



BL-M8188FU3(VQ1)

802.11n 72.2Mbps WLAN

USB2.0 Module Specification

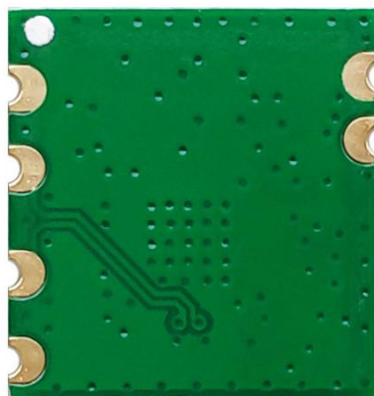
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Web: www.b-link.net.cn



(Top View)



(Bottom View)

Module Name: BL-M8188FU3(VQ1)	
Module Type: 802.11b/g/n 72.2Mbps WLAN USB2.0 Module	
Revision: V1.1	
Customer Approval:	
Company:	
Title:	
Signature:	Date:
LB-link Approval:	
Title:	
Signature:	Date:

Revision History

Revision	Summary	Release Date	Revised By
1.0	Official release	2020-04-22	
1.1	Update the specification version	2023-05-09	CH

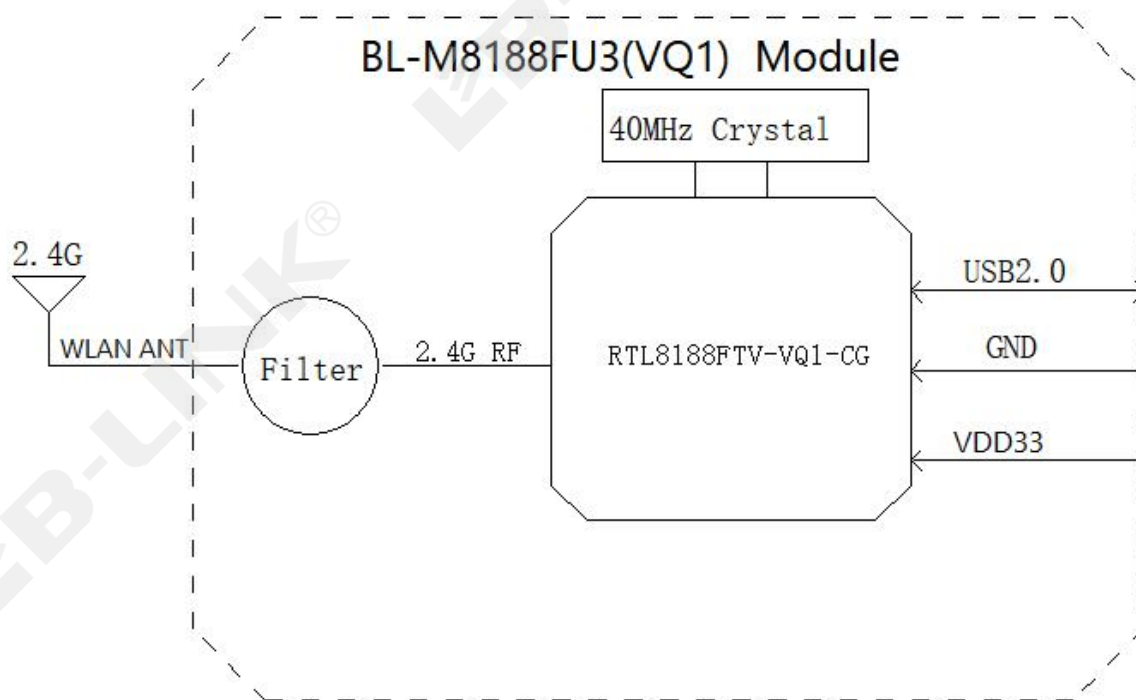
1. Introduction

BL-M8188FU3(VQ1) is a highly integrated 1T1R Single-band WLAN module. It compatible IEEE 802.11 b/g/n standard and provides the maximum PHY rate up to 72.2Mbps, offering feature-rich wireless connectivity and delivering reliable, giving end users the highest cost performance.

