BL-M8821CS1

802.11ac 433Mbps WLAN + BT v4.2

Combo SDIO Module Specification

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(Top View)

(Bottom View)

Module Name: BL-M8821CS1	
Module Type: 802.11a/b/g/n/ac 433Mbps WLAN + BT v4.2 Combo SDIO Module	
Revision: V1.1	
Customer Approval:	
Company:	
Title:	
Signature:	Date:
Approval:	
Title:	
Signature:	Date:

Revision History

Revision	Summary	Release Date	Revised By
0.1.0	Initial release	2020-01-16	
1.1.0	Official release	2023-03-21	
1.1.1	Update the specification version	2025-02-19	Cxf

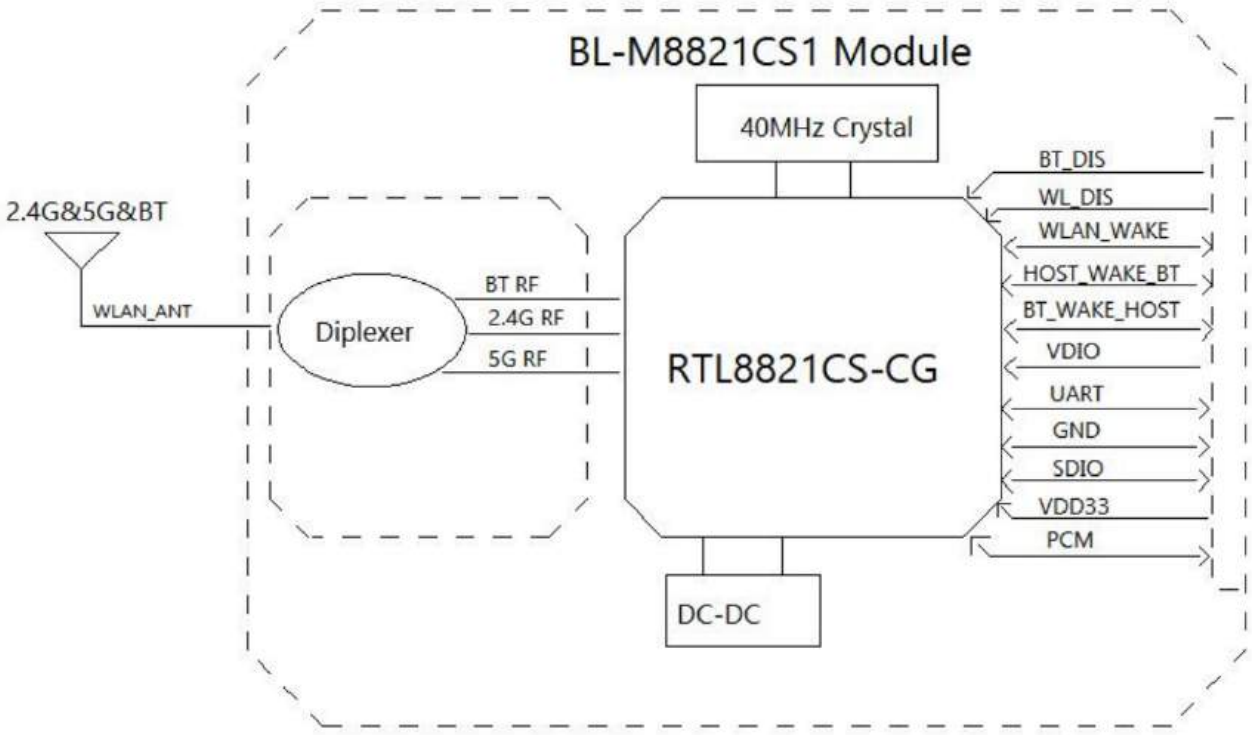
1. Introduction

BL-M8821CS1 is a highly integrated Dual-band WLAN + Bluetooth v4.2 Combo module. It compatible IEEE802.11a/b/g/n/ac standard and provides the maximum PHY rate up to 433.3Mbps, and supports Bluetooth dual mode with BT v4.2/4.0/2.1 compliant, offering feature-rich wireless connectivity at high standards, and delivering reliable, cost-effective, high throughput from an extended distance.

1.1 Features

- Operating Frequencies: 2.4~2.4835GHz or 5.15~5.85GHz
- Host Interface is SDIO and UART
- IEEE Standards: IEEE 802.11a/b/g/n/ac, wireless PHY rate can reach up to 433.3Mbps
- Support Bluetooth v4.2/4.0/2.1 with Simultaneous LE and BR / EDR
- Connect to external antenna through half hole pad
- Power Supply: DC 3.3V for main power, DC 3.3V or 1.8V for I/O power

