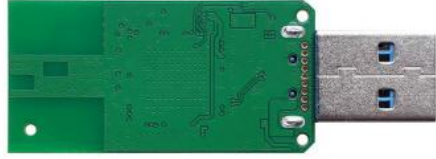




BL-M8852CU1

802.11ax 2402Mbps WLAN + BT v5.3

USB Card Specification



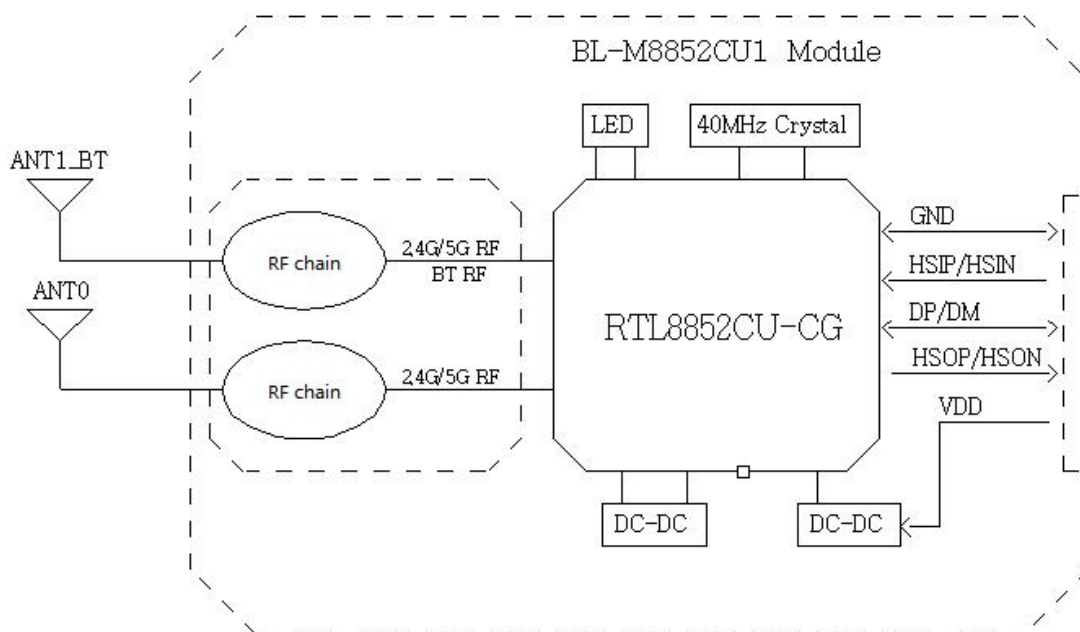
1. Introduction

BL-M8852CU1 is a highly integrated Tri-band WLAN+Bluetooth Combo Card. It combines a 2T2R Tri-band WLAN subsystem and a Bluetooth v5.3 subsystem with USB interface controller. The Card compatible IEEE 802.11a/b/g/n/ac/ax standard and provides the maximum PHY rate up to 2402Mbps, it supports Bluetooth dual mode with v5.3/v4.2/v2.1 compliant. The Card provides a complete solution for high-performance integrated WLAN and Bluetooth devices such as OTT Boxes, Set-top Boxes, HD Cameras, etc.

1.1 Features

- 54.9*2.0*4.7mm small profile including USB3.0 Type-A plug
- Compatible with USB2.0 for WLAN and BT controller
- Compatible with USB3.0 for WLAN only mode
- Operating Frequencies: 2.4~2.4835GHz or 5.15~5.835GHz
- Support Tri-band 2T2R mode with 20/40/80/160MHz bandwidth
- Support 802.11ax with OFDMA and MU-MIMO
- Support Dual band concurrent (2.4G 1T1R+ 5G 1T1R)
- Dual Mode Bluetooth support : Simultaneous LE and BR / EDR
- Connect to external antennas through IPEX-1 / MHF-1 connector

