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## Product Specification

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

Project Name	<b>Realtek RTL8188FTV 11n WIFI Module</b>	
Model NO	<b>F88FTUM13-W3</b>	
Customer		
Customer's Part NO		
Drawing: Allen Hu	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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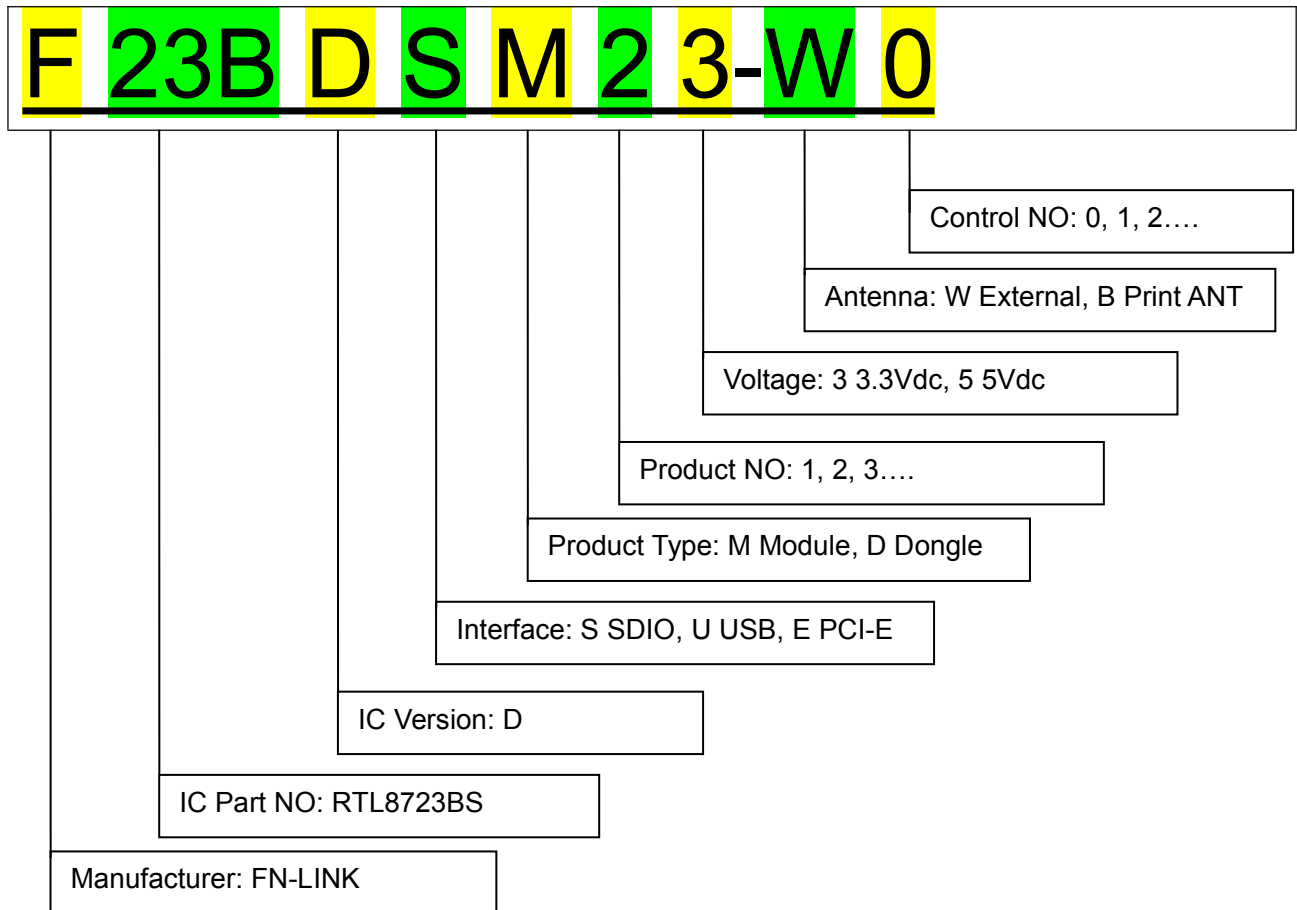
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**0. Revision History**

REV NO	Date	Modifications	Draft
Rev1.0	2016-02-29	First Released	Allen Hu

**0.1. Model No Definition**

Example: F23BDSM23-W0



1. Introduction

1.1 Overview

F88FTUM13-W3 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 RTL8188FTV. 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.

