



# **FLW8189FSA7-A WiFi module**

**Model: FLW8189FSA7-A**

**Manufacturer: Jiangsu Fulian Communication Technology Co.,Ltd**



## 一、 Version update instructions

date	version	Update content
January 20th, 2019	V1.0	Initial document
December 9, 2022	V1.1	Improve module size information



## 二、 Product Introduction

The FLW8189FSA7-A module adopts the Realtek RTL8189FTV-VC-CG chip, which is an 802.11b/g/n standard WLAN single chip SDIO (SDIO1.1/2.0 compatible) interface module. This module integrates WLAN MAC, 1T1R WLAN BaseBand, and WLAN RF, with a physical speed of up to 150Mbps. FLW8189FSA7-A adopts a stamp hole packaging design that is easy to weld, with a size of 21 \* 23mm and a laser carved shielding cover, which is beautiful and traceable, optimized for matching and RF performance, and has an ultimate experience. It is widely used in IoT fields such as smart home, smart city, smart healthcare, and intelligent security.

## 三、 main features

- 2.4-2.4835 GHz ISM frequency band, supporting IEEE 802.11b/g/n
- SDIO1.1/2.0 interface
- 1T1R, with a maximum physical speed of 150Mbps (40M bandwidth)
- Supports 802.11b: CCK (11, 5.5Mbps), QPSK (2Mbps), BPSK (1Mbps), 802.11 g/n: OFDM
- Supports 802.11i (WPA-PSK, WPA2, WPA2-PSK, WEP 64bit&128bit)
- Supports Wi Fi Direct
- Supports 20M and 40M bandwidth
- Laser engraving with shielding cover, size 21x23x2.1mm ( $\pm 0.2$ mm)
- Stamp hole design, 19PIN
- Standard 3.3V power supply (3.0-3.6V)
- Working temperature 0-70 °C
- Tape packaging



#### 四、 Detailed parameters

Parameter Name	Parameter Description
Module model	FLW8189FSA7-A
Module type	WLAN 11n SDIO 1T1R module
Main chip	RTL8189FTV
standard	802.11b/g/n
speedometer	1, 2, 5.5, 6, 11, 12, 18, 22, 24, 30, 36, 48, 54, 60, 90120 and maximum of 150Mbps
modulation mode	BPSK/QPSK/16-QAM/64-QAM
Physical frequency band	2.4-2.4835 GHz
Transmission power	802.11b@11Mbps 16dBm $\pm$ 2dB 802.11g@6Mbps 15dBm $\pm$ 2dB 802.11g@54Mbps 15dBm $\pm$ 2dB 802.11n 14dBm $\pm$ 2dB (MCS 7_HT20) and 13dBm $\pm$ 2dB (MCS 7_HT40)
Receiving sensitivity	11b: CCK 11 (PER<8%)<-85dBm $\pm$ 2dB 11g: OFDM 54 (PER<10%)<-73dBm $\pm$ 2dB 11n: HT20 MCS7 (PER<10%)<-69dBm $\pm$ 2dB 11n: HT40 MCS7 (PER<10%)<-68dBm $\pm$ 2dB
Operating system support	Windows 2000, XP, Vista, Win7, Linux, Mac, Android, Win CE
Security mechanism	WEP, TKIP, AES, WPA, WPA2
interface	SDIO1.1/2.0 compatibility
Power supply method	DC3.3V (minimum3.0V - maximum3.6V)
working temperature	0~+70 ° C
Storage temperature	-20~125 ° C
Humidity level	5% to 90%
size	21x23x2.1mm ( $\pm$ 0.2mm) (with laser engraved shielding cover)