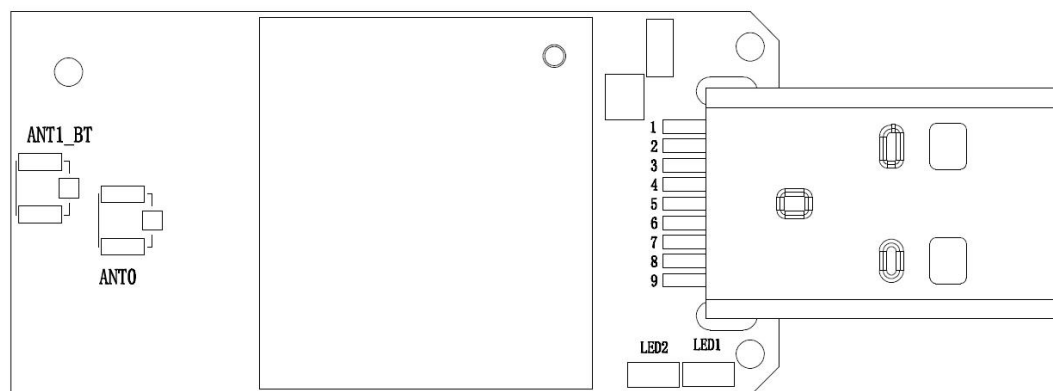
1.2 Block Diagram



1.3 General Specifications

Card Name	BL-M8852CU1
Chipset	RTL8852CU-CG
WLAN Standards	IEEE802.11a/b/g/n/ac/ax
BT Specification	Bluetooth Core Specification v5.3/v4.2/v2.1
Host Interface	USB3.0 for WLAN / USB2.0 for WLAN and BT
Antenna	Connect to the external antennas through IPEX-1 / MHF-1 connector(Two antennas)
Dimension	54.9*20.0*4.7mm (L*W*H)
Power Supply	DC 4.75V~5.5V@0.9A (Max RMS Current)
Operation Temperature	-20°C to +50°C
Operation Humidity	10% to 95% RH (Non-Condensing)

2. Pin Assignments



(Top View)

2.1 USB3.0 Type-A Plug Pin Definition

No	Pin Name	Type	I/O Level	Card Pin Description
1	HSIP	AI		USB 3.0 Receive Differential Pair
2	VDD	P		DC 5.0V power supply
3	HSIN	AI		USB 3.0 Receive Differential Pair
4	DM	AI/O		USB 2.0 Transceiver Differential Pair

5	GND	P		Ground connections
6	DP	AI/O		USB 2.0 Transceiver Differential Pair
7	HSOP	AO		USB 3.0 Transmit Differential Pair
8	GND	P		Ground connections
9	HSOP	AO		USB 3.0 Transmit Differential Pair
	ANT0	RF		IPEX-1 / MHF-1 connector for 2.4G / 5G / 6G RF to WLAN_ANT0
	ANT1_BT	RF		IPEX-1 / MHF-1 connector for 2.4G / 5G / 6G RF to WLAN_ANT1 and BT_ANT
	LED1	-		Reserved BT LED (Active Low) , BLUE , Internal controlled by pin64 of RTL8852CU
	LED2	-		Reserved WLAN LED (Active Low) , GREEN , Internal controlled by pin63 of RTL8852CU

P: Power or Ground; AI: Analog Input; AO: Analog Output;
AI/O: Analog In/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	50	°C
External Antenna VSWR			1.7	2.1	/
Supply Voltage	VDD	4.75	5.0	5.5	V

Note: When the module continuously transmitting in MIMO mode, it generates more heat, but the heat dissipation area is not large enough, so it can only work in an environment of -20~50°C. If the customer adds a heat dissipation device to it may work stably in a higher temperature environment ($\leq 70^{\circ}\text{C}$).

Current Consumption

Conditions : VDD=5.0V ; Ta:25°C			
Use Case	VDD Current		
	Typ (I _{RMS})	Max (I _{Peak})	Units
2.4G WLAN TCP throughput TX 400Mbps (Linux Driver, BT disable)	514	748	mA
2.4G WLAN TCP throughput RX 400Mbps (Linux Driver, BT disable)	221	708	mA

