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Product Specification

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

Project Name	Realtek RTL8189ETV 11n WIFI Module	
Model NO	F89ETSM13-W2 12.0*12.0*1.8, 3.3V SDIO Interface	
Customer		
Customer's Part NO		
Drawing: LF WEI	Approved: Jim HU	Sales: Sunny LIU

	Check	Approved	Date
Customer Approval			

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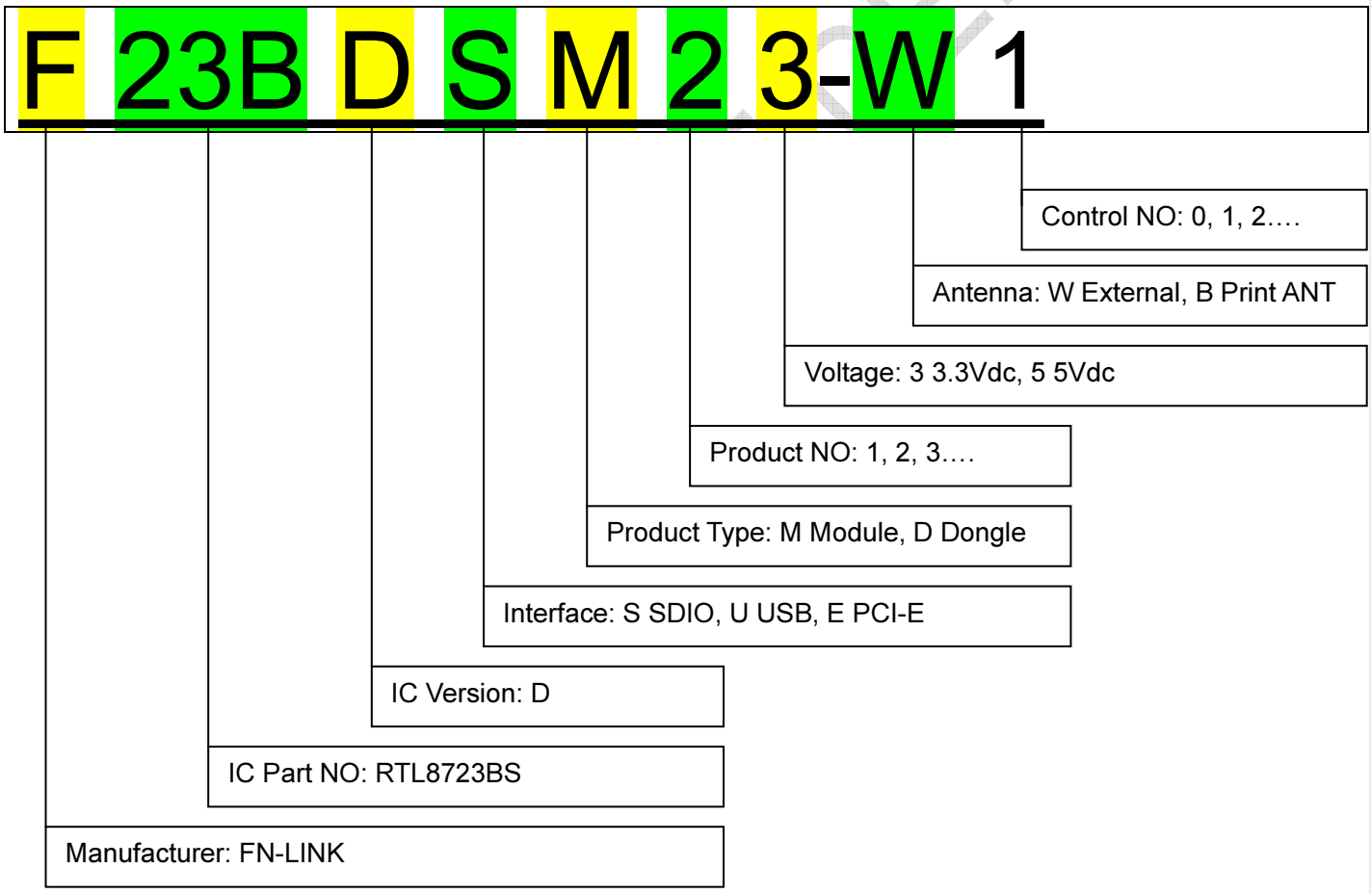
0. Revision History