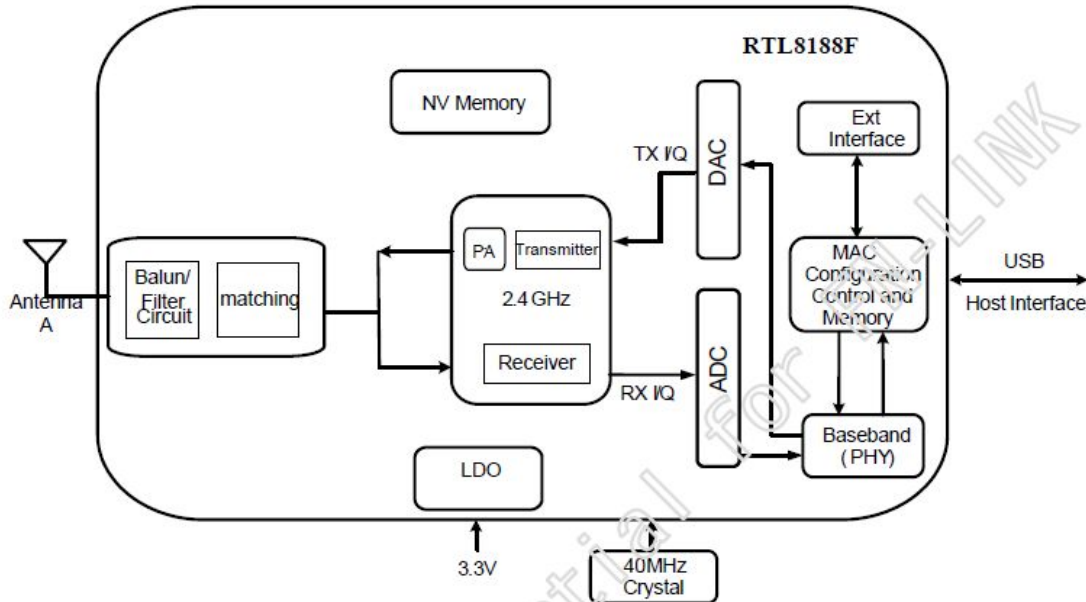


Figure 1. Single-Band 11n (1x1) Solution

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	RTL8188FTV
Frequency Range	2.400~2.4835GHz
Operating Voltage	3.3Vdc ±10% I/O supply voltage
Host Interface	WiFi: USB
Standards	WiFi: IEEE 802.11b, IEEE 802.11g, IEEE 802.11n,
Modulation	WiFi: 802.11b(DSSS): CCK(11, 5.5Mbps), DQPSK(2Mbps), DBPSK(1Mbps); 802.11g(OFDM): BPSK(9,6Mbps), QPSK(18,12Mbps), 16QAM(36,24Mbps), 64QAM(54,48Mbps); 802.11n(OFDM): BPSK, QPSK, 16QAM, 64QAM(150Mbps)
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

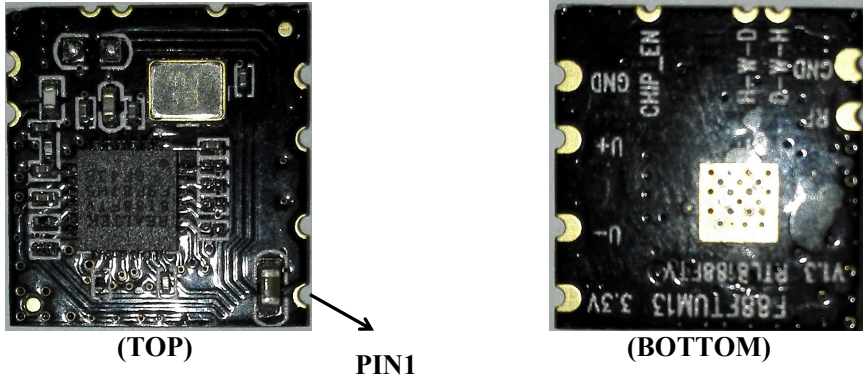
<b>Transmit Output Power</b>	<b>WiFi:</b> 802.11b <18dBm 802.11g <14dBm 802.11n <13dBm
<b>EVM</b>	802.11b /11Mbps : EVM $\leq$ -9dB 802.11g /54Mbps : EVM $\leq$ -25dB 802.11n /65Mbps : EVM $\leq$ -28dB
<b>Receiver Sensitivity</b>	<b>802.11b@8% PER</b> 11Mbps -86dBm
	<b>802.11g@10% PER</b> 54Mbps -73dBm
	<b>802.11n@10% PER</b> HT20_MCS 7 -70dBm HT40_MCS 7 -66dBm
<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, AES, TKIP
<b>Antenna</b>	External
<b>OS Supported</b>	Android /Linux/ Win CE /iOS /XP/WIN7
<b>Dimension</b>	Typical L12.90*W12.20*H1.6mm