2.4G WLAN TCP throughput TRX 400Mbps (Linux Driver, BT disable)	387	724	mA
5G WLAN TCP throughput TX 1200Mbps (Linux Driver, BT disable)	689	908	mA
5G WLAN TCP throughput RX 1400Mbps (Linux Driver, BT disable)	398	764	mA
5G WLAN TCP throughput TRX 1300Mbps (Linux Driver, BT disable)	564	868	mA
2.4G 11b@11Mbps TX @20dBm (1TX RF test)	222	412	mA
2.4G 11g@6Mbps TX @20dBm (1TX RF test)	249	468	mA
2.4G 11n@HT20_MCS8 TX@20dBm (2TX RF test)	331	660	mA
2.4G 11n@HT20_MCS15 TX@17dBm (2TX RF test)	187	612	mA
2.4G 11ax@HE_SU 40M_MCS0 TX@19dBm (2TX RF test)	275	668	mA
2.4G 11ax@HE_SU 40M_MCS11 TX@15dBm (2TX RF test)	187	612	mA
2.4G 11g@6Mbps RX (1RX RF test)	113	140	mA
2.4G 11ax@HE_SU 40M_MCS0 RX (2RX RF test)	129	180	mA
2.4G 11ax@HE_SU 40M_MCS11 RX (2RX RF test)	129	180	mA
5G 11a@6Mbps TX @18dBm (1TX RF test)	319	572	mA
5G 11n@HT20_MCS8 TX @18dBm (2TX RF test)	536	988	mA
5G 11n@HT20_MCS15 TX @15dBm (2TX RF test)	251	924	mA
5G 11ac@VHT80_MCS0 TX@16dBm (2TX RF test)	313	908	mA
5G 11ac@VHT80_MCS9 TX@13dBm (2TX RF test)	209	812	mA
5G 11ax@HE_SU 160M_MCS0 TX@14dBm (2TX RF test)	289	852	mA
5G 11ax@HE_SU 160M_MCS11 TX@11dBm (2TX RF test)	244	772	mA
5G 11a@6Mbps RX (1RX RF test)	118	164	mA
5G 11ax@HE_SU 160M_MCS0 RX (2RX RF test)	179	276	mA
5G 11ax@HE_SU 160M_MCS11 RX (2RX RF test)	180	268	mA
BT BR_1M TX@5dBm (BT RF test, WLAN disable)	79	124	mA
BT BR_1M RX Active (BT RF test, WLAN disable)	51	100	mA
BT EDR_3M TX@5dBm (BT RF test, WLAN disable)	76	116	mA
BT EDR_3M RX Active (BT RF test, WLAN disable)	51	100	mA
BT LE_1M TX@5dBm (BT RF test, WLAN disable)	68	116	mA
BT LE_1M RX Active (BT RF test, WLAN disable)	51	100	mA

4. WLAN & Bluetooth RF Specifications

4.1 2.4G WLAN RF Specification

Conditions : VDD=5.0V ; Ta:25°C			
Features	Description		
WLAN Standard	IEEE 802.11b/g/n/ax		
Frequency Range	2.4~2.4835GHz (2.4GHz ISM Band)		
Channels	Ch1~Ch11 (For 20MHz Channels)		
Modulation	802.11b (DSSS): CCK, DQPSK, DBPSK; 802.11g (OFDM): BPSK, QPSK, QAM16, QAM64; 802.11n (OFDM): BPSK, QPSK, QAM16, QAM64; 802.11ax (OFDMA): BPSK, BPSK_DCM, QPSK, QPSK_DCM, QAM16, QAM16_DCM, QAM64, QAM256, QAM1024;		
Data 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; 802.11ax (HE_MU,26~242RU): MCS0~MCS11(1T1R) 0.4~143.4Mbps; 802.11ax (HE_MU,26~242RU): MCS0~MCS11(2T2R) 0.8~286.8Mbps; 802.11ax (HE_SU, non-OFDMA 20MHz): MCS0~MCS11(1T1R) 3.6~143.4Mbps; 802.11ax (HE_SU, non-OFDMA 20MHz): MCS0~MCS11(2T2R) 7.3~286.8Mbps; 802.11ax (HE_SU, non-OFDMA 40MHz): MCS0~MCS11(1T1R) 7.3~286.8Mbps; 802.11ax (HE_SU,non-OFDMA 40MHz): MCS0~MCS11(2T2R) 14.6~573.5Mbps;		
Frequency Tolerance	≤±20ppm		
2.4G Transmitter Specifications (ANT0 & ANT1_BT TX power tolerance calibrated, customers can define the target TX power by modifying configuration file of the driver software. Customers must define the TX power same or lower than recommended Target TX Power as below)			
TX Rate	Recommended Target TX Power (dBm)	TX Power Tolerance (dBm)	EVM (dB)
802.11b@1Mbps	20	±3	≤ -10
802.11b@11Mbps	20	±3	≤ -10
802.11g@6Mbps	20	±3	≤ -10
802.11g@54Mbps	20	±3	≤ -25
802.11n@HT20_MCS0	22	±3	≤ -10
802.11n@HT20_MCS7	22	±3	≤ -28
802.11n@HT40_MCS0	22	±3	≤ -10

