



B-LINK®

BL-M8852BP2

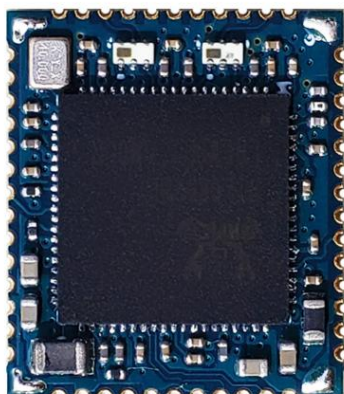
802.11ax 1200Mbps WLAN + BT v5.2

PCI-E Module Specification

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(Top View)



(Bottom View)

Module Name: BL-M8852BP2	
Module Type: 802.11a/b/g/n/ac/ax 1200Mbps WLAN + Bluetooth v5.2 Combo PCI-E Module	
Revision: V1.1	
Customer Approval:	
Company:	
Title:	
Signature:	Date:
Approval:	
Title:	
Signature:	Date:

Revision History

Revision	Summary	Release Date	Revised By
0.1	Initial release	2022-6-30	
1.0	Official version	2022-10-23	
	RF update	2023-5-17	Fnz
1.1	Update key materials and formats	2023-8-4	Fnz

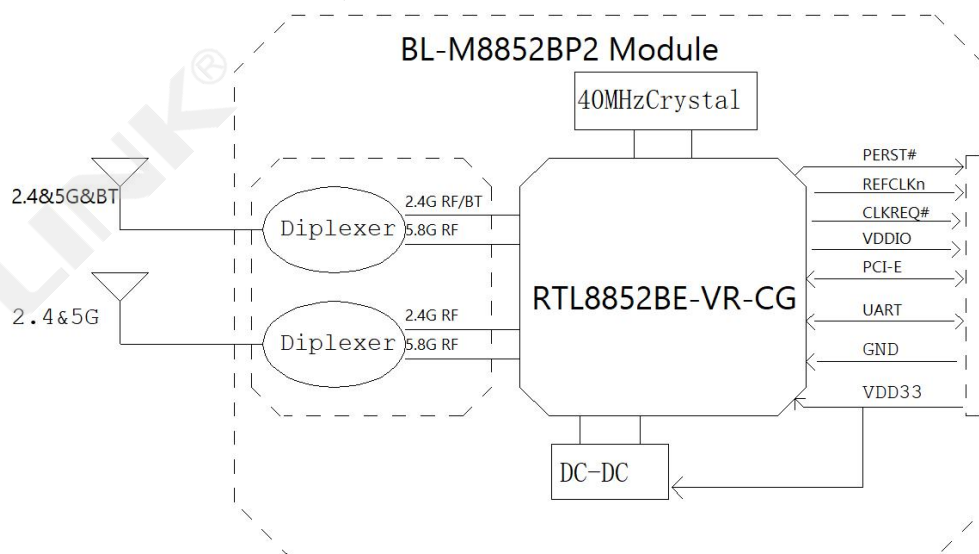
1. Introduction

BL-M8852BP2 is a highly integrated Dual-band WLAN+Bluetooth Combo module. It combines a 2T2R Dual-band WLAN subsystem with PCI Express interface controllers and a Bluetooth v5.2 subsystem with UART interface controller. The module compatible IEEE 802.11a/b/g/n/ac/ax standard and provides the maximum PHY rate up to 1201Mbps, it supports Bluetooth dual mode with v5.2/v4.2/v2.1 compliant. The module 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

- 50pin half hole pads with 13*15*1.7mm ultra small profile
- Operating Frequencies: 2.4~2.4835GHz or 5.15~5.85GHz
- Support Dual-band 2T2R mode with 20/40/80Mhz bandwidth
- Support 802.11ax with OFDMA and MU-MIMO
- Dual Mode Bluetooth support : Simultaneous LE and BR / EDR

