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# Operating manual

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LawMate

***LM8189FTV***

WiFi Module

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Version: 1.0

更改记录:

### Reversion History:

[illegible]

## 1. Overview

The LM-8189FTV is a highly integrated WI-FI single chip which supports 72.2Mbps PHY rate. It fully complies with IEEE 802.11n and IEEE 802.11b/g standards, offering feature-rich wireless connectivity at high standards, and delivering reliable, cost-effective though put from an extended distance. Optimized RF architecture and baseband algorithms provide superb performance and low power consumption .Intelligent MAC design deploys a high efficient DMA engine and hardware data processing accelerators which offloads the host processor.

The CDW-B18189F-02 is designed to support standard based features in the areas of security, quality of service and international regulations, giving end users the greatest performance any time and in any circumstance.

## 2. Features

- IEEE 802.11b/g/n
- Embedded high-performance 32-bit RISC microprocessor
- Highly integrated RF with 55nm CMOS technology
- 1T1R mode with support of 72.2Mbps PHY rate
- Integrate high efficiency switching regulator
- Best –in-class power consumption performance
- 802.11d/h/k compliant
- Security support for WPA WPA2 personal,WPS2.0,WAPI
- Supports 802.11n protected managed frames
- QoS support of WFA WMM,WMM PS
- Supports Wi-Fi Direct
- Fully compliance with SDIO 2.0 High-speed mode

### 3. General Specification

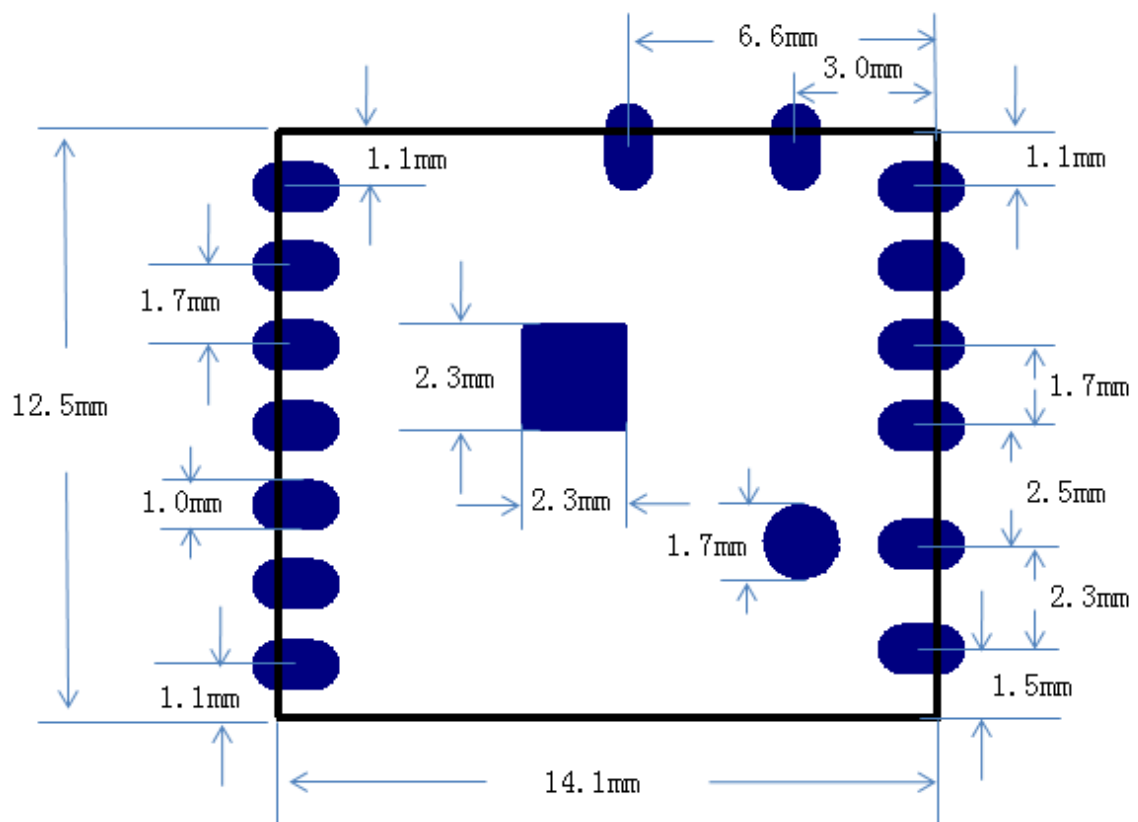
Model	The LM-8189FTV
Product Name	WLAN 11n USB 1T1R module
Major Chipset	RTL8189FTV-VC-CG
Standard	802.11b/g/n, 802.3, 802.3u
Data Transfer Rate	1,2,5.5,6,11,12,18,22,24,30,36,48,54,60,90,120 and maximum of 72.2Mbps
Modulation Method	BPSK/ QPSK/ 16-QAM/ 64-QAM
Frequency Band	2.4~2.4835 GHz ISM Band
Spread Spectrum	IEEE 802.11b: DSSS (Direct Sequence Spread Spectrum)IEEE802.11g/n:OFDM(OrthogonalFrequency Division Multiplexing)
RF Output Power	11n > 12dBm, 11g > 13dBm, 11b > 16dBm
Operation Mode	Ad hoc, Infrastructure
Receiver Sensitivity	11b CCK11(PER<8%) < -85dBm , 11g OFDM54(PER<10%) < -73dBm , 11n HT20 MCS7(PER<10%) < -69dBm
Operation Range	Up to 180 meters in open space
OS Support	Windows2000,XP32-64,Vista32/64,Win732/64, Linux, Mac, Android, WIN CE
Security	WEP, TKIP, AES, WPA, WPA2
Interface	SDIO2.0
Power Consumption	DC3.3V 600mA
Operating Temperature	0~ +70°C ambient temperature
Storage Temperature	-20 ~ 125°C ambient temperature
Humidity	5 to 90 % maximum (non-condensing)
Dimension	14.1 x 12.5 x0.6 mm (LxW) ±0.15mm

