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## Product Specification

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

Project Name	<b>Realtek RTL8188ETV 11n WIFI Module</b>
Model NO	<b>HR8188ETU3 USB Interface (HR8112MET-11)</b>
Customer	
Customer's Part NO	

<u>Approved:</u> SYMEN SONG	<u>Reviewed:</u> Watt huang	<u>Drafted:</u> Duncan
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Customer	Customer signature	Approved Date

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**0. Revision History**

<b>DATE</b>	<b>VERSION</b>	<b>DESCRIPTIONS</b>	<b>DRAFTED</b>
Rev1.0	2015-3-3	First Released	Duncan

## 1. Introduction

### 1.1 Overview

HR8188ETU3 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 RTL8188ETV. 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.

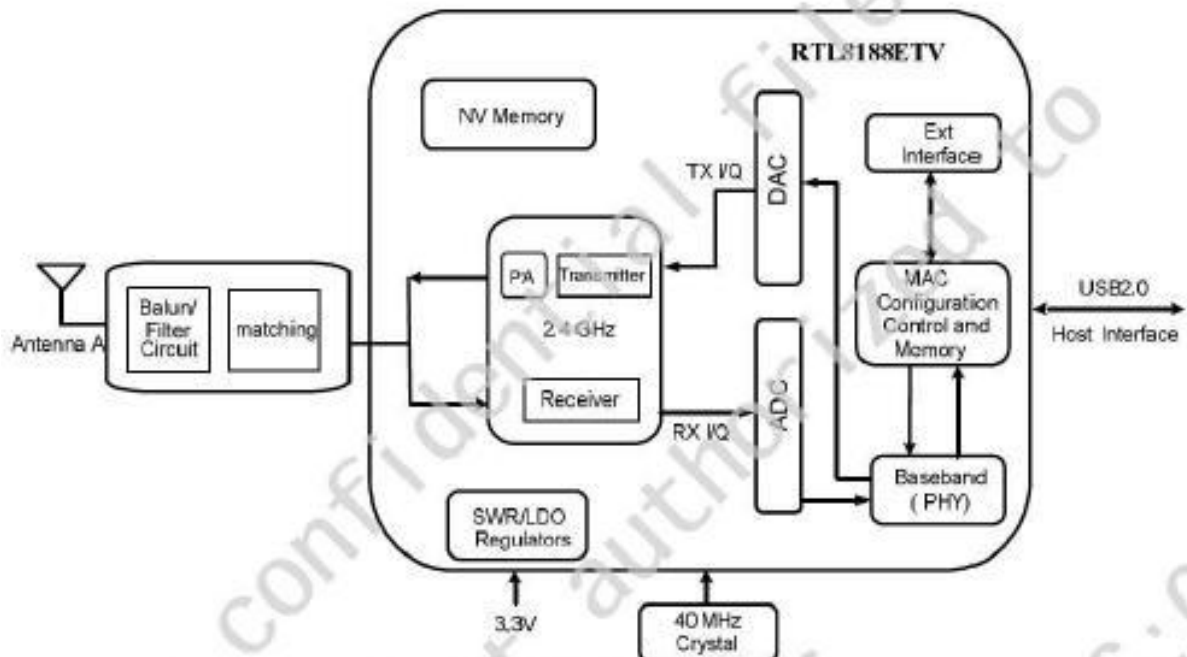


Figure 1. Single-Band 11n (1x1) Solution

### 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**

<b>Features</b>	<b>Descriptions</b>
<b>Main Chipset</b>	RTL8188ETV
<b>Frequency Range</b>	2.400~2.4835GHz
<b>Operating Voltage</b>	3.3Vdc ±10% I/O supply voltage
<b>Host Interface</b>	<b>WiFi:</b> USB
<b>Standards</b>	<b>WiFi:</b> IEEE 802.11b, IEEE 802.11g, IEEE 802.11n,
<b>Modulation</b>	<b>WiFi:</b> 802.11b: CCK(11, 5.5Mbps), QPSK(2Mbps), BPSK(1Mbps), 802.11 g/n: OFDM
<b>PHY Data rates</b>	<b>WiFi:</b> 802.11b: 11,5.5,2,1 Mbps 802.11g: 54,48,36,24,18,12,9,6 Mbps 802.11n: up to 150Mbps