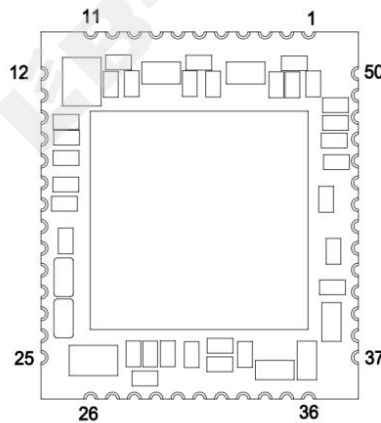
1.2 Block Diagram



1.3 General Specifications

Module Name	BL-M8852BP2
Chipset	RTL8852BE-VR-CG
WLAN Standards	IEEE802.11a/b/g/n/ac/ax
BT Specification	Bluetooth Core Specification v5.2/4.2/2.1
Host Interface	PCI Express 2.1 for WLAN & UART for Bluetooth
Antenna	Connect to the external antenna through half hole pads
Dimension	15.1*13.1*1.7mm (L*W*H)
Power Supply	VDD33=3.3V±0.2V@1200 mA (Max) VDDIO=3.3V±0.2V / 1.8V±0.1V
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	I/O Level	Module Pin Description
1	GND	RF		RF Ground
2	WLAN/BT ANT1	RF		RF Pad for 2.4G WLAN / 5G WLAN / 2.4G BT RF to WLAN/BT_ANT1 and BT_ANT1

3	GND	RF		RF Ground
4	GND	RF		RF Ground
5	GND	RF		RF Ground
6	GND	RF		RF Ground
7	GND	RF		RF Ground
8	GND	RF		RF Ground
9	WLAN ANT0	RF		RF Pad for 2.4G WLAN / 5G WLAN RF to WLAN_ANT0
10	GND	RF		RF Ground
11	GND	RF		RF Ground
12	PERST#	I	VDD33	PCI Express Reset active low input. When the PERST# is asserted at power-on state, the module returns to a pre-defined reset state and is ready for initialization and configuration after the de-assertion of the PERST#
13	NC	-		NC
14	NC	-		NC
15	WL_DIS#	I	VDDIO	WL_DIS# can be defined as the WLAN Radio-off function with host interface remaining connected. When this pin is pulled low, WLAN function will be Radio-off. Shared with GPIO9. Internal pull High by 100K resistor
16	WAKE#	O/D	VDD33	Power Management Event active low open drain output. Used to reactivate the PCI Express bus main power rails and reference clock. This WAKE# can be shared with BT wake up host function via side band signals
17	NC	-		NC
18	HOST_WAKE_WL	I	VDDIO	The Host wakes up WLAN controller in remote Wake up Mode. Suggest configuring the control pin in platform side as open-drain output. Shared with GPIO12
19	PCM_OUT	O	VDDIO	PCM data output. Shared with GPIO1
20	PCM_IN	I	VDDIO	PCM data input. Shared with GPIO0
21	PCM_SYNC	I/O	VDDIO	PCM Frame Sync signal. Shared with GPIO2
22	PCM_CLK	I/O	VDDIO	PCM Clock signal. Shared with GPIO3
23	GND	P		Ground
24	NC	-		NC
25	NC	-		NC
26	NC	-		NC
27	GND	P		Ground
28	NC	-		NC

29	NC	-		NC
30	GND	P		Ground
31	NC	-		NC
32	GND	P		Ground
33	REFCLKn	AI		PCI Express 100MHz differential reference clock input
34	VDDIO	P		Power supply for some digital IO, 3.3V or 1.8V
35	REFCLKp	AI		PCI Express 100MHz differential reference clock input
36	VDD33	P		DC3.3V power supply
37	CLKREQ#	O/D	VDD33	Reference Clock Request open drain output, it used to request for the the reference clock. It also used by L1 PM substates
38	BT_DIS#	I	VDDIO	BT_DIS# can externally shut down the module BT function when its pulled Low, and UART interface will be also disabled. Shared with GPIO11. Internal pull High by 100K resistor
39	GND	P		Ground
40	UART_TX	O	VDDIO	High-speed UART data output
41	UART_RX	I	VDDIO	High-speed UART data input
42	UART_RTS	O	VDDIO	High-speed UART RTS output
43	UART_CTS	I	VDDIO	High-speed UART CTS input
44	PERn	AI		PCI Express device receive differential pair for WLAN
45	PERp	AI		PCI Express device receive differential pair for WLAN
46	PETn	AO		PCI Express device transmit differential pair for WLAN (AC coupling capacitors are integrated on module)
47	PETp	AO		PCI Express device transmit differential pair for WLAN (AC coupling capacitors are integrated on module)
48	NC	-		NC (Reserved RF PAD for BT_ANT)
49	HOST_WAKE_BT	I	VDDIO	The Host wakes up BT controller. Shared with GPIO7
50	BT_WAKE_HOST	O	VDDIO	BT to wake up the Host. Shared with GPIO14

