

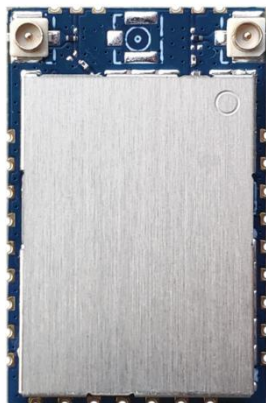


BL-M7920XU1

**802.11ax 1200Mbps WLAN + BT v5.3
USB3.0 Module Specification**

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(Top View)



(Bottom View)

Module Name: BL-M7920XU1	
Module Type: 802.11a/b/g/n/ac/ax 1200Mbps WLAN + Bluetooth v5.3 Combo USB3.0 Module	
Revision: V1.0	
Customer Approval:	
Company:	
Title:	
Signature:	Date:
B-link Approval:	
Title:	
Signature:	Date:

Revision History

Revision	Summary	Release Date	Revised By
0.1	Initial release	2023-08-09	Fnz
1.0	Official release	2023-10-25	Fnz

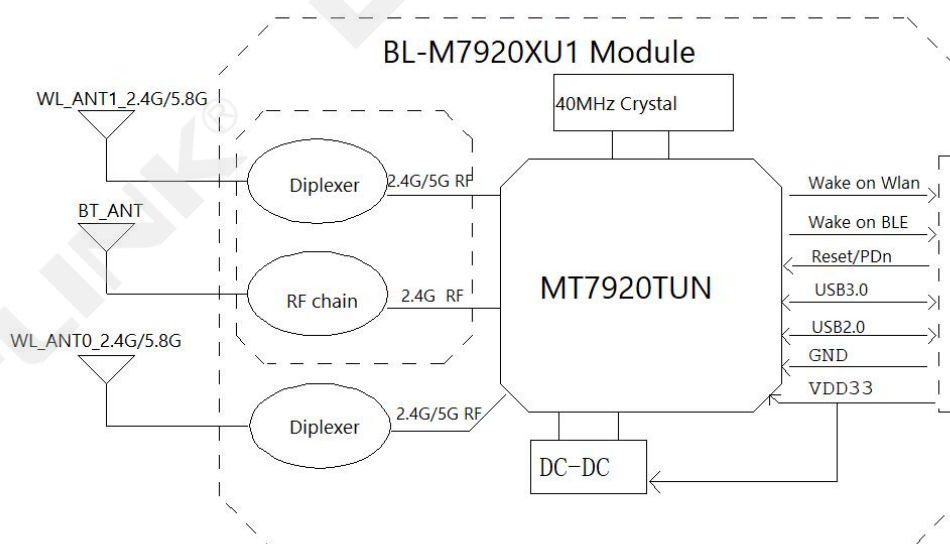
1. Introduction

BL-M7920XU1 is a highly integrated Dual-band WLAN + Bluetooth v5.3 Combo module. It combines a 2T2R Dual-band WLAN subsystem and a Bluetooth v5.3 subsystem, This module compatible IEEE 802.11 a/b/g/n/ac/ax standard and provides the maximum PHY rate up to 1200Mbps, it supports BT / BLE dual mode with BT v5.3/v4.2/v2.1 compliant, offering feature-rich wireless connectivity at high standards, and delivering reliable, cost-effective throughput from an extended distance.

1.1 Features

- Operating Frequency: 2.4~2.4835GHz or 5.15~5.85GHz
- IEEE Standards: IEEE 802.11a/b/g/n/ac/ax
- Wireless PHY rate can reach up to 1200Mbps
- Support BT Classic / BT Low Energy dual mode
- DC 3.3V±0.2V main power supply

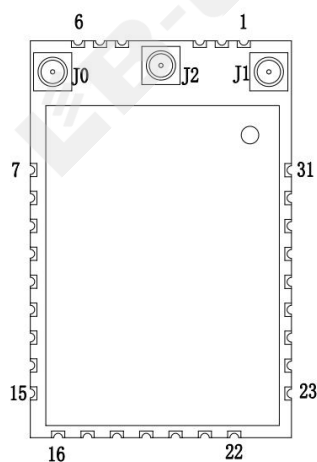
1.2 Block Diagram



1.3 General Specifications

Module Name	BL-M7920XU1
Chipset	MT7920TUN
WLAN Standards	IEEE 802.11 a/b/g/n/ac/ax
BT Specification	Bluetooth Core Specification v5.3/4.2/2.1
Host Interface	USB3.0/USB2.0 for WLAN & Bluetooth
Antenna	Connect to the external antennas through IPEX connectors Half hole PADs for external BT antenna (Reserved IPEX connector for BT)
Dimension	27.0*17.8*2.4mm (L*W*H)
Power Supply	DC 3.3V±0.2V @1200mA (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	Description
1	GND	RF		RF Ground for WLAN_ANT1
2	NC	RF		NC (Reserved 2.4G / 5G RF PAD for WLAN_ANT1)

