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Product Specification

IEEE 802.11b/g/n 1T1R USB WiFi Module

Project Name	**RTL8188ETV 1T1R USB WIFI Module**
Model NO	**F88ETUM35-C2**
Customer	
Customer's Part NO	

Approved: SYMEN SONG	Check: Jim Hu	Drafted: SJ LI

Feedback of customer's Confirmation		
We accept the specification after Confirmed.		
Customer name	Customer signature	Confirmation Date

CONTENTS

0. Revision History

REV NO	Date	Modifications	Draft	Approved
Rev1.0	Jul.10,2014	First Released	SJ LI	SYMEN
Rev1.1	Aug.15,2014	Updated the PIN definition	SJ LI	SYMEN
Rev1.2	Aug.20,2014	1. Added Package information; 2. Added Label information; 3. Added the shielding case.	SJ LI	SYMEN
Rev1.3	Oct.30 2014	Added Label information;	SJ LI	SYMEN

0.1. Model No Definition

Example: F88ETUM35-C2

F 88E T U M 3 5-C 2

Control NO: 0, 1, 2….

ANT: W External, B Print, C Metal ANT

Voltage: 3 3.3Vdc, 5 5Vdc

Product NO: 1, 2, 3….

Product Type: M Module, D Dongle

Interface: S SDIO, U USB, E PCI-E

IC Version: T

IC Part NO: RTL8188ETV

Manufacturer: FN-LINK
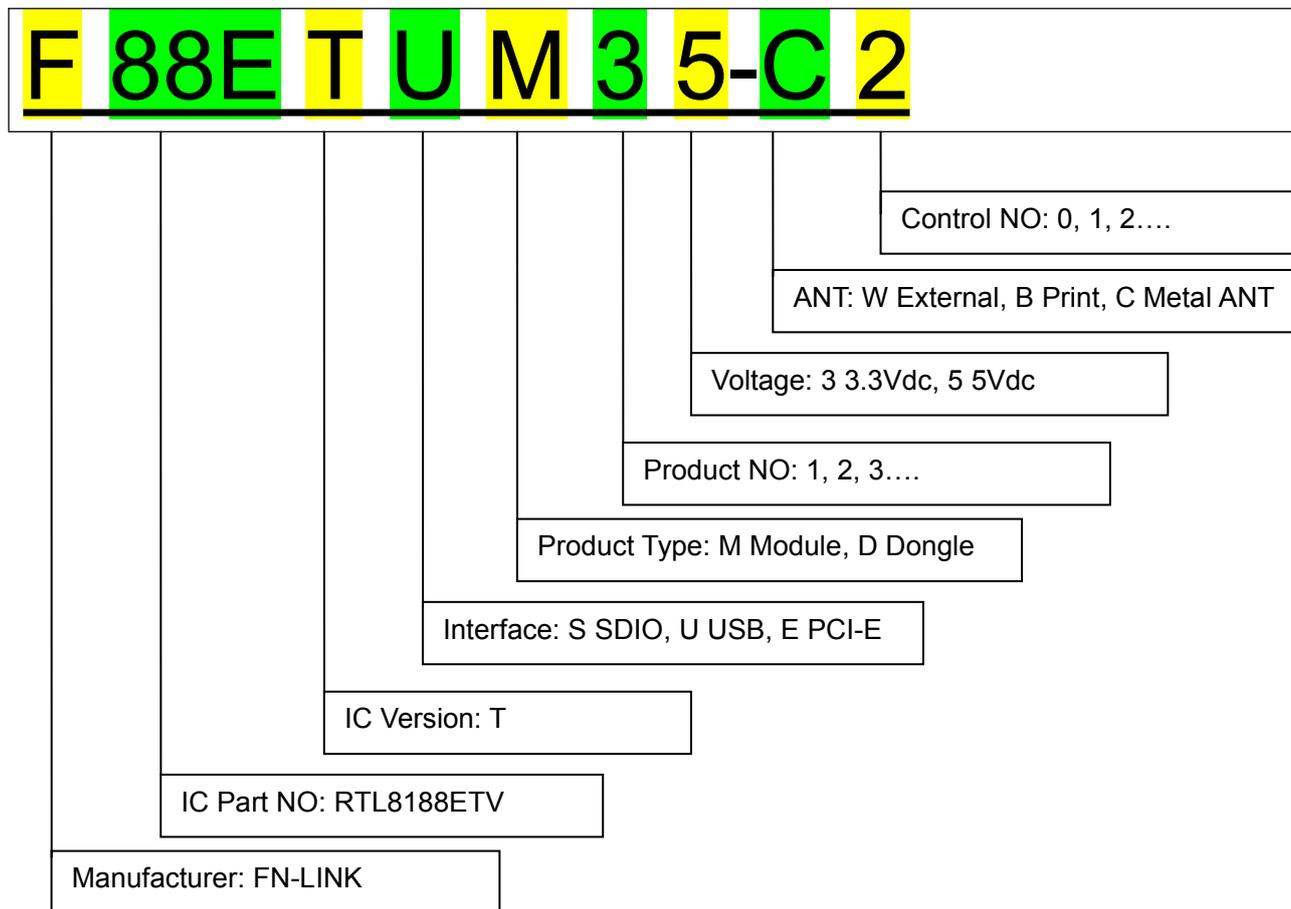
1. Introduction

F88ETUM35-C2 is a highly integrated and excellent performance Wireless LAN (WLAN) USB2.0 network interface device. High-speed wireless connection up to 150 Mbps.

1.1 Overview

The general hardware for the module is shown in Figure 1. This WLAN Module design is based on Realtek RTL8188ETV. It is a 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.
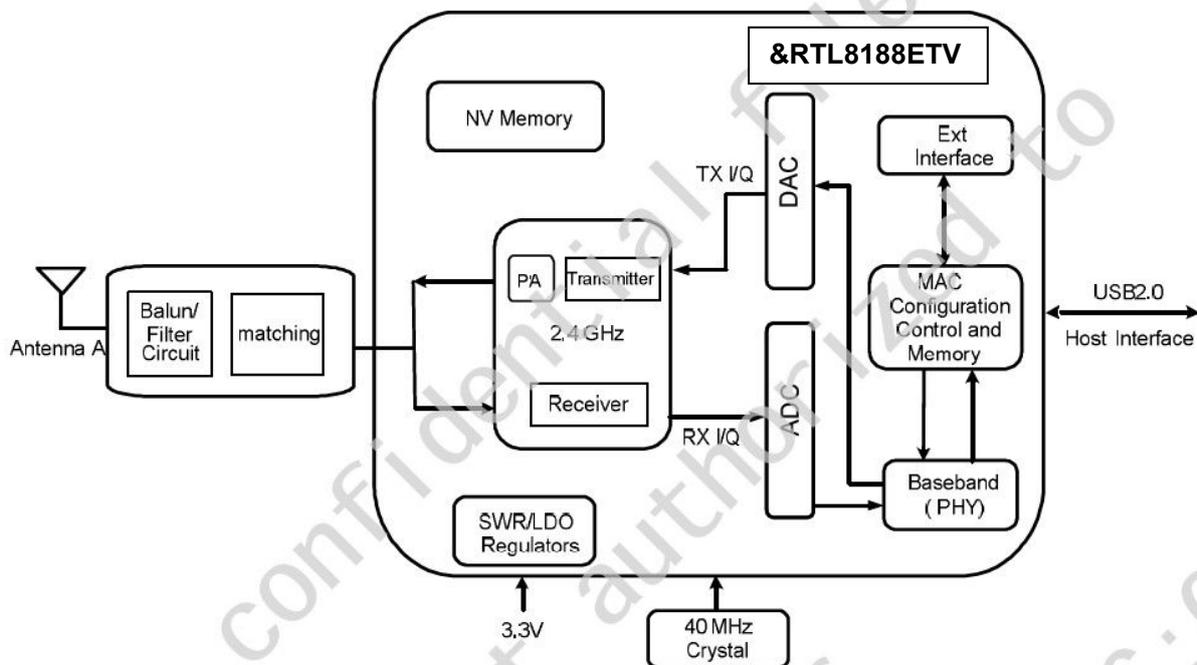