1.1 Features

- Operating Frequencies: 2.4~2.484GHz
- Host Interface is USB 2.0
- IEEE Standards: IEEE 802.11b/g/n
- Wireless PHY rate can reach up to 72.2Mbps
- Connect to the external antenna through MHF1/IPEX connector
- DC 3.3V±0.2V single power supply

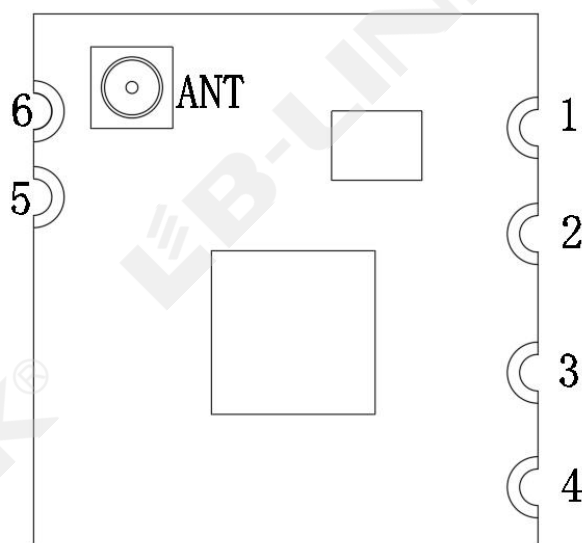
1.2 Block Diagram



1.3 General Specifications

Module Name	BL-M8188FU3(VQ1)
Chipset	RTL8188FTV-VQ1-CG
WLAN Standards	IEEE802.11b/g/n
Host Interface	USB2.0
Antenna	Connect to the external antenna through MHF1/IPEX connector
Dimension	13.0*12.3*2.1mm (L*W*H)
Power Supply	DC 3.3V±0.2V @ 500 mA(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	Module Pin Description
1	GND	P		Power Ground
2	USB2.0_DP	A I/O		USB2.0 Transmitter/Receiver Differential Pair
3	USB2.0_DM	A I/O		USB2.0 Transmitter/Receiver Differential Pair

4	VDD33	P		DC 3.3V Power Supply
5	WLAN_ANT	NC		NC(Reserved RF PAD for 2.4G WLAN_ANT)
6	GND	RF		RF Ground connections
	ANT	RF		IPEX RF for 2.4G WLAN_ANT

P: Power or Ground; I/O: In/Output; I: Input; 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 Current Consumption