## 五、 Hardware framework diagram

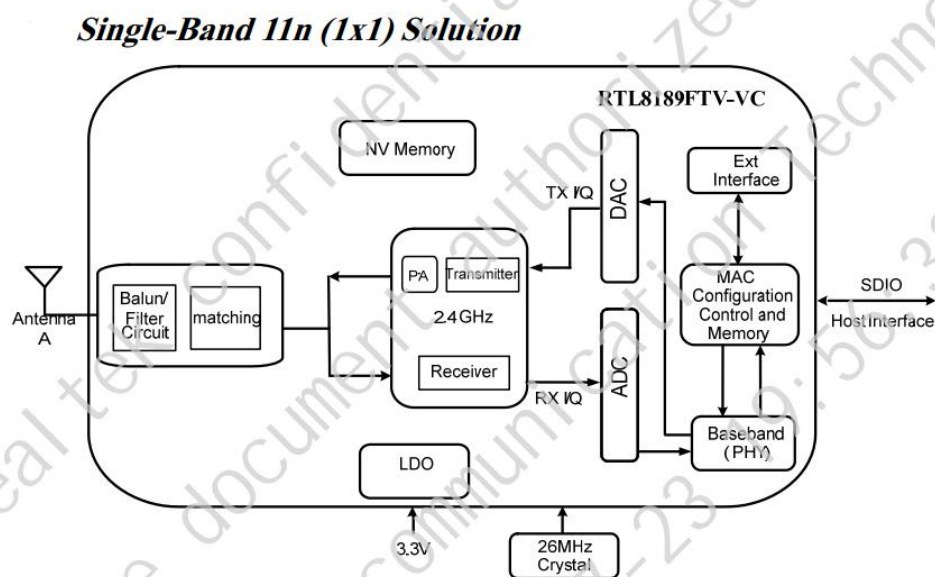
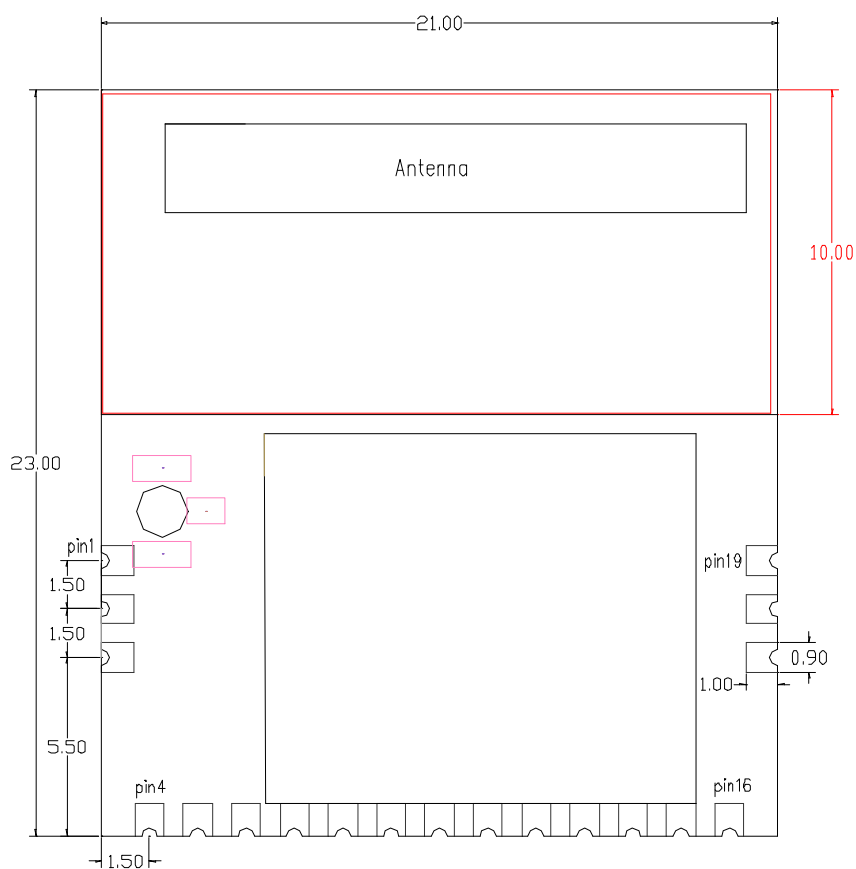