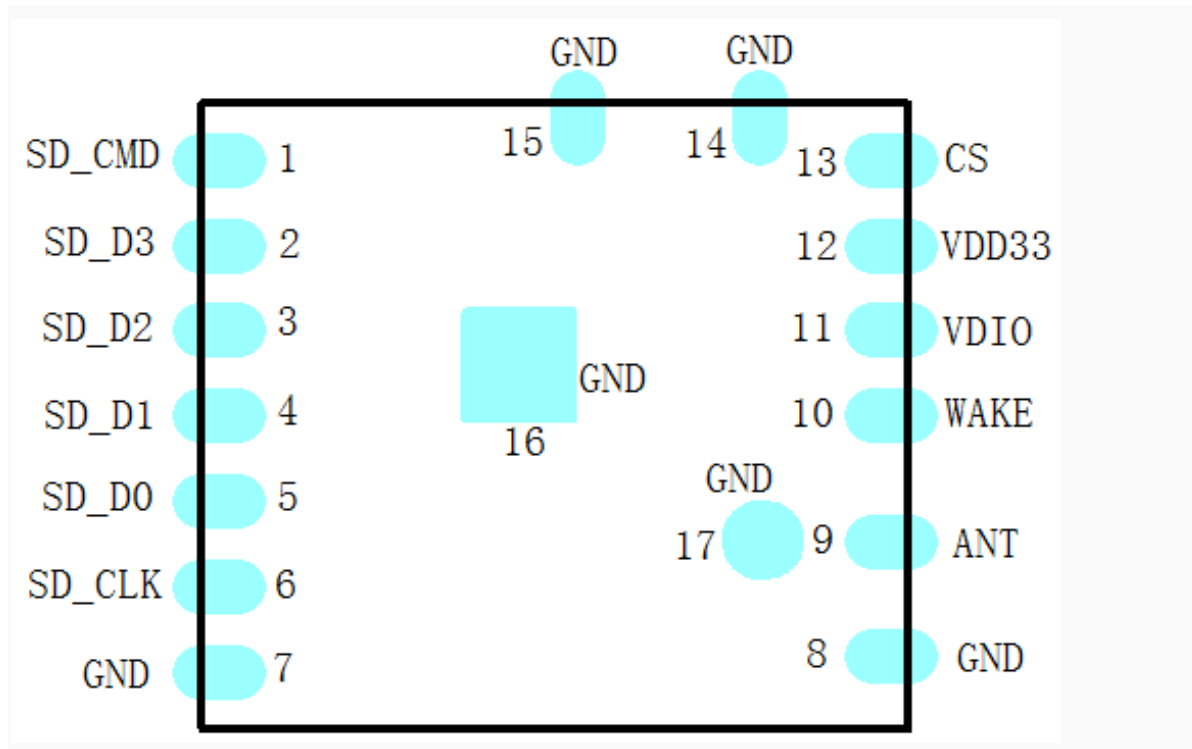
## 4. DC Characteristics

Description	TYP	Unit
Sleep mode	1.5	mA
RX Active,HT40,MCS7	220	mA
RX Power saving, DTIM=1	20	mA
RX Listen	10	mA
TX HT40,mcs7 @13dBm	230	mA
TX CCK,11Mbps @17dBm	280	mA

Note: All result is measured at the antenna port and VDD33 is 3.3V, 3.3V Rating Current 600mA.