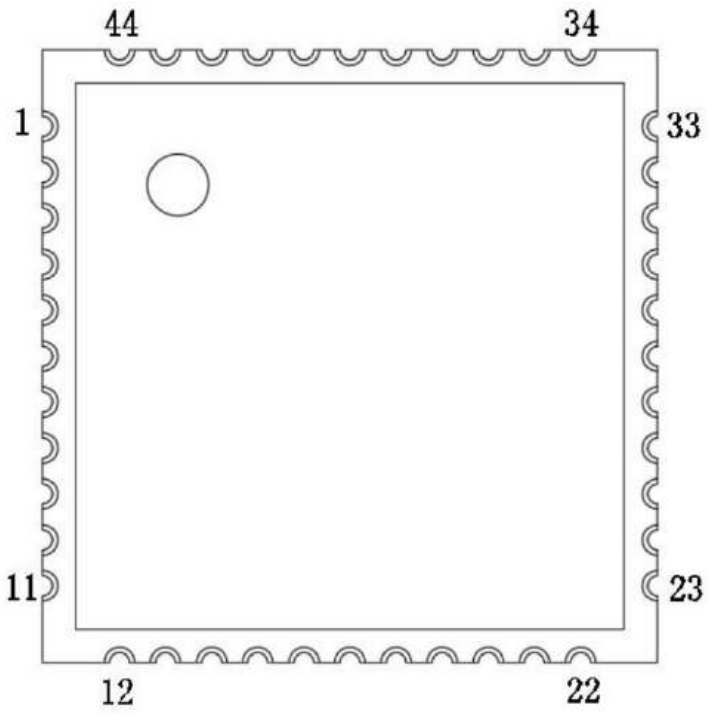
1.2 Block Diagram



1.3 General Specifications

Module Name	BL-M8821CS1
Chipset	RTL8821CS-CG
WLAN Standard	IEEE802.11a/b/g/n/ac
BT Specification	Bluetooth Core Specification v4.2/4.0/2.1
Host Interface	SDIO3.0/SDIO2.0 for WLAN & UART for Bluetooth
Antenna	Connect to the external antenna through half hole pad
Dimension	12.0*12.0*2.4mm (L*W*H)
Power Supply	DC 3.3V±0.2V main power supply @600 mA (Max) DC 3.3V±0.2V or 1.8V±0.1V I/O power supply
Operation Temperature	-20℃ to +70℃
Operation Humidity	10% to 95% RH (Non-Condensing)

2. Pin Assignments



(Top View)

2.1 Pin Definition

No	Pin Name	Type	I/O Level	Description
1	GND	RF		RF Ground connections
2	WLAN/BT_ANT	RF		RF Pad for 2.4G/5G WLAN and BT ANT
3	GND	RF		RF Ground connections
4	NC	--		NC
5	NC	--		NC
6	HOST_WAKE_BT	I/O	VDIO	Function1. General Purpose Input / Output Pin GPIO13 Function2. Host to wake-up this Bluetooth device input
7	BT_WAKE_HOST	I/O	VDIO	Function1. General Purpose Input / Output Pin GPIO14 Function2. Bluetooth device to wake-up HOST
8	NC	--		NC
9	VDD33	P		3.3V Main Power Supply
10	NC	--		NC
11	NC	--		NC
12	WL_DIS#	I	VDIO	Shared with GPIO9, This Pin Can Externally Shutdown the RTL8821CS WLAN function when WL_DIS# is pulled low input. When this pin pulled low, SDIO interface will be disabled.
13	WL_WAKE_HOST	I/O	VDIO	Function1. General Purpose Input / Output Pin GPIO10 Function2. WLAN to wake-up Host output
14	SD_D2	I/O	VDIO	SDIO data line 2
15	SD_D3	I/O	VDIO	SDIO data line 3
16	SD_CMD	I/O	VDIO	SDIO command line
17	SD_CLK	I	VDIO	SDIO CLK line
18	SD_D0	I/O	VDIO	SDIO data line 0
19	SD_D1	I/O	VDIO	SDIO data line 1
20	GND	P		Ground connections.
21	NC	--		NC
22	VDIO	P		Supply voltage for digital IO, 3.3V or 1.8V is alternative; VDDIO 3.3V for SDIO default speed and high-speed modes, 1.8V for SDR12/SDR25/SDR50/DDR50 modes.

23	NC	--		NC
24	SUSCLK_IN	I	VDIO	External 32K or RTC clock input
25	PCM_DOUT	I/O	VDIO	Function1. General Purpose Input / Output Pin GPIO1 Function2. PCM Data output
26	PCM_CLK	I/O	VDIO	Function1. General Purpose Input / Output Pin GPIO3 Function2. PCM Clock input
27	PCM_DIN	I/O	VDIO	Function1. General Purpose Input / Output Pin GPIO0 Function2. PCM data input
28	PCM_SYNC	I/O	VDIO	Function1. General Purpose Input / Output Pin GPIO2 Function2. PCM sync I/O signal
29	NC	--		NC
30	NC	--		NC
31	GND	p		Ground connections.
32	NC	--		NC
33	GND	p		Ground connections.
34	BT_DIS#	I	VDIO	Shared with GPIO11, This Pin Can Externally Shutdown the RTL8821CS BT function when BT_DIS# is pulled low input. When this pin pulled low, UART interface will be also disabled.
35	NC	--		NC
36	GND	P		Ground connections.
37	NC	--		
38	NC	--		
39	NC	--		
40	NC	--		
41	UART_RTS	O	VDIO	High-Speed UART RTS
42	UART_OUT	O	VDIO	High-Speed UART Data Out
43	UART_IN	I	VDIO	High-Speed UART Data In
44	UART_CTS	I	VDIO	High-Speed UART CTS