P: Power or Ground; I/O: digital In/Output; O/D:Open Drain digital 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	70	°C
External Antenna VSWR			1.7	2.1	
Supply Voltage	VDD33	3.1	3.3	3.5	V
	VDDIO/3.3V	3.1	3.3	3.5	V
	VDDIO/1.8V	1.7	1.8	1.9	V

3.2 Digital 3.3V IO 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 IO DC Specifications

Symbol	Parameter	Min	Typ	Max	Units
VIH	Input High Voltage	1.7	1.8	3.6	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 ; Ta:25°C			
Use Case	VDD33 Current		
	Typ (I _{RMS})	Max (I _{Peak})	Units
2.4G WLAN TCP throughput TX 360Mbps (Linux Drive, BT disable)	540	870	mA
2.4G WLAN TCP throughput RX 340Mbps (Linux Drive, BT disable)	340	850	mA

5G WLAN TCP throughput TX 800Mbps (Linux Drive, BT disable)	560	950	mA
5G WLAN TCP throughput RX 700Mbps (Linux Drive, BT disable)	350	940	mA
2.4G 11b@11Mbps TX @18dBm (1TX RF test)	460	510	mA
2.4G 11g@6Mbps TX @18dBm (1TX RF test)	180	210	mA
2.4G 11n@HT20_MCS15 TX@17dBm (2TX RF test)	350	820	mA
2.4G 11ax@HE_SU 40M_MCS11 TX@15dBm (2TX RF test)	560	920	mA
2.4G 11ax@HE_SU 40M_MCS11 RX (2RX RF test)	200	240	mA
5G 11a@6Mbps TX @18dBm (1TX RF test)	470	600	mA
5G 11n@HT20_MCS7 TX @16dBm (1TX RF test)	290	560	mA
5G 11ac@VHT80_MCS0 TX@17dBm (2TX RF test)	530	1080	mA
5G 11ac@VHT80_MCS9 TX@16dBm (2TX RF test)	350	980	mA
5G 11ax@HE_SU 80M_MCS0 TX@16dBm (2TX RF test)	500	980	mA
5G 11ax@HE_SU 80M_MCS11 TX@15dBm (2TX RF test)	360	940	mA
5G 11ax@HE_SU 80M_MCS11 RX (2RX RF test)	210	280	mA
BT BR_1M TX@5dBm (BT RF test, WLAN disable)	270	320	mA
BT BR_1M RX Active (BT RF test, WLAN disable)	230	280	mA
BT EDR_3M TX@5dBm (BT RF test, WLAN disable)	280	320	mA
BT EDR_3M RX Active (BT RF test, WLAN disable)	235	280	mA
BT LE_1M TX@5dBm (BT RF test, WLAN disable)	260	320	mA

4. WALN & 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/ax
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;

	802.11ax (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	$\leq \pm 20\text{ppm}$

2.4G Transmitter Specifications (ANT0 & ANT1. 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@1~11Mbps	18	± 2	≤ -15
802.11g@6Mbps	18	± 2	≤ -15
802.11g@54Mbps	17	± 2	≤ -25
802.11n@HT20_MCS0	18	± 2	≤ -10
802.11n@HT20_MCS7	17	± 2	≤ -28
802.11n@HT40_MCS0	17	± 2	≤ -10
802.11n@HT40_MCS7	16	± 2	≤ -28
802.11ax@HE_SU 20M_MCS0	16	± 2	≤ -15
802.11ax@HE_SU 20M_MCS11	15	± 2	≤ -35
802.11ax@HE_SU 40M_MCS0	16	± 2	≤ -15
802.11ax@HE_SU 40M_MCS11	15	± 2	≤ -35