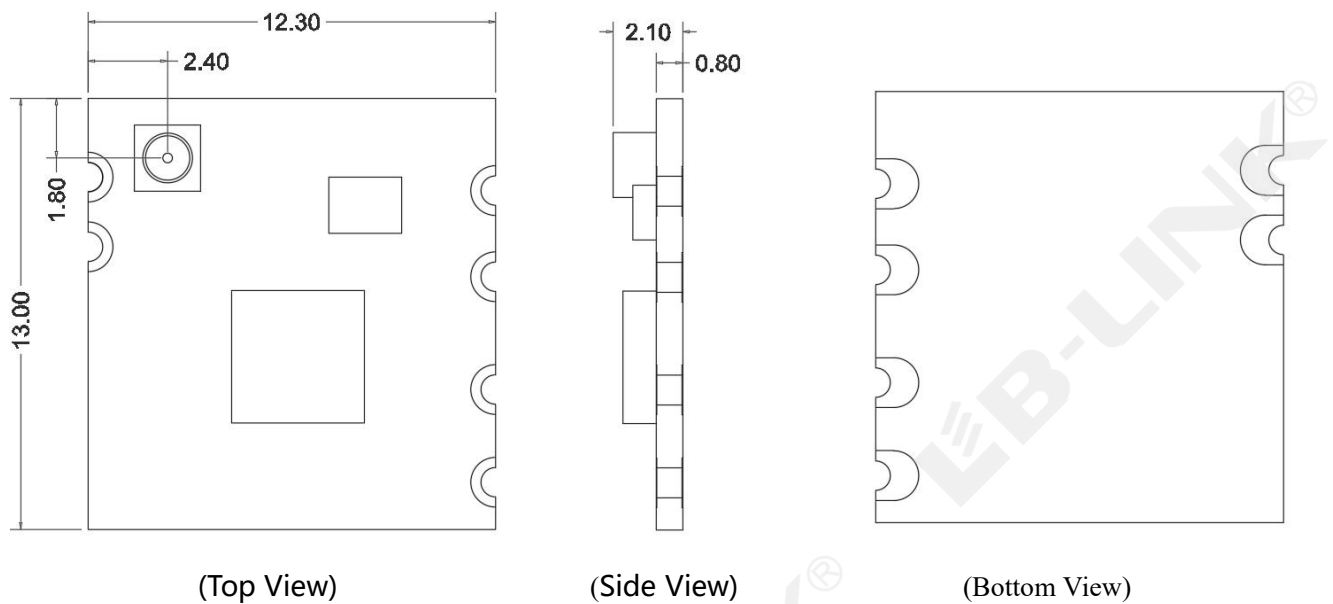
Conditions : VDD33=3.3V ; Ta:25°C			
Use Case	VDD33 Current (average)		
	Typ	Max	Units
WLAN Unassociated (Linux Driver)	40	60	mA
WLAN TRX Throughput(Linux Driver)	276	293	mA
2.4G 11b@1Mbps TX (RF-Test)17dBm	312	350	mA
2.4G 11b@11Mbps TX (RF-Test)17dBm	310	330	mA
2.4G 11g@6Mbps TX (RF-Test)17dBm	287	320	mA
2.4G 11g@54Mbps TX (RF-Test)15dBm	244	316	mA
2.4G 11n@HT20_MCS0 TX (RF-Test)16dBm	242	286	mA
2.4G 11n@HT20_MCS7 TX (RF-Test)14dBm	220	277	mA
2.4G 11b@11M RX (RF-Test)	141	144	mA
2.4G 11g@6M RX (RF-Test)	141	144	mA
2.4G 11n@HT20_MCS7 RX (RF-Test)	142	144	mA

4. WLAN RF Specifications

Conditions : VDD33=3.3V ; Ta:25°C			
Features	Description		
WLAN Standard	IEEE 802.11b/g/n		
Frequency Range	2.4~2.484GHz (2.4GHz ISM Band)		
Channels	Ch1~Ch14 (For 20MHz Channels)		
Modulation	802.11b (DSSS): DBPSK, DQPSK, CCK; 802.11g (OFDM): BPSK, QPSK, 16QAM, 64QAM; 802.11n (OFDM): BPSK, QPSK, 16QAM, 64QAM;		
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;		
Frequency Tolerance	≤±20ppm		
2.4G Transmitter Specifications (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 :17	±2	≤ -10
802.11b@11Mbps	Calibrated TX Power :17	±2	≤ -10
802.11g@6Mbps	Recommended Target TX Power :17	±2	≤ -10
802.11g@54Mbps	Calibrated TX Power :15	±2	≤ -25
802.11n@HT20_MCS0	Recommended Target TX Power :16	±2	≤ -10
802.11n@HT20_MCS7	Calibrated TX Power :14	±2	≤ -28
2.4G Receiver Specifications			
RX Rate	Min Input Level (Typ,dBm)	Max Input Level (Typ,dBm)	PER
802.11b@1Mbps	-92	-10	< 8%
802.11b@11Mbps	-86	-10	< 8%
802.11g@6Mbps	-90	-10	< 10%
802.11g@54Mbps	-72	-10	< 10%
802.11n@HT20_MCS0	-88	-10	< 10%
802.11n@HT20_MCS7	-69	-10	< 10%