Figure 1. Single-Band 11n (1x1) Solution

1.2 SPECIFICATION REFERENCE

This specification is based on additional references listed as below.
iEEE 802.11b
iEEE 802.11g
iEEE 802.11n

2. GENERAL SPECIFICATION

2.1 WiFi Specifications

| Features	Descriptions
Main Chipset	RTL8188ETV
Frequency Range	2.400～2.4835GHz
Operating Voltage	5.0Vdc ±5% 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**±2**dBm 802.11g@6Mbps　14**±2**dBm 802.11g@54Mbps 14**±2**dBm 802.11n@65Mbps 13**±2**dBm (MCS 0_HT20) 　　　　　　　　　13**±2**dBm (MCS 7_HT20) 　　　　　　　　　13**±2**dBm (MCS 0_HT40) 　　　　　　　　　13**±2**dBm (MCS 7_HT40)
EVM	802.11b /11Mbps : EVM≦-9dB 802.11g /54Mbps : EVM≦-25dB 802.11n /65Mbps : EVM≦-28dB
Receiver Sensitivity (HT 20)	**802.11b@8% PER** 1Mbps -88±1dBm 2Mbps -87±1dBm 5.5Mbps -85±1dBm 11Mbps -82±1dBm **802.11g@10% PER** 6Mbps -86±1dBm 9Mbps -85±1dBm 12Mbps -84±1dBm 18Mbps -82±1dBm 24Mbps -80±1dBm 36Mbps -77±1dBm 48Mbps -73±1dBm 54Mbps -71±1dBm **802.11n@10% PER** 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
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	Onboard Metal ANT
OS Supported	Android /Linux/ Win CE /iOS /XP/WIN7
Dimension	Typical L40.0*W33.0*T3.5mm

2.2 Power Consumption

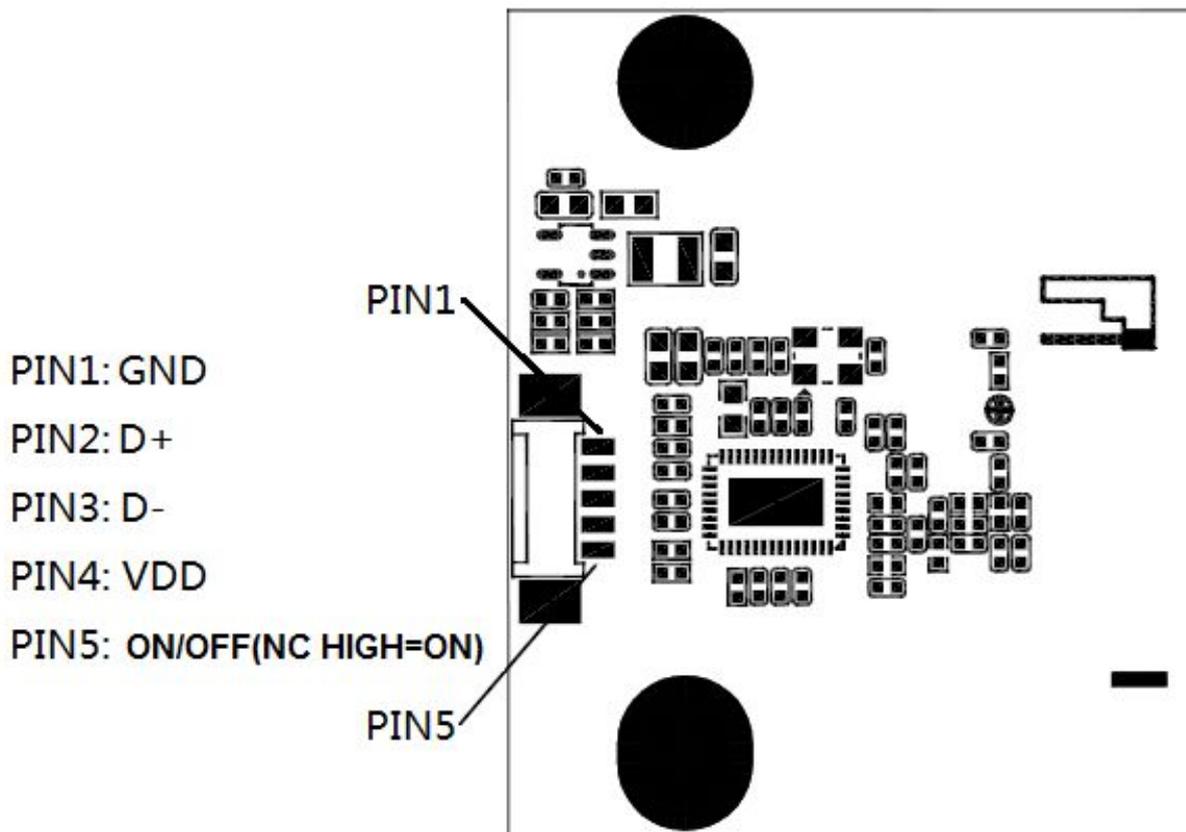| STATUS	Power Consumption (mA)
LINK	140
TX (11n,20M MCS7)	210
TX (11n,40M MCS7)	180
TX (11g,54M)	220
TX (11b,CCK11)	310
RX	145