P: Power, I: Input, O: Output, I/O: In/Output, A I/O: Analog In/Output, RF: Analog RF Port

3. Electrical and Thermal Specifications

3.1 Recommended Operating Conditions

Parameters		Min	Typ	Max	Units
Ambient Operating Temperature		-20	25	70	℃
External Antenna VSWR			1.7	2.0	/
Supply Voltage	VDD33	3.1	3.3	3.5	V
	VDIO	3.1	3.3	3.5	V
		1.7	1.8	1.9	V

3.2 Digital 3.3V I/O DC Specifications

Symbol	Parameter	Min	Typ	Max	Units
VIH	Input High Voltage	2.0	3.3	3.6	V
VIL	Input Low Voltage	--	0	0.9	V
VOH	Output High Voltage	2.97	--	3.3	V
VOL	Output Low Voltage	0	--	0.33	V

3.3 Digital 1.8V I/O DC Specifications

Symbol	Parameter	Min	Typ	Max	Units
VIH	Input High Voltage	1.3	1.8	2.0	V
VIL	Input Low Voltage	--	0	0.8	V
VOH	Output High Voltage	1.62	--	1.8	V
VOL	Output Low Voltage	0	--	0.18	V

3.4 Current Consumption

Conditions : VDD33=3.3V ; VDIO=3.3V Ta:25℃			
Use Case	VDD33 Current (average)		
	Typ	Max	Units

WLAN and BT Unassociated (Linux)	130	160	mA
2.4G 11b 11Mbps TX @16.5dBm (RF test)	330	400	mA
2.4G 11n HT40 MCS7 TX @14.5dBm (RF test)	280	320	mA
5G 11ac VHT80MCS0TX @14dBm (RF test)	338	372	mA
5G 11ac VHT80 MCS9 TX @12dBm (RF test)	304	364	mA
2.4G 11n HT40 MCS7 RX (RF test)	140	165	mA
5G 11ac VHT80 MCS9 RX (RF test)	160	185	mA
BT BR 1M TX@5dBm (RF test)	160	188	mA
BT LE 1M TX@5dBm (RF test)	148	188	mA
BT LE 1M RX (RF test)	129	156	mA

4. WLAN & Bluetooth RF Specifications

4.1 2.4G WLAN RF Specification

Conditions: VDD33=3.3V; Ta:25℃	
Features	**Description**
WLAN Standard	IEEE 802.11b/g/n
Frequency Range	2.4~2.4835GHz (2.4GHz ISM Band)
Channels	Ch1~Ch13 (For 20MHz Channels)
Modulation	802.11b (DSSS): DBPSK, DQPSK, CCK; 802.11g (OFDM): BPSK, QPSK, QAM16, QAM64; 802.11n (OFDM): BPSK, QPSK, QAM16, QAM64;
Data Rate	802.11b: 1, 2, 5.5, 11Mbps; 802.11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps; 802.11n (HT20): MCS0~MCS7 6.5~72.2Mbps; 802.11n (HT40): MCS0~MCS7 13.5~150Mbps;
Frequency Tolerance	≦ ±20ppm

2.4G Transmitter Specifications (WLAN_ANT.TX power of some rates is calibrated, customers can define the target TX power of other rates 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	**TX Power (dBm)**	**TX Power Tolerance (dBm)**	**EVM (dB)**
802.11b@1Mbps	Recommended Target TX Power :18.5	±1.5	≦ -15
802.11b@11Mbps	Calibrated TX Power :16.5	±1.5	≦ -15

802.11g@6Mbps	Recommended Target TX Power :17	±1.5	≦ -15
802.11g@54Mbps	Calibrated TX Power :15	±1.5	≦ -25
802.11n@HT20_MCS0	Recommended Target TX Power :17	±1.5	≦ -10
802.11n@HT20_MCS7	Calibrated TX Power :15	±1.5	≦ -28
802.11n@HT40_MCS0	Recommended Target TX Power :16.5	±1.5	≦ -10
802.11n@HT40_MCS7	Calibrated TX Power :14.5	±1.5	≦ -28
2.4G Receiver Specifications (WLAN_ANT)			
RX Rate	Min Input Level (Typ.dBm)	Max Input Level (Typ.dBm)	PER
802.11b@1Mbps	-93	-10	< 8%
802.11b@11Mbps	-86	-10	< 8%
802.11g@6Mbps	-91	-10	< 10%
802.11g@54Mbps	-74	-10	< 10%
802.11n@HT20_MCS0	-89	-10	< 10%
802.11n@HT20_MCS7	-69	-10	< 10%
802.11n@HT40_MCS0	-87	-10	< 10%
802.11n@HT40_MCS7	-67	-10	< 10%