Figure 1FLW8189FSA7-A Hardware Block Diagram

## 六、Module size specifications



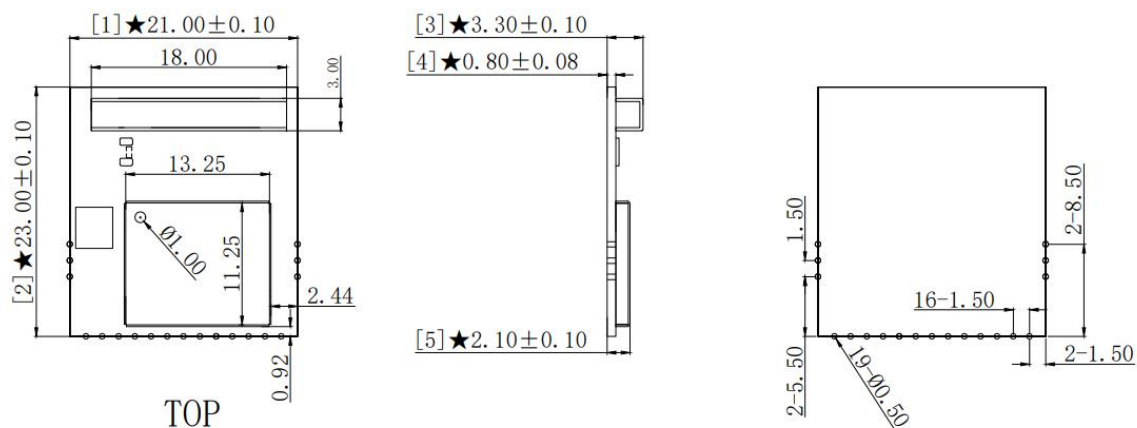


Figure 2FLW8189FSA7-A Dimensional Drawing

## 七、 Module Pin Description

Table 1 Module Pin Comparison Table

Pin number	Pin Name	Pin Description
1-3	GND	GND
four	VBAT	3.3V
five	NC	NC
six	VDDIO	1.8-3.3V, IO Supply, Max3.6V
seven	GND	GND
eight	CHIP_EN	Chip enable
nine	INT/GPIO0	WL_DEV_WAKE_HOST
ten	SD_D2	SD_D2
eleven	SD_D3	SD_D3
twelve	SD_CMD	SD_CMD
thirteen	SD_CLK	SD_CLK
fourteen	SD_D0	SD_D0
fifteen	SD_D1	SD_D1
16-19	GND	GND