3. Mechanical Specification
3.1 Outline Drawing (unit: mm)
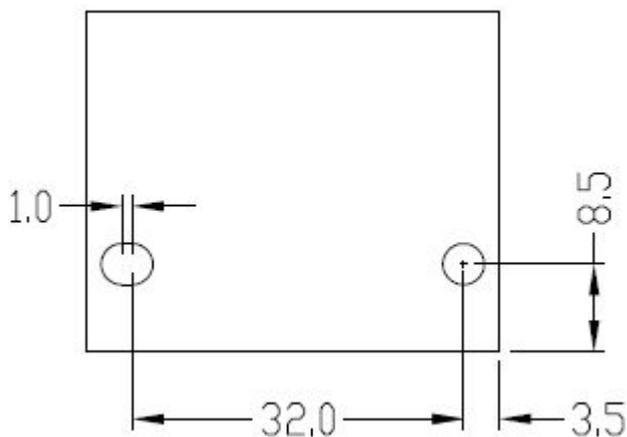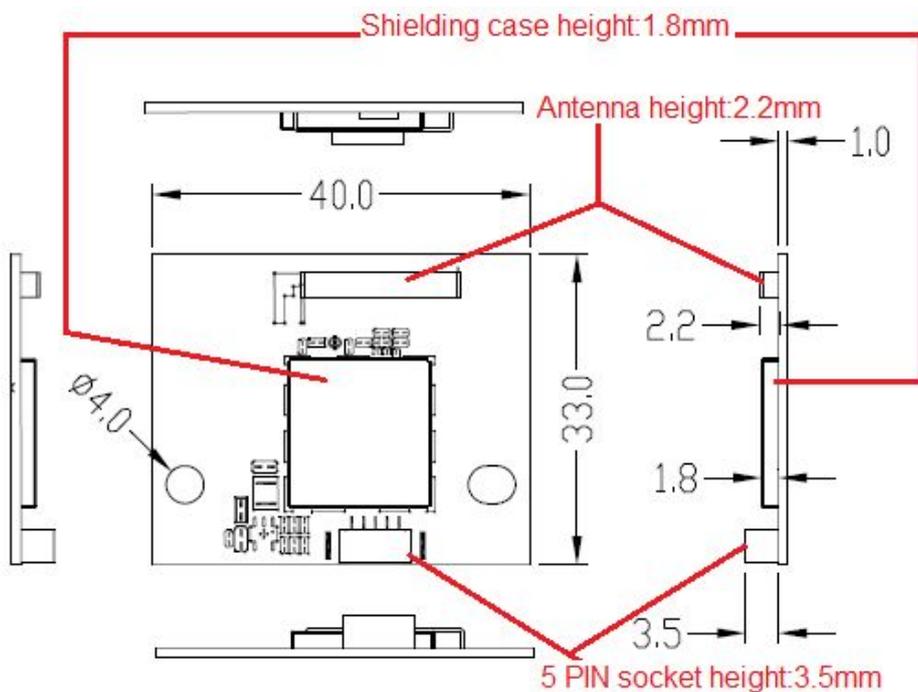
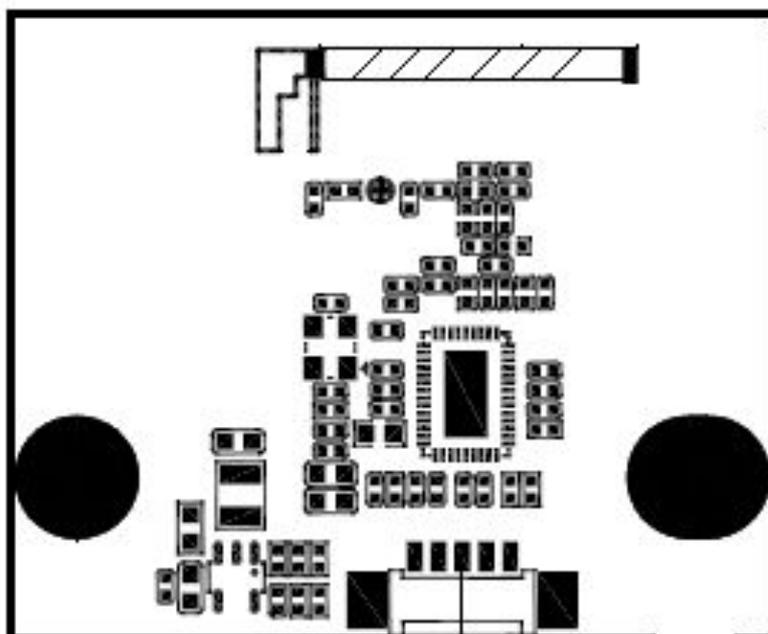### 3.2 Connector Pin Definition