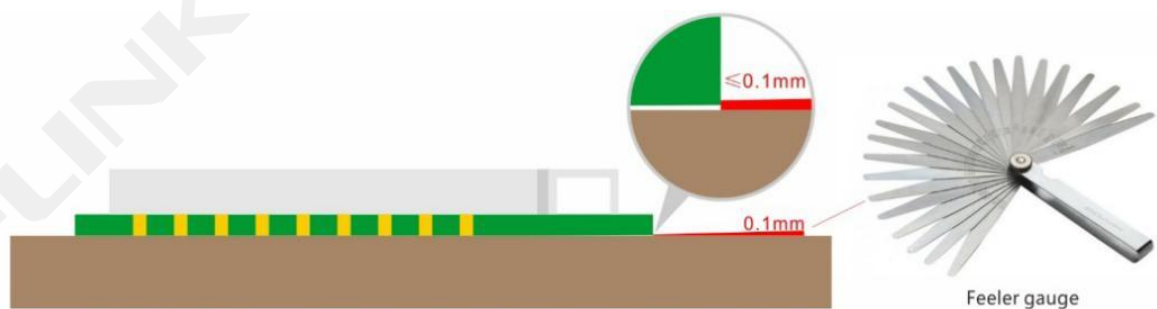
5. Mechanical Specifications

5.1 Module Outline Drawing



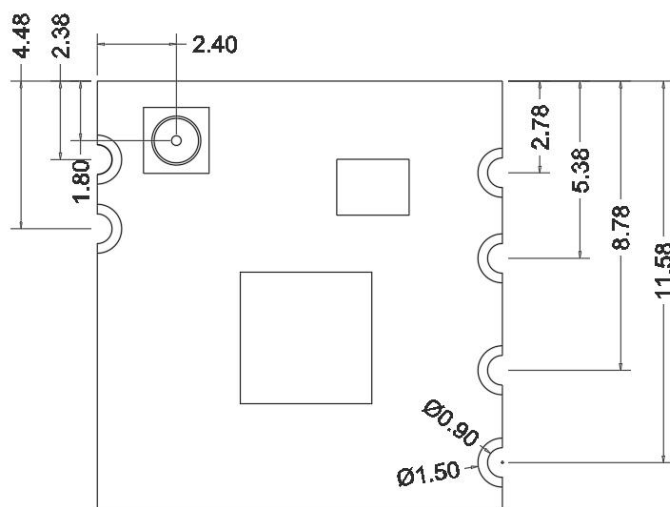
Module dimension: 13.0*12.3*2.1mm (L*W*H; Tolerance: $\pm 0.15\text{mm}$)

IPEX / MHF-1 connector dimension: 3.0*2.6*1.25mm (L*W*H; $\varnothing 2.0\text{mm}$)

