



BL-M8188FU3 (VQ1)

802.11n 72.2bps WLAN

USB2.0 Module Specification

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Module Name: BL-M8188FU3 (VQ1)

Module Type: 802.11b/g/n 72.2Mbps WLAN USB2.0 Module

Revision: V1.0

Customer Approval:

Company:

Title:

Signature:

Date:

BL-link Approval:

Title:

Signature:

Date:

Revision History

Revision	Summary	Release Date
1.0	Official release	2020-04-22

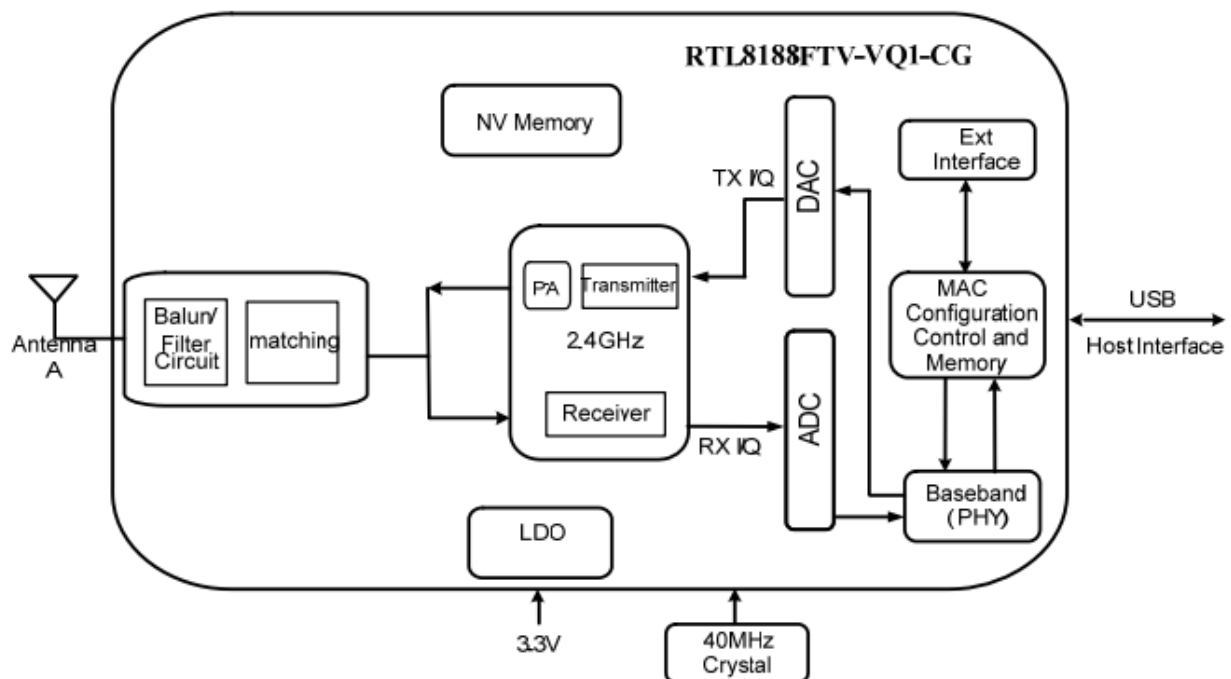
1. Introduction

BL-M8188FU3 is a highly WLAN USB2.0 module designed base on The Realtek RTL8188FTV-VQ1 chipset. This module supports IEEE 802.11b/g/n standard and provides the maximum PHY data rate up to 72.2Mbps, it combines a WLAN MAC, a 1T1R capable WLAN baseband, modem and offers stable, high rate, long distance wireless connectivity through IPEX connector. It can implement the wireless network function on the laptop/desktop/MID and other wireless devices easily.