PIN1: GND
PIN2: D+
PIN3: D-
PIN4: VDD
PIN5: ON/OFF(NC HIGH=ON)

Pin #	Name	Description
1	GND	Ground
2	D+	USB Data DP
3	D-	USB Data DN
4	VDD	Supply power input (5V)
5	ON/OFF	Control "Enable" of DC-DC, High level defaulted.

3.3 Layout reference

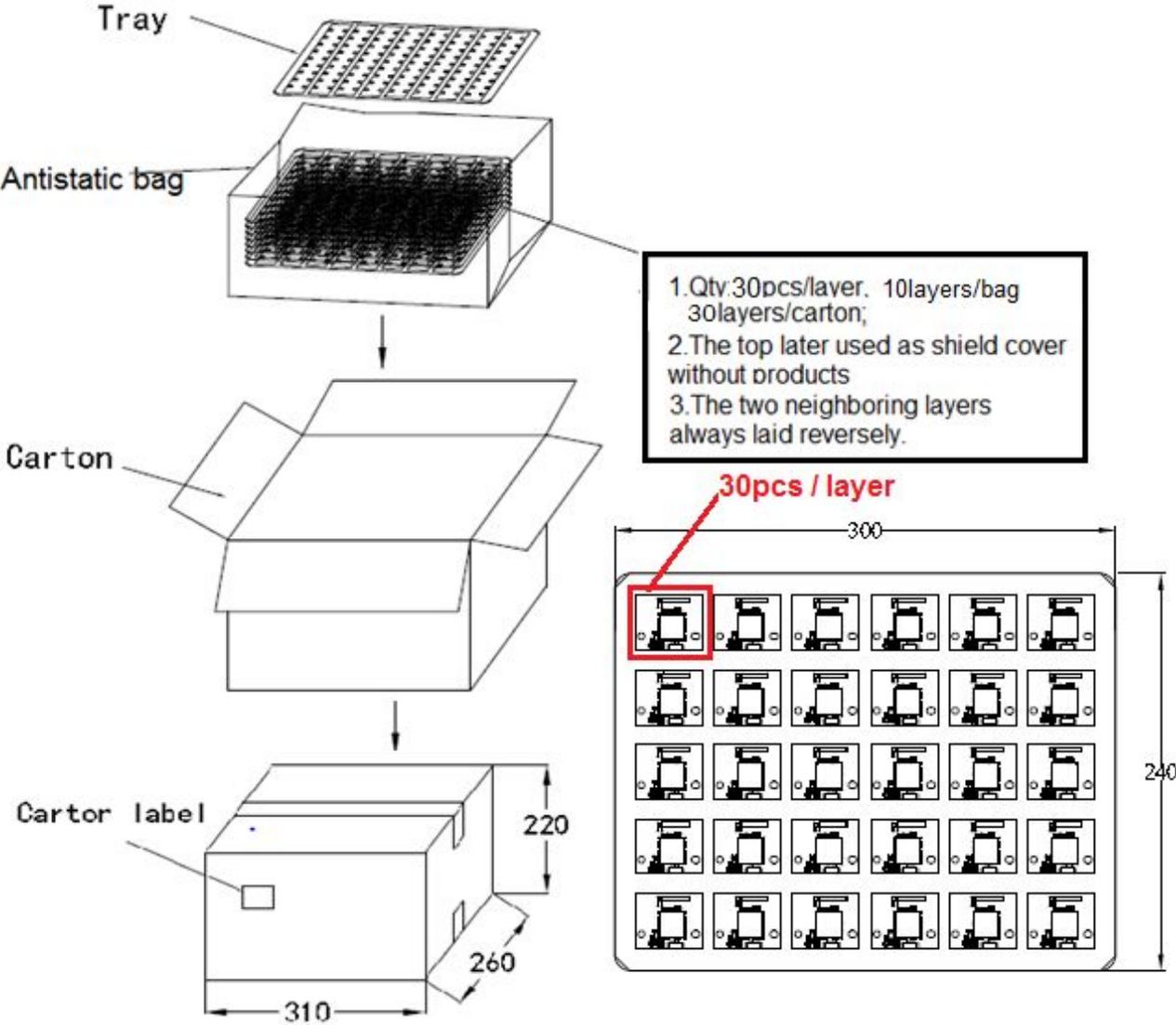## 4. Package

4.1 Package information

Layer size: L300.0*W240.0 mm
Layer material: PVC
Carton size: L310.0*W260.0*H220.0 mm
Carton material: A=A

Tray

Antistatic bag

1. Qty:30pcs/layer. 10layers/bag 30layers/carton;
2. The top later used as shield cover without products
3. The two neighboring layers always laid reversely.