REV NO	Date	Modifications	Draft	Approved
Rev0.1	2013-8-10	First Released		XJ Hu
Rev0.2	2013-12-20	Update PCB Layout Package		XJ Hu

0.1. Model No Definition

Example: F23BDSM23-W1



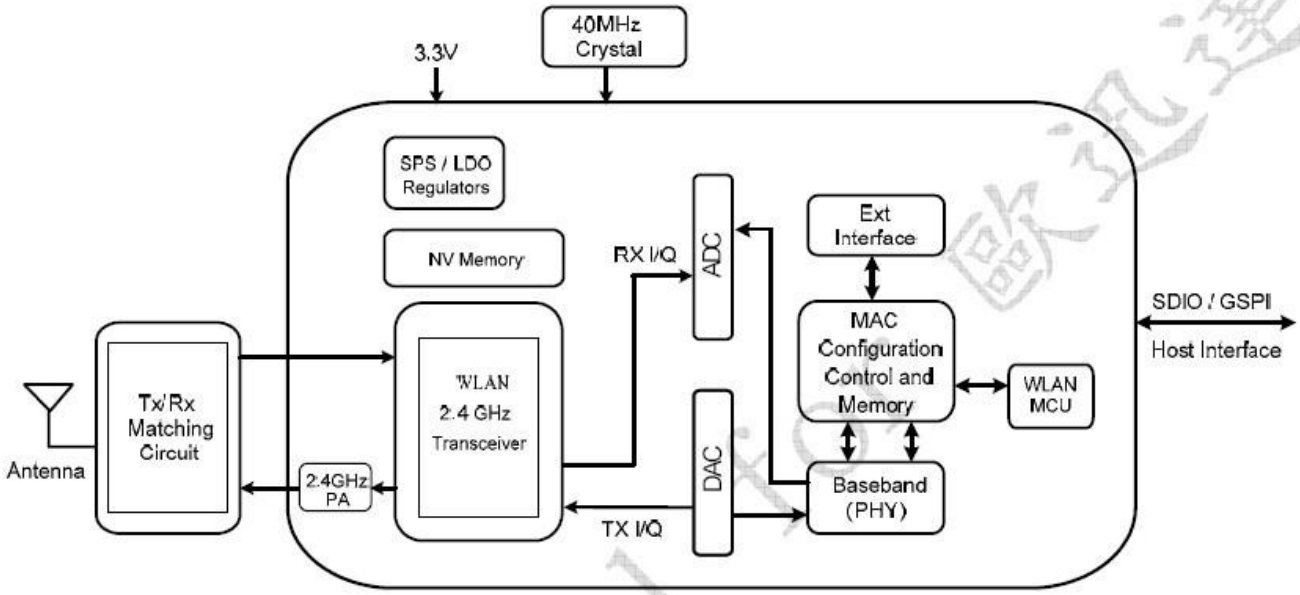
1. Introduction

1.1 Overview

F89ETSM13-W2 is a highly integrated and excellent performance Wireless LAN (WLAN) SDIO 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 RTL8189ETV. It is a highly integrated single-chip 1*1 MIMO (Multiple In Multiple Out) Wireless LAN (WLAN) SDIO 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.

Single-Band 11n (1x1) Solution



1.2 Product Features

- Operate at ISM frequency bands (2.4GHz)
- SDIO 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

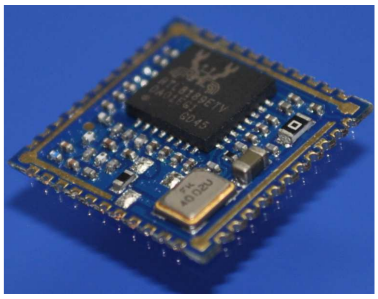
Main Chipset	RTL8189ETV
Operating Frequency	2.400～2.4835GHz
Standards	**WiFi:** IEEE 802.11b, IEEE 802.11g, IEEE 802.11n,
Modulation	**WiFi:** 802.11b: CCK(11, 5.5Mbps), QPSK(2Mbps), BPSK(1Mbps), 802.11 g/n: OFDM
PHY Data rates	**WiFi:** 802.11b: 11,5.5,2,1 Mbps 802.11g: 54,48,36,24,18,12,9,6 Mbps 802.11n: up to 150Mbps
Transmit Output Power (Tolerance: ±2.0dBm)	**WiFi:** 802.11b@11Mbps 16dBm 802.11g@6Mbps 15dBm 802.11g@54Mbps 15dBm 802.11n 14dBm (MCS 0_HT20) 14dBm (MCS 7_HT20) 13dBm (MCS 0_HT40) 13dBm (MCS 7_HT40)
Receiver Sensitivity	802.11b@11Mbps -82±1dBm 802.11g@54Mbps -71±1dBm 802.11n -67±1dBm (MCS 7_HT20) -67±1dBm (MCS 7_HT40)
Operating Channel	**WiFi 2.4GHz:** 11: (Ch. 1-11) – United States 13: (Ch. 1-13) – Europe 14: (Ch. 1-14) – Japan
Media Access Control	**WiFi:** CSMA/CA with ACK
Antenna	External Antenna
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,
OS Supported	Android /Linux
Host Interface	**WiFi:** SDIO/GPIO
Operating Voltage	3.3Vdc ±10% I/O supply voltage
Dimension	Typical L12.0*W12. 0*H1.8mm

