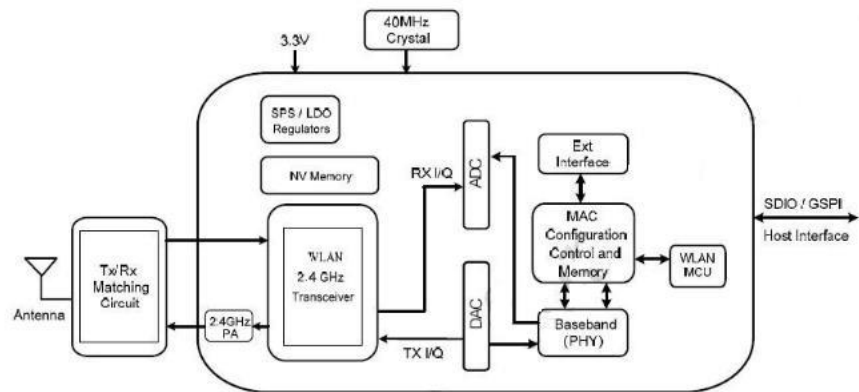


# Product Specification

## IEEE 802.11b/g/n 1T1R SDIO WiFi Module

FG89FTSM33-W4 is a highly integrated and excellent performance Wireless LAN (WLAN) SDIO network interface device. High-speed wireless connection up to 72.2 Mbps . The general hardware for the module is shown in Figure 1. This WLAN Module design is based on Realtek RTL8189FTV -VQ1. 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.



This specification is based on additional references listed as below.

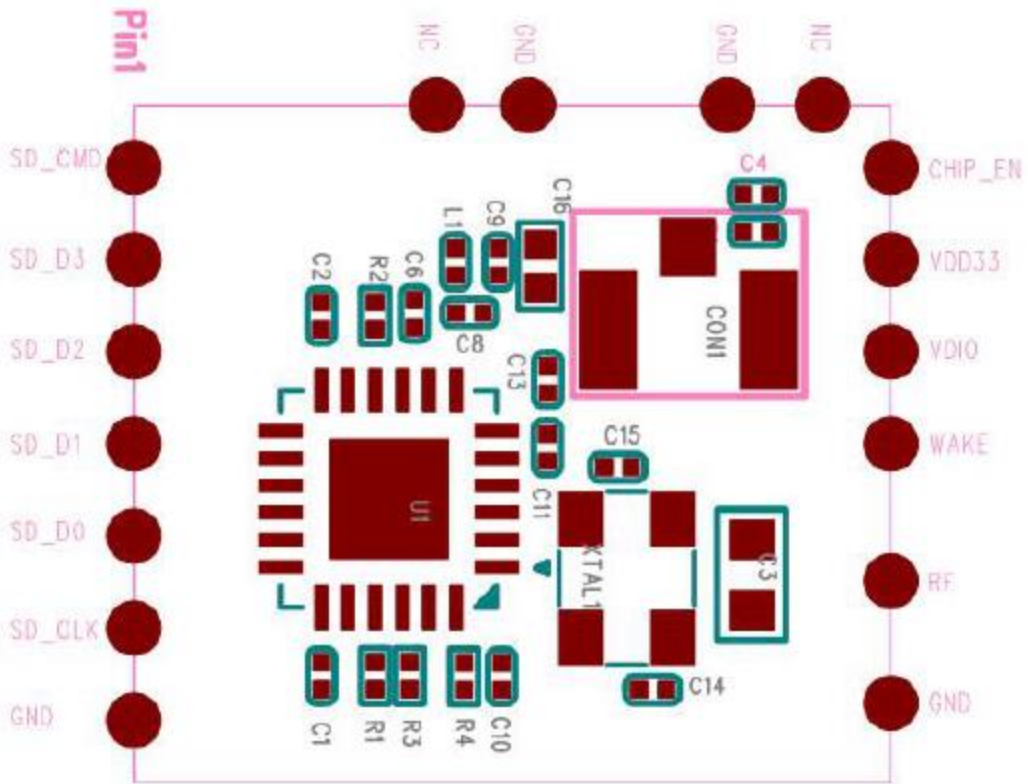
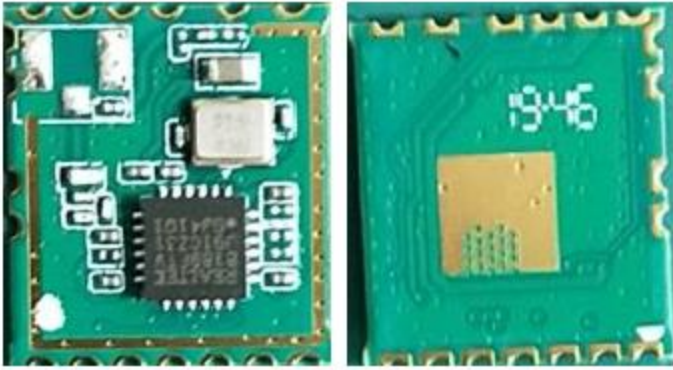
- IEEE 802.11b
- IEEE 802.11g
- IEEE 802.11n