2.4G Receiver Specifications (WLAN ANT0&WLAN ANT1)

RX Rate	Min Input Level (dBm)	Max Input Level (dBm)	PER
802.11b@1Mbps	-94	-5	< 8%
802.11b@11Mbps	-90	-5	< 8%
802.11g@6Mbps	-93	-5	< 10%
802.11g@54Mbps	-75	-5	< 10%
802.11n@HT20_MCS0	-92	-5	< 10%

802.11n@HT20_MCS7	-73	-5	< 10%
802.11n@HT40_MCS0	-91	-5	< 10%
802.11n@HT40_MCS7	-70	-5	< 10%
802.11ax@HE_SU 20M_MCS0	-90	-5	< 10%
802.11ax@HE_SU 20M_MCS11	-62	-5	< 10%
802.11ax@HE_SU 40M_MCS0	-89	-5	< 10%
802.11ax@HE_SU 40M_MCS11	-60	-5	< 10%

4.2 5G WLAN RF Specification

Conditions: VDD33 =3.3V; 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,26~484RU): MCS0~MCS11(1T1R) 0.4~286.8Mbps; 802.11ax (HE_MU,26~484RU): MCS0~MCS11(2T2R) 0.8~573.5Mbps;

	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) 30.6~1201Mbps;
Frequency Tolerance	$\leq \pm 20\text{ppm}$

5G Transmitter Specifications (ANT0 & ANT1. 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)
802.11a@6Mbps	18	± 2	≤ -10
802.11a@54Mbps	17	± 2	≤ -25
802.11n@HT20_MCS0	17	± 2	≤ -13
802.11n@HT20_MCS7	16	± 2	≤ -28
802.11n@HT40_MCS0	17	± 2	≤ -13
802.11n@HT40_MCS7	16	± 2	≤ -28
802.11ac@VHT20_MCS0	17	± 2	≤ -13
802.11ac@VHT20_MCS8	16	± 2	≤ -30
802.11ac@VHT80_MCS0	17	± 2	≤ -13
802.11ac@VHT80_MCS9	16	± 2	≤ -32
802.11ax@HE_SU80_MCS0	16	± 2	≤ -13
802.11ax@HE_SU80_MCS11	15	± 2	≤ -35

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	-92	-5	< 10%
802.11n@HT20_MCS7	-72	-5	< 10%
802.11n@HT40_MCS0	-89	-5	< 10%
802.11n@HT40_MCS7	-69	-5	< 10%
802.11ac@VHT80_MCS0	-85	-5	< 10%
802.11ac@VHT80_MCS9	-60	-5	< 10%
802.11ax@HE_SU80_MCS0	-86	-5	< 10%

802.11ax@HE_SU80_MCS11	-58	-5	< 10%
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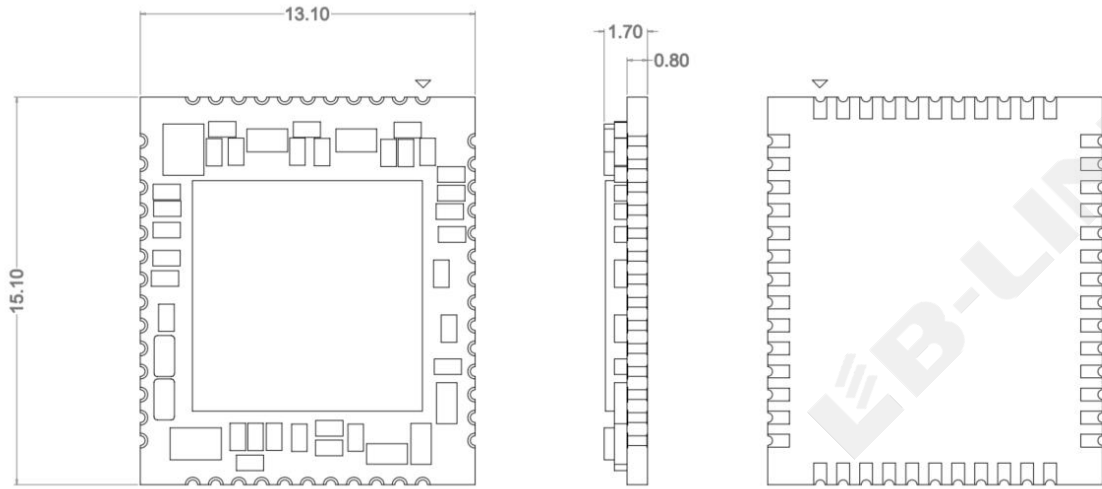
4.3 Bluetooth RF Specification