3	GND	RF		RF Ground for WLAN_ANT1
4	GND	RF		RF Ground for WLAN_ANT0
5	NC	RF		NC (Reserved 2.4G / 5G RF PAD for WLAN_ANT0)
6	GND	RF		RF Ground for WLAN_ANT0
7	GND	P		Ground connections
8	NC	-		NC
9	NC	-		NC
10	GND	P		Ground connections
11	GPIO_UART_TXD_BT	I/O	3.3V	Function1: GPIO15, output, shall not be used as input; Function2: UART TXD_BT output; Function3: BT Host Interface Select Boot strap: 0: USB (internal pull low by 10K resistor) 1: UART If not used, this Pin can be left floating.
12	GPIO_UART_RXD_BT	I/O	3.3V	1、GPIO14, I/O; 2、UART RXD_BT input. If not used, this Pin can be left floating.
13	GND	P		Ground connections
14	USB3SSTX-	AO		USB 3.0 Device SuperSpeed Interface TX differential pair, DC blocked output (to connect USB 3.0 Host "SSRX-") If USB3.0 is not used, this Pin can be left floating.
15	USB3SSTX+	AO		USB 3.0 Device SuperSpeed Interface TX differential pair, DC blocked output (to connect USB 3.0 Host "SSRX+") If USB3.0 is not used, this Pin can be left floating.
16	USB3SSRX-	AI		USB 3.0 Device SuperSpeed Interface RX differential pair (to connect USB 3.0 Host "SSTX-") If USB3.0 is not used, this Pin can be left floating.
17	USB3SSRX+	AI		USB 3.0 Device SuperSpeed Interface RX differential pair (to connect USB 3.0 Host "SSTX+") If USB3.0 is not used, this Pin can be left floating.
18	GND	P		Ground connections
19	HSD+	A I/O		USB 2.0 Device HighSpeed Interface differential pair (to connect USB 2.0/3.0 Host "HSD+")
20	HSD-	A I/O		USB 2.0 Device HighSpeed Interface differential pair (to connect USB 2.0/3.0 Host "HSD-")
21	VDD33	P		DC 3.3V power supply

22	Reset	I	3.3V	Reset active low input, this Pin can externally shutdown/ reset the module, internal pull high by 10K resistor. The external Reset input signal should remain asserted for 1mS at least. If not used, this Pin can be left floating.
23	GPIO	I/O	3.3V	1、GPIO7, output, shall not be used as input; 2、Normal/Test mode Select Boot strap: 0 : Normal mode (internal pull low by 10K resistor) 1 : Test mode If not used, this Pin can be left floating.
24	GPIO_UART_RTS_BT	I/O	3.3V	1、GPIO11, output, shall not be used as input; 2、UART RTS_BT output; 3、USB3.0 Frequency Select_Boot strap: 0: USB 2.5GHz bit half super speed Mode 1: USB 5GHz Mode (internal pull high by 10K resistor) If not used, this Pin can be left floating.
25	GPIO_UART_CTS_BT	I/O	3.3V	1、GPIO12, I/O; 2、UART RTS_BT input; 3、WLAN Wake up Host, Active high output (need a external 10K pull low resistor); 4、802.11mc TSF timing synchronization input. If not used, this Pin can be left floating.
26	NC	-		NC
27	GPIO_WL_DIS	I/O	3.3V	1、GPIO5, I/O; 2、Reserved for WLAN Radio-off function. If not used, this Pin can be left floating.
28	GPIO_BT_Stereo	I/O	3.3V	1、GPIO3, output, shall not be used as input; 2、BT_Stereo output. 3、XTAL clock mode Select_Boot strap: 0: 40MHz XTAL(internal weak pull low, do not pull high during power up!) If not used, this Pin can be left floating.
29	GND	RF		RF Ground for BT_ANT
30	BT_RF	RF		RF PAD for BT_ANT
31	GND	RF		RF Ground for BT_ANT
J0	WLAN_RF0	RF		IPEX connector for 2.4G / 5G RF to WLAN_ANT0
J1	WLAN_RF1	RF		IPEX connector for 2.4G / 5G RF to WLAN_ANT1
J2	NC	NC		NC (Reserved IPEX connector PAD for BT_ANT)