## 八、 Temperature curve of secondary reflow soldering

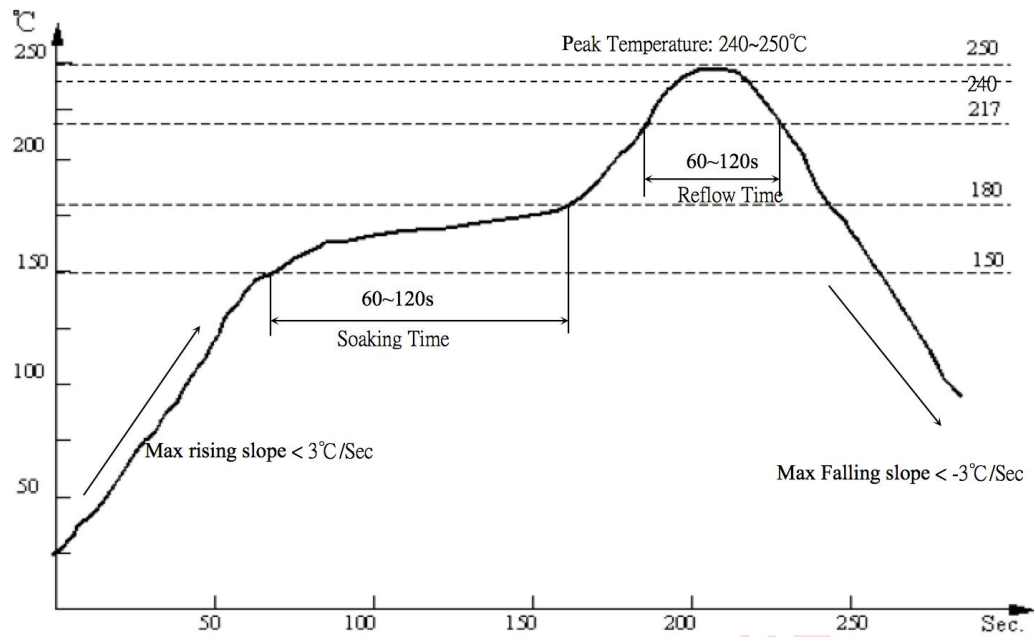


Figure 3FLW8189FSA7-A reflow soldering temperature curve

## 九、 Packaging method

We use a reel packaging method for shipment, which is convenient for customers to SMT. It is equipped with a humidity card and desiccant, an electrostatic bag for vacuum extraction, and packaged in cardboard boxes for shipment. Both the reel and outer box are labeled with factory labels and inspection QR codes for easy tracking and cross shipment.



Figure 4FLW8189FSA7-A packaging method



## ■ matters needing attention

- Operators at each workstation must wear electrostatic gloves throughout the production process;
- The bottom plate corresponding to the red area in Figure 2 needs to be cleaned of copper. The larger the area, the smaller the impact on the antenna, and the better the performance.
- During operation, strictly prevent the bottom surface of the module from being contaminated with water or dirt;
- If the unpacking time exceeds 3 months, it is prohibited to use the SMT process to weld this batch of modules, because the PCB sinking gold process causes severe oxidation of the solder pads after 3 months, which is highly likely to cause virtual soldering and missing soldering during SMT mounting. Our company does not assume corresponding responsibility for any problems caused by this;
- Before SMT mounting, please provide ESD (electrostatic discharge) protection for the module;
- Please perform SMT mounting according to the reflow soldering curve, with a peak temperature of 245 °C. The reflow soldering temperature curve is shown in the figure;
- To ensure the qualification rate of reflow soldering, please select 10% of the products for visual inspection and AOI testing for the first SMT to ensure the rationality of furnace temperature control, device adsorption method, and placement method; For future mass production, it is recommended to take 5-10 pieces per hour for visual inspection and AOI testing.

## ■ Storage conditions and ESD protection

	<b>CAUTION</b> This bag contains <b>MOISTURE-SENSITIVE DEVICES</b>	<b>LEVEL</b> <b>3</b> <small>If Blank, see adjacent bar code label</small>
<p>1. Calculated shelf life in sealed bag: 12 months at &lt; 40°C and &lt; 90% relative humidity (RH)</p> <p>2. Peak package body temperature: <u>260</u> °C <small>If Blank, see adjacent bar code label</small></p> <p>3. After bag is opened, devices that will be subjected to reflow solder or other high temperature process must a) Mounted within: <u>168</u> hrs. of factory conditions <small>If Blank, see adjacent bar code label</small> ≤ 30°C/60%RH, OR b) Stored at &lt;10% RH</p> <p>4. Devices require bake, before mounting, if: a) Humidity Indicator Card is &gt; 10% when read at 23 ± 5°C b) 3a or 3b not met.</p> <p>5. If baking is required, devices may be baked for 48 hrs. at 125 ± 5°C</p> <p>Note: If device containers cannot be subjected to high temperature or shorter bake times are desired, reference IPC/JEDEC J-STD-033 for bake procedure</p> <p>Bag Seal Date: _____ <small>If Blank, see adjacent bar code label</small></p> <p>Note: Level and body temperature defined by IPC/JEDEC J-STD-020</p>		



Figure 5FLW8189FSA7-A Storage Conditions and ESD Protection Guidelines





## ■ Sales and technical support information

If you need to inquire or purchase this product, please call Jiangsu Fulian Communication Technology Co., Ltd. during office hours to inquire.