802.11n@HT40_MCS7	22	±3	≤ -28
802.11ax@HE_SU 40M_MCS0	22	±3	≤ -13
802.11ax@HE_SU 40M_MCS11	22	±3	≤ -35
2.4G Receiver Specifications (ANT0&ANT1_BT)			
RX Rate	Min Input Level (Typ. dBm)	Max Input Level (Typ. dBm)	PER
802.11b@1Mbps	-96	-10	< 8%
802.11b@11Mbps	-88	-10	< 8%
802.11g@6Mbps	-92	-10	< 10%
802.11g@54Mbps	-75	-10	< 10%
802.11n@HT20_MCS0	-91	-10	< 10%
802.11n@HT20_MCS7	-73	-10	< 10%
802.11n@HT40_MCS0	-90	-10	< 10%
802.11n@HT40_MCS7	-70	-10	< 10%
802.11ax@HE_SU 40M_MCS0	-89	-10	< 10%
802.11ax@HE_SU 40M_MCS11	-60	-10	< 10%

4.2 5G WLAN RF Specification

Conditions: VDD = 5.0V; Ta:25°C	
Features	Description
WLAN Standard	IEEE 802.11a/n/ac/ax
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; 802.11ax (OFDMA): BPSK, BPSK_DCM, QPSK, QPSK_DCM, QAM16, QAM16_DCM, QAM64, QAM256, QAM1024;
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; 802.11ax (HE_MU,26~996RU): MCS0~MCS11(1T1R) 0.4~600.4Mbps; 802.11ax (HE_MU,26~996RU): MCS0~MCS11(2T2R) 0.8~1201.0Mbps; 802.11ax (HE_SU, non-OFDMA 20MHz): MCS0~MCS11(1T1R) 3.6~143.4Mbps; 802.11ax (HE_SU, non-OFDMA 20MHz): MCS0~MCS11(2T2R) 7.3~286.8Mbps; 802.11ax (HE_SU, non-OFDMA 40MHz): MCS0~MCS11(1T1R) 7.3~286.8Mbps; 802.11ax (HE_SU,non-OFDMA 40MHz): MCS0~MCS11(2T2R) 14.6~573.5Mbps; 802.11ax (HE_SU,non-OFDMA 80MHz): MCS0~MCS11(1T1R) 15.3~600.4Mbps; 802.11ax (HE_SU, non-OFDMA 80MHz): MCS0~MCS11(2T2R) 30.6~1201.0Mbps; 802.11ax (HE_SU, non-OFDMA 160MHz): MCS0~MCS11(1T1R)30.6~1021.0Mbps; 802.11ax (HE_SU, non-OFDMA 160MHz): MCS0~MCS11(2T2R) 61.2~2401.9Mbps;
Frequency Tolerance	$\leq \pm 20\text{ppm}$

5G Transmitter Specifications (ANT0 & ANT1_BT TX power tolerance calibrated, customers can define the target TX power by modifying configuration file of the driver software. Customers must define the TX power same or lower than recommended Target TX Power as below)

4.3 Bluetooth RF Specification

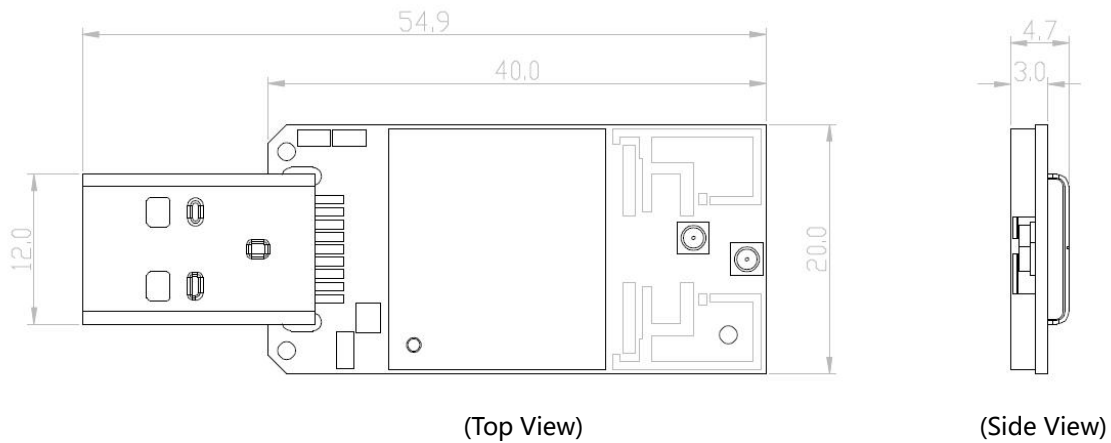
Conditions: VDD=5.0V; Ta:25°C			
Features	Description		
Bluetooth Specification	Bluetooth Core Specification v5.3/v4.2/v2.1		
Frequency Range	2.4~2.4835GHz (2.4GHz ISM Band)		
Channels	Bluetooth Classic: Ch0~Ch78 (For 1MHz Channels); Bluetooth Low Energy: Ch0~Ch39 (For 2MHz Channels);		
Power Classes	Bluetooth Classic: Class1; Bluetooth Low Energy: Class1.5;		
Data 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 (ANT1_BT)			
Items	Min (dBm)	Typ (dBm)	Max (dBm)
TX Power			
BR_1M	2	5	7
EDR_2/3M	2	5	10
LE_125K/500K/1M/2M	2	5	7
Items	Min	Typ	Max