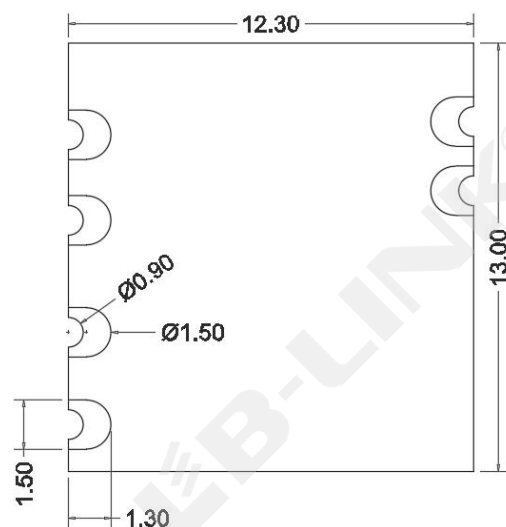


Module Bow and Twist: $\leq 0.1\text{mm}$

5.2 Mechanical Dimensions



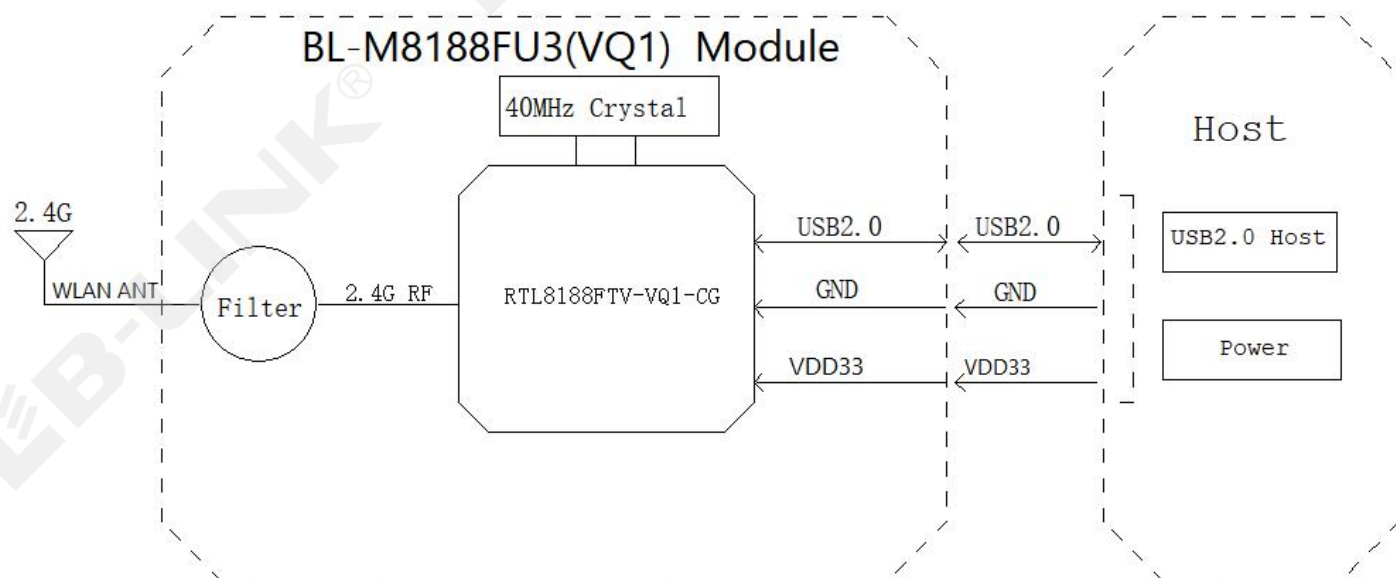
(Top View)



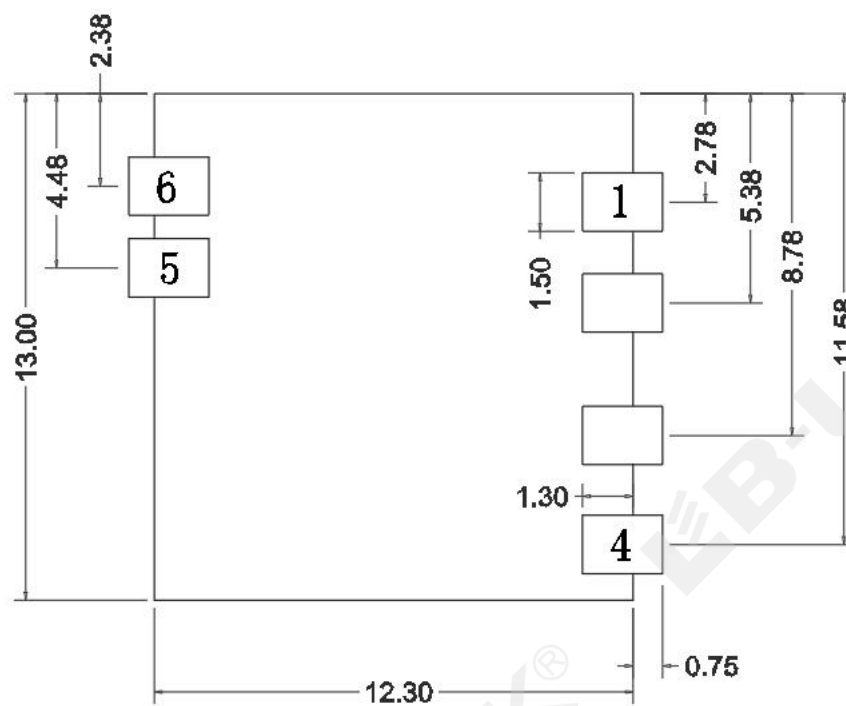
(Bottom View)