**2.2 Power Consumption**

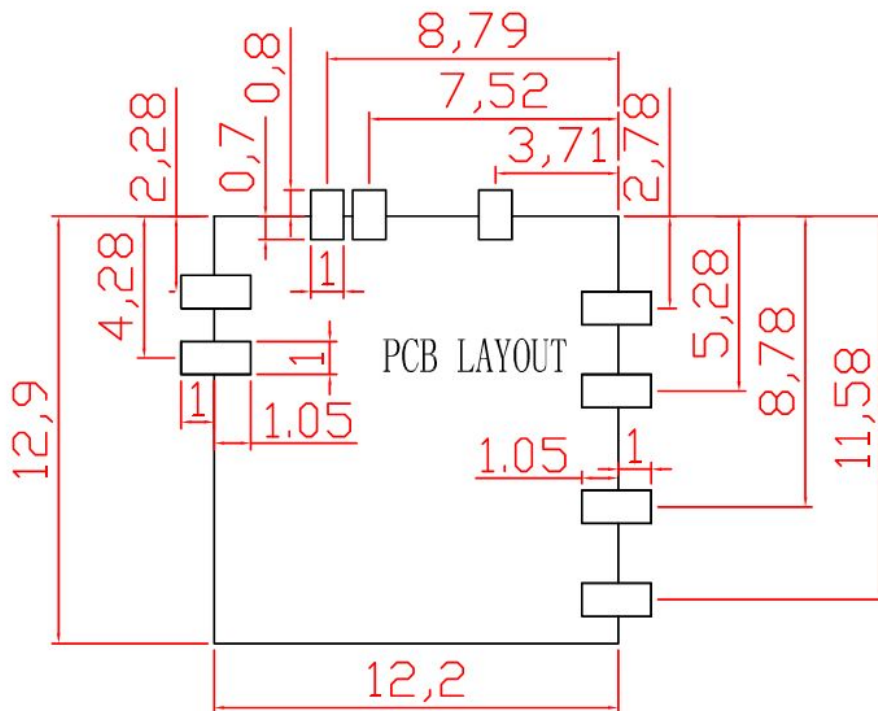
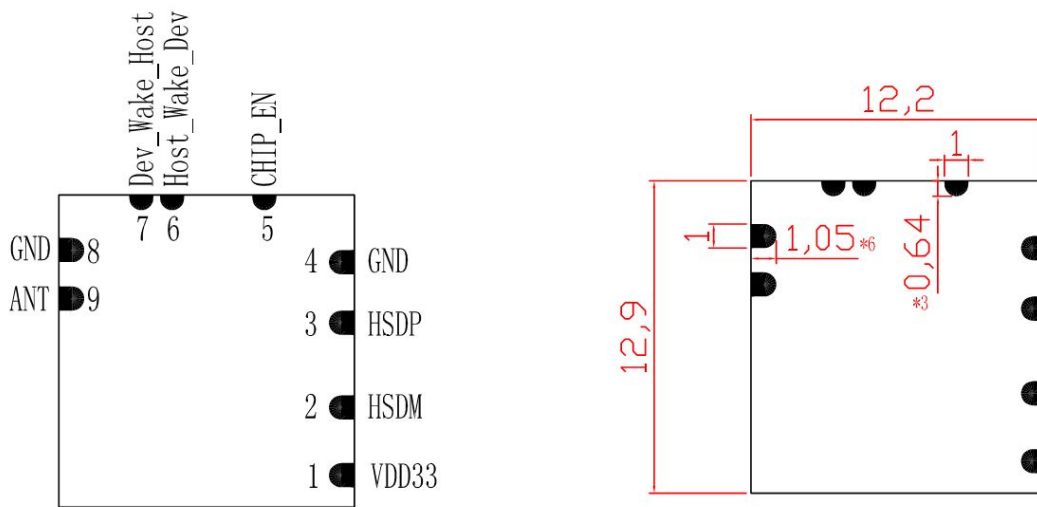
<b>Power Consumption (Typical by using SWR)</b>	<b>WiFi only:</b> TX Mode: (Continuous mode) 185mA (MCS7/BW40/13dBm) RX Mode: (Continuous mode) 145mA (MCS7/BW40/-68dBm) LINK:140mA DISABLE:40mA
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3. Mechanical Specification

