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Product Specification

IEEE 802.11 b/g/n 2.4GHz 1T1R WiFi Module

Project Name	Realtek RTL8188EUS 11n USB WIFI Module	
Model NO	FN-8112M	
Customer		
Customer's Part NO		
Drawing: SJ LI	Approved: Jim HU	Sales: Sunny LIU

Feedback of customer's Confirmation

We accept the specification after Confirmed.

Customer	Customer signature	Approved Date

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0. Revision History

REV NO	Date	Modifications	Draft
Rev0.1	2012-3-1	First Released	XJ Hu
Rev0.2	2014-6-25	Update PCB Layout Package	SJ LI

1. Introduction

1.1 Overview

FN8112-M is a highly integrated and excellent performance Wireless LAN (WLAN) USB2.0 network interface device. High-speed wireless connection up to 150 Mbps.

The general hardware for the module is shown in Figure 1. This WLAN Module design is based on Realtek RTL8188EUS. It is a highly integrated single-chip 1*1 MIMO (Multiple In Multiple Out) Wireless LAN (WLAN) USB2.0 network interface controller complying with the 802.11n specification. It combines a MAC, a 1T1R capable baseband, and RF in a single chip. It is designed to provide excellent performance with low power Consumption and enhance the advantages of robust system and cost-effective.

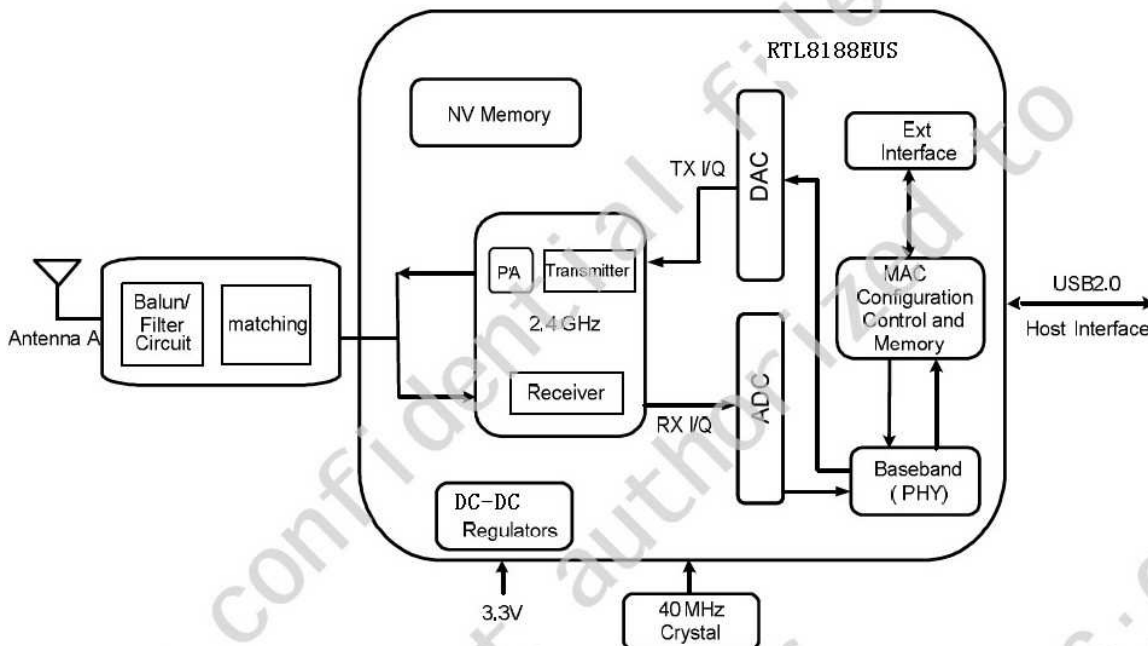


Figure 1. Single-Band 11n (1x1) Solution

1.2 Product Features

- Operate at ISM frequency bands (2.4GHz)
- USB Interface for WiFi
- IEEE standards support: IEEE 802.11b, IEEE 802.11g, IEEE 802.11n,
- Enterprise level security which can apply WPA/WPA2 certification for WiFi.
- WiFi 1 transmitter and 1 receiver allow data rates supporting up to 150 Mbps downstream and 150 Mbps upstream PHY rates