P: Power or Ground; I/O: In/Output; I: Input; O :Output; O/D:Open Drain Output; A I/O: Analog In/Output; AI: Analog Input; AO: Analog 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	/
Supply Voltage	VDD33	3.1	3.3	3.5	V

3.2 Digital I/O DC Specifications

Symbol	Parameter	Min	Typ	Max	Units
VIH	Input High Voltage	VDD33*0.625	--	VDD33+0.3	V
VIL	Input Low Voltage	-0.3	--	VDD33*0.25	V
VOH	Output High Voltage	VDD33*0.75	--	VDD33+0.3	V
VOL	Output Low Voltage	-0.3	--	VDD33*0.125	V

3.3 Current Consumption

Conditions : VDD33=3.3V ; Ta:25°C			
Use Case	VDD33 Current		
	Typ(I _{RMS})	Max(I _{Peak})	Units
WLAN & BT Unassociated (Linux Driver)	137	145	mA
BT MP3 playback (Linux Driver, WLAN disable)	137	145	mA
2.4G WLAN TCP throughput TX 420Mbps (Linux Drive, BT disable)	461	760	mA
2.4G WLAN TCP throughput RX 400Mbps (Linux Drive, BT disable)	204	740	mA
5G WLAN TCP throughput TX 780Mbps (Linux Driver)	648	880	mA
5G WLAN TCP throughput RX 800Mbps (Linux Driver)	240	820	mA
2.4G 11b 1Mbps TX@20dBm (1TX RF test)	419	448	mA
2.4G 11b 11Mbps TX@20dBm (1TX RF test)	344	465	mA
2.4G 11b 1Mbps RX (1RX RF test)	95	100	mA
2.4G 11a 6Mbps TX @19dBm (1TX RF test)	348	432	mA

2.4G HE_SU 20MHz MCS0 TX@18dBm (2TX RF test)	371	784	mA
2.4G HE_SU 20MHz MCS0 RX (2RX RF test)	109	120	mA
2.4G HE_SU 40MHz MCS11 TX@14dBm (2TX RF test)	225	584	mA
2.4G HE_SU 40MHz MCS11 RX (2RX RF test)	109	120	mA
5G 11a 6Mbps TX @19dBm (1TX RF test)	293	416	mA
5G 11a 6Mbps RX (1RX RF test)	119	131	mA
5G HE_SU 80MHz MCS0 TX@17dBm (2TX RF test)	422	912	mA
5G HE_SU 80MHz MCS11 TX@13dBm (2TX RF test)	271	720	mA
5G HE_SU 80MHz MCS11 RX (2RX RF test)	144	150	mA
BT BR_1M TX@8dBm (BT RF test, WLAN disable)	90	100	mA
BT BR_1M RX Active (BT RF test, WLAN disable)	41	50	mA
BT EDR_3M TX@5dBm (BT RF test, WLAN disable)	82	100	mA
BT LE_1M TX@5dBm (BT RF test, WLAN disable)	69	80	mA
BT LE_2M TX@5dBm (BT RF test, WLAN disable)	60	70	mA
BT LE_2M RX Active (BT RF test, WLAN disable)	48	60	mA

4. WLAN 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, 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; 802.11ax (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 (WLAN_ANT0&WLAN_ANT1)

TX Rate	TX Power	TX Power Tolerance	EVM
802.11b@1~11Mbps	20dBm	$\pm 2\text{dBm}$	$\leq -10\text{dB}$
802.11g@6Mbps	19dBm	$\pm 2\text{dBm}$	$\leq -15\text{dB}$
802.11g@54Mbps	17dBm	$\pm 2\text{dBm}$	$\leq -25\text{dB}$
802.11n@HT20_MCS0	18dBm	$\pm 2\text{dBm}$	$\leq -10\text{dB}$
802.11n@HT20_MCS7	16dBm	$\pm 2\text{dBm}$	$\leq -28\text{dB}$
802.11n@HT40_MCS0	18dBm	$\pm 2\text{dBm}$	$\leq -10\text{dB}$
802.11n@HT40_MCS7	16dBm	$\pm 2\text{dBm}$	$\leq -28\text{dB}$
802.11ax@HE_SU 20M_MCS0	18dBm	$\pm 2\text{dBm}$	$\leq -10\text{dB}$
802.11ax@HE_SU 20M_MCS11	14dBm	$\pm 2\text{dBm}$	$\leq -35\text{dB}$
802.11ax@HE_SU 40M_MCS0	18dBm	$\pm 2\text{dBm}$	$\leq -10\text{dB}$
802.11ax@HE_SU 40M_MCS11	14dBm	$\pm 2\text{dBm}$	$\leq -35\text{dB}$