Conditions: VDD33=3.3V; Ta:25°C			
Features	Description		
Bluetooth Specification	Bluetooth Core Specification v5.2/4.2/2.1		
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: $\pi/4$ -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 ANT1)			
Items	Min (dBm)	Typ (dBm)	Max (dBm)
TX Power			
BR_1M	0	5	10
EDR_2/3M	0	5	10
LE_125K/500K/1M/2M	0	5	10
Items	Min	Typ	Max
BR_1M (DH1) Modulation Characteristics			
Δf_{1avg}	140KHz	164.94KHz	175KHz
Δf_{2avg}	115KHz	153.25KHz	175KHz
Δf_{2max}	115KHz	161.21KHz	/
$\Delta f_{2avg}/\Delta f_{1avg}$	0.8	0.929	/
Items	Min	Typ	Max
EDR_3M(3DH5) EDR Carrier Frequency Stability and Modulation Accuracy			

ω_i	-75KHz	3.73KHz	+75KHz	
$\omega_i + \omega_o$	-75KHz	4.07KHz	+75KHz	
ω_o	-10KHz	0.323KHz	+10KHz	
8DPSK RMS DEVM	/	0.041	0.13	
8DPSK DEVM	/	0.085	0.25	
Items	Min	Typ	Max	
LE_1M Modulation Characteristics				
Δf_{1avg}	225KHz	250.4KHz	275KHz	
Δf_{2avg}	185KHz	232.1KHz	275KHz	
Δf_{2max}	185KHz	240.3KHz	/	
$\Delta f_{2avg}/\Delta f_{1avg}$	0.8	0.926	/	
Items	Min	Typ	Max	
LE_2M Modulation Characteristics				
Δf_{1avg}	450KHz	500.25KHz	550KHz	
Δf_{2avg}	370KHz	493.87KHz	550KHz	
Δf_{2max}	370KHz	469.4KHz	/	
$\Delta f_{2avg}/\Delta f_{1avg}$	0.8	0.987	/	
Bluetooth Receiver Specifications(BT_ANT)				
Items	Sensitivity		Maximum Input Level	
	Input Level(dBm)	BER	Input Level(dBm)	BER
BR_1M (DH1)	-90	$\leq 0.1\%$	-5	$\leq 0.1\%$
EDR_2M(DH1)	-90	$\leq 0.01\%$	-10	$\leq 0.1\%$
EDR_3M (3DH5)	-80	$\leq 0.01\%$	-5	$\leq 0.1\%$
	Input Level (dBm)	PER	Input Level (dBm)	PER
LE_125/500K	-92	$\leq 5\%$	-5	$\leq 5\%$
LE_1M	-88	$\leq 5\%$	-5	$\leq 5\%$
LE_2M	-84	$\leq 5\%$	-5	$\leq 5\%$

