

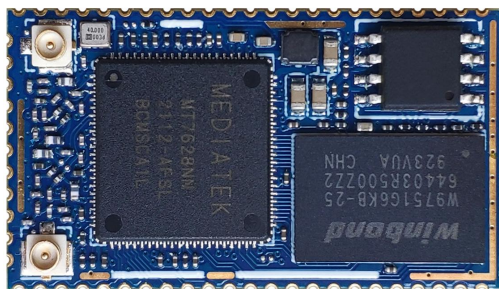


BL-M7628NA2

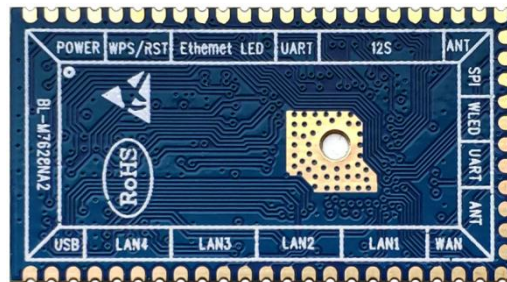
**802.11n 300Mbps WLAN AP/Router
Module Specification**

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(Top View)



(Bottom View)

Module Name: BL-M7628NA2	
Module Type: 802.11b/g/n 300Mbps WLAN AP/Router Module	
Revision: V1.2	
Customer Approval:	
Company:	
Title:	
Signature:	Date:
BL-link Approval:	
Title:	
Signature:	Date:

Revision History

Revision	Summary	Release Date	Revised By
1.0	Officials release	2018-06-28	
1.1	Modify DDR2@64MB(128M Optional)	2020-01-03	
1.2	Update the specification version	2023-04-20	Ch

1、Introduction

BL-M7628NA2 is a wireless router WLAN module, designed base on MT7628NN chipset. fully complies with IEEE 802.11b/g/n standards, it can be applied in the fields of IP camera, smart home and IOT. It support both wire and wireless connection, Wireless PHY rate can reach up to 300Mbps, It has rich interface, which can solve the monitoring audio and video services better, and it has excellent RF performance and wireless transmission is more stable.