## 5. Pin Description and PCB size





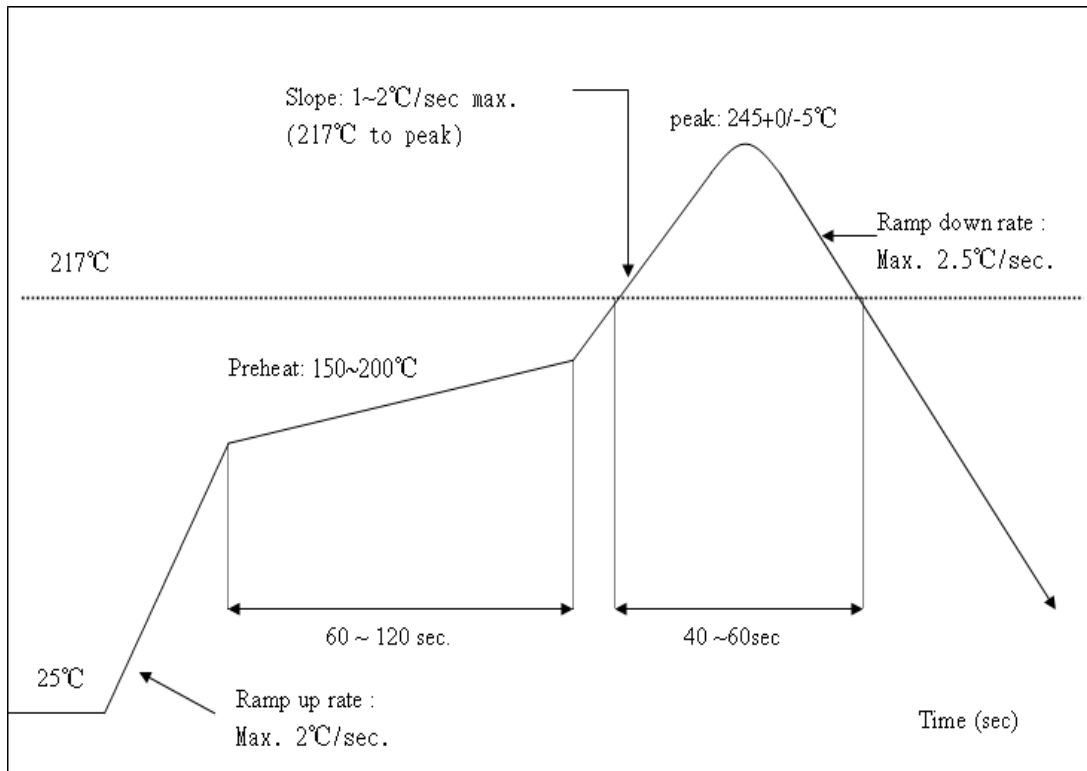
NO.	Name	Description
1	SD_CMD	SDIO Command Input
2	SD_D3	SDIO Data Line 3
3	SD_D2	SDIO Data Line 2
4	SD_D1	SDIO Data Line 1
5	SD_D0	SDIO Data Line 0
6	SD_CLK	SDIO Clock Input
7	GND	Ground
8	GND	Ground
9	ANT	WIFI radio antenna, Impedence control to 50oh
10	WAKE	WIFI WAKE Device
11	VDIO	VDD for SDIO Pin. The power supply is the same as the signal level of SDIO bus(3.3V ~ 1.8V)
12	VDD33	Power supply 3.3V
13	CS	This pin can Externally Shutdown theRTL8189FTVwithoutrequiring an extra power switch
14,15	GND	Ground
16,17	GND	Ground , no connect

## 6. Recommended Reflow Profile


Referred IPC/JEDEC standard.

Peak Temperature :  $<250^{\circ}\text{C}$

Number of Times : 2 times



取得審驗證明之低功率射頻器材，非經核准，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。  
低功率射頻器材之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。  
前述合法通信，指依電信管理法規定作業之無線電通信。  
低功率射頻器材須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

安裝該模組之主體裝置或設備上必須標示『內含發射器模組：  CCXXxxYYyyZzW』

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.

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.

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

This equipment 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.



### ESD CAUTION

The CDW-B18189F-02 is ESD (electrostatic discharge) sensitive device and may be damaged with ESD or spike voltage. Although CDW-B18189F-02 is with built-in ESD protection circuitry, please handle with care to avoid the permanent malfunction or the performance degradation.



## **Integration instructions for host product manufacturers according to KDB 996369 D03 OEM Manual v01**

### **2.2 List of applicable FCC rules**

CFR 47 FCC PART 15 SUBPART C has been investigated. It is applicable to the modular transmitter

### **2.3 Specific operational use conditions**

This module is stand-alone modular. If the end product will involve the Multiple simultaneously transmitting condition or different operational conditions for a stand-alone modular transmitter in a host, host manufacturer have to consult with module manufacturer for the installation method in end system.

### **2.4 Limited module procedures**

Not applicable

### **2.5 Trace antenna designs**

Not applicable

### **2.6 RF exposure considerations**

This equipment 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 Antennas**

This radio transmitter **2AHTX-LMRTL8189FTV** has been approved by Federal Communications Commission to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Model	Type	Peak Gain(dBi)
2.4GWLAN	FPC antenna	2.5 dBi

### **2.8 Label and compliance information**

The final end product must be labeled in a visible area with the following "Contains FCC ID: 2AHTX-LMRTL8189FTV".

### **2.9 Information on test modes and additional testing requirements**

Host manufacturer is strongly recommended to confirm compliance with FCC requirements for the transmitter when the module is installed in the host.

### **2.10 Additional testing, Part 15 Subpart B disclaimer**

Host manufacturer is responsible for compliance of the host system with module installed with all other applicable requirements for the system such as Part 15 B.