2.4G Receiver Specifications (WLAN_ANT0&WLAN_ANT1)

RX Rate	Min Input Level(Typ)	Max Input Level(Typ)	PER
802.11b@1Mbps	-94dBm	-10dBm	< 8%
802.11b@11Mbps	-88dBm	-10dBm	< 8%
802.11g@6Mbps	-92dBm	-10dBm	< 10%
802.11g@54Mbps	-73dBm	-10dBm	< 10%
802.11n@HT20_MCS0	-92dBm	-10dBm	< 10%

802.11n@HT20_MCS7	-72dBm	-10dBm	< 10%
802.11n@HT40_MCS0	-89dBm	-10dBm	< 10%
802.11n@HT40_MCS7	-69dBm	-10dBm	< 10%
802.11ax@HE_SU 20M_MCS0	-91dBm	-10dBm	< 10%
802.11ax@HE_SU 20M_MCS11	-61dBm	-10dBm	< 10%
802.11ax@HE_SU 40M_MCS0	-88dBm	-10dBm	< 10%
802.11ax@HE_SU 40M_MCS11	-58dBm	-10dBm	< 10%

4.2 5G WLAN RF Specification

Conditions: VDD33=3.3V; Ta:25°C	
Features	Description
WLAN Standard	IEEE 802.11a/n/ac/ax, 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; 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 (WLAN_ANT0&WLAN_ANT1)

TX Rate	TX Power	TX Power Tolerance	EVM
802.11a@6Mbps	19dBm	$\pm 2\text{dBm}$	$\leq -10\text{dB}$
802.11a@54Mbps	17dBm	$\pm 2\text{dBm}$	$\leq -25\text{dB}$
802.11n@HT20_MCS0	18dBm	$\pm 2\text{dBm}$	$\leq -10\text{dB}$
802.11n@HT20_MCS7	16dBm	$\pm 2\text{dBm}$	$\leq -28\text{dB}$
802.11n@HT40_MCS0	18dBm	$\pm 2\text{dBm}$	$\leq -10\text{dB}$
802.11n@HT40_MCS7	16dBm	$\pm 2\text{dBm}$	$\leq -28\text{dB}$
802.11ac@VHT20_MCS0	18dBm	$\pm 2\text{dBm}$	$\leq -10\text{dB}$
802.11ac@VHT20_MCS8	15dBm	$\pm 2\text{dBm}$	$\leq -30\text{dB}$
802.11ac@VHT40_MCS0	18dBm	$\pm 2\text{dBm}$	$\leq -10\text{dB}$
802.11ac@VHT40_MCS9	15dBm	$\pm 2\text{dBm}$	$\leq -32\text{dB}$
802.11ac@VHT80_MCS0	18dBm	$\pm 2\text{dBm}$	$\leq -10\text{dB}$
802.11ac@VHT80_MCS9	14dBm	$\pm 2\text{dBm}$	$\leq -32\text{dB}$
802.11ax@HE_SU 20M_MCS0	18dBm	$\pm 2\text{dBm}$	$\leq -10\text{dB}$
802.11ax@HE_SU 20M_MCS11	14dBm	$\pm 2\text{dBm}$	$\leq -35\text{dB}$
802.11ax@HE_SU 80M_MCS0	17dBm	$\pm 2\text{dBm}$	$\leq -10\text{dB}$
802.11ax@HE_SU 80M_MCS11	13dBm	$\pm 2\text{dBm}$	$\leq -35\text{dB}$

5G Receiver Specifications (WLAN_ANT0&WLAN_ANT1)

RX Rate	Min Input Level(Typ)	Max Input Level(Typ)	PER
802.11a@6Mbps	-92dBm	-10dBm	< 10%
802.11a@54Mbps	-73dBm	-10dBm	< 10%
802.11n@HT20_MCS0	-92dBm	-10dBm	< 10%
802.11n@HT20_MCS7	-72dBm	-10dBm	< 10%
802.11n@HT40_MCS0	-89dBm	-10dBm	< 10%
802.11n@HT40_MCS7	-69dBm	-10dBm	< 10%

802.11ac@VHT80_MCS0	-86dBm	-10dBm	< 10%
802.11ac@VHT80_MCS9	-59dBm	-10dBm	< 10%
802.11ax@HE_SU 80M_MCS0	-86dBm	-10dBm	< 10%
802.11ax@HE_SU 80M_MCS11	-56dBm	-10dBm	< 10%