BR_1M (DH1) Modulation Characteristics				
Δf1avg	140KHz	164.9KHz	175KHz	
Δf2avg	115KHz	154KHz	175KHz	
Δf2max	115KHz	168.4KHz	/	
Δf2avg/Δf1avg	0.8	0.93	/	
Items	Min	Typ	Max	
EDR_3M(3DH5) EDR Carrier Frequency Stability and Modulation Accuracy				
ωi	-75KHz	-6.22KHz	+75KHz	
ωi+ωo	-75KHz	-6.34KHz	+75KHz	
ωo	-10KHz	0.17KHz	+10KHz	
8DPSK RMS DEVM	/	0.049	0.13	
8DPSK Peak DEVM	/	0.116	0.25	
Items	Min	Typ	Max	
LE_1M Modulation Characteristics				
Δf1avg	225KHz	250.4KHz	275KHz	
Δf2avg	185KHz	232.2KHz	275KHz	
Δf2max	185KHz	249.5KHz	/	
Δf2avg/Δf1avg	0.8	0.92	/	
Items	Min	Typ	Max	
LE_2M Modulation Characteristics				
Δf1avg	450KHz	500.8KHz	550KHz	
Δf2avg	370KHz	464.1KHz	550KHz	
Δf2max	370KHz	499KHz	/	
Δf2avg/Δf1avg	0.8	0.92	/	
Bluetooth Receiver Specifications (ANT1_BT)				
Items	Sensitivity		Maximum Input Level	
	Input Level (Typ.dBm)	BER	Input Level (Typ.dBm)	BER
BR_1M (DH1)	-92	≤ 0.1%	-10	≤ 0.1%
EDR_2M(DH1)	-90	≤ 0.01%	-10	≤ 0.1%

EDR_3M (3DH5)	-80	$\leq 0.01\%$	-10	$\leq 0.1\%$
	Input Level (Typ.dBm)	PER	Input Level (Typ.dBm)	PER
LE_125/500K	-92	$\leq 5\%$	-10	$\leq 5\%$
LE_1M	-90	$\leq 5\%$	-10	$\leq 5\%$
LE_2M	-88	$\leq 5\%$	-10	$\leq 5\%$