4.2 5G WLAN RF Specification

Conditions: VDD33=3.3V; Ta:25℃	
Features	Description
WLAN Standard	IEEE 802.11a/n/ac
Frequency Range	5.15~5.25GHz; 5.25~5.35GHz; 5.47~5.725GHz; 5.725~5.850GHz (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 6.5~72.2Mbps; 802.11n (HT40): MCS0~MCS7) 13.5~150Mbps; 802.11ac (VHT20): MCS0~MCS8 6.5~86.7Mbps;

	802.11ac (VHT40): MCS0~MCS9 13.5~200Mbps; 802.11ac (VHT80): MCS0~MCS9 29.3~433.3Mbps;
Frequency Tolerance	≦ ±20ppm

5G Transmitter Specifications (WLAN_ANT. TX power of some rates is calibrated, customers can define the target TX power of other rates 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	TX Power (dBm)	TX Power Tolerance (dBm)	EVM (dB)
802.11a@6Mbps	Recommended Target TX Power :15	±2	≦ -10
802.11a@54Mbps	Calibrated TX Power :13	±2	≦ -25
802.11n@HT20_MCS0	Recommended Target TX Power :15	±2	≦ -10
802.11n@HT20_MCS7	Calibrated TX Power :13	±2	≦ -28
802.11n@HT40_MCS0	Recommended Target TX Power :15	±2	≦ -10
802.11n@HT40_MCS7	Calibrated TX Power :13	±2	≦ -28
802.11ac@VHT80_MCS0	Recommended Target TX Power :14	±2	≦ -10
802.11ac@VHT80_MCS9	Calibrated TX Power :12	±2	≦ -32

5G Receiver Specifications(WLAN_ANT)			
RX Rate	Min Input Level (Typ.dBm)	Max Input Level (Typ.dBm)	PER
802.11a@6Mbps	-89	-10	< 10%
802.11a@54Mbps	-72	-10	< 10%
802.11n@HT20_MCS0	-87	-10	< 10%
802.11n@HT20_MCS7	-69	-10	< 10%
802.11n@HT40_MCS0	-86	-10	< 10%
802.11n@HT40_MCS7	-67	-10	< 10%
802.11ac@VHT80_MCS0	-82	-10	< 10%
802.11ac@VHT80_MCS9	-57	-10	< 10%

4.3 Bluetooth RF Specification

Conditions: VDD33=3.3V; Ta:25℃			
Features	**Description**		
Bluetooth Specification	Bluetooth Core Specification v4.2/4.0/2.1		
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;		
Data Rate & Modulation	BR_1Mbps: GFSK; EDR_2Mbps: π/4-DQPSK; EDR_3Mbps: 8DPSK; LE_1Mbps: GFSK (Uncoded);		
Bluetooth Transmitter Specifications (BT_ANT)			
Items	**Min**	**Typ**	**Max**
TX Power			
BR_1M	2dBm	5dBm	8dBm
EDR_2/3M	2dBm	5dBm	8dBm
LE_1M	2dBm	5dBm	8dBm
Items	**Min**	**Typ**	**Max**
BR_1M (DH1) Modulation Characteristics			
Δf1avg	140KHz	164.91KHz	175KHz
Δf2avg	115KHz	165.46KHz	/
Δf2max	115KHz	166.83KHz	/
Δf2avg/Δf1avg	0.8	1.00	/
BR_1M (DH1) Initial Carrier Frequency Tolerance			
Init Freq Error	-75kHz	-2.5kHz	+75kHz
EDR_3M(3DH5) EDR Carrier Frequency Stability and Modulation Accuracy			
ωi	-75KHz	10.49KHz	+75KHz
ωi+ωo	-75KHz	13.32KHz	+75KHz
ωo	-10KHz	2.83KHz	+10KHz
8DPSK RMS DEVM	/	0.0915	0.13