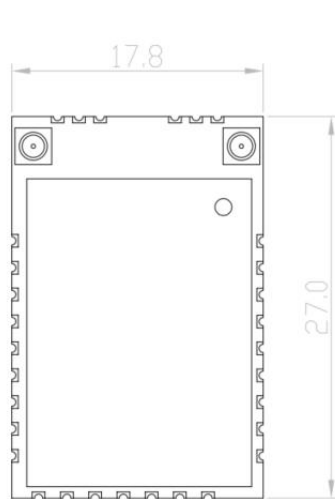
4.3 Bluetooth RF Specification

Conditions: VDD33=3.3V; Ta:25℃			
Features	Description		
Bluetooth Specification	Bluetooth Core Specification v5.3/4.2/2.1		
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 BR/EDR: 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_ANT)			
Items	Min	Typ	Max
TX Power			
BR_1M	5dBm	8dBm	11dBm
EDR_2/3M	2dBm	5dBm	8dBm
LE_125K/500K/1M/2M	2dBm	5dBm	8dBm
Items	Min	Typ	Max
BR_1M (DH1) Modulation Characteristics			
Δf_{1avg}	140KHz	165.1kHz	175KHz
Δf_{2avg}	115KHz	149.9kHz	/
Δf_{2max}	115KHz	155.2kHz	/

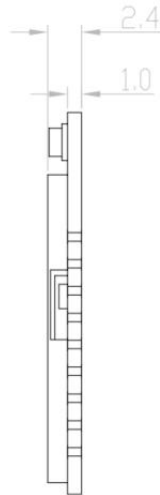
$\Delta f_{2avg}/\Delta f_{1avg}$	0.8	0.96	/	
BR_1M (DH1) Initial Carrier Frequency Tolerance				
Init Freq Error	-75kHz	-13.3kHz	+75kHz	
EDR_3M(3DH5) EDR Carrier Frequency Stability and Modulation Accuracy				
ω_i	-75KHz	-2.98KHz	+75KHz	
$\omega_i+\omega_o$	-75KHz	-3.2KHz	+75KHz	
ω_o	-10KHz	-0.3KHz	+10KHz	
8DPSK RMS DEVM	/	0.042	0.13	
8DPSK Peak DEVM	/	0.085	0.25	
LE_1M Modulation Characteristics				
Δf_{1avg}	225KHz	252.24KHz	275KHz	
Δf_{2avg}	185KHz	226.9KHz	/	
Δf_{2max}	185KHz	219.21KHz	/	
$\Delta f_{2avg}/\Delta f_{1avg}$	0.8	0.899	/	
LE_2M Modulation Characteristics				
Δf_{1avg}	450KHz	499.72KHz	550KHz	
Δf_{2avg}	370KHz	494.59KHz	/	
Δf_{2max}	370KHz	474.7KHz	/	
$\Delta f_{2avg}/\Delta f_{1avg}$	0.8	0.989	/	
Bluetooth Receiver Specifications (BT_ANT)				
Items	Sensitivity		Maximum Input Level	
	Input Level(Typ)	BER	Input Level(Typ)	BER
BR_1M(1DH1)	-90dBm	$\leq 0.1\%$	-5dBm	$\leq 0.1\%$
EDR_2M(2DH1)	-80dBm	$\leq 0.01\%$	-5dBm	$\leq 0.1\%$
EDR_3M(3DH5)	-80dBm	$\leq 0.01\%$	-5dBm	$\leq 0.1\%$
	Input Level (Typ)	PER	Input Level (Typ)	PER
LE_125K/500K	-92dBm	$\leq 5\%$	-5dBm	$\leq 5\%$
LE_1M	-88dBm	$\leq 5\%$	-5dBm	$\leq 5\%$
LE_2M	-84dBm	$\leq 5\%$	-5dBm	$\leq 5\%$

5. Mechanical Specifications

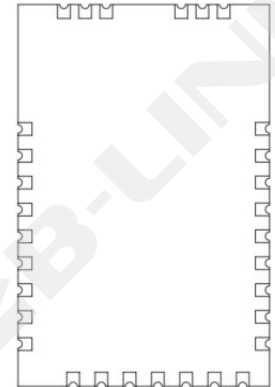
5.1 Module Outline Drawing



(Top View)