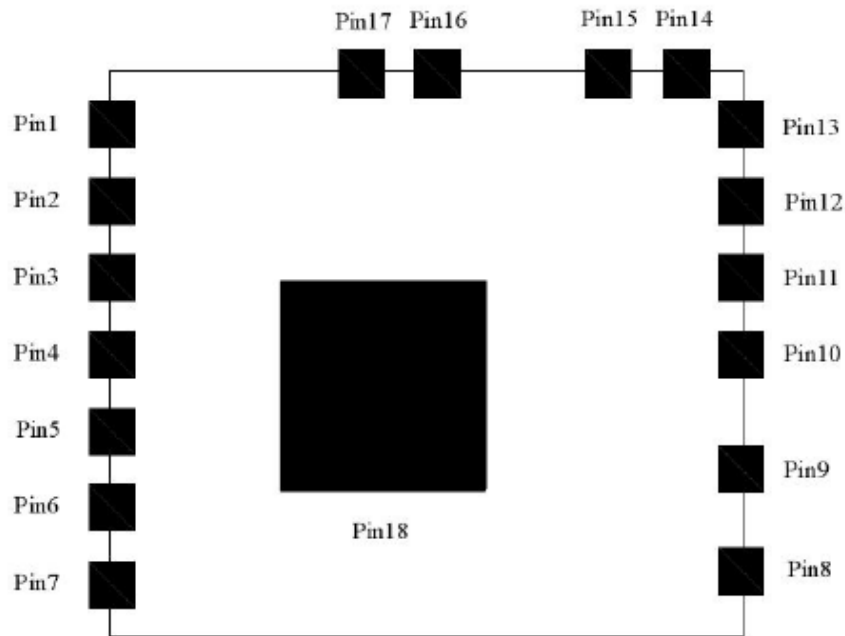
Features	Descriptions
Main Chipset	Realtek RTL8189FTV -VQ1
Operating Frequency	2.400~2.4835GHz
Operating Voltage	3.3Vdc $\pm$ 10% I/O supply voltage
Host Interface	SDIO/GSPI
WiFi Standard	<b>WiFi:</b> IEEE 802.11b, IEEE 802.11g, IEEE 802.11n,
Modulation	<b>WiFi:</b> 802.11b: CCK(11, 5.5Mbps), QPSK(2Mbps), BPSK(1Mbps), 802.11 g/n: OFDM
PHY Data rates	<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 72.2Mbps
Transmit Output Power	<b>WiFi:</b> 802.11b@11Mbps 16 $\pm$ 2dBm 802.11g@54Mbps 14 $\pm$ 2dBm 802.11n@MCS7 13 $\pm$ 2dBm (MCS 7_HT20)
EVM	802.11b /11Mbps : EVM $\leq$ -9dB 802.11g /54Mbps : EVM $\leq$ -25dB 802.11n /65Mbps : EVM $\leq$ -28dB
Receiver Sensitivity (HT 20) Tolerance: $\pm$ 2dBm	<b>802.11b@8% PER</b> 1Mbps -88dBm 2Mbps -87dBm 5.5Mbps -85dBm 11Mbps -82dBm  <b>802.11g@10% PER</b> 6Mbps -86dBm 9Mbps -85dBm 12Mbps -84dBm 18Mbps -82dBm 24Mbps -80dBm 36Mbps -77dBm 48Mbps -73dBm 54Mbps -71dBm  <b>802.11n@10% PER</b> MCS 0 -83dBm MCS 1 -82dBm MCS 2 -80dBm MCS 3 -78dBm MCS 4 -75dBm MCS 5 -71dBm MCS 6 -69dBm MCS 7 -67dBm
Operating Channel	<b>WiFi 2.4GHz:</b> 11: (Ch. 1-11) – United States(North America) 13: (Ch. 1-13) – Europe 14: (Ch. 1-14) – Japan
Media Access Control	<b>WiFi:</b> CSMA/CA with ACK
Network Architecture	<b>WiFi:</b> Ad-hoc mode (Peer-to-Peer ) Infrastructure mode Software AP WiFi Direct
Security	WPA, WPA-PSK, WPA2, WPA2-PSK, WEP 64bit & 128bit,