<b>Transmit Output Power</b>	<b>WiFi:</b> 802.11b@11Mbps 16±2dBm 802.11g@6Mbps 14±2dBm 802.11g@54Mbps 14±2dBm 802.11n@65Mbps 13±2dBm (MCS 0_HT20) 13±2dBm (MCS 7_HT20) 13±2dBm (MCS 0_HT40) 13±2dBm (MCS 7_HT40)
<b>EVM</b>	802.11b /11Mbps : EVM ≤ -9dB 802.11g /54Mbps : EVM ≤ -25dB 802.11n /65Mbps : EVM ≤ -28dB
<b>Receiver Sensitivity (HT 20)</b>	<b>802.11b@8% PER</b> 1Mbps -88±1dBm 2Mbps -87±1dBm 5.5Mbps -85±1dBm 11Mbps -82±1dBm
	<b>802.11g@10% PER</b> 6Mbps -86±1dBm 9Mbps -85±1dBm 12Mbps -84±1dBm 18Mbps -82±1dBm 24Mbps -80±1dBm 36Mbps -77±1dBm 48Mbps -73±1dBm 54Mbps -71±1dBm
	<b>802.11n@10% PER</b> MCS 0 -83±1dBm MCS 1 -82±1dBm MCS 2 -80±1dBm MCS 3 -78±1dBm MCS 4 -75±1dBm MCS 5 -71±1dBm MCS 6 -69±1dBm MCS 7 -67±1dBm
<b>Operating Channel</b>	<b>WiFi 2.4GHz:</b> 11: (Ch. 1-11) – United States(North America) 13: (Ch. 1-13) – Europe 14: (Ch. 1-14) – Japan
<b>Media Access Control</b>	<b>WiFi:</b> CSMA/CA with ACK

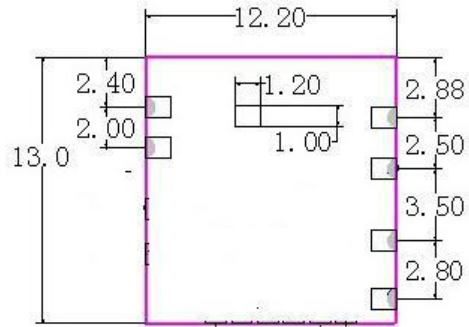
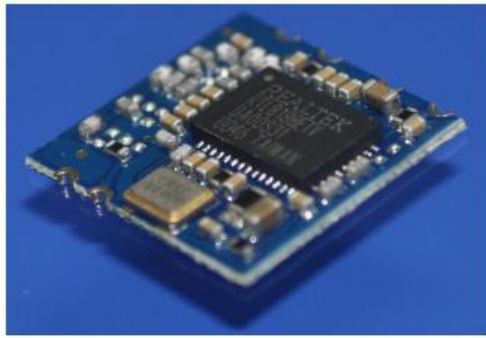
<b>Network Architecture</b>	<b>WiFi:</b> Ad-hoc mode (Peer-to-Peer ) Infrastructure mode Software AP WiFi Direct
<b>Security</b>	<b>WiFi:</b> WPA, WPA-PSK, WPA2, WPA2-PSK, WEP 64bit & 128bit,
<b>Antenna</b>	External
<b>OS Supported</b>	Android /Linux/ Win CE /iOS /XP/WIN7
<b>Dimension</b>	Typical L13.0*W12.20*H2.0mm