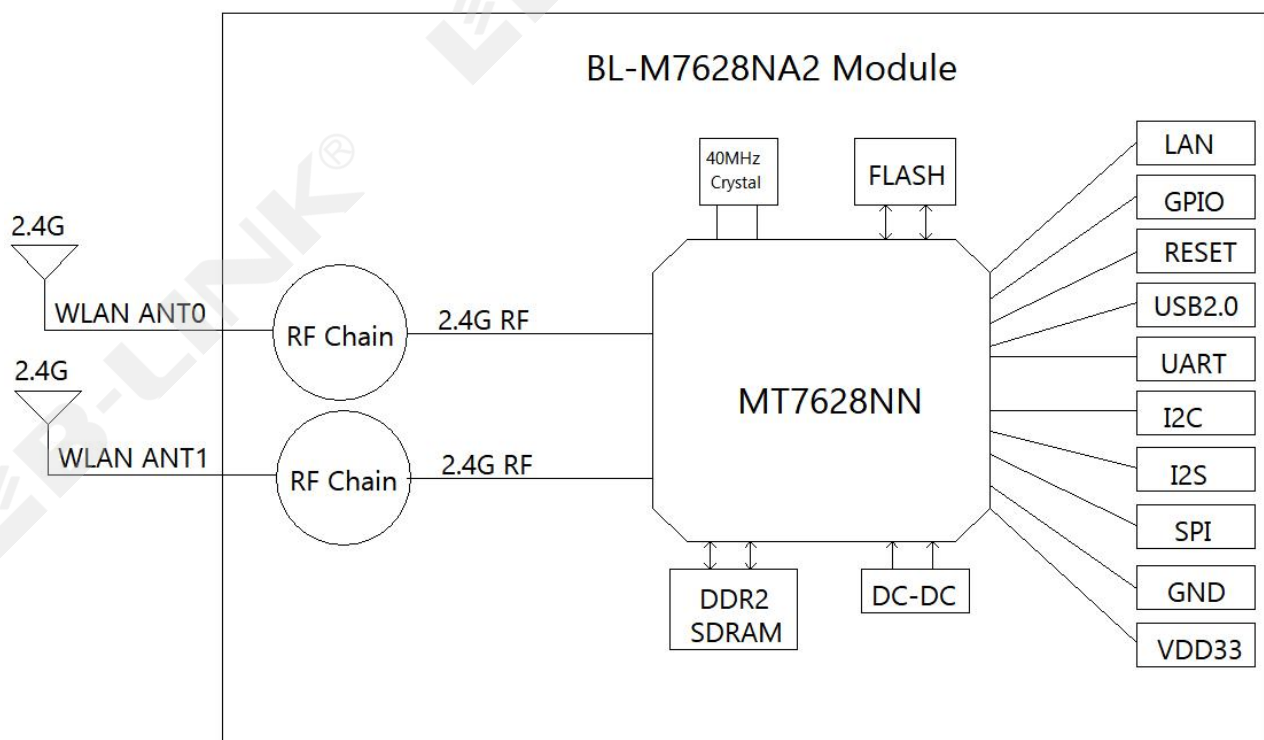
1.1 Features

- WLAN Operating Frequency: 2.4~2.4835GHz
- WLAN Support 2T2R mode with 20/40 bandwidth, maximum PHY rate up to 300Mbps
- Connect to the external antenna through IPEX connector
- Power Supply:DC 3.3V±0.2V

1.2 Application

- IP Camera
- Security monitor
- wireless security NVR systems
- Intelligent wireless control
- Smart house

1.3 Block Diagram



1.4 General Specifications

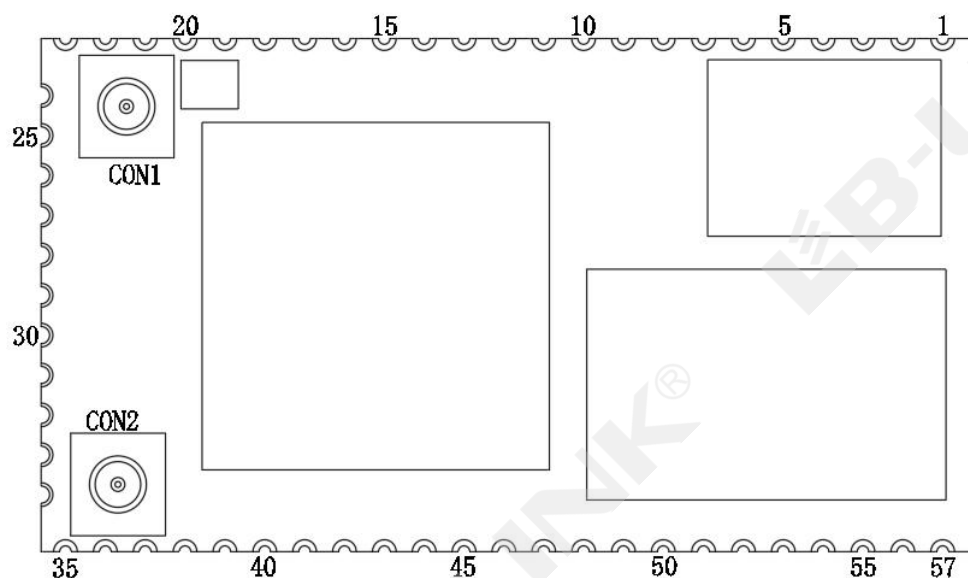
Item	Description
Product Name	BL-M7628NA2
Main Chip	MT7628NN
Chip	Flash@8MB(16MB Optional) DDR2@64MB(128M Optional)
Interface	WAN/LAN, USB2.0, I2C, SPI Card,2*UART, 1*GPIO,5*LED, RESET
IEEE Standards	IEEE 802.11b/g/n
Operating Frequencies	2.4GHz~2.4835GHz
Modulation	802.11b: CCK, DQPSK, DBPSK 802.11g: 64-QAM,16-QAM, QPSK, BPSK 802.11n: 64-QAM,16-QAM, QPSK, BPSK
Working Mode	Router (Default Router)
Wireless Data Rate	802.11b: 1, 2 ,5.5,11 802.11g: 6,9,12,18,24,36,48,54 802.11n: MCS0~7, HT20 reach up to72.2Mbps, HT40 reach up to150Mbps HT40 reach up to 300Mbps (2T2R)
Antenna Type	connect to the external antenna through IPEX connector
Dimension(L*W*H)	33.0 mm *18.0 mm *2.6mm, Tolerance: ±0.15mm
Power Supply	DC3.3V±0.2 (800 mA Max)
Clock Source	40MHz
Operation Temperature	-20℃ to +70℃
Operation Humidity	10% to 95% RH (Non-Condensing)