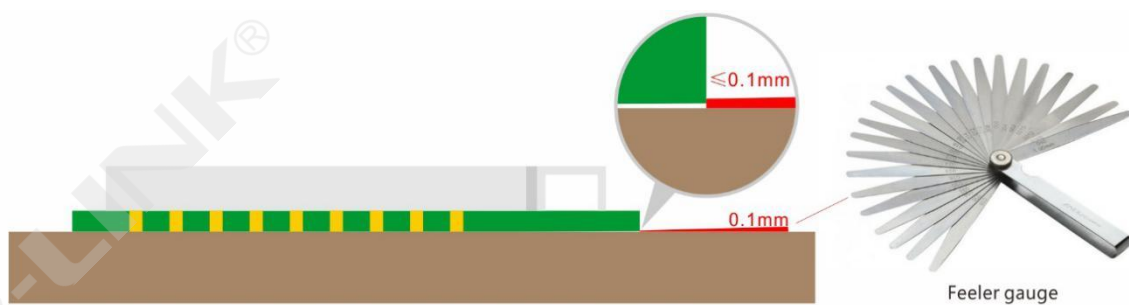
(Side View)



(Bottom View)

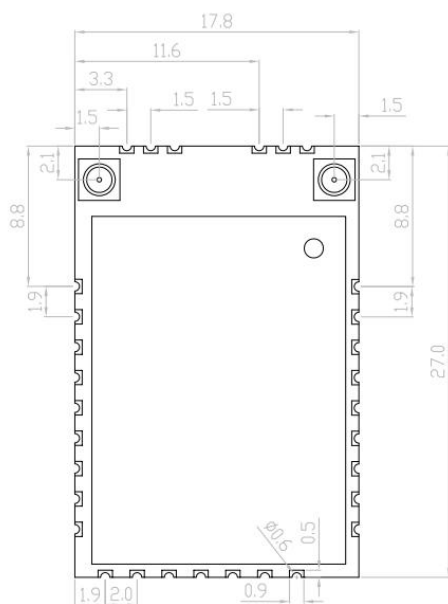
Module dimension: 27.0mm*17.8mm*2.4mm (L*W*H; Tolerance: $\pm 0.3\text{mm}_L/W$, $\pm 0.2\text{mm}_H$)

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

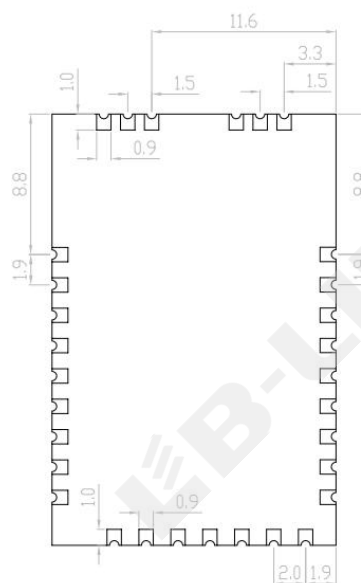


Module Bow and Twist: $\leq 0.1\text{mm}$

5.2 Mechanical Dimensions



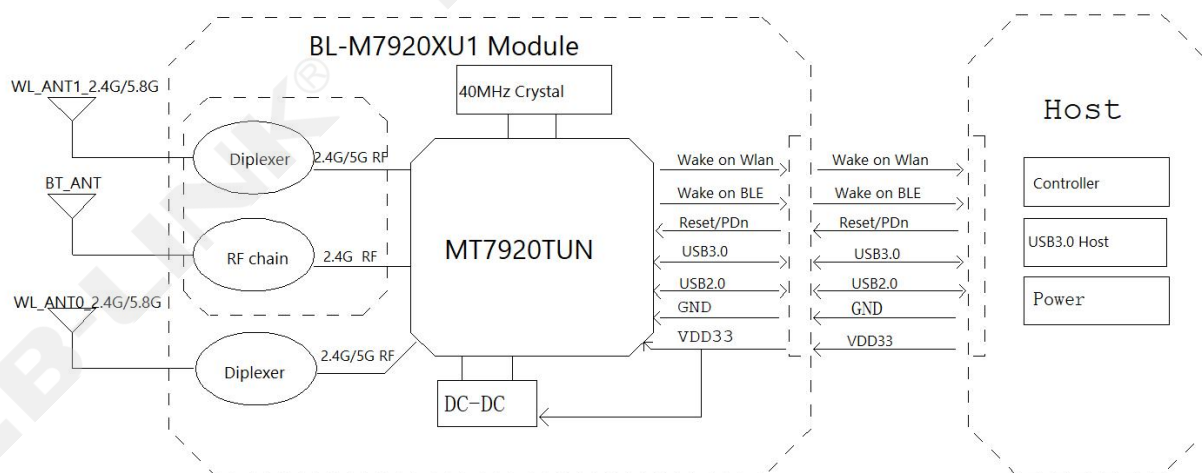
(Top View)