5. Mechanical Specifications

5.1 Card Outline Drawing

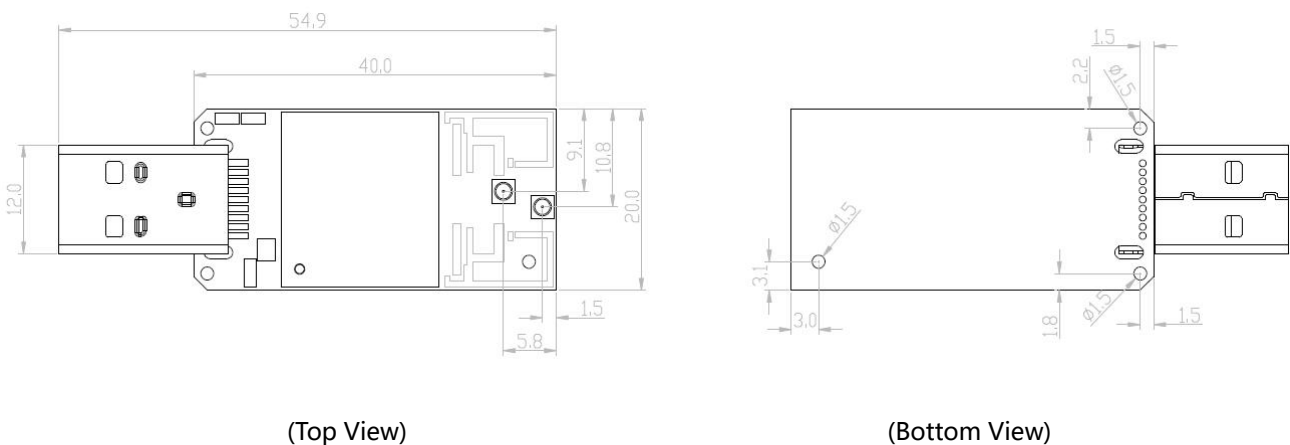


Card dimension: 54.9*20.0*4.7mm(L*W*H; Tolerance: $\pm 0.3\text{mm}_L/W$, $\pm 0.2\text{mm}_H$)

Card Net Weight: 5.09 g (Tolerance: $\pm 0.5\text{g}$)

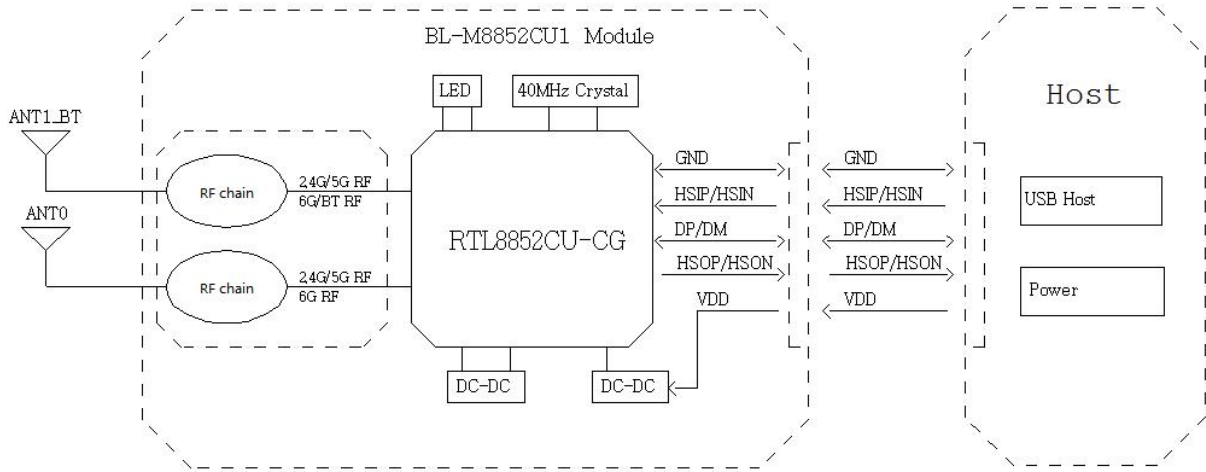
IPEX -1/ MHF-1 connector dimension: 2.6*3.0*1.2mm (L*W*H, $\varnothing 2.0\text{mm}$)

5.2 Mechanical Dimensions



6. Application Information

6.1 Typical Application Circuit



6.2 HW Application Note

6.2.1 External Antenna Isolation

Isolation of Ant0 and Ant1_BT $\geq 17\text{dB}$ (2.4G band) & $\geq 20\text{dB}$ (5G band & 6G band) for better MIMO Application;

6.2.2 VDD Power requirement

Supply Voltage: DC 4.75~5.5V & Ripple Voltage <200mV;

Maximum RMS current $\geq 0.9\text{A}$ (The current limit of the USB3.0 host port is 0.9A) and Maximum Peak current $\geq 1.5\text{A}$;