2. GENERAL SPECIFICATION

2.1 WiFi RF Specifications

Features	Descriptions
Main Chipset	RTL8188EUS
Frequency Range	2.400~2.4835GHz
Operating Voltage	3.3Vdc $\pm$ 10% I/O supply voltage
Host Interface	WiFi: USB
Standards	WiFi: IEEE 802.11b, IEEE 802.11g, IEEE 802.11n,
Modulation	WiFi: 802.11b: CCK(11, 5.5Mbps), QPSK(2Mbps), BPSK(1Mbps), 802.11 g/n: OFDM
PHY Data rates	WiFi: 802.11b: 11,5.5,2,1 Mbps 802.11g: 54,48,36,24,18,12,9,6 Mbps 802.11n: up to 150Mbps
Transmit Output Power	WiFi: 802.11b@11Mbps 16 $\pm$ 2dBm 802.11g@6Mbps 14 $\pm$ 2dBm 802.11g@54Mbps 14 $\pm$ 2dBm 802.11n@65Mbps 13 $\pm$ 2dBm (MCS 0_HT20) 13 $\pm$ 2dBm (MCS 7_HT20) 13 $\pm$ 2dBm (MCS 0_HT40) 13 $\pm$ 2dBm (MCS 7_HT40)
EVM	802.11b /11Mbps : EVM $\leq$ -9dB 802.11g /54Mbps : EVM $\leq$ -25dB 802.11n /65Mbps : EVM $\leq$ -28dB
Receiver Sensitivity (HT 20)	802.11b@8% PER 1Mbps -88 $\pm$ 1dBm 2Mbps -87 $\pm$ 1dBm 5.5Mbps -85 $\pm$ 1dBm 11Mbps -82 $\pm$ 1dBm 802.11g@10% PER 6Mbps -86 $\pm$ 1dBm 9Mbps -85 $\pm$ 1dBm 12Mbps -84 $\pm$ 1dBm 18Mbps -82 $\pm$ 1dBm 24Mbps -80 $\pm$ 1dBm 36Mbps -77 $\pm$ 1dBm 48Mbps -73 $\pm$ 1dBm 54Mbps -71 $\pm$ 1dBm 802.11n@10% PER MCS 0 -83 $\pm$ 1dBm MCS 1 -82 $\pm$ 1dBm MCS 2 -80 $\pm$ 1dBm MCS 3 -78 $\pm$ 1dBm MCS 4 -75 $\pm$ 1dBm MCS 5 -71 $\pm$ 1dBm MCS 6 -69 $\pm$ 1dBm MCS 7 -67 $\pm$ 1dBm
Operating Channel	WiFi 2.4GHz: 11: (Ch. 1-11) – United States(North America) 13: (Ch. 1-13) – Europe 14: (Ch. 1-14) – Japan

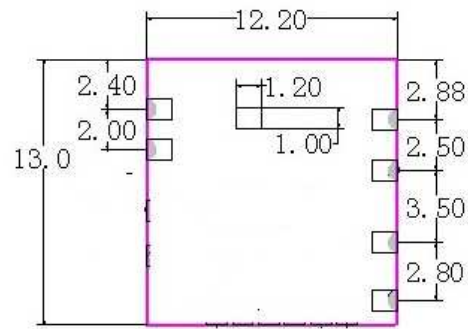
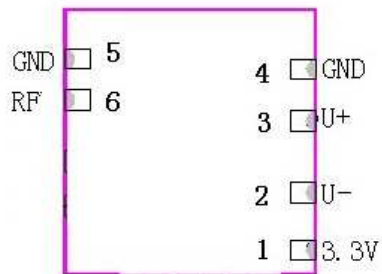
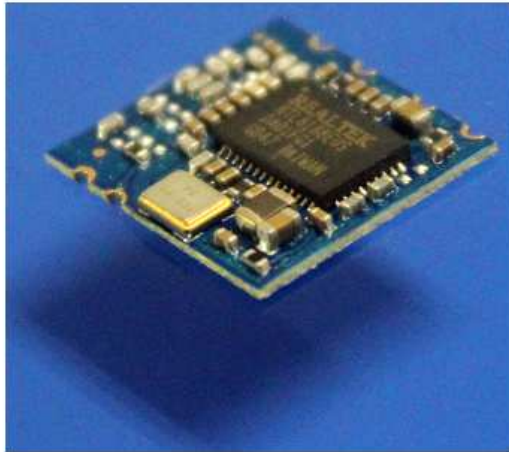
Media Access Control	WiFi: CSMA/CA with ACK
Network Architecture	WiFi: Ad-hoc mode (Peer-to-Peer) Infrastructure mode Software AP WiFi Direct
Security	WiFi: WPA, WPA-PSK, WPA2, WPA2-PSK, WEP 64bit & 128bit,
Antenna	External
OS Supported	Android /Linux/ Win CE /iOS /XP/WIN7
Dimension	Typical L13.0*W12.20*H2.0mm