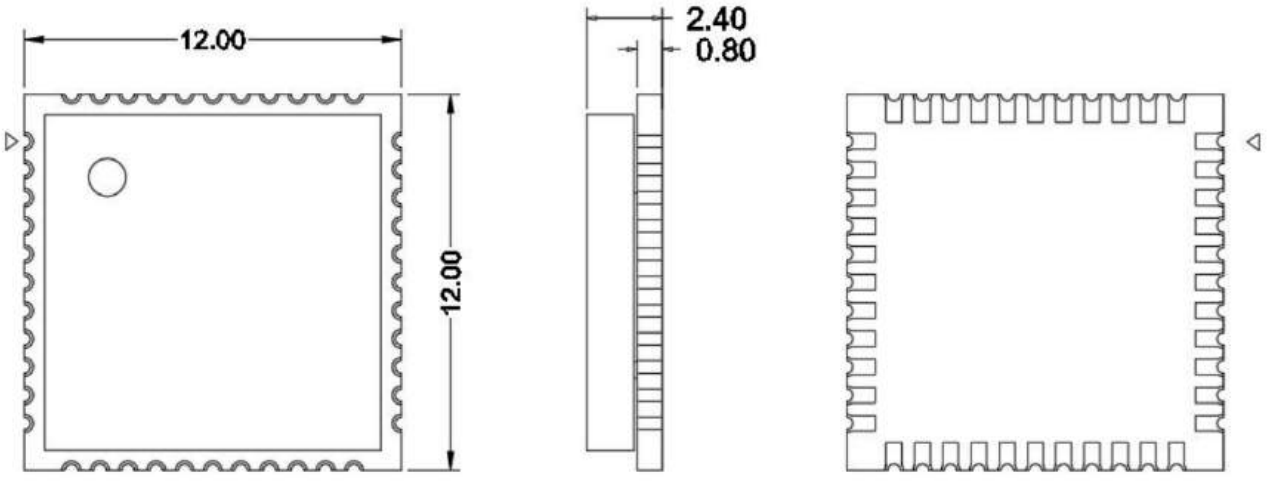
8DPSK Peak DEVM	/	0.0455	0.25
LE_1M Modulation Characteristics			
Δf1avg	225KHz	252.08KHz	275KHz
Δf2avg	185KHz	229.77KHz	/
Δf2max	185KHz	222.07KHz	/
Δf2avg/Δf1avg	0.8	0.91	/

Bluetooth Receiver Specifications (BT_ANT)

Items	Sensitivity		Maximum Input Level	
	Input Level(Typ)	BER	Input Level(Typ)	BER
BR_1M (DH1)	-88dBm	≦ 0.1%	-10dBm	≦ 0.1%
EDR_3M (3DH5)	-84dBm	≦ 0.01%	-10dBm	≦ 0.1%
Items	**Input Level (Typ)**	**PER**	**Input Level (Typ)**	**PER**
LE_1M	-90dBm	≦ 5%	-10dBm	≦ 5%

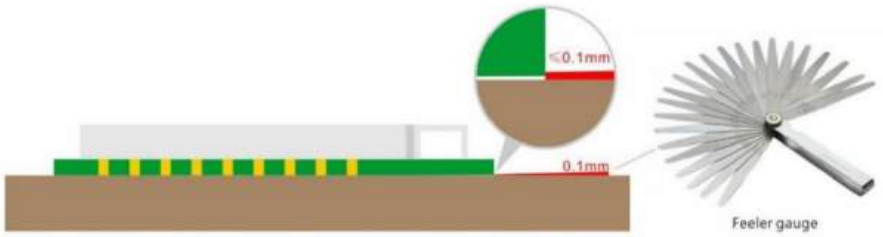
5. Mechanical Specifications

5.1 Module Outline Drawing



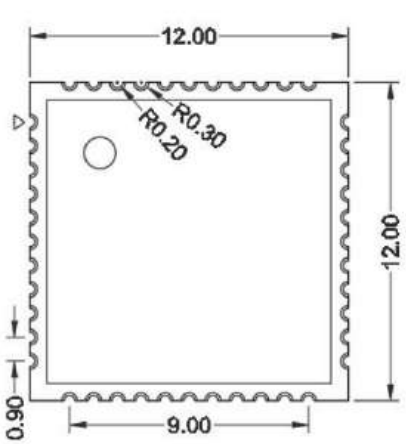
(Top View) (Side View) (Bottom View)

Module dimension: 12.0mm*12.0mm*2.4mm (L*W*H; Tolerance: ±0.3mm_L/W, ±0.2mm_H)