1.1 Features

- Operating Frequencies: 2.4~2.4835GHz
- IEEE Standards: IEEE 802.11b/g/n
- Wireless data rate can reach up to 72.2Mbps
- Connect to external antenna through IPEX connector
- Power Supply: VDD 3.3V±0.2V main power supply

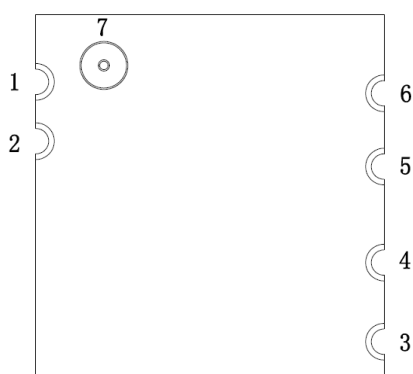
1.2 Block Diagram



1.3 General Specifications

Module Name	BL-M8188FU3 WLAN USB2.0 Module
Chipset	RTL8188FTV-VQ1-CG
WLAN Standards	IEEE 802.11b/g/n
Host Interface	USB1.0/1.1/2.0
Antenna	Connect to the external antenna through IPEX connector
Dimension	13.0*12.3*2.1mm (L*W*H)
Power Supply	VDD 3.3V±0.2V @ 380 mA (Max)
Operation Temperature	-20°C to +70°C
Operation Humidity	10% to 95% RH (Non-Condensing)

2. Pin Assignments



2.1 Pin Definition

No	Pin Name	Type	Description	Supply
1	GND	P	Ground	
2	NC	--	No Connection	
3	VDD33	P	DC 3.3V Power Supply	
4	UDM	I/O	USB Transmitter/Receiver Differential Pair	
5	UDP	I/O	USB Transmitter/Receiver Differential Pair	
6	GND	P	Ground	
7	IPEX	RF	IPEX connector	

P: Power, I: Input, O: Output, I/O: 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	°C
External Antenna VSWR			1.92:1	2:1	/
Supply Voltage	VDD	3.1	3.3	3.5	V

3.2 Current Consumption

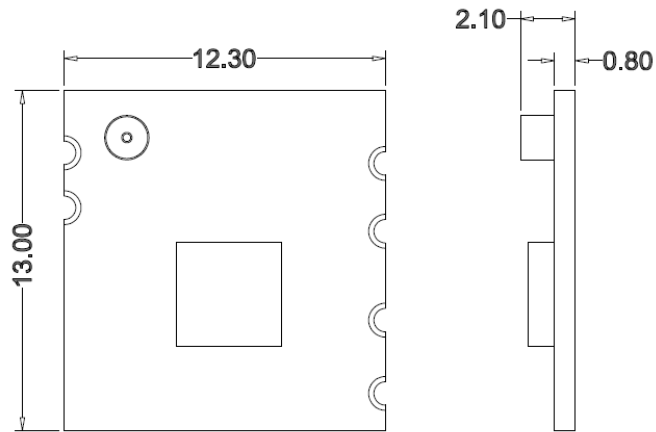
Conditions : VDD=3.3V ; Ta:25°C			
Use Case	VDD Current (average)		
	Typ	Max	Units
2.4G 1Mbps TX @17dBm (RF-Test)	312	350	mA
2.4G 1Mbps RX (RF-Test)	127	128	mA
2.4G 11Mbps TX@17dBm (RF-Test)	310	330	mA
2.4G 11Mbps RX (RF-Test)	129	140	mA
2.4G 6Mbps TX @15dBm (RF-Test)	287	320	mA
2.4G 6Mbps RX (RF-Test)	137	148	mA
2.4G 54Mbps TX @15dBm (RF-Test)	244	316	mA
2.4G 54Mbps RX (RF-Test)	142	152	mA
2.4G MCS0(HT20) TX @14dBm (RF-Test)	242	286	mA
2.4G MCS0(HT20) RX (RF-Test)	145	158	mA
2.4G MCS7(HT20) TX @14dBm (RF-Test)	220	277	mA
2.4G MCS7(HT20) RX (RF-Test)	142	144	mA