2.2 Power Consumption

Power Consumption (Typical by using SWR)	WiFi only: TX Mode: (Continuous mode) 80mA (MCS7/BW40/13dBm) RX Mode: (Continuous mode) 65mA (MCS7/BW40/-60dBm) Associated Idle power saving with DTIM=3 2.1mA Unassociated Idle: 0.1mA RF disable Mode: 0.1mA
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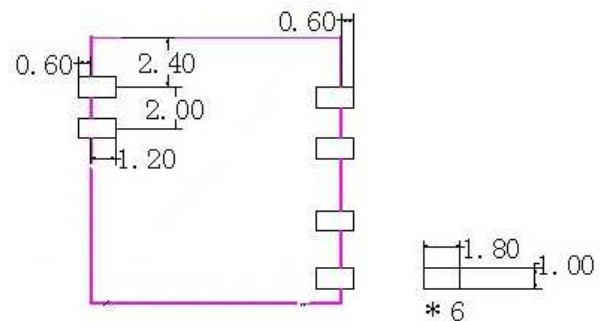
3. Mechanical Specification

3.1 Outline Drawing (Unit: $\pm 0.15\text{mm}$)



U : MM

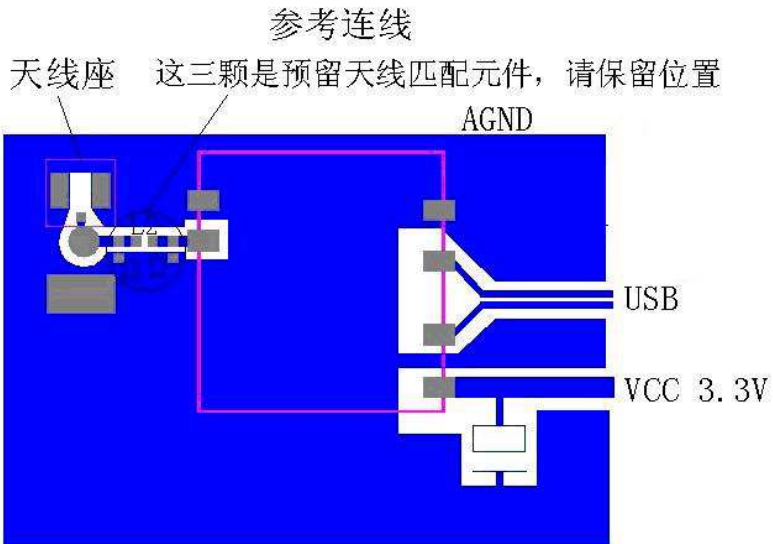
PCB Layout



3.2 PIN Assignment

Pin #	Name	Description
1	3.3V	3.3V DC power supply input
2	U-	USB Data DN
3	U+	USB Data DP
4	GND	Ground
5	GND	RF Ground
6	RF	External Antenna (2.4GHz 50Ohm)