1.5 Software Features

Software Features	
Working Modes	Router/Client Routing/Repeater/Bridging and AP/Client(Default Router)
Default Gateway	192.168.16.1
Account/Password	admin/admin
WAN Connection Type:	PPPOE、STATIC、DHCP(Default DHCP)
DHCP	Open
SSID	B-LINK_XXXXXX(MAC address after six)
Firewall Security Features	MAC/IP/Port Filtering、URL Filter
Wireless Security Mode	WPA-PSK/WPA2-PSK (Default Disable)
WDS Mode	Repeater Mode(Default Disable)
WPS	Default Disable
QoS Setup	Default Disable

System Management	Load Factory Defaults
	Update Firmware
	Restart Router

2. Pin Assignments



(Top View)

2.1 Pin Definition

No.	Pin Name	Type	I/O Level	Module Pin Description
1	GND	p		Ground connection
2	VDD33	p		Power Supply DC3.3V±0.2V
3	VDD33	p		Power Supply DC3.3V±0.2V
4	GND	p		Ground connection
5	REF_CLK0	O, IPD	VDD33	Reference clock output
6	RESET	I, IPU	VDD33	Watchdog timeout reset
7	SPI_CS1	O, IPD	VDD33	SPI chip select1
8	EPHY_LED4	O	VDD33	10/100M PHY Port#4 activity LED , JTAG_TRST_N
9	EPHY_LED3	O	VDD33	10/100M PHY Port#4 activity LED , JTAG_CLK
10	EPHY_LED2	O	VDD33	10/100M PHY Port#4 activity LED , JTAG_TMS
11	EPHY_LED1	O	VDD33	10/100M PHY Port#4 activity LED , JTAG_TDI
12	EPHY_LED0	O	VDD33	10/100M PHY Port#4 activity LED , JTAG_TDO

13	UART_TXD1	O, IPU	VDD33	UART1 Lite TXD
14	UART_RXD1	I	VDD33	UART1 Lite RXD
15	I2S_SDI	I	VDD33	I2S data input
16	I2S_SDO	O, IPD	VDD33	I2S data output
17	I2S_WS	O	VDD33	I2S word select
18	I2S_CLK	O	VDD33	I2S clock
19	I2C_CLK	O	VDD33	I2C clock
20	I2C_SD	I/O	VDD33	I2C data
21	GND	RF		Ground for RF
22	NC	--		NC(reserved for WLAN ANT0)
23	GND	RF		Ground for RF
24	SPI_CS0	O, IPU	VDD33	SPI chip select0
25	SPI_CLK	O, IPU	VDD33	SPI clock
26	SPI_MISO	I	VDD33	SPI Master input/Slave output
27	SPI_MOSI	O, IPD	VDD33	SPI Master output/Slave output
28	WLED_N	O	VDD33	WLAN Activity LED
29	GPIO0	I/O	VDD33	General Purpose I/O
30	UART_TXD0	I,IPD	VDD33	UART0 Lite TXD
31	UART_RXD0	O,IPD	VDD33	UART0 Lite RXD
32	GND	RF		Ground for RF
33	NC	--		NC(reserved for WLAN ANT1)
34	GND	RF		Ground for RF
35	MDI_RP_P0	AI/O	VDD33	10/100 PHY Port#0 RXN
36	MDI_RN_P0	AI/O	VDD33	10/100 PHY Port#0 RXP
37	MDI_TP_P0	AI/O	VDD33	10/100 PHY Port#0 TXN
38	MDI_TN_P0	AI/O	VDD33	10/100 PHY Port#0 TXP
39	MDI_TP_P1	AI/O	VDD33	10/100 PHY Port#1 TXN
40	MDI_TN_P1	AI/O	VDD33	10/100 PHY Port#1 TXP
41	MDI_RP_P1	AI/O	VDD33	10/100 PHY Port#1 RXN
42	MDI_RN_P1	AI/O	VDD33	10/100 PHY Port#1 RXP
43	MDI_RP_P2	AI/O	VDD33	10/100 PHY Port#2 RXN
44	MDI_RN_P2	AI/O	VDD33	10/100 PHY Port#2 RXP
45	MDI_TP_P2	AI/O	VDD33	10/100 PHY Port#2 TXN
46	MDI_TN_P2	AI/O	VDD33	10/100 PHY Port#2 TXP
47	MDI_TP_P3	AI/O	VDD33	10/100 PHY Port#3 TXN
48	MDI_TN_P3	AI/O	VDD33	10/100 PHY Port#3 TXP