(Bottom View)

6. Application Information

6.1 Typical Application Circuit



6.2 External Antenna Isolation

Isolation of BT_ANT and WLAN_ANT $\geq 30\text{dB}$ for better BT and WLAN T/RX Concurrent performance;

Isolation of WLAN_ANT0 and WLAN_ANT1 $\geq 17\text{dB}$ (2.4G band) & $\geq 20\text{dB}$ (5G band) for better MIMO Application;

6.3 Reset input requirement

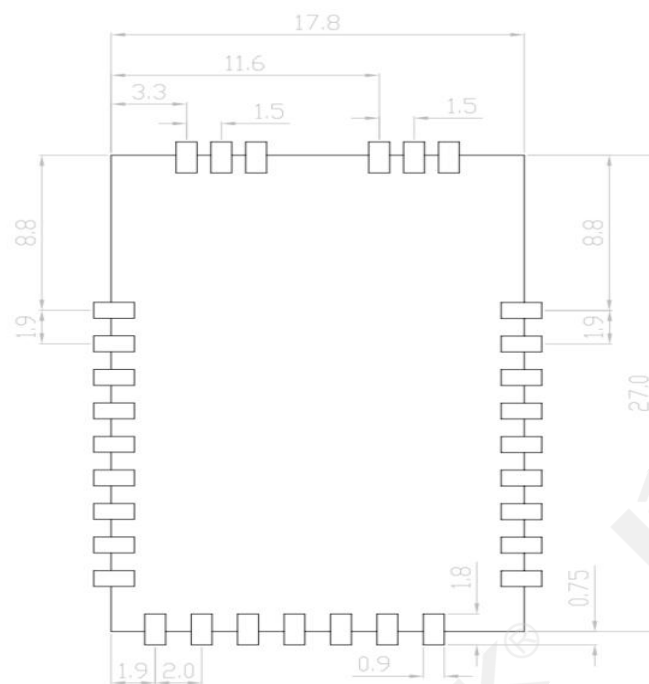
The module has built-in power on reset function, an external Reset signal can also be input from Pin22.

- A、 Power on reset: When VDD33 is powered on and reaches 2.85V, a stable waiting time $> 55.1\text{ms}$ is required for the crystal oscillator. Then the external Reset signal continues to remain asserted ($< 0.9\text{V}$) $> 1\text{ms}$. When the external Reset signal goes to high level ($> 1.2\text{V}$), BL-M7920XU1 releases reset and enters the ready state.
- B、 Hot reset: When the module is ready, external Reset signal drops from high to low level ($< 0.9\text{V}$) and remains at least 1ms, then rises again to high level ($> 1.2\text{V}$), the module completes a hot reset and re-enter the ready state.
- C、 Cold reset: When the module is ready, VDD33 power down and remain at a low level ($< 0.4\text{V}$) least 1ms, then power on again and repeat the process of A above.