## 2.2 Power Consumption

<b>Power Consumption (Typical by using SWR)</b>	<b>WiFi only:</b> TX Mode: (Continuous mode) 185mA (MCS7/BW40/13dBm) RX Mode: (Continuous mode) 145mA (MCS7/BW40/-68dBm) LINK:140mA DISABLE:40mA
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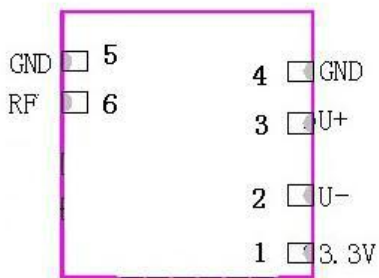
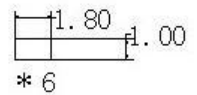
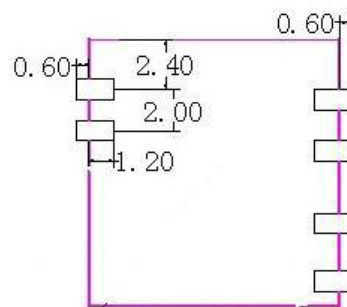
### 3. Mechanical Specification

#### 3.1 Outline Drawing (Unit: ±0.15mm)



U:MM

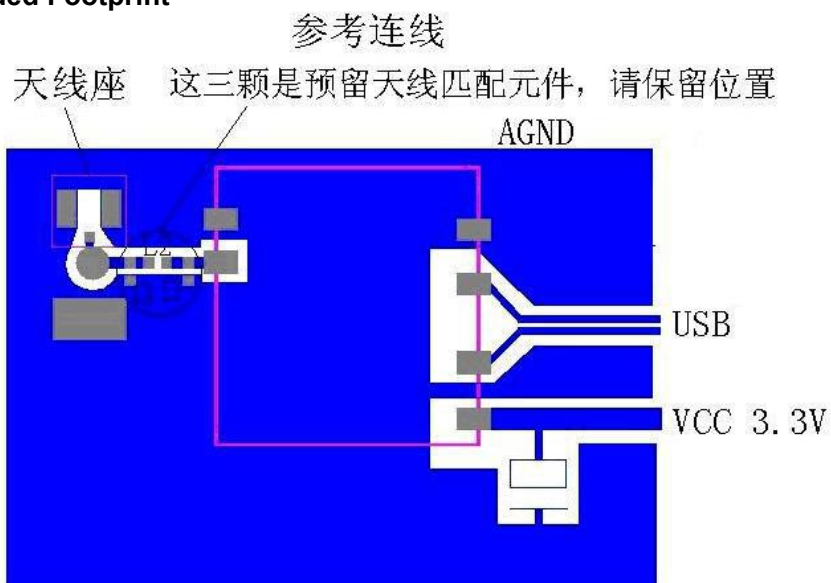
PCB Layout



#### 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**

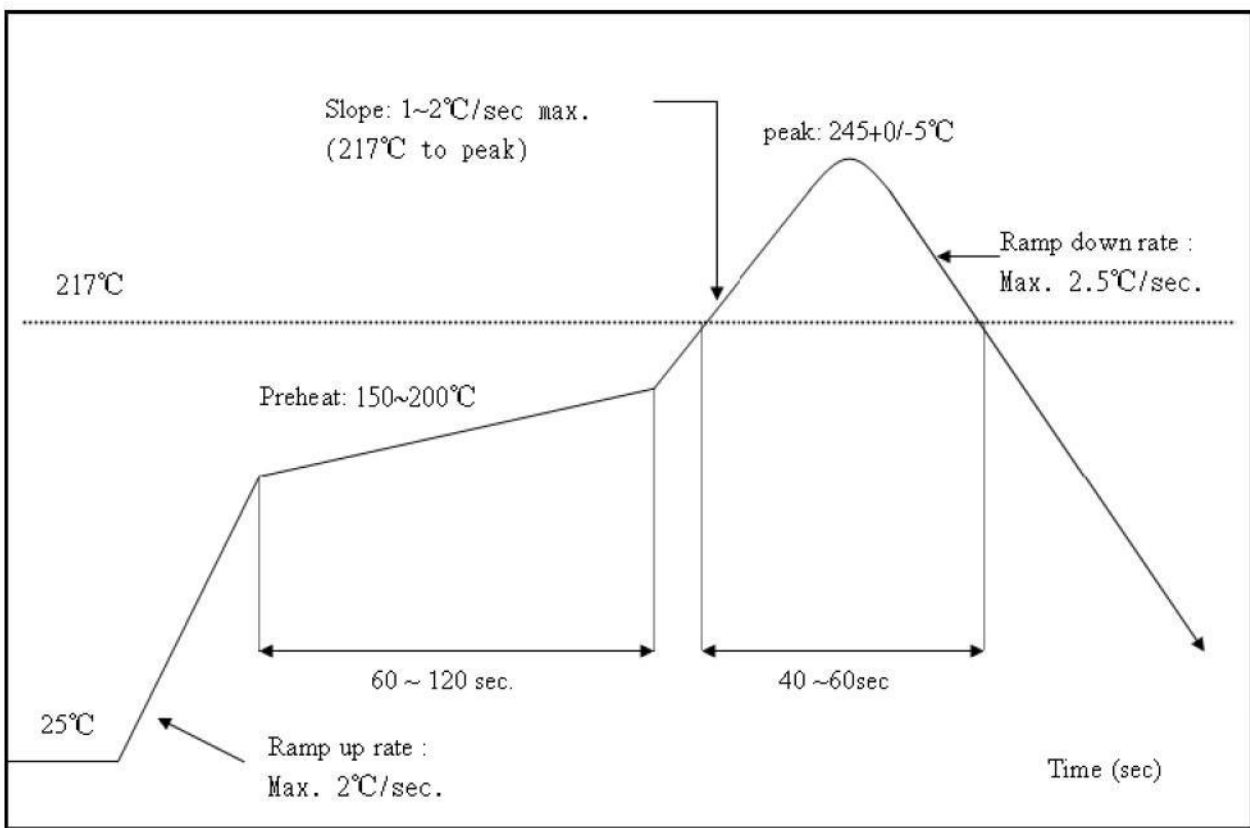
Operating	Temperature: 0°C to +55°C