49	MDI_RP_P3	AI/O	VDD33	10/100 PHY Port#3 RXN
50	MDI_RN_P3	AI/O	VDD33	10/100 PHY Port#3 RXP
51	MDI_RP_P4	AI/O	VDD33	10/100 PHY Port#4 RXN
52	MDI_RN_P4	AI/O	VDD33	10/100 PHY Port#4 RXP
53	MDI_TP_P4	AI/O	VDD33	10/100 PHY Port#4 TXN
54	MDI_TN_P4	AI/O	VDD33	10/100 PHY Port#4 TXP
55	USB2.0_DP	AI/O		USB2.0 Host Port0 differential pair data+
56	USB2.0_DM	AI/O		USB2.0 Host Port0 differential pair data-
57	GND	P		Ground connection
	CON1	RF		IPEX connector for 2.4G RF to WLAN_ANT0
	CON2	RF		IPEX connector for 2.4G RF to WLAN_ANT1

P: Power or Ground; I/O: In/Output bi-directional; I: Input; O: Output; AI/O: Analog In/Output;

A_I/O: Analog and digital multiplexed I/O; RF: Analog RF Port or RF Ground; NC: Not connected;

IPD: Internal Pull Low; IPU: Internal Pull High;

3. Electrical and Thermal Specifications

3.1 Recommended Operating Conditions

Parameters		Min	Type	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	Type	Max	Units
VIH	Input High Voltage	2	--	3.6	V
VIL	Input Low Voltage	-0.3	--	0.9	V
VOH	Output High Voltage	2.5	--	3.5	V

3.4 Current Consumption

Conditions : VDD33=3.3V ; Ta:25°C ;			
Use Case	Current(average)		
	Typ	MAX	Units
Standby	250	260	mA
2.4G 11b@1Mbps TX @17dBm (1TX RF test)	460	470	mA
2.4G 11b@1Mbps RX (RF-Test)	253	265	mA
2.4G 11b@11Mbps TX @17dBm (1TX RF test)	440	450	mA
2.4G 11b@11Mbps RX (RF-Test)	255	268	mA
2.4G 11g@6Mbps TX@17dBm (1TX RF test)	430	440	mA
2.4G 11g@6Mbps RX (RF-Test)	255	268	mA
2.4G 11g@54Mbps TX@15dBm (1TX RF test)	410	420	mA
2.4G 11g@54Mbps RX (RF-Test)	262	267	mA
2.4G 11n@HT20 MCS0 TX@16dBm (1TX RF test)	380	290	mA
2.4G 11n@HT20 MCS0 RX(RF-Test)	256	258	mA
2.4G 11n@HT20 MCS07 TX@15dBm (1TX RF test)	370	380	mA
2.4G 11n@HT20 MCS0 RX(RF-Test)	267	273	mA
2.4G 11n@HT40 MCS0 TX@16dBm (1TX RF test)	370	380	mA
2.4G 11n@HT40 MCS0 RX(RF-Test)	256	258	mA
2.4G 11n@HT40 MCS7 TX@14dBm (1TX RF test)	360	370	mA
2.4G 11n@HT40 MCS7 RX(RF-Test)	267	273	mA
2.4G 11n@HT40 MCS15 TX@14dBm (2TX RF test)	390	400	mA
2.4G 11n@HT40 MCS15 RX(2RX (RF-Test)	283	287	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
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;
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;
Frequency Tolerance	$\leq \pm 20\text{ppm}$

2.4G Transmitter Specifications (2.4G_ANT0&2.4G_ANT1)