6.2.3 USB interface Design Guidelines

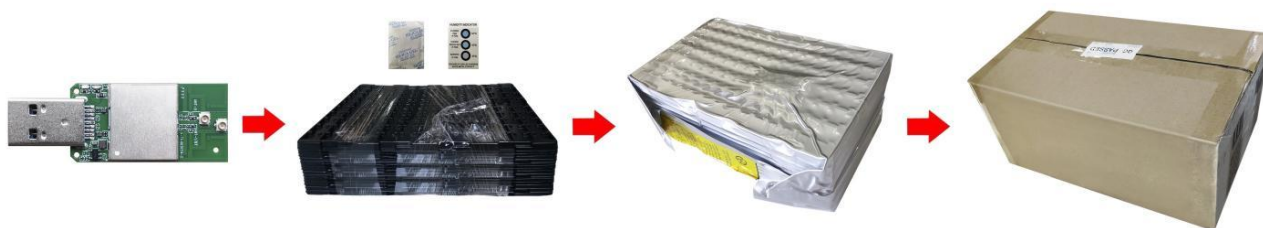
- A、The module supports a USB device port which is fully compliant with USB v3.0 specification.
- B、USB high speed differential pair should be maintain $90\Omega \pm 5\Omega$ differential impedance.
- C、USB signal pairs as short as possible, avoid interference from Power and other signals.
- D、AC coupling capacitors for HSOP,HSON and Common Mode filters for HSIP, HSIN, HSOP,HSON are integrated on Module.
- E、The equivalent capacitance of ESD protection component (option) on DM, DP should be less than 3pF.
The equivalent capacitance of ESD protection component (option) on HSIP, HSIN, HSOP, HSON should be less than 0.3pF.

7. Key Components Of Card

No.	Parts	Specification	Manufacturer	Note
1	Chipset	RTL8852CU-CG	Realtek Semiconductor Corp.	
2	PCB	BL-M8852CU1	ShenZhen Tie Fa Technology Limited	
			MILLION SOURCE PRINTED CIRCUIT BOARD CO.,LTD	
			Quzhou Sunlord Electronics Co.,Ltd	
			SHEN ZHEN QILI ELECTRON CO., LTD	
3	Crystal	40MHz	HOSONIC ELECTRONIC CO., LTD	
			Chengde Oscillator Electronic Technology Co., Ltd.	
			LUCKI CM ELECTRONICS CO.,LTD	
			JinHua East Crystal Electronic CO.,LTD	
4	Diplexer	1608	Advanced Ceramic X Corp.	
			Dongguan Hekang Electronics Co.,LTD	
			Walsin Technology Corporation	

8. Package and Storage Information

8.1 Package Dimensions



Package specification:

1. 30 Cards per blister plate and 510 Cards per box.
2. The blister is bound with wire membrane and put into anti-static vacuum bag.
3. Put 1 bag of dry beads (20g) and 1 humidity card in each anti-static vacuum bag.
4. The outer box size is 35.2*21.5*15.5cm.

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 Card within 12month after vacuum-packaged.

The Card shall be stored without opening the packing.

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

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

The Card shall be baked before use.

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

ESD Sensitivity:

ESD Protection: 2KV (HBM, Maximum rating)

The Card is a static-sensitive electronic device.

Do not operate or store near strong electrostatic fields.

Take proper ESD precautions!



ESD CAUTION

FCC Information

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.

Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications or change to this equipment. Such modifications or change could void the user's authority to operate the equipment.

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.

RF Exposure Information: This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 20cm during normal operation. This module is for internal use only and not sold outside.

Product/PMN: 802.11a/b/g/n/ac/ax 2402Mbps WLAN + Bluetooth v5.3 Combo USB Card

Model no./HVIN: BL-M8852CU1

Antenna Information

It is External antenna (IPEX port and Reverse SMA).

Module procedures: The module has its own RF shielding, which belong to signal module Standard requires: Clear and specific instructions describing the conditions, limitations and procedures for third-parties to use and/or integrate the module into a host device (see Comprehensive integration instructions below). Resolve: Supply example as follows: Installation Notes:

1) BL-M8852CU1 Module Power supply range is DC 4.75V~5.5V, when you use BL-M8852CU1 Module design product, the power supply cannot exceed this range.2)When connect BL-M8852CU1 Module to the host device, the host device must be power off.3)Make sure the module pins correctly installed.4)Make sure that the module does not allow users to replace or demolition.

Trace antenna designs: Not applicable.

RF exposure considerations:

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. The antenna(s) used for this transmitter must not be collocated or operating in conjunction with any other antenna or transmitter.

Note: the host product manuals must include a statement in order to alert the users of FCC RF exposure compliance.

