition: 60°C, 24hours, 1time.

#### ESD Sensitivity :

The Module is a static-sensitive electronic device.

Do not operate or store near strong electrostatic fields.

Take proper ESD precautions!



**ESD CAUTION**



## FCC WARNING

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.

15.105 Information to the user.

(b) For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

Note: 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.

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 and your body.

Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

This transmitter must not be co-located or operating in conjunction with any other

antenna or transmitter.

The availability of some specific channels and/or operational frequency bands are country dependent and are firmware programmed at the factory to match the intended destination.

The firmware setting is not accessible by the end user.

The final end product must be labelled in a visible area with the following:

“Contains Transmitter Module 2AL6KBL-M7663BU1”

The module can be used for camera with 2dBi antenna. The host manufacturer installing this module into their product must ensure that the final compost product complies with the FCC requirements by a technical assessment or evaluation to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual.

## **Requirement per KDB996369 D03**

### **2.2 List of applicable FCC rules**

List the FCC rules that are applicable to the modular transmitter. These are the rules that specifically establish the bands of operation, the power, spurious emissions, and operating fundamental frequencies. DO NOT list compliance to unintentional-radiator rules (Part 15 Subpart B) since that is not a condition of a module grant that is extended to a host manufacturer. See also Section 2.10 below concerning the need to notify host manufacturers that further testing is required.<sup>3</sup>

**Explanation:** This module meets the requirements of FCC part 15C (15.247). It specifically identified AC Power Line Conducted Emission, Radiated Spurious emissions, Band edge and RF Conducted Spurious Emissions, Conducted Peak Output Power, Bandwidth, Power Spectral Density, Antenna Requirement.

Summarize the specific operational use conditions

Describe use conditions that are applicable to the modular transmitter, including for example any limits on antennas, etc. For example, if point-to-point antennas are used that require reduction in power or compensation for cable loss, then this information must be in the instructions. If the use condition limitations extend to professional users, then instructions must state that this information also extends to the host manufacturer's instruction manual. In addition, certain information may also be needed, such as peak gain per frequency band and minimum gain, specifically for master devices in 5 GHz DFS bands.

**Explanation:** The EUT has one External antenna, the antenna can not be replaced by other authorized antennas, and the gain of each replacement antenna is no more than 2.06dBi

### **2.3 Limited module procedures**

If a modular transmitter is approved as a "limited module," then the module manufacturer is responsible for approving the host environment that the limited module is used with. The manufacturer of a limited module must describe, both in the filing and in the installation instructions, the alternative means that the limited module manufacturer uses to verify that the host meets the necessary requirements to satisfy the module limiting conditions.

A limited module manufacturer has the flexibility to define its alternative method to address the conditions that limit the initial approval, such as: shielding, minimum signaling amplitude, buffered modulation/data inputs, or power supply regulation. The alternative method could include that the limited

module manufacturer reviews detailed test data or host designs prior to giving the host manufacturer approval.

This limited module procedure is also applicable for RF exposure evaluation when it is necessary to demonstrate compliance in a specific host. The module manufacturer must state how control of the product into which the modular transmitter will be installed will be maintained such that full compliance of the product is always ensured. For additional hosts other than the specific host originally granted with a limited module, a Class II permissive change is required on the module grant to register the additional host as a specific host also approved with the module.

**Explanation:** The module is a single module.

## **2.6 RF exposure considerations**

It is essential for module grantees to clearly and explicitly state the RF exposure conditions that permit a host product manufacturer to use the module. Two types of instructions are required for RF exposure information: (1) to the host product manufacturer, to define the application conditions (mobile, portable – xx cm from a person's body); and (2) additional text needed for the host product manufacturer to provide to end users in their end-product manuals. If RF exposure statements and use conditions are not provided, then the host product manufacturer is required to take responsibility of the module through a change in FCC ID (new application).

**Explanation:** This module complies with FCC RF radiation exposure limits set forth for an uncontrolled environment, This equipment should be installed and operated with a minimum distance of 5 centimeters between the radiator and your body." This module is designed to comply with the FCC statement, FCC ID is: 2AL6KBL-M7663BU1.

## **2.7 Antennas**

A list of antennas included in the application for certification must be provided in the instructions. For modular transmitters approved as limited modules, all applicable professional installer instructions must be included as part of the information to the host product manufacturer. The antenna list shall also identify the antenna types (monopole, PIFA, dipole, etc. (note that for example an "omni-directional antenna" is not considered to be a specific "antenna type"))).

For situations where the host product manufacturer is responsible for an external connector, for example with an RF pin and antenna trace design, the integration instructions shall inform the installer that unique antenna connector must be used on the Part 15 authorized transmitters used in the host product.

The module manufacturers shall provide a list of acceptable unique connectors.

**Explanation:** The EUT has one External antenna, the antenna can not be replaced by other authorized antennas, and the gain of each replacement antenna is no more than 2.06dBi

## **2.8 Label and compliance information**

Grantees are responsible for the continued compliance of their modules to the FCC rules. This

includes advising host product manufacturers that they need to provide a physical or e-label stating "Contains FCC ID" with their finished product. See Guidelines for Labeling and User Information for RF Devices – KDB Publication 784748.

**Explanation:** The host system using this module, should have label in a visible area indicated the following texts: "Contains FCC ID: 2AL6KBL-M7663BU1.

## **2.9 Information on test modes and additional testing requirements<sup>5</sup>**

Additional guidance for testing host products is given in KDB Publication 996369 D04 Module Integration Guide. Test modes should take into consideration different operational conditions for a stand-alone modular transmitter in a host, as well as for multiple simultaneously transmitting modules or other transmitters in a host product.

The grantee should provide 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.

Grantees can increase the utility of their modular transmitters by providing special means, modes, or instructions that simulates or characterizes a connection by enabling a transmitter. This can greatly simplify a host manufacturer's determination that a module as installed in a host complies with FCC requirements.

**Explanation:** ShenZhen RF Crazy Technology Co., Ltd. can increase the utility of our modular transmitters by providing instructions that simulates or characterizes a connection by enabling a transmitter.

## **2.10 Additional testing, Part 15 Subpart B disclaimer**

The grantee should include a statement that the modular transmitter is only FCC authorized for the specific rule parts (i.e., FCC transmitter rules) listed on the grant, and that the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. If the grantee markets their product

as being Part 15

Subpart B compliant (when it also contains unintentional-radiator digital circuitry), then the grantee shall provide a notice stating that the final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.

**Explanation:** The module without unintentional-radiator digital circuitry, so the module does not require an evaluation by FCC Part 15 Subpart B. The host should be evaluated by the FCC Subpart B.