4. WIFI RF Specifications

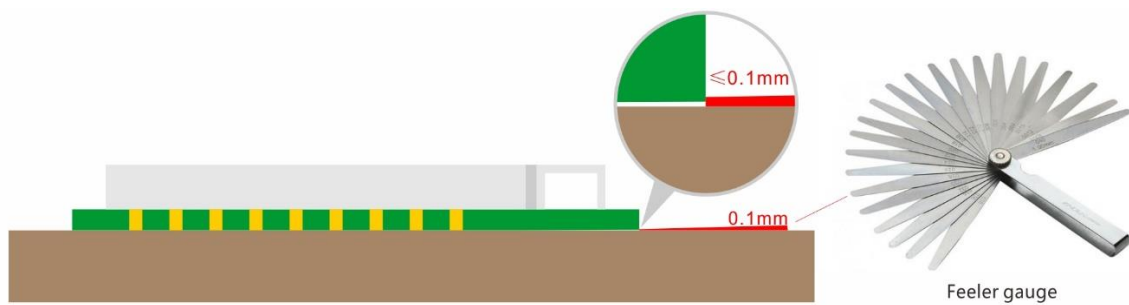
Conditions : VDD=3.3V ; Ta:25°C			
Features	Description		
WLAN Standard	IEEE 802.11b/g/n, CSMA/CA		
Frequency Range	2.4~2.4835GHz (2.4GHz ISM Band)		
Channels	Ch1~Ch13 (For 20MHz Channels)		
Modulation	802.11b (DSSS): CCK, DQPSK, DBPSK; 802.11g (OFDM): BPSK, QPSK, QAM16, QAM64; 802.11n (OFDM): BPSK, QPSK, QAM16, QAM64;		
Date 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	≤±10ppm		
2.4G Transmitter Specifications			
TX Rate	TX Power (dBm)	TX Power Tolerance (dB)	EVM (dB)
802.11b@1~11Mbps	17	±2	≤-15
802.11g@6Mbps	15	±2	≤-15
802.11g@54Mbps	15	±2	≤-28
802.11n@HT20_MCS0	14	±2	≤-10
802.11n@HT20_MCS7	14	±2	≤-28
2.4G Receiver Specifications			
RX Rate	Min Input Level (dBm)	Max Input Level (dBm)	PER
802.11b@1Mbps	-94	-10	< 8%
802.11b@11Mbps	-87	-10	< 8%
802.11g@6Mbps	-90	-10	< 10%
802.11g@54Mbps	-74	-10	< 10%
802.11n@HT20_MCS0	-91	-10	< 10%
802.11n@HT20_MCS7	-71	-10	< 10%

5. Mechanical Specifications

5.1 Module Outline Drawing

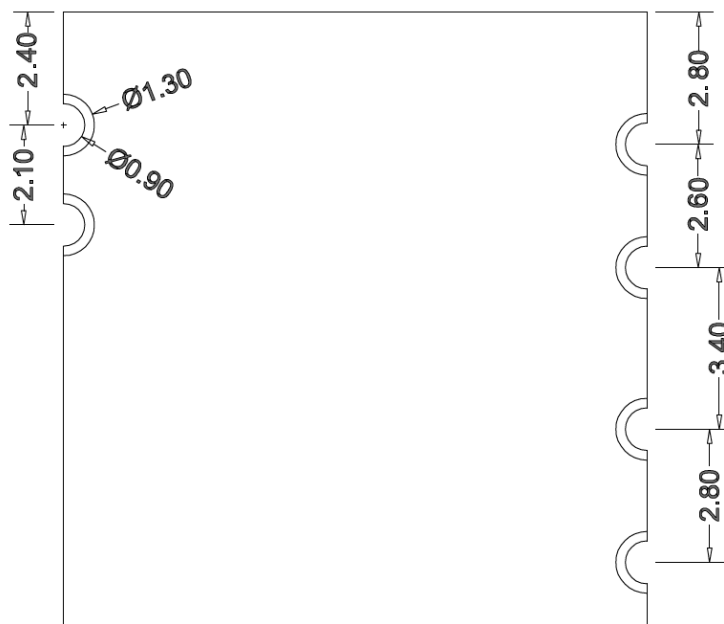


Module dimension: 13.0*12.3*2.1mm(L*W*H; Tolerance: $\pm 0.15\text{mm}$)



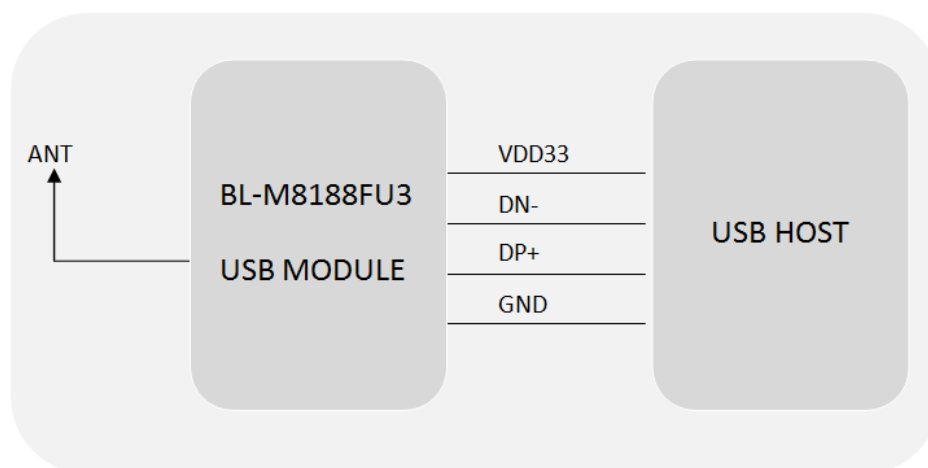
Module Bow and Twist: $\leq 0.1\text{mm}$