6. Application Information

6.1 Typical Application Circuit

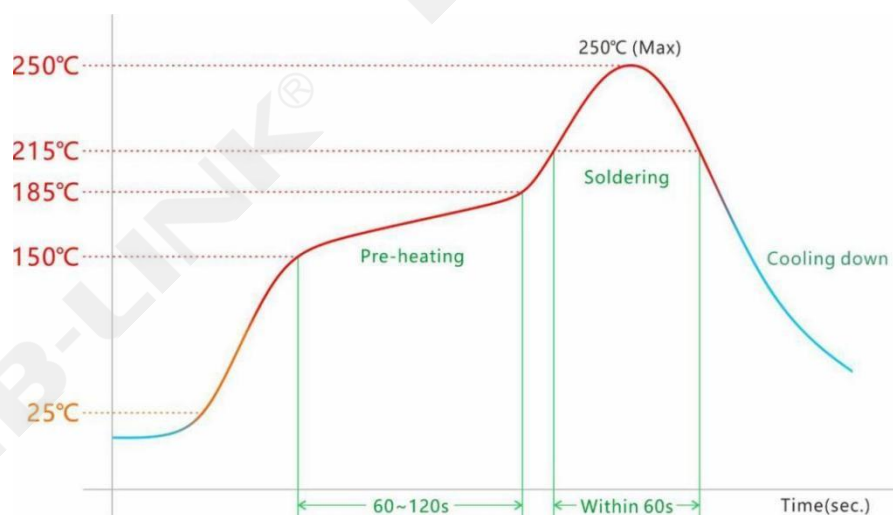


6.2 Recommend PCB Layout Footprint



(Design Units: mm)

6.3 Reflow Soldering Standard Conditions



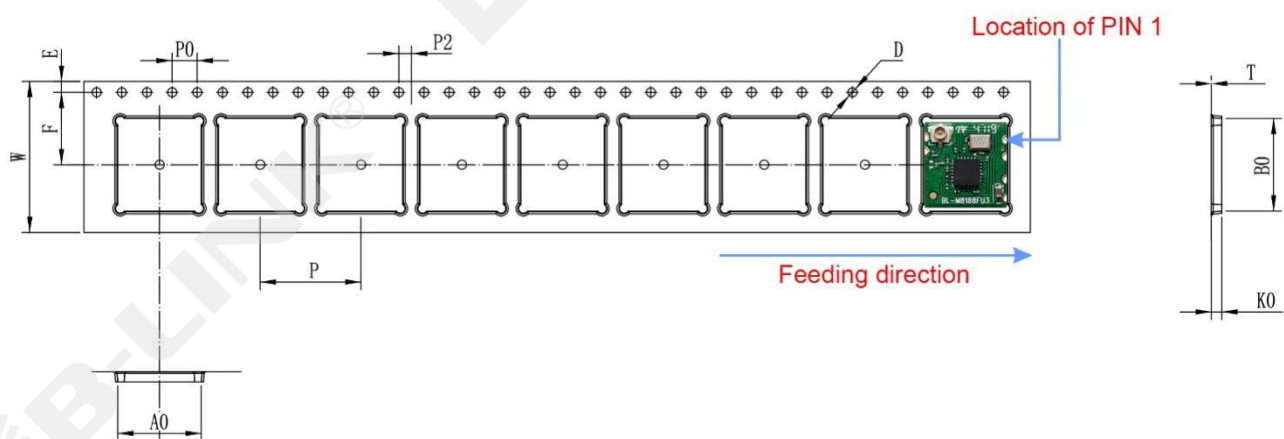
Please use the reflow within 2 times.
Set up the highest temperature within 250°C.

7. Key Components Of Module

No.	Parts	Specification	Manufacturer	Note
1	Chipset	RTL8188FTV-VQ1-CG	Realtek Semiconductor Corp.	
2	PCB	BL-M8188FU3	ShenZhen Tie Fa Technology Limited	
			SHEN ZHEN QILI ELECTRON CO.,LTD	
			Huizhou Dayawan Kexiang Technology Circuit Board Co., Ltd	
3	Crystal	40MHz-3225	HUBEI TKD CRYSTAL ELECTRONIC SCIENCE AND TECHNOLOGY CO.,LTD	
			SHENZHEN KAIYUEXIANG ELECTRONICS CO.,LTD	
			Chengde oscillator Electronic Technology CO.,LTD	
			JinHua East Crystal Electronic CO.,LTD	

8. Package and Storage Information

8.1 Package Dimensions



ITEM	W	A0	B0	KO	E	F	P	P0	P2	D	T
DIM	24.00±0.3	12.70±0.1	13.60±0.1	2.50±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 1 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