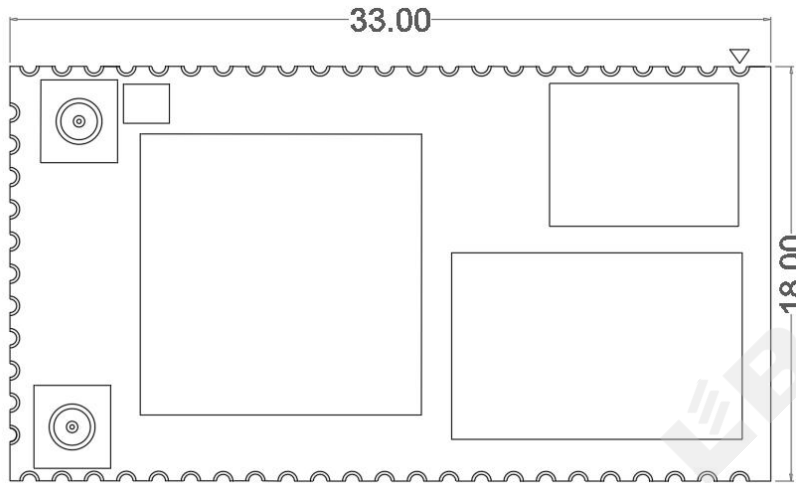
TX Rate	TX Power (dBm)	Power Tolerance (dBm)	EVM (dB)
802.11b@1~11Mbps	17	± 2	≤ -15
802.11g@6Mbps	17	± 2	≤ -15
802.11g@54Mbps	15	± 2	≤ -25
802.11n@HT20_MCS0	16	± 2	≤ -10
802.11n@HT20_MCS7	15	± 2	≤ -28
802.11n@HT40_MCS0	16	± 2	≤ -10
802.11n@HT40_MCS7	14	± 2	≤ -28

2.4G Receiver Specifications (2.4G_ANT0&2.4G_ANT1)

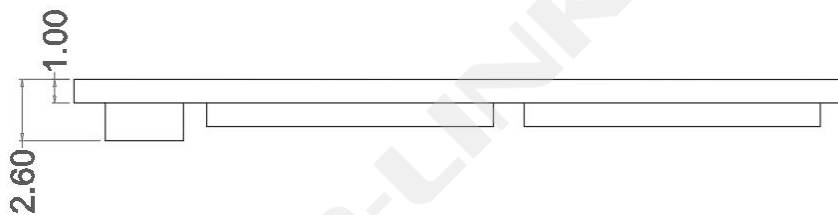
RX Rate	Min Input Level(Typ dBm)	Max Input Level(Typ dBm)	PER
802.11b@1Mbps	-95	-10	< 8%
802.11b@11Mbps	-86	-10	< 8%
802.11g@6Mbps	-92	-10	< 10%
802.11g@54Mbps	-75	-10	< 10%
802.11n@HT20_MCS0	-91	-10	< 10%
802.11n@HT20_MCS7	-72	-10	< 10%
802.11n@HT40_MCS0	-89	-10	< 10%
802.11n@HT40_MCS7	-68	-10	< 10%

5. Mechanical Specifications

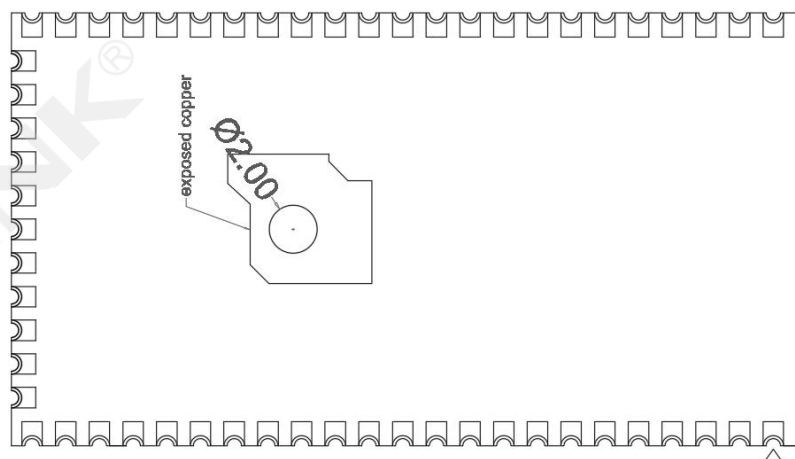
5.1 Module Outline Drawing(Units:mm)



(Top View)



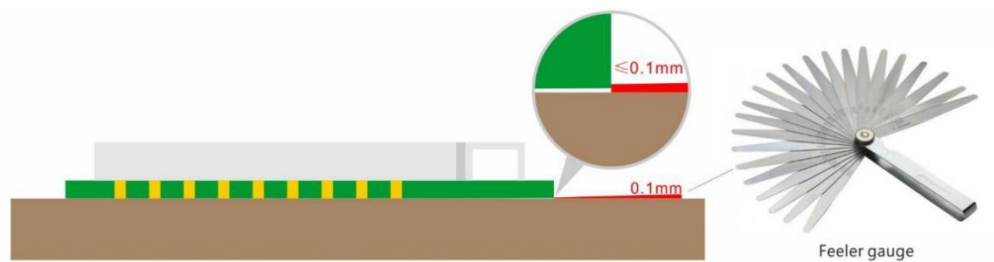
(Side View)