Office hours: Monday to Saturday, morning: 8:00-12:00, afternoon: 13:00-17:00

Postal Code: 212310

Contact number: 0511-80760088

Email: [sales@fulian-link.com](mailto:sales@fulian-link.com)

Contact address: Fulian Communication Industrial Park, Lanling Road, Economic and Technological Development Zone, Danyang City, Jiangsu Province



## 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, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

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.

This modular has been tested and found to comply with part 15 requirements for Modular Approval.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

## Integration instructions for host product manufacturers according to KDB 996369 D03 OEM Manual v01r01

### 2.2 List of applicable FCC rules

CFR 47 FCC Part 15 Subpart C and Subpart F has been investigated. It is applicable to the modular transmitter

### 2.3 Specific Operational Use Conditions - Antenna Placement Within the Host Platform

The module is tested for standalone mobile RF exposure use condition.

- The antenna must be installed such that 20cm is maintained between the antenna and users,
- The transmitter module may not be co-located with any other transmitter or antenna.

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

### 2.4 Limited Module Procedures

Not applicable

### 2.5 Trace Antenna Designs

Not applicable



## 2.6 RF Exposure Considerations

This device complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

## 2.7 Antenna Type and Gain

The following antennas have been certified for use with this module.

Only antennas of the same type with equal or lower gain may also be used with this module.

Other types of antennas and/or higher gain antennas may require the additional authorization for operation.

Antenna Specification list below:

Antenna Type	Antenna Model No.	Maximum Antenna Gain (dBi)	Frequency Range
Metal Antenna	H1	3.10	2400 – 2500 MHz

## 2.8 End Product Labelling Compliance Information

When the module is installed in the host device, the FCC ID label must be visible through a window on the final device or it must be visible when an access panel, door or cover is easily removed. If not, a second label must be placed on the outside of the final device that contains the following text: "Contains FCC ID: **2AXS5-FLW8189FSA7-A**". The FCC ID can be used only when all FCC compliance requirements are met.

## 2.9 Information on Test Modes and Additional Testing Requirements

This transmitter is tested in a standalone mobile RF exposure condition and any co-located or simultaneous transmission with other transmitter(s) class II permissive change re-evaluation or new FCC authorization.

Host manufacturer installed this modular with single modular approval should perform the test of radiated emission and spurious emission according to FCC part 15C, 15.209, 15.207 requirement, only if the test result comply with FCC part 15C, 15.209, 15.207 requirement, then the host can be sold legally.

## 2.10 Additional testing, Part 15 Subpart B Disclaimer

This transmitter modular is tested as a subsystem and its certification does not cover the FCC Part 15 Subpart B rules requirement applicable to the final host. The final host will still need to be reassessed for compliance to this portion of rules requirements if applicable.

As long as all conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this modular installed.

## 2.11 Manual Information to The End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

The host integrator must follow the integration instructions provided in this document and ensure that the composite system end product complies with the requirements by a technical assessment or evaluation to the rules and to KDB Publication 996369.

The host integrator installing this module into their product must ensure that the final composite product complies with the requirements by a technical assessment or evaluation to the rules, including the transmitter operation and should refer to guidance in KDB Publication 996369.



### OEM/Host Manufacturer Responsibilities

OEM/Host manufacturers are ultimately responsible for the compliance of the Host and Module. The final product must be reassessed against all the essential requirements of the FCC rule such as FCC Part 15 Subpart B before it can be placed on the US market. This includes reassessing the transmitter module for compliance with the Radio and RF Exposure essential requirements of the FCC rules.

#### 2.12 How to Make Changes - Important Note

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.