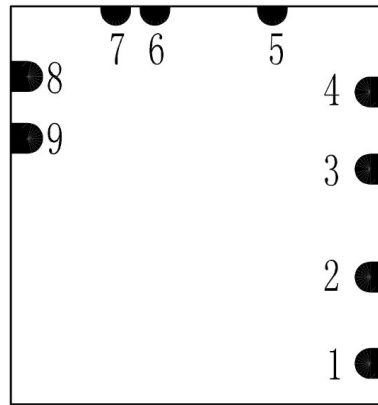
3.1 Outline Drawing (Unit:  $\pm 0.15\text{mm}$ )



Unit: mm  
 Errot:  $\pm 0.1\text{mm}$



### 3.2 PIN Assignment

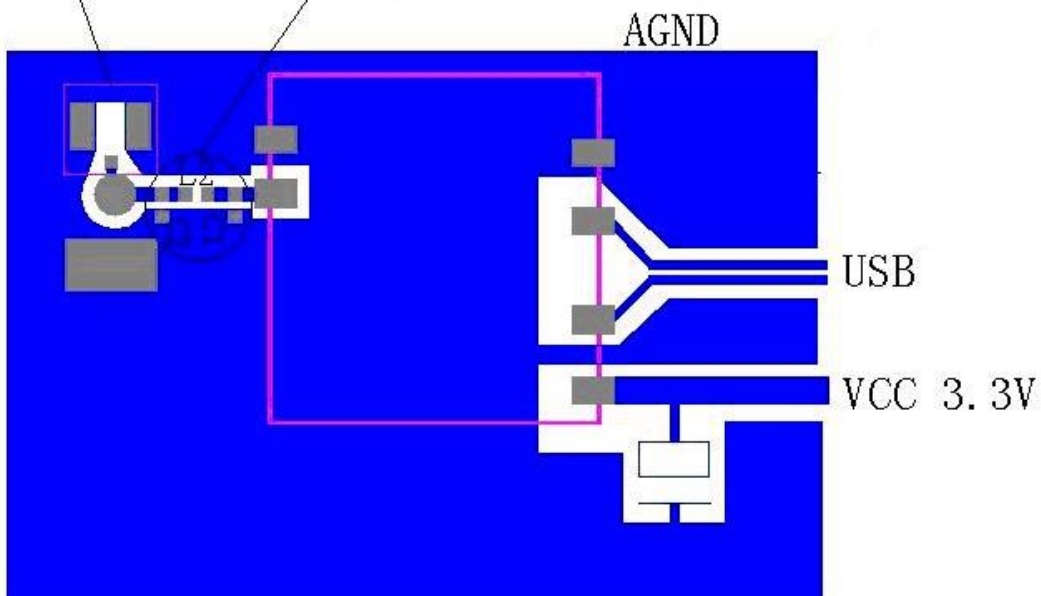


Pin #	Name	Description
1	VDD33	3.3V DC power supply input
2	HSDM	USB DATA-
3	HSDP	USB DATA+
4	GND	Ground
5	CHIP_EN	This Pin Can Externally Shutdown RTL8188FTV
6	Host_Wake_Dev	Host Wake Device Input Pin
7	Dev_Wake_Host	Device Wake Host Output Pin
8	GND	RF GROUND
9	ANT	External Antenna (2.4GHz 50Ohm )