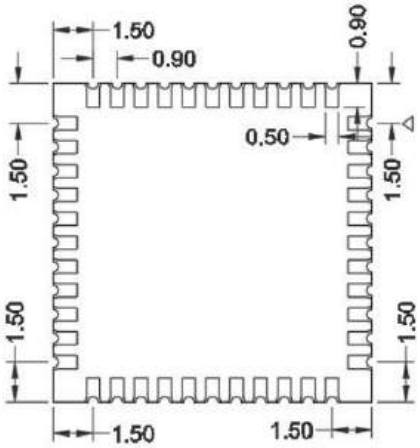


Module Bow and Twist: ≤0.1mm

5.2 Mechanical Dimensions



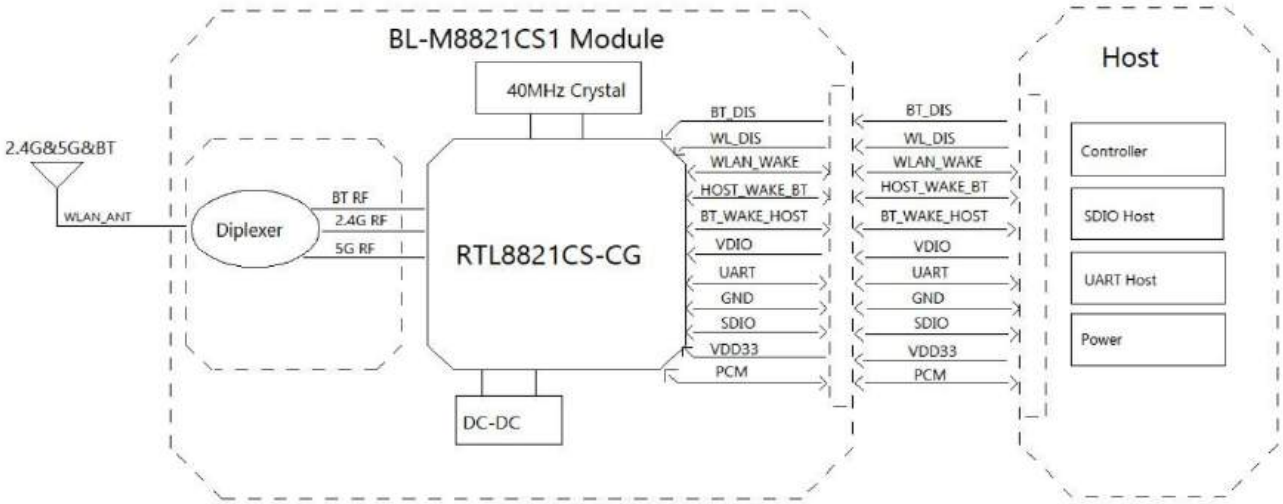
(Top View)



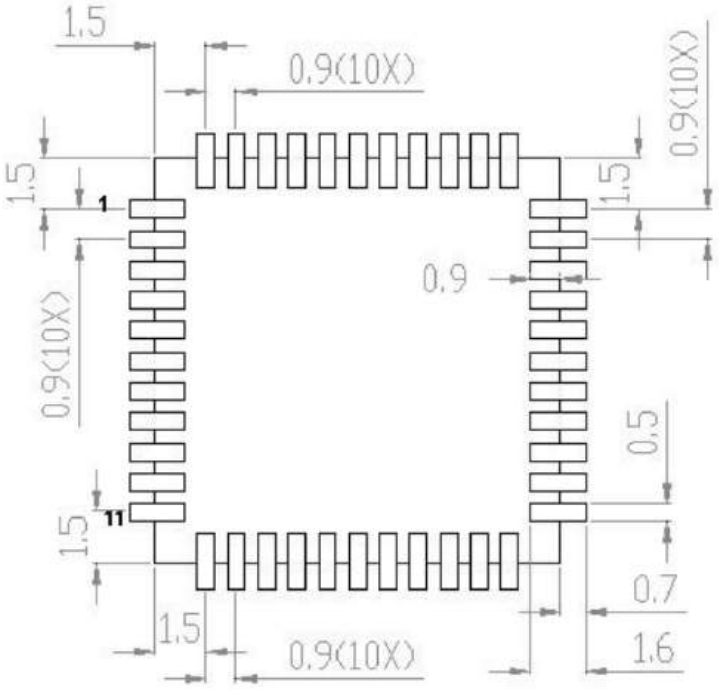
(Bottom View)

6. Application Information

6.1 Typical Application Circuit

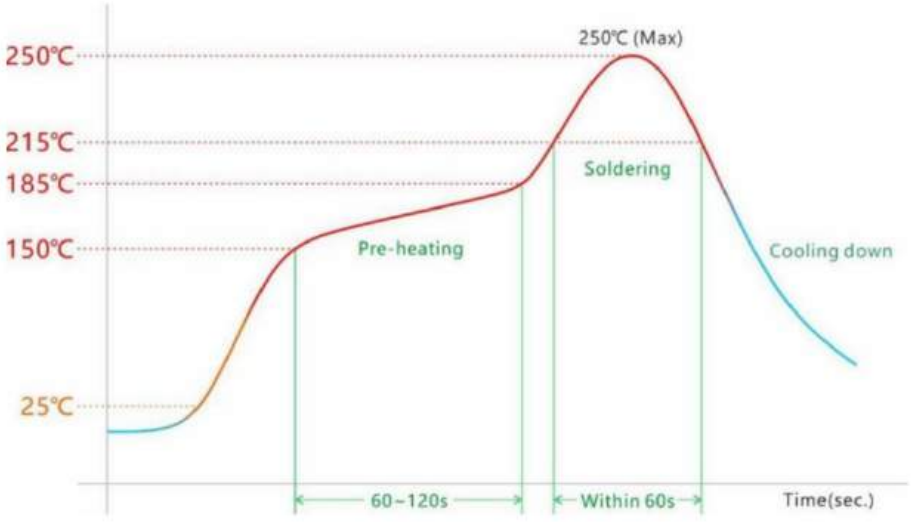


6.2 Recommend PCB Layout Footprint



(Design Unit: mm)