(Bottom View)

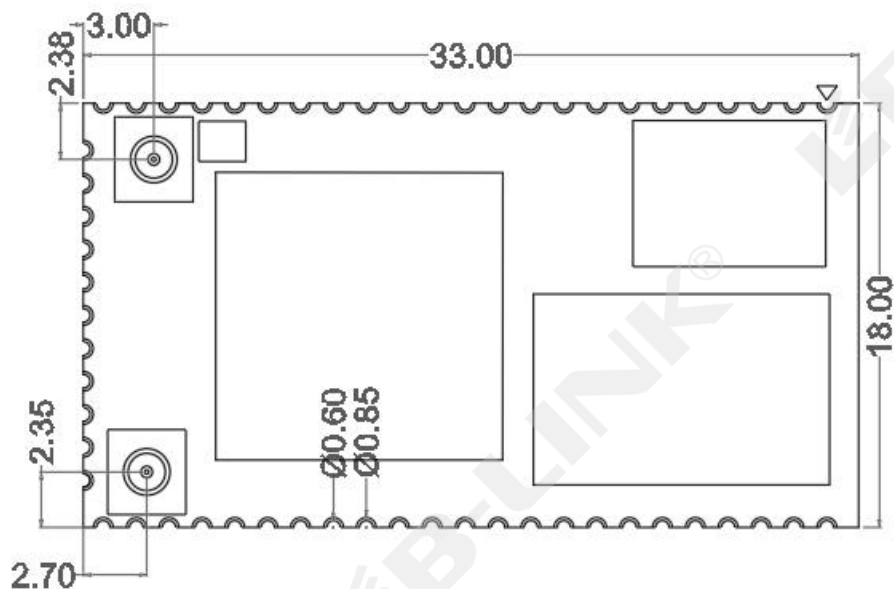
Module dimension: 33.0*18.0*2.6mm(L*W*H; Tolerance: ± 0.15 mm)

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

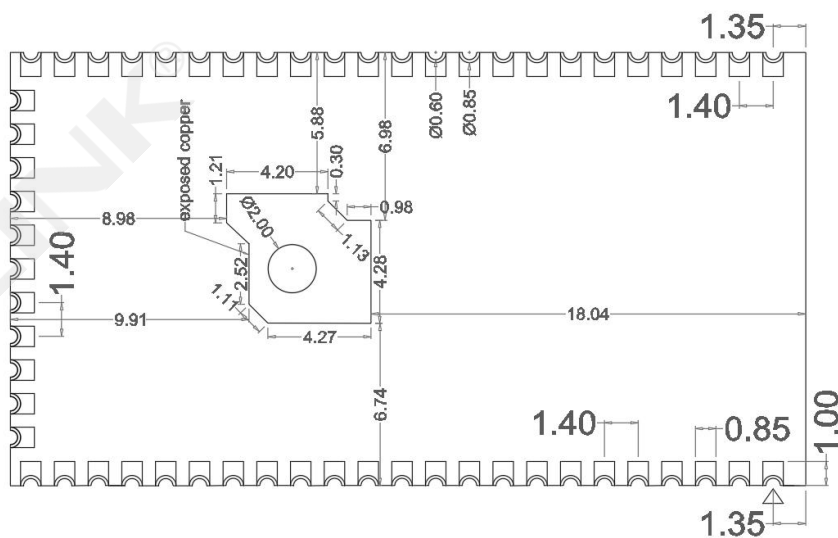


Module Bow and Twist: $\leq 0.1\text{mm}$

5.2 Mechanical Dimensions(Units:mm)



(Top View)



(Bottom View)

7. Key Components Of Module

No.	Parts	Specification	Manufacturer	Note
1	Chipset	MT7628NN	MediaTek Inc.	
2	PCB	BL_M7628NA2	MILLION SOURCE PRINTED CIRCUIT BOARD CO.,LTD	
			SHEN ZHEN QILI ELECTRON CO.,LTD	
			ShenZhen Tie Fa Technology Limited	
3	Crystal	40MHz-2016	HOSONIC ELECTRONIC CO.,LTD	
			LUCKI CM ELECTRONICS CO.,LTD	
			Chengde oscillator Electronic Technology CO.,LTD	

8. Package and Storage Information

8.1 Package Dimensions



Package specification:

1. 60 modules per blister plate and 960 modules 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 pcs 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 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