2.2 Power Consumption

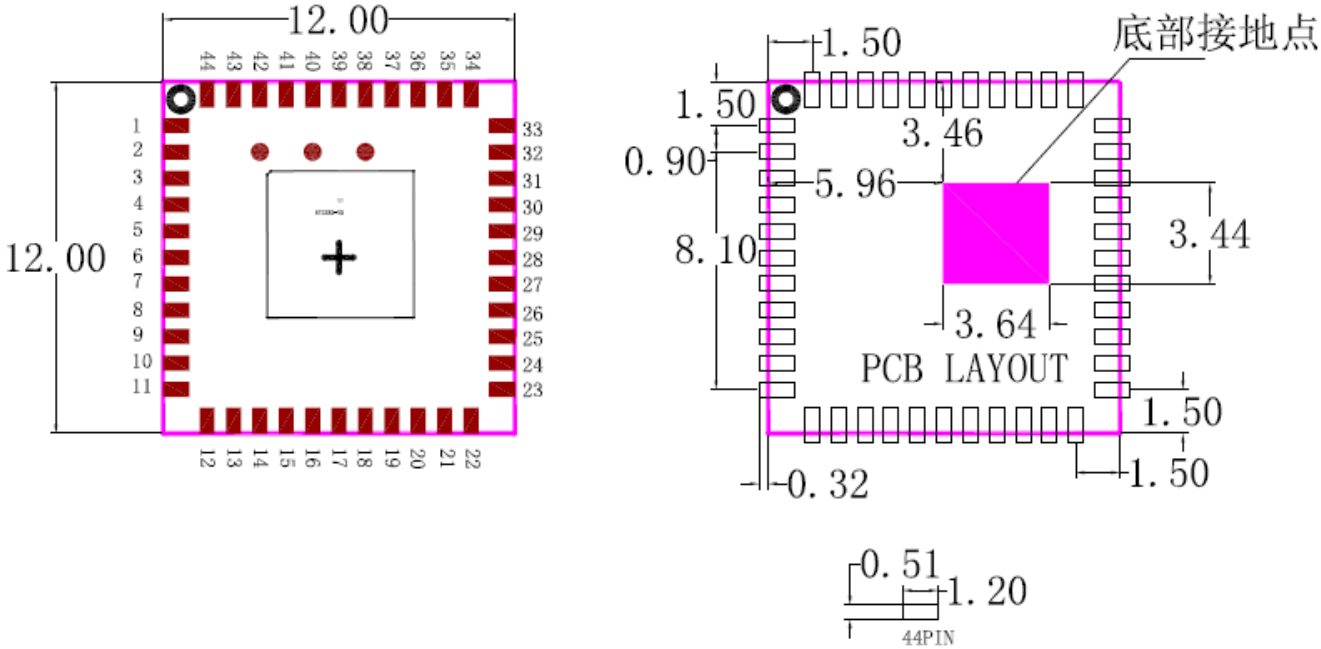
Power Consumption (Typical by using SWR)	**WiFi only:** TX Mode: (Continuous mode) 190mA (MCS7/BW40/13dBm) RX Mode: (Conituous mode) 130mA (MCS7/BW40/-60dBm) Associated Idle power saving with DTIM=3 20mA Unassociated Idle: 0.1mA RF disable Mode: 0.1mA