	Relative Humidity: 10-90% (non-condensing)
Storage	Temperature: -40°C to +80°C (non-operating)
	Relative Humidity: 5-90% (non-condensing)
MTBF (Mean Time Between Failures)	Over 150,000hours

**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:

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 + 5 °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 °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: ≤ 30% °C, ≤ 60% r.h..
- 3). Once opened, the workshop the preservation of life for 168 hours.

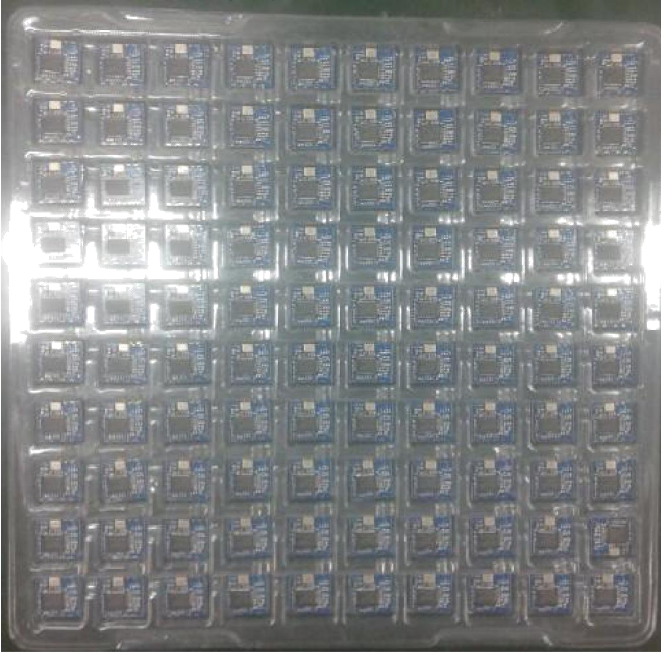


3. Once opened, such as when not used up within 168 hours:

- 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