Antenna	External
OS Supported	Android /Linux/ Win CE /iOS /XP/WIN7
Dimension	Typical L14.00*W12.50*T2.0mm

## 2.2 Power Consumption

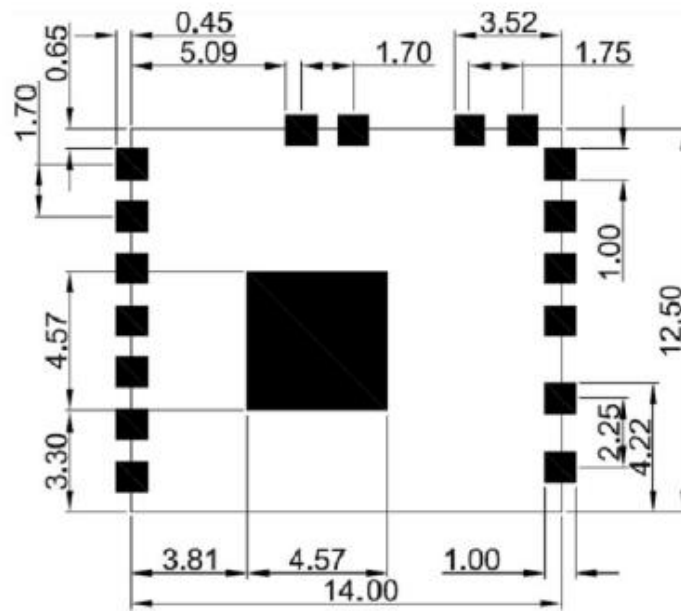
Mode	Status	Current(mA)	Note
OS Windows XP	Link	120mA	20M
	RX (MCS7)	190mA	20M
	TX	120mA	20M
Device Disable	0		
Radio Off	0		