5.2 Mechanical Dimensions

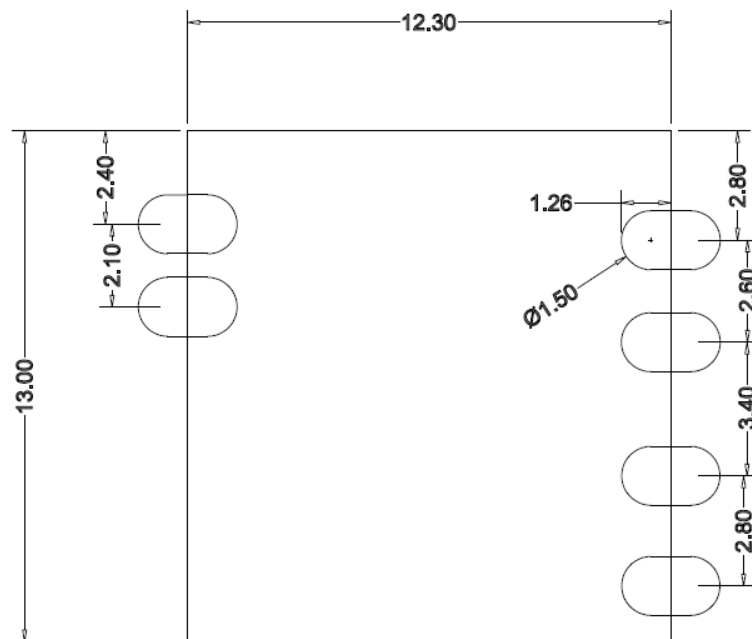


6. Application Information

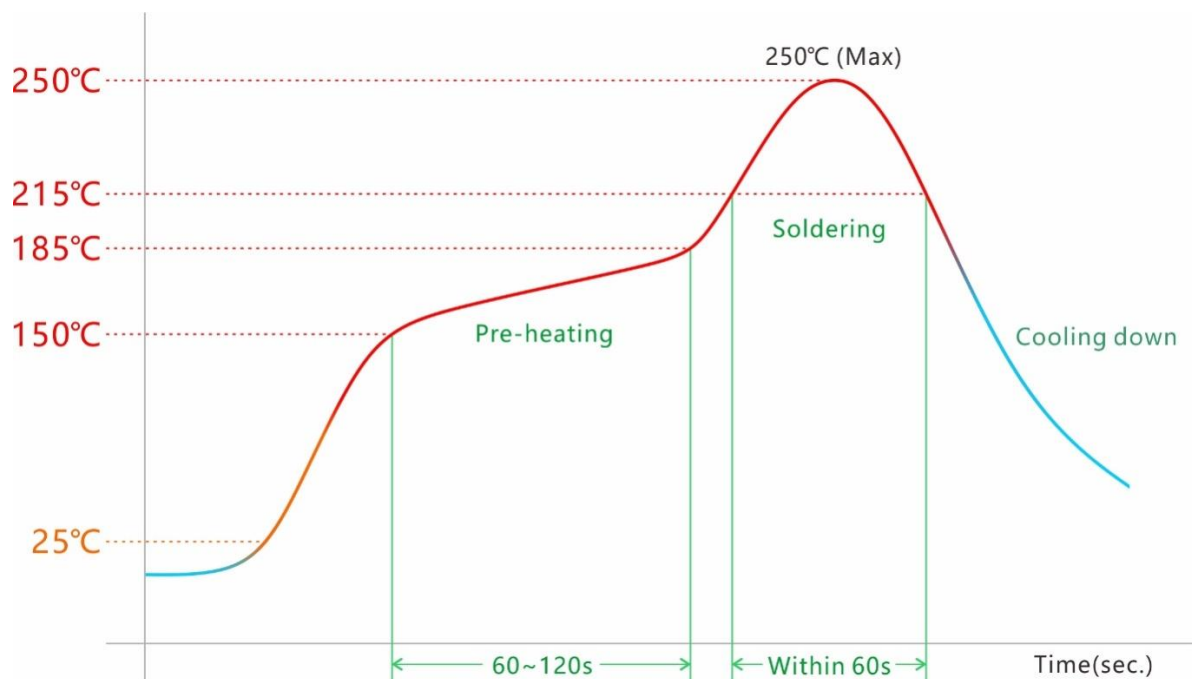
6.1 Typical Application Circuit



6.2 Recommend PCB Layout Footprint



6.3 Reflow Soldering Standard Condition



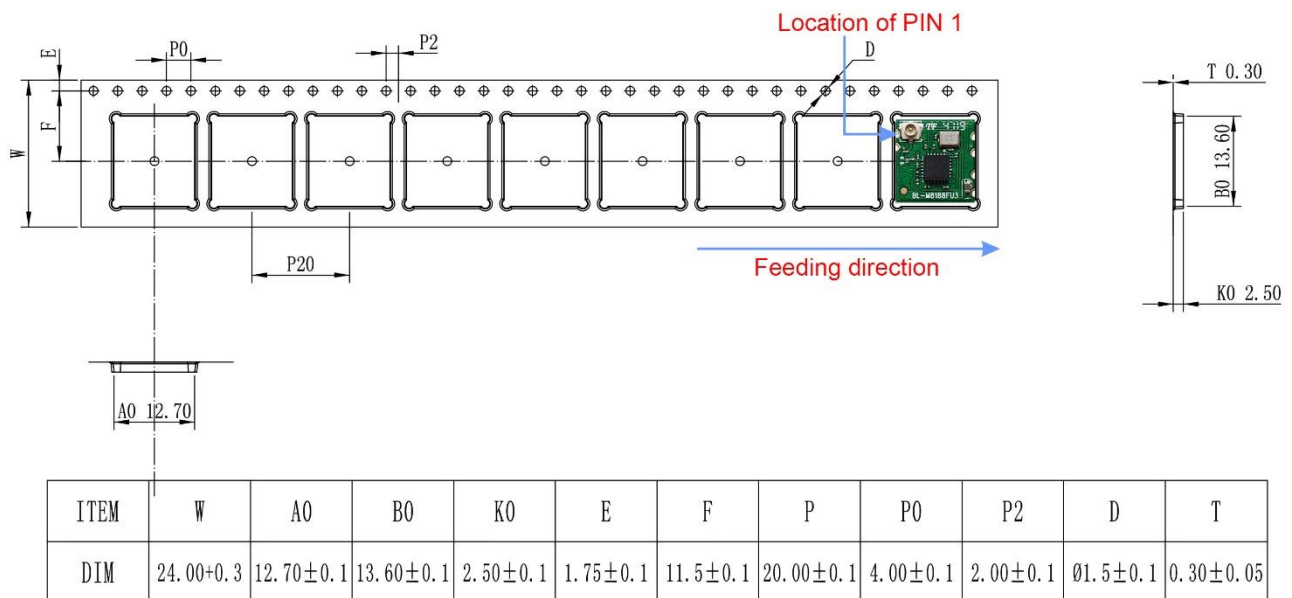
Please use the reflow within 2 times.
Set up the highest temperature within 250°C.

7. Key Components Of Module

No.	Parts	Specification	Manufacturer	Note
1	Chipset	RTL8188FTV-VQ1-CG	Realtek CO., LTD	
2	PCB	BL-M8188FU3	Shenzhen Tie Fa Technology CO., LTD	
			Guangdong KINGSHINE ELECTRONICS CO., LTD	
			MILLION SOURCE PRINTED CIRCUIT BOARD CO., LTD	
			Quzhou Sunlord Electronics CO., LTD	
3	Crystal	40MHz-10pF-15ppm-3225	HUBEI TKD ELECTRONICS CO., LTD	
			HOSONIC ELECTRONIC CO., LTD	

8. Package and Storage Information

8.1 Package Dimensions





Package specification:

1. 2000 modules per roll and 10,000 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 25.3mm (with a width of 21.3mm 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:

The Module is a static-sensitive electronic device.
Do not operate or store near strong electrostatic fields.
Take proper ESD precautions!