The system integrator must place an exterior label on the outside of the final product housing the BL-M8852CU1 Module. Below is the content that must be included on this label. The host product Labeling Requirements: NOTICE: The host product must make sure that FCC/RSS labeling requirements are met. This includes clearly visible exterior label on the outside of the final product housing that displays the contents shown in below:

Contains FCC ID: ZPJBL-M8852CU1

Information on test modes and additional testing requirements: When testing host product, the host manufacture should follow FCC KDB Publication 996369 D04 Module Integration Guide for testing the host products. The host manufacturer may operate their product during the measurements. In setting up the configurations, if the pairing and call box options for testing does not work, then the host product manufacturer should coordinate with the module manufacturer for access to test mode software.

Additional testing, Part 15 Subpart B disclaimer:

The modular transmitter is only FCC authorized for the specific rule parts (FCC Part 15.247) list 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. The final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed when contains digital circuitry.

Information on test modes and additional testing requirements:

When testing host product, the host manufacture should follow FCC KDB Publication 996369 D04 Module Integration Guide for testing the host products. The host manufacturer may operate their product during the measurements.

ISED

The host product shall be properly labelled to identify the modules within the host product.

The Innovation, Science and Economic Development Canada certification label of a module shall be clearly visible at all times when installed in the host product; otherwise, the host product must be labelled to display the Innovation, Science and Economic Development Canada certification number for the module, preceded by the word "Contains" or similar wording expressing the same meaning, as follows:

"Contains IC: 27338-BLM8852CU1

A label with the following statements must be attached to the host end product: This device contains IC: 27338-BLM8852CU1

The manual provides guidance to the host manufacturer will be included in the documentation that will be provided to the OEM.

The module is limited to installation in mobile or fixed applications.

The separate approval is required for all other operating configurations, including portable configurations and

different antenna configurations.

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:

This device may not cause interference.

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

User should also be advised that:

- (i) the device for operation in the band 5150_5250 MHz is only for indoor use to reduce the potential for harmful interference to co_channel mobile satellite systems;
- (ii) the maximum antenna gain permitted for devices in the bands 5250_5350 MHz and 5470_5725 MHz shall comply with the e.i.r.p. limit; and
- (iii) the maximum antenna gain permitted for devices in the band 5725_5850 MHz shall comply with the e.i.r.p. limits specified for point_to_point and non point_to_point operation as appropriate. High_power radars are allocated as primary users (i.e. priority users) of the bands 5250_5350 MHz and 5650_5850 MHz and that these radars could cause interference and/or damage to LE_LAN devices

Les utilisateurs devraient aussi être avisés que

- (i) les dispositifs fonctionnant dans la bande 5150_5250 MHz sont réservés uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux;
- (ii) le gain maximal d'antenne permis pour les dispositifs utilisant les bandes 5250_5350 MHz et 5470_5725 MHz doit se conformer à la limite de e.i.r.p.;
- (iii) le gain maximal d'antenne permis (pour les dispositifs utilisant la bande 5725_5850 MHz) doit se conformer à la limite de p.i.r.e. spécifiée pour l'exploitation point à point et non point à point, selon le cas. De plus, les utilisateurs de radars de haute puissance sont désignés utilisateurs principaux (c.-à-d., qu'ils ont la priorité) pour les bandes 5250_5350 MHz et 5650_5850 MHz et que ces radars pourraient causer du brouillage et/ou des dommages aux dispositifs LAN_EL.

The operation of this device to indoor use only.

The operation of this device is prohibited on oil platforms, cars, trains, boats, and aircraft, except that operation of this device is permitted in large aircraft while flying above 10,000 feet.

Utilisation limitée à l'intérieur seulement;

Utilisation interdite à bord de plateformes de forage pétrolier, de voitures, de trains, de bateaux et d'aéronefs, sauf à bord d'un gros aéronef volant à plus de 10000 pieds d'altitude.

Cet appareil contient des émetteurs/récepteurs exemptés de licence qui sont conformes aux flux RSS exemptés de licence de Innovation, Science et développement économique Canada. L'exploitation est soumise aux deux conditions suivantes: Cet appareil ne doit pas causer d'interférences. Ce dispositif doit accepter toute interférence, y compris toute interférence pouvant causer un fonctionnement indésirable du dispositif

Les antennes utilisées pour cet émetteur doivent être installées pour assurer une distance de séparation d'au moins 20 cm par rapport à toutes les personnes et ne doivent pas être localisées ou fonctionner conjointement avec d'autres antennes ou émetteurs. Les utilisateurs doivent avoir des conditions de fonctionnement de l'émetteur pour satisfaire à la conformité à l'exposition RF.