6.4 USB interface Design Guidelines

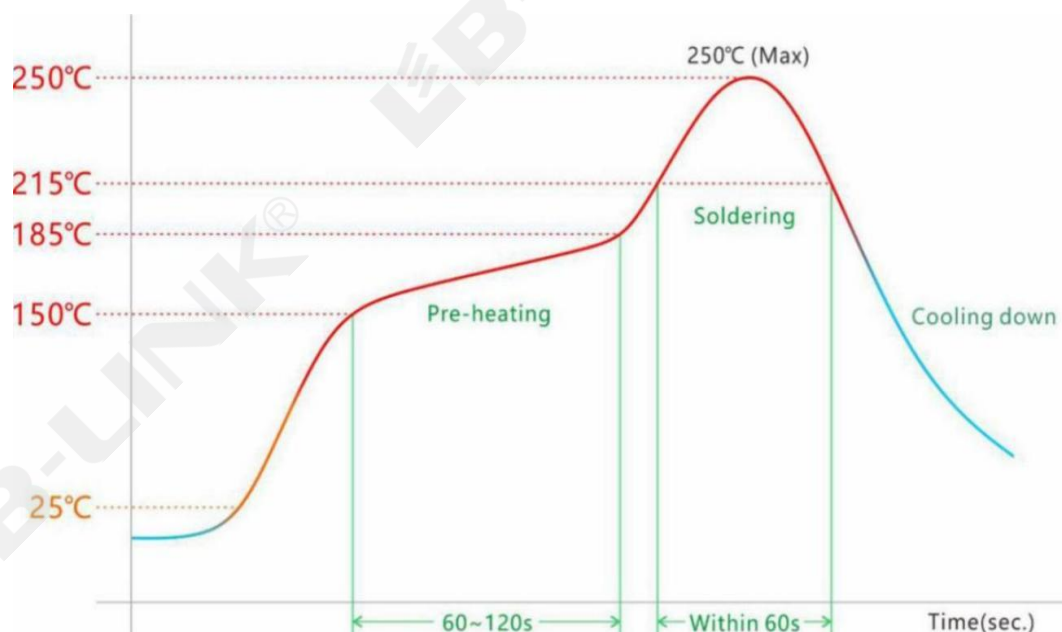
- A、 BL-M7920XU1 supports a USB device port which is fully compliant with USB v3.0 specification.
The Module can provide a concurrent operation of WLAN and Bluetooth over USB interface, also features the high speed UART interface (Set PIN11 to "1" during power up) to support Bluetooth over UART.
- B、 It can connect to a USB 3.0 host port (connect all of HSD+/-、 SSTX+/-、 SSRX+/- signals) of System Controller, WLAN & BT data rate up to 800Mbps with USB 3.0 Super Speed mode.
It can connect to a USB 2.0 host port(connect HSD+/- signals, left SSTX+/- and SSRX+/- float) of System Controller, WLAN & BT data rate up to 330Mbps with USB 2.0 High Speed mode.
- D、 The USB high speed differential pair should be maintain $90\Omega \pm 5\Omega$ differential impedance.
- D、 Use minimum of PCB layer change、 PCB trace/cable corner、 connector--cable interconnection、 signal pairs length mismatch, to reduces signal reflections and impedance changes.
- E、 USB signal pairs as short as possible, avoid interference from Power and other signals.
- F、 AC coupling capacitors for SSTX+/-、 Common Mode filters for SSTX+/-、 SSRX+/- are integrated on module.
- G、 The equivalent capacitance of optional ESD protection component on HSD+/- should $< 3\text{pF}$.
The equivalent capacitance of optional ESD protection component on SSTX+/-、 SSRX+/- should be $< 0.3\text{pF}$.

6.5 Recommend PCB Layout Footprint



(Design Units:mm)

6.6 Reflow Soldering Standard Conditions



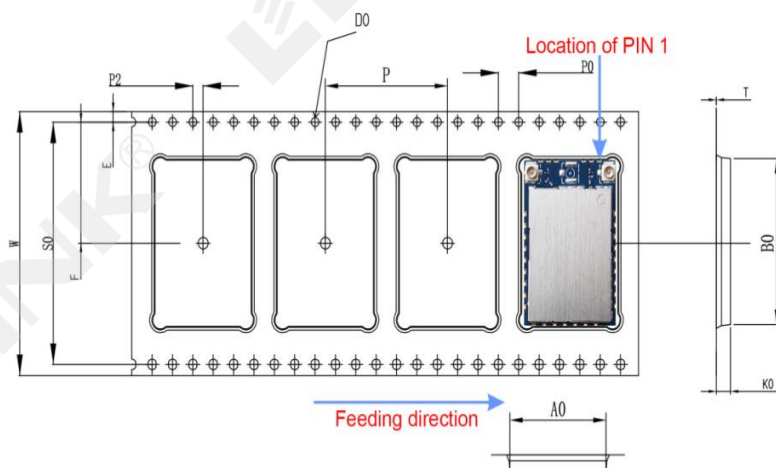
Please use the reflow within 2 times.
Set up the highest temperature within 250°C.

7. Key Components Of Module

No.	Parts	Specification	Manufacturer	Note
1	Chipset	MT7920TUN	MediaTek Inc.	
2	PCB	BL-M7920XU1	SHEN ZHEN QILI ELECTRON CO.,LTD	
			ShenZhen Tie Fa Technology Limited	
			Huizhou Dayawan Kexiang Technology Circuit Board Co., Ltd	
3	Crystal	40MHz-2016	Chengde oscillator Electronic Technology CO.,LTD	
			LUCKI CM ELECTRONICS CO.,LTD	
			JinHua East Crystal Electronic CO.,LTD	
4	Diplexer	DIP1608	Walsin Technology Corporation	
			Dongguan Hekang Electronics Co.,LTD	
			FTR Technology Corporation	

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	18.50±0.1	27.30±0.1	2.90±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	0.40±0.05



Package specification:

1. 900 modules per roll and 3,600 modules per box.
2. Outer box size: 39.5*38*35cm.
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.
5. Each carton is packed with 4 boxes.

9. Storage Conditions

Absolute Maximum Ratings:

Storage temperature: -40°C to +85°C

Storage humidity: 10% to 95% RH (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