Carton

Cartor label

30pcs / layer

5.User's Manual

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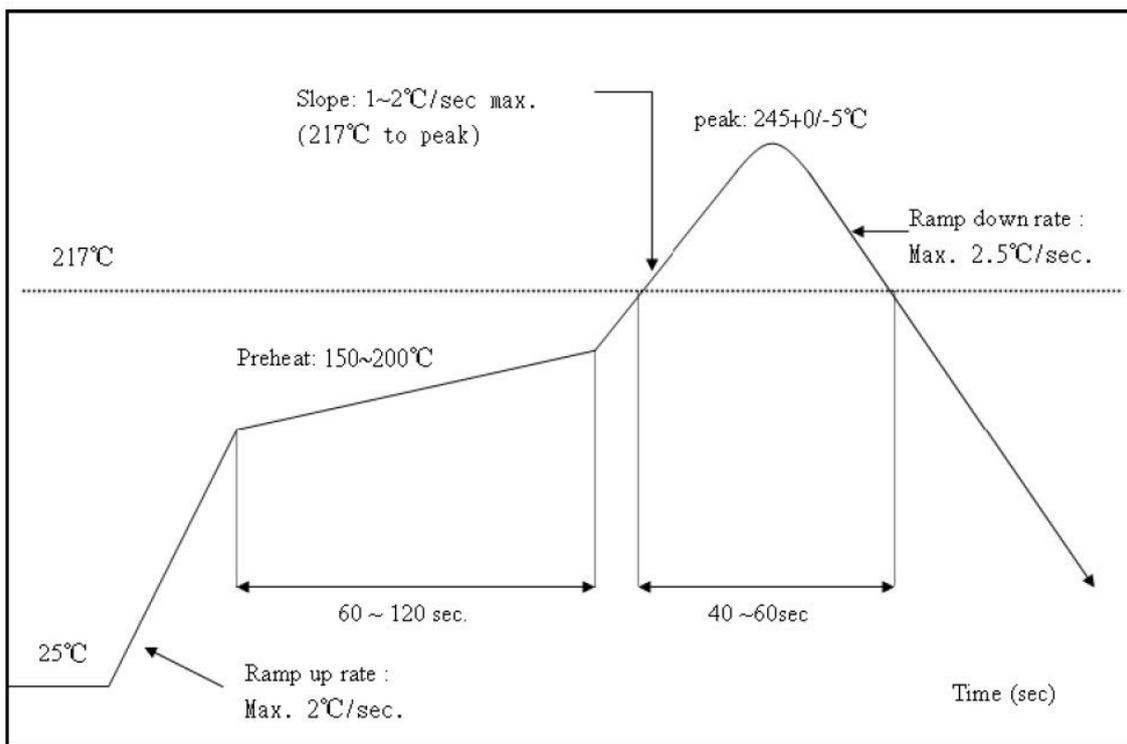
Operating	Temperature: -5°C to +55°C
	Relative Humidity: 10-90% (non-condensing)
Storage	Temperature: -40°C to +80°C (non-operating)
	Relative Humidity: 5-90% (non-condensing)
MTBF (Mean Time Between Failures)	Over 150,000hours

5.2 Recommended Reflow Profile
Referred to IPC/JEDEC standard.
Peak Temperature : <250°C
Number of Times : ≤2 times

5.3 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 ℃ 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 ℃, relative humidity: < 90%RH.
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 ℃, ≦ 60% RH
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 ℃, 8 hours.
3.) After baking, put the right amount of desiccant to seal packages.

THE END

FCC Statement:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference. (2) This device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

---Reorient or relocate the receiving antenna.

---Increase the separation between the equipment and receiver.

---Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

---Consult the dealer or an experienced radio/TV technician for help.

WARNING: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

LABEL OF THE END PRODUCT:

The final end product must be labelled in a visible area with the following "Contains FCC ID:

2AATL-F88ETUM35-C2". If the size of the end product is smaller than 8x10cm, then additional FCC part 15.19 statement is required to be available in the users manual: This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

RF Exposure

This device has been evaluated and shown compliant with the FCC RF Exposure limits under fixed exposure conditions (antennas are greater than 20cm from a person's body) when installed in certain specific OEM configurations.

This modular complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

IMPORTANT NOTE:

This device is intended only for OEM integrators under the following conditions:

(1) This module has been designed to operate with Onboard Metal antenna having a gain of 0dBi. The module is only certified with the installed antenna. Any change of the antenna will void the certification.

(2) Integration is typically strictly restricted to Grantee himself or dedicated OEM integrators under control of the Grantee.

The module Integrator will be responsible to satisfy SAR/RF exposure requirements, when the module integrated into any (portable, mobile, fixed) host device.

This module is intended for OEM integrator only and the OEM integrators and instructed to ensure that the end user has no manual instructions to remove or install the device. The OEM integrator is still responsible for the FCC compliance requirement of the end product, which integrates this module.

EU Regulatory Conformance

Hereby, we (FN-Link Technology Limited) declared that this device is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

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