5. Mechanical Specifications

5.1 Module Outline Drawing

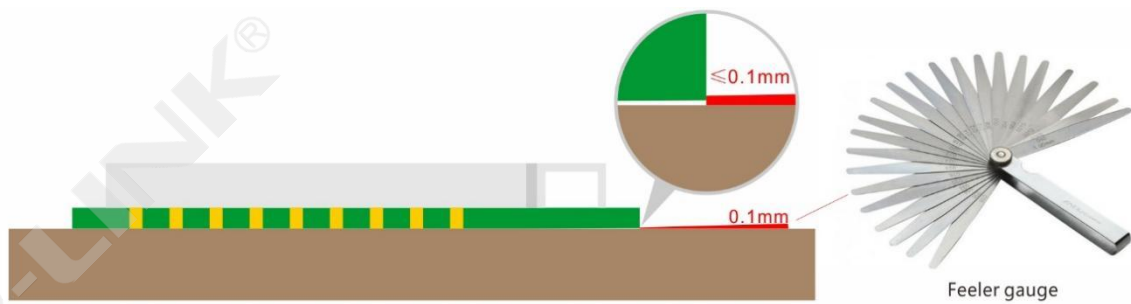


(Top View)

(Side View)

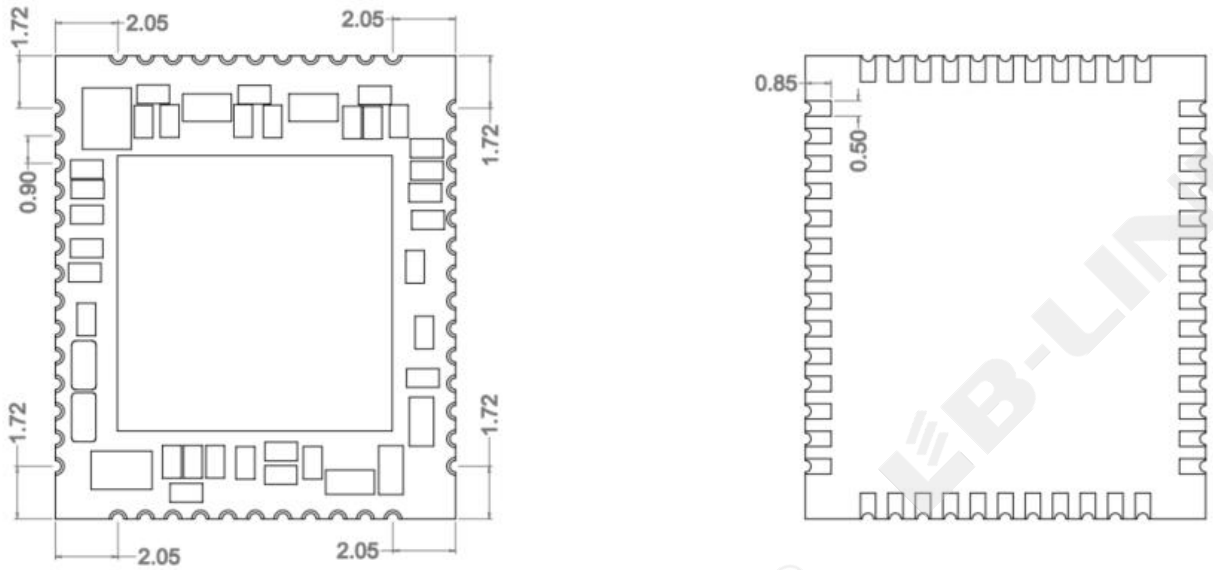
(Bottom View)

Module dimension: 15.1*13.1*1.7mm(L*W*H; Tolerance: $\pm 0.15\text{mm}$)