3. Mechanical Specification

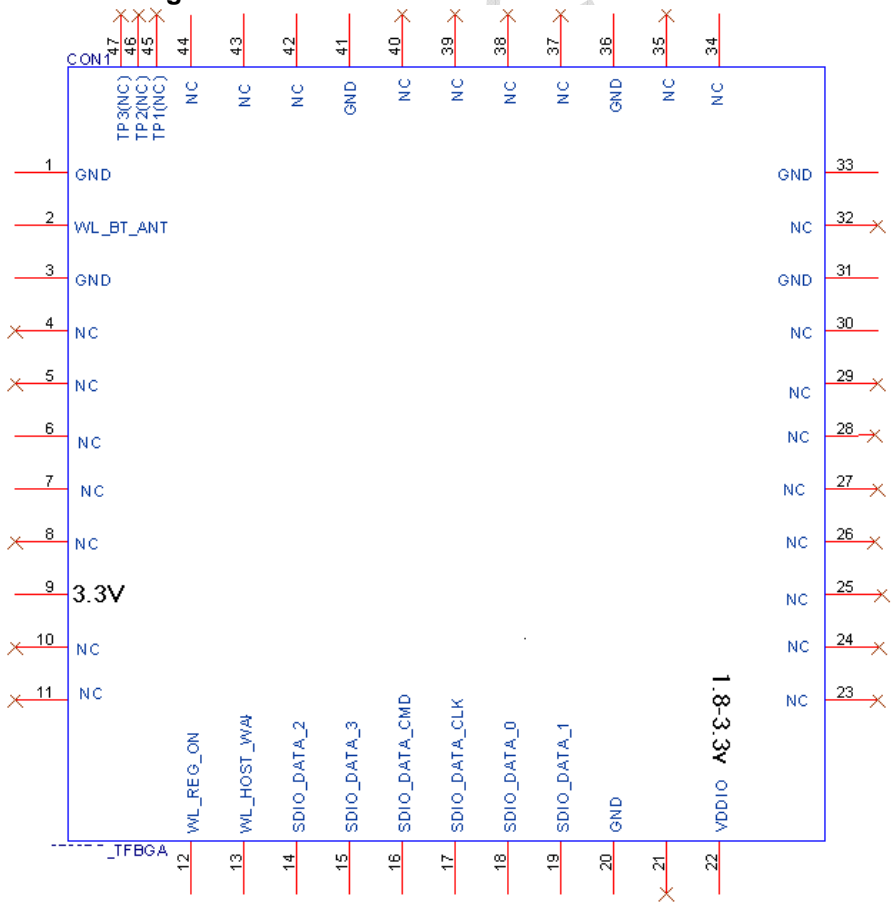
3.1 Outline Drawing (Unit: ±0.15mm)



3.2 Recommended Footprint



3.3 PIN Assignment



Pin #	Name	Description
1	GND	GND
2	RF	RF OUTPUT
3	GND	GND
4~8	NC	NC
9	VBAT	3.3 or 4.2V Optional
10	NC	NC
11	NC	NC
12	WL_REG_ON	WL_REG_ON
13	WL_HOST_WAKE	WAKE UP
14	SDIO_DATA_2	SDIO_D2
15	SDIO_DATA_3	SDIO_D3
16	SDIO_DATA_CMD	SDIO_CMD
17	SDIO_DATA_CLK	SDIO_CLK
18	SDIO_DATA_D0	SDIO_D0
19	SDIO_DATA_D1	SDIO_D1
20	GND	GND
21	NC	NC
22	VDIO	1.8~3.3V
23~30	NC	NC
31	GND	GND
32	NC	NC
33	GND	GND
34~35	NC	NC
36	GND	GND
37~40	NC	NC
41	GND	GND
42~44	NC	NC

4. Environmental Requirements

4.1

Operating Condition:

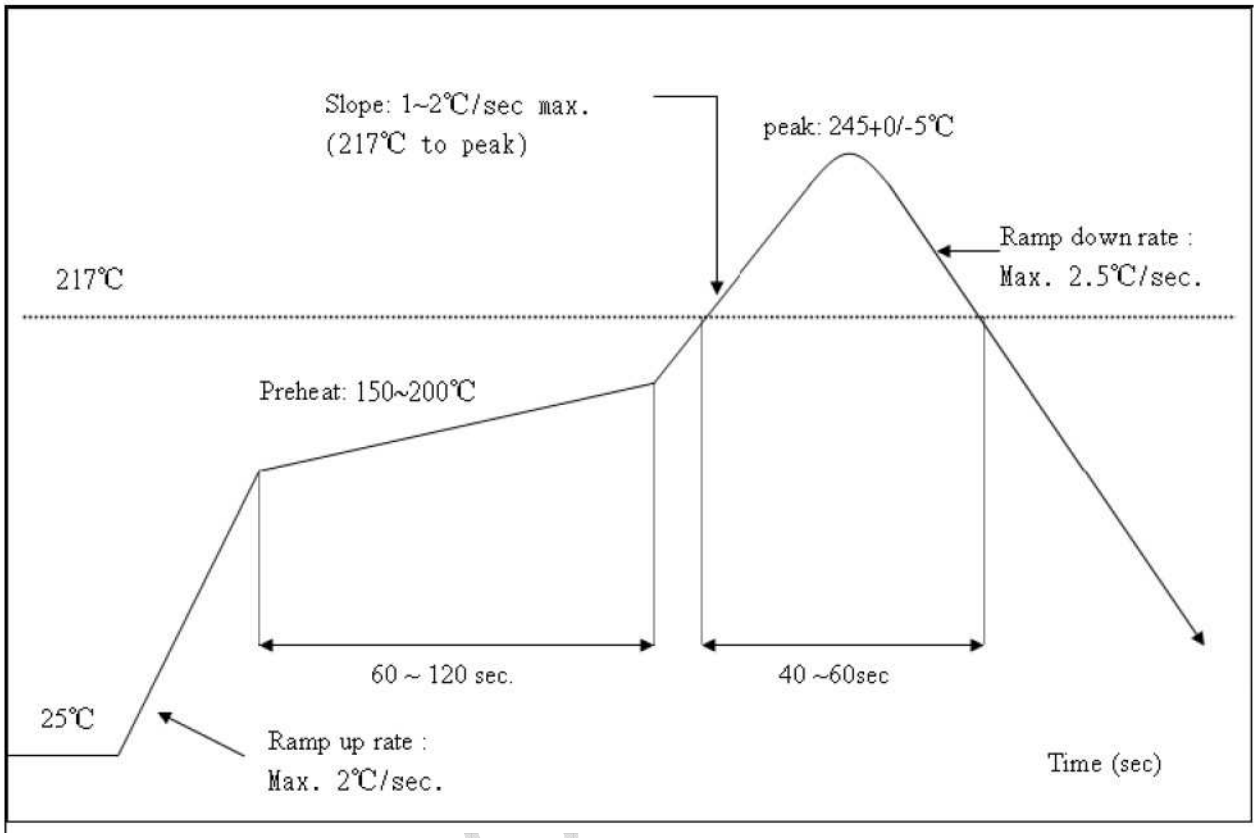
Operating Temperature: 0°C to +55°C
Relative Humidity: 10-90% (non-condensing)

Storage Condition:

Temperature: -40°C to +80°C (non-operating)
Relative Humidity: 5-90% (non-condensing)

MTBF: 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 ℃ 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% 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℃, ≦ 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 ℃, 8 hours.
3.) After baking, put the right amount of desiccant to seal packages.

贴片 WIFI 模块装机的前注意事项：

1、 客户在开钢网时一定要将 WIFI 模块焊盘的孔开大，请按 1 比 1 再向外扩大 0.7mm 比例来开，厚度按 0.12mm。
2、有需要拿 WIFI 模时一定不要光着手去拿 WIFI 模块，一定要戴上手套及静电环。
3、过炉温度要根据客户主板的大小而定，一般像贴在平板电脑上 250+-5 度。

关于模块包装，储存以及使用管制应注意事项如下：
1.模块的卷盘加真空包装之储存期限：1）.保存期限：8 个月，储存环境条件：温度在：<40℃，相对湿度：<90%R.H
2.模块真空包装拆封后，组装之时限：
1）.检查湿度卡：显示值应小于 30%（蓝色），如：30%~40%(粉红色）或者大于 40%（红色）表示模块已吸湿气。

2）.工厂环境温度湿度管制：≦30℃，≦60%R.H。3）.拆封后，车间的保存寿命为 168 小时。
3.拆封后，如未在 168 小时内使用完时：
1）.模块须重新烘烤，以除去模块吸湿问题。
2）.烘烤温度条件：125℃，8 小时。
3）.烘烤后，放入适量的干燥剂再密封包装。