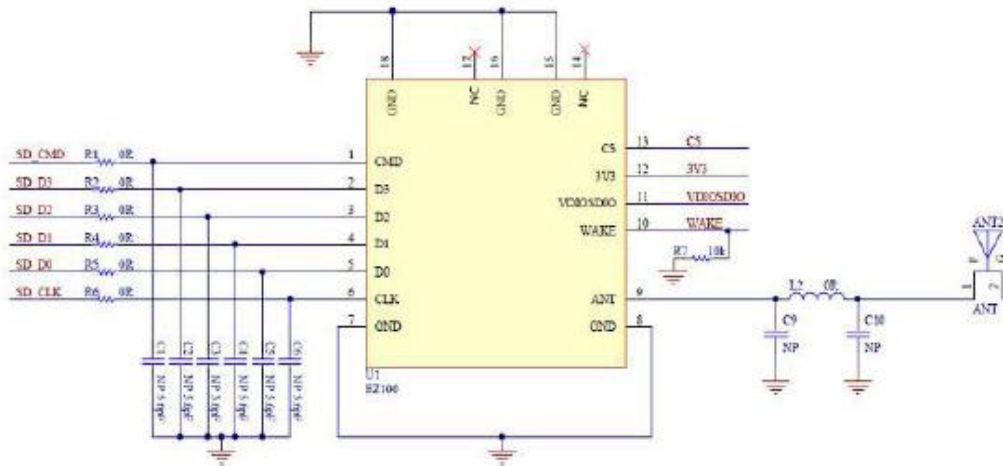


Pin #	Name	Description
1	SD_CMD	SDIO Command Input
2	SD_D3	SDIO Data Line 3
3	SD_D2	SDIO Data Line 2
4	SD_D1	SDIO Data Line 1
5	SD_D0	SDIO Data Line 0
6	SD_CLK	SDIO Clock Input
7	GND	POWER GND
8	GND	POWER GND
9	ANT	RF I/O port
10	WAKE	Wake Function
11	VDIOSDIO	SDIO Voltage 1.8V-3.3V
12	3V3	Power Supply
13	CHIP_EN	CHIP ENABLE
14	NC	NC
15	GND	POWER GND
16	GND	POWER GND
17	NC	NC
18	GND	POWER GND

### 3.3 Layout reference



### 3.4 Application Circuit



## FCC Information

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.

**Warning:** Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications or change to this equipment. Such modifications or change could void the user's authority to operate the equipment.

**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.

### RF Exposure Information:

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 20cm during normal operation. This module is for internal use only and not sold outside.

Product/PMN: T401AI WIFI Module  
Model no./HVIN: BT534217

### Antenna Information

It is 2.4GHz FPC antenna(IPEX port).

### Module procedures:

The module has its own RF shielding, which belong to signal module Standard requires: Clear and specific instructions describing the conditions, limitations and procedures for third-parties to use and/or integrate the module into a host device (see Comprehensive integration instructions below).

Resolve: Supply example as follows:

### Installation Notes:

- 1) BT534217 Module Power supply range is DC 3.1V~3.5V, when you use BT534217 Module design product, the power supply cannot exceed this range.
- 2) When connect BT534217 Module to the host device, the host device must be power off.
- 3) Make sure the module pins correctly installed.
- 4) Make sure that the module does not allow users to replace or demolition.

Trace antenna designs: Not applicable.

### RF exposure considerations:

This equipment complies with FCC RF radiation exposure limits set forth for an

uncontrolled environment. The antenna(s) used for this transmitter must not be collocated or operating in conjunction with any other antenna or transmitter.

Note: the host product manuals must include a statement in order to alert the users of FCC RF exposure compliance.

The system integrator must place an exterior label on the outside of the final product housing the T401AI WIFI Module. Below is the content that must be included on this label. The host product Labeling Requirements: NOTICE: The host product must make sure that FCC labeling requirements are met. This includes clearly visible exterior label on the outside of the final product housing that displays the contents shown in below:

Contains FCC ID: WUI-T401AI

Information on test modes and additional testing requirements: When testing host product, the host manufacture should follow FCC KDB Publication 996369 D04 Module Integration Guide for testing the host products. The host manufacturer may operate their product during the measurements. In setting up the configurations, if the pairing and call box options for testing does not work, then the host product manufacturer should coordinate with the module manufacturer for access to test mode software.

Additional testing, Part 15 Subpart B disclaimer:

The modular transmitter is only FCC authorized for the specific rule parts (FCC Part 15.247) list on the grant, and that the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. The final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed when contains digital circuitry.

Information on test modes and additional testing requirements:

When testing host product, the host manufacture should follow FCC KDB Publication 996369 D04 Module Integration Guide for testing the host products. The host manufacturer may operate their product during the measurements.