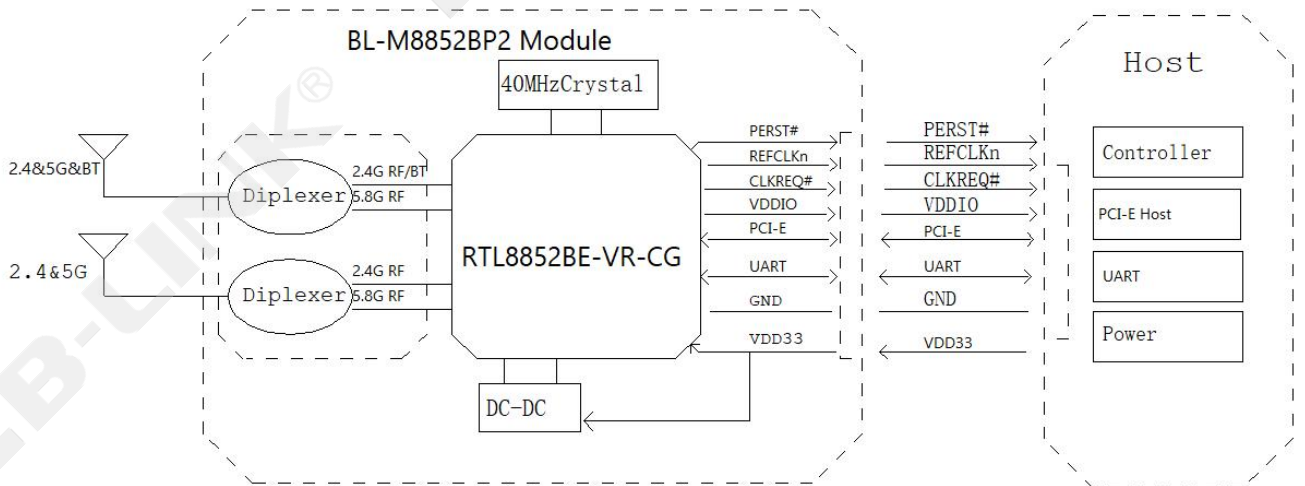
Module Bow and Twist: $\leq 0.1\text{mm}$