6.3 Reflow Soldering Standard Condition



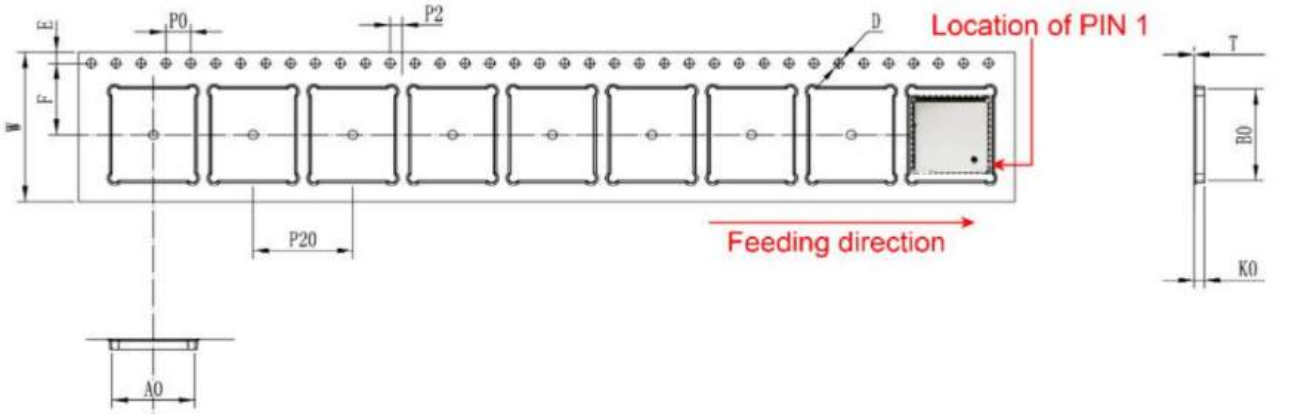
Please use the reflow within 2 times.
Set up the highest temperature within 250℃.

7. Key Components Of Module

No.	Parts	Specification	Manufacturer	Note
1	Chipset	RTL8821CS-CG	Realtek Semiconductor Corp.	
2	PCB	BL-M8821CS1	ShenZhen Tie Fa Technology Limited	
			Quzhou Sunlord Electronics Co.,Ltd	
			SHEN ZHEN QILI ELECTRON CO.,LTD	
3	Crystal	40MHz-2016	HOSONIC ELECTRONIC CO.,LTD	
			SHENZHEN KAIYUEXIANG ELECTRONICS CO.,LTD	
			Chengde oscillator Electronic Technology CO.,LTD	
4	Diplexer	DP1005	Advanced Ceramic X Corp.	
			Dongguan Hekang Electronics Co.,LTD	

8. Package and Storage Information

8.1 Package Dimensions



ITEM	W	A0	B0	K0	E	F	P	P0	P2	D	T
DIM	24.00+0.3	12.40±0.1	12.40±0.1	2.90±0.1	1.75±0.1	11.5±0.1	20.00±0.1	4.00±0.1	2.00±0.1	Ø1.5±0.1	0.30±0.05

Package specification:

1、 1,000 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 28mm (with a width of 24mm carrying belt).
4、 Put 1 package of dry agent (20g) and humidity card in each anti-static vacuum bag.
5、 Each carton is packed with 5 boxes.

8.2 Storage Conditions

Absolute Maximum Ratings:
Storage temperature: -40℃ to +85℃,
Storage humidity: 10% to 95 (Non-Condensing)
Recommended Storage Conditions:
Storage temperature: 5℃ to +40℃,
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℃, 24hours, 1time.

ESD Sensitivity:
ESD Protection: 2KV(HBM, Maximum rating)
The Module is a static-sensitive electronic device.
Do not operate or store near strong electrostatic fields.
Take proper ESD precautions!

ESD CAUTION

The Module is designed to comply with the FCC statement. FCC ID is 2AL6K-M8821CS1. The host system using Module, should have label indicated it contain modular's FCC ID: 2AL6K-M8821CS1. This radio module must not installed to collocate and operating simultaneously with other radios in host system additional testing and equipment authorization may be required to operating simultaneously with other radio.
The Module and its antenna must not be co-located or operating in conjunction with any other transmitter or antenna within a host device.

The modular must be installed in the host that assign by Company name: Shenzhen Bilian Electronic Co.,Ltd., Model no.: BL-M8821CS1 if other host types used would need further evaluation and possible C2PC if they are not significantly similar to the one tested The WIFI Module is designed for a compact PCB design. It should be installed and operated with host or other minimum distance of 20 centimeters between the radiator and your body." To comply with FCC regulations limiting both maximum RF output power and human exposure to RF radiation, the maximum antenna gain including cable loss in a mobile-only exposure condition must not exceed 3.39 dBi in the 2.4G band, 7.25 dBi in the 5G band. The module uses External Antenna, the antennas are sold with the module.