3.3 Recommended Footprint



备注：RF输出走线尽量最短，保持50欧姆阻抗。

4. Environmental Requirements

4.1 Operating & Storage Conditions

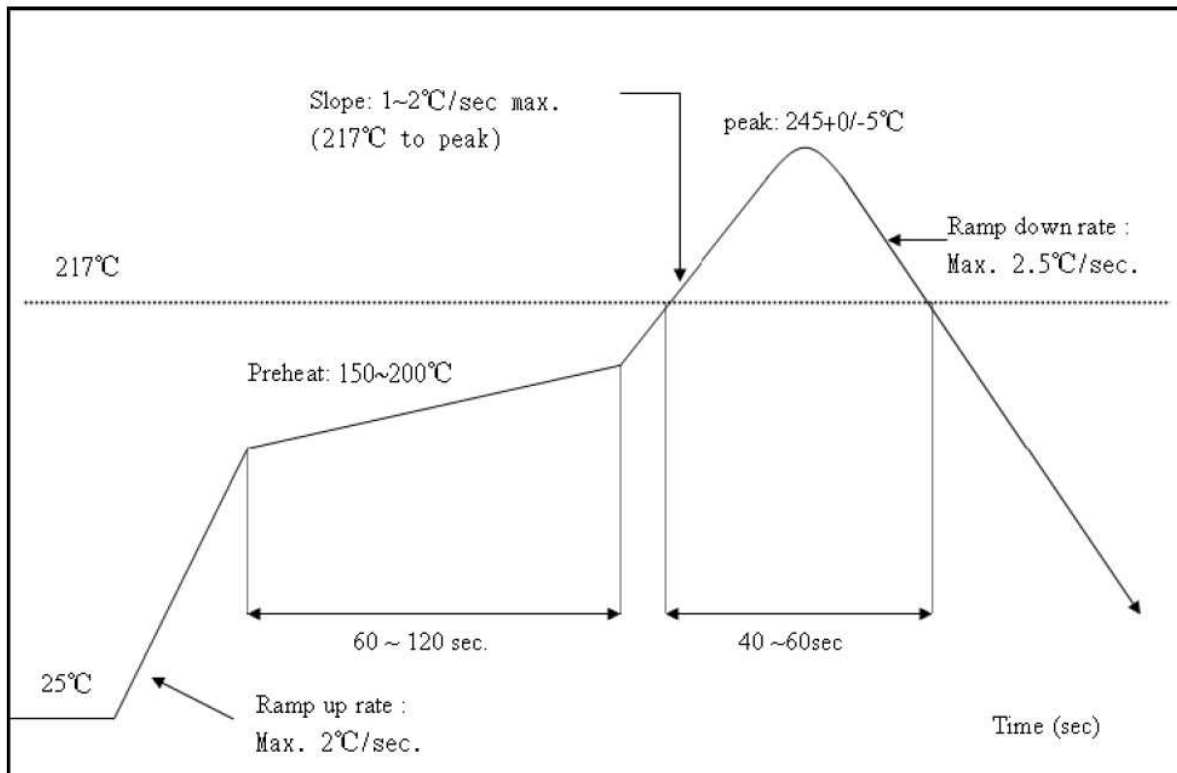
Operating	Temperature: 0°C to +55°C
	Relative Humidity: 10-90% (non-condensing)
Storage	Temperature: -40°C to +80°C (non-operating)
	Relative Humidity: 5-90% (non-condensing)
MTBF (Mean Time Between Failures)	Over 150,000hours

4.2 Recommended Reflow Profile

Referred to IPC/JEDEC standard.

Peak Temperature : <250°C

Number of Times : ≤2 times



4.3 Patch WIFI modules installed before the notice:

WIFI module installed note:

<http://www.fn-link.com>

1. Please press 1 : 1 and then expand outward proportion to 0.7 mm, 0.12 mm thickness When open a stencil
2. Take and use the WIFI module, please insure the electrostatic protective measures.
3. Reflow soldering temperature should be according to the customer the main size of the products, such as the temperature set at $250 \pm 5^{\circ}\text{C}$ for the MID motherboard.

About the module packaging, storage and use of matters needing attention are as follows:

1. The module of the reel and storage life of vacuum packing: 1). Shelf life: 8 months, storage environment conditions: temperature in: $< 40^{\circ}\text{C}$, relative humidity: $< 90\%$ r.h.
2. The module vacuum packing once opened, time limit of the assembly:
Card: 1) check the humidity display value should be less than 30% (in blue), such as: 30% ~ 40% (pink), or greater than 40% (red) the module have been moisture absorption.
2.) factory environmental temperature humidity control: $\leq 30^{\circ}\text{C}$, $\leq 60\%$ r.h..
3). Once opened, the workshop the preservation of life for 168 hours.
3. Once opened, such as when not used up within 168 hours:
1). The module must be again to remove the module moisture absorption.
2). The baking temperature: 125°C , 8 hours.
3.) After baking, put the right amount of desiccant to seal packages.

5. PACKING INFORMATION

5.1 Blister packaging



A piece of 100 PCS

5.2 Coiling Packaging



A roll of 2000pcs

THE END