5.2 Mechanical Dimensions

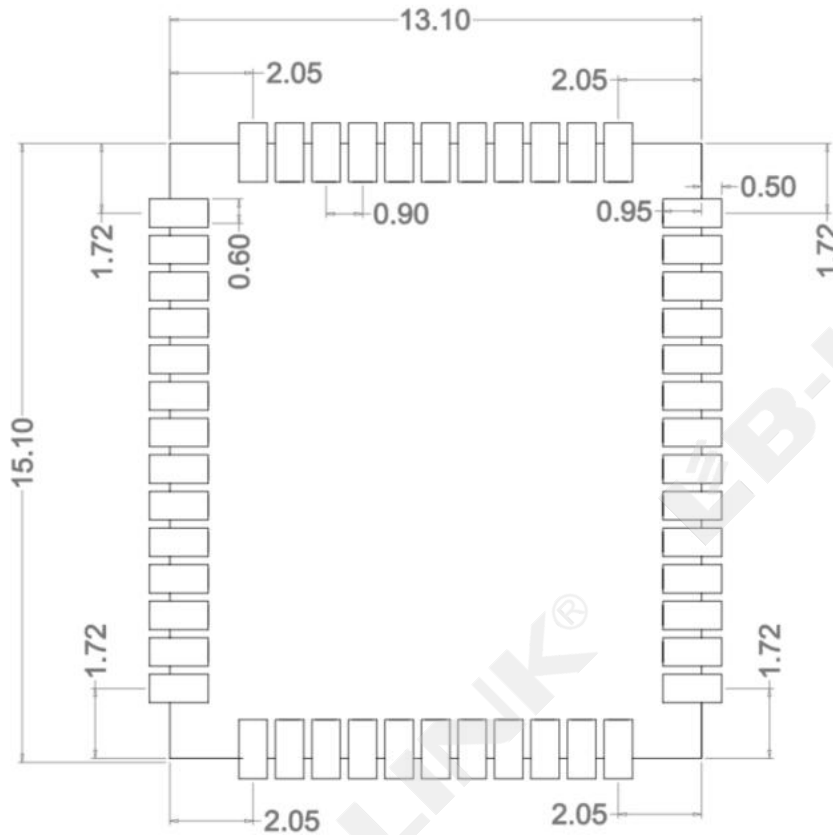


6. Application Information

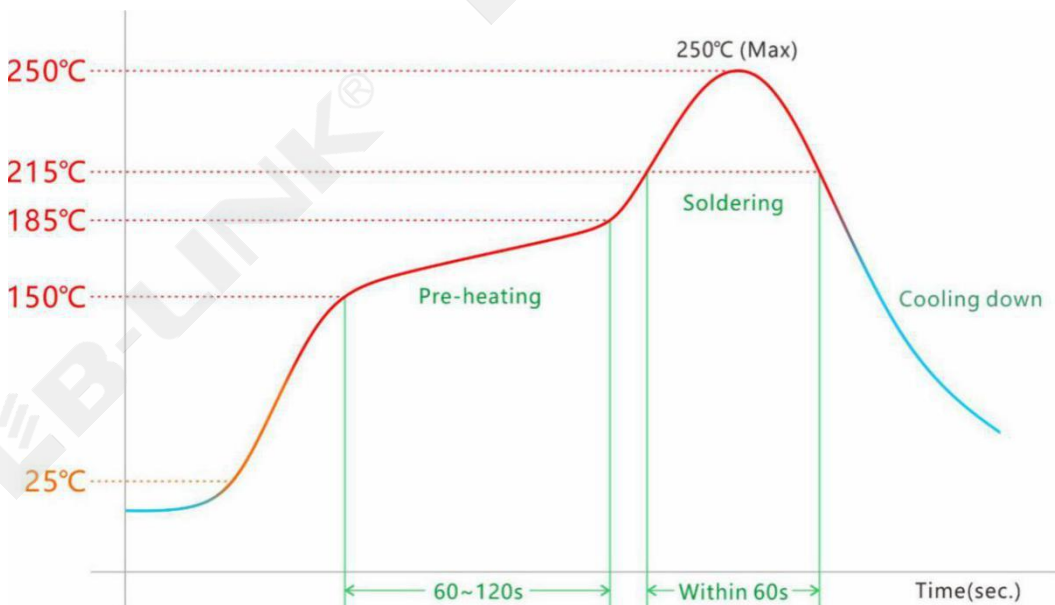
6.1 Typical Application Circuit



6.2 Recommend PCB Layout Footprint



6.3 Reflow Soldering Standard Conditions



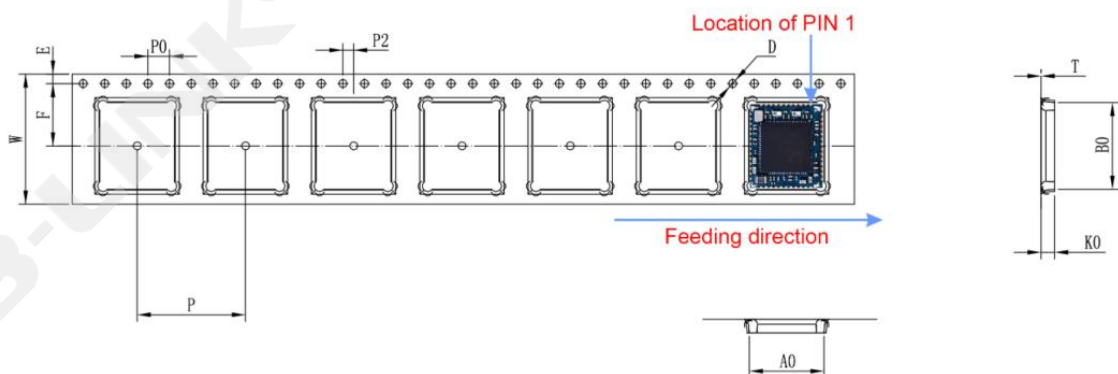
Please use the reflow within 2 times.
Set up the highest temperature within 250°C.

7. Key Components Of Module

No.	Parts	Specification	Manufacturer	Note
1	Chipset	RTL8852BE-VR-CG	Realtek Semiconductor Corp.	
2	PCB	BL-M8852BP2	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.	
			SHENZHEN KAIYUEXIANG ELECTRONICS CO., LTD	
4	Diplexer	1608	Advanced Ceramic X Corp.	
			Dongguan Hekang Electronics Co.,LTD	
5	Power inductor	2.2uH	Shenzhen Sunlord Electronics Co.,Ltd.	
			Maijie Micro Electronic Technology 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	13.40±0.1	15.60±0.1	2.70±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. 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 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°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:

- 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