### 3.3 Recommended Footprint

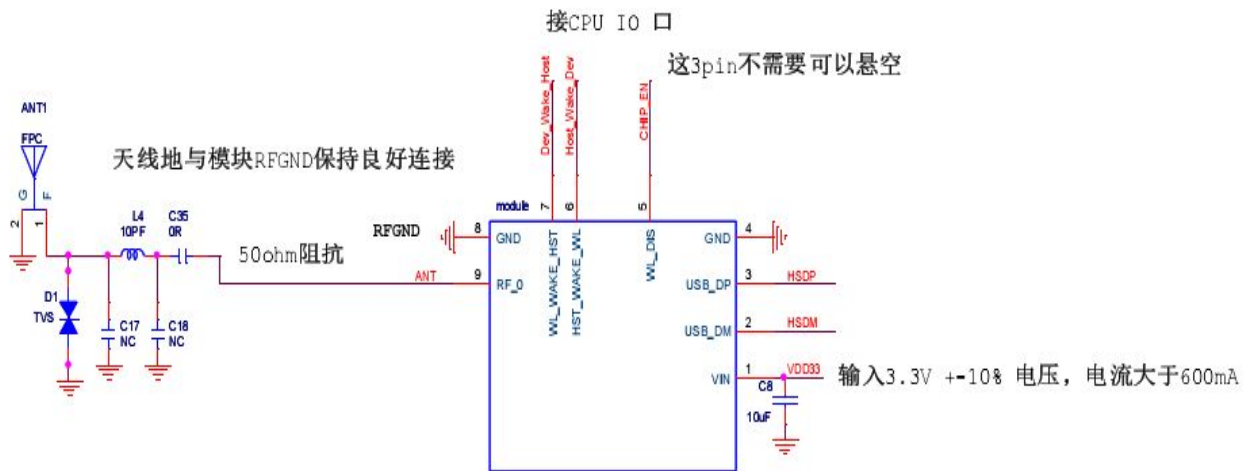
#### 参考连线

天线座 这三颗是预留天线匹配元件，请保留位置



备注：RF输出走线尽量最短，保持50欧姆阻抗。

### 3.4 Application Circuit



## 4. Environmental Requirements

### 4.1 Operating & Storage Conditions

Operating	Temperature: 0°C to +70°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

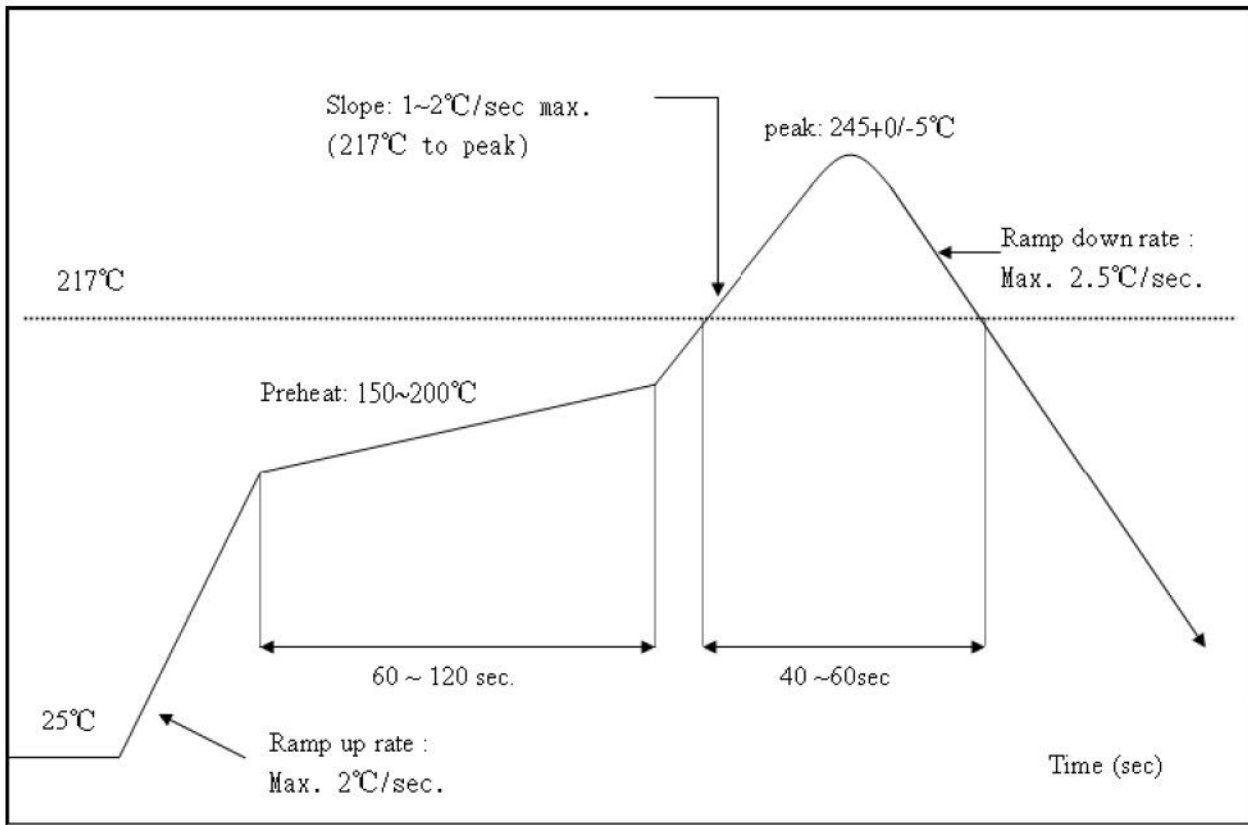
### 4.2 Recommended Reflow Profile

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  $250 + 5 \text{ }^{\circ}\text{C}$  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:  $< 40 \text{ }^{\circ}\text{C}$ , relative humidity:  $< 90\% \text{ r.h.}$
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:  $\leq 30\% \text{ }^{\circ}\text{C}$ ,  $\leq 60\% \text{ r.h.}$
  - 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:  $125 \text{ }^{\circ}\text{C}$ , 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**