Notice to OEM integrator
The end user manual shall include all required regulatory information/warning as show in this manual. The OEM integrator is responsible for testing their end-product for any additional compliance requirements required with this module installed. If the final product contains circuits of other FCC PART 15 Subparts, the final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed The intended use is generally not for the general public. It is generally for industry/commercial use. The connector is within the transmitter enclosure and can only be accessed by disassembly of the transmitter that is not normally required, the user has no access to the connector. Installation must be controlled. Installation requires special training.
This device complies with Part 15 of the FCC Rules.
This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and your body.

2.4G:
Antenna type: External Antenna
The max antenna gain (in dBi): 3.39 dBi

5G:
Antenna type: External Antenna
The max antenna gain (in dBi): 7.25 dBi

2.2
This module has been assessed against the following FCC rule parts: CFR 47 FCC Part 15 C (15.247. DTS) and CFR 47 FCC Part 15 E (NII). It is applicable to the modular transmitter

2.3
This radio transmitter Module has been approved by Federal Communications Commission to operate

with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

The concrete contents to check are the following three points.
1) Maximum antenna gains are shown in item 2.7 below.
2) Should be installed so that the end user cannot modify the antenna
3) Feed line should be designed in 50ohm
Fine-tuning of return loss etc. can be performed using a matching network.
The antenna shall not be accessible for modification or change by the end user.

2.4
The module complies with FCC Part 15.247 / Part 15.407 and apply for Single module approval.

2.5
Trace antenna designs: applicable.
Any deviation(s) from the defined parameters of the antenna trace, as described by the instructions, require that the host product manufacturer must notify the module grantee that they wish to change the antenna trace design. in this case, a Class II permissive change application is required to be filed by the grantee, or the host manufacturer can take responsibility through the change in FCC ID (new application) procedure followed by a Class II permissive change application.
The device must be professionally installed.
The intended use is generally not for the general public.
It is generally for industry/commercial use.
The connector is within the transmitter enclosure and can only be accessed by disassembly of the transmitter that is not normally required.
The user has no access to the connector.
Installation must be controlled.
Installation requires special training.

2.6
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator & your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

2.7
The following antennas have been certified for use with this module.
Only antennas of the same type with equal or lower gain may also be used with this module.
Other types of antennas and/or higher gain antennas may require the additional authorization for operation. The installer should use unique antenna connector and Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device. The manufacturer of module will inform installer to meet with the FCC part 15.203 in the warning part.

Antenna Specification list below:

2.8
Please notice that if the FCC identification number is 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. This exterior label can use wording such as "Contains FCC ID: 2AL6K-M8821CS1"; any similar wording that expresses the same meaning may be used.

2.9
Testing of the host product with all the transmitters installed - referred to as the composite investigation test- is recommended, to verify that the host product meets all the applicable FCC rules. The radio spectrum is to be investigated with all the transmitters in the final host product functioning to determine that no emissions exceed the highest limit permitted for any one individual transmitter as required by Section 2.947(f). The host manufacturer is responsible to ensure that when their product operates as intended it does not have any emissions present that are out of compliance that were not present when the transmitters were tested individually.
If the modular transmitter has been fully tested by the module grantee on the required number of channels, modulation types, and modes, it should not be necessary for the host installer to re-test all the available transmitter modes or settings. It is recommended that the host product manufacturer, installing the modular transmitter, perform some investigative measurements to confirm that the resulting composite system does not exceed the spurious emissions limits or band edge limits (e.g., where a different antenna may be causing additional emissions).
The testing should check for emissions that may occur due to the intermixing of emissions with the other transmitters, digital circuitry, or due to physical properties of the host product (enclosure). This investigation is especially important when integrating multiple modular transmitters where the certification is based on testing each of them in a stand-alone configuration.

2.10
Any company of the host device which install this modular should perform the test of radiated & conducted emission and spurious emission etc. according to FCC Part 15C: 15.247 and15.209 & 15.207, part 15 E 15.407 class B requirement, only if the test result comply with FCC part 15C: 15.247 and 15.209 & 15.207 part 15 E 15.407, 15B class B requirement. Then the host can be sold legally.
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 circuity), 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.

FCC Statement

1. 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.
(2)This device must accept any interference received, including interference that may cause undesired operation.
2. Changes or modifications not expressly approved by the party responsible for compliance 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.

The device has been evaluated to meet general RF exposure requirement. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and 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.

The device has been evaluated to meet general RF exposure requirement. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and your body.

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 :
L'appareil ne doit pas produire de brouillage;
L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Cet équipement doit être installé et utilisé avec une distance minimale de 20 cm entre le radiateur et votre

corps.

Operations in the 5.15-5.25GHz band are restricted to indoor usage only.
Les opérations dans la bande 5.15-5.25GHz sont limitées à une utilisation à l'intérieur seulement.