

6189NËÛØÔ

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**Module manual**



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Customer Approval : \_\_\_\_\_ Company  
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Title  
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Signature  
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Date  
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Fn-Link

## Revision History

Version	Date	Revision Content	Draft	Approved
1.0	2019/01/10	New version	Lzm	Lxy
1.1	2019/04/10	Update thickness dimension	Lxy	Szs
1.2	2019/08/06	Update packing information	Lxy	Szs
1.3	2019/11/12	Update module photo	Lxy	Szs

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# 1 Overview

## 1.1 Introduction

6189N-SFC is a highly integrated and excellent performance Wireless LAN (WLAN) SDIO network interface device. High-speed wireless connection up to 150 Mbps. It can be easily manufactured on SMT process.

This WLAN Module design is based on Realtek RTL8189FTV-VC-CG. It is a highly integrated single-chip 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 compact module is a total solution for Wi-Fi technology. The module is specifically developed for Smart phones and Portable devices.

## 1.2 Features

- Operate at ISM frequency bands (2.4GHz)
- CMOS MAC, Baseband PHY, and RF in a single chip for 802.11b/g/n compatible WLAN
- Wi-Fi 1 transmitter and 1 receiver allow data rates supporting up to 150 Mbps downstream and 150 Mbps upstream PHY rates

## 1.3 General Specification

Model Name	6189NIG
Product Description	SDIO Interface
Dimension	L x W x T: 23 x 21 x 4.8 (typical) mm
Wi-Fi Interface	Support SDIO
Operating temperature	0°C to 70°C
Storage temperature	-55°C to +125°C

## 1.4 Recommended Operating Rating

	Min.	Typ.	Max.	Unit
Operating Temperature	0	25	70	deg.C
VBAT	3.0	3.3	3.6	V
VDDIO	1.7	1.8 or 3.3	3.6	V

## ※1.5 EEPROM Information

WI-FI

Vendor ID	024C
Product ID	F179

## 2 General Specification

### 2.1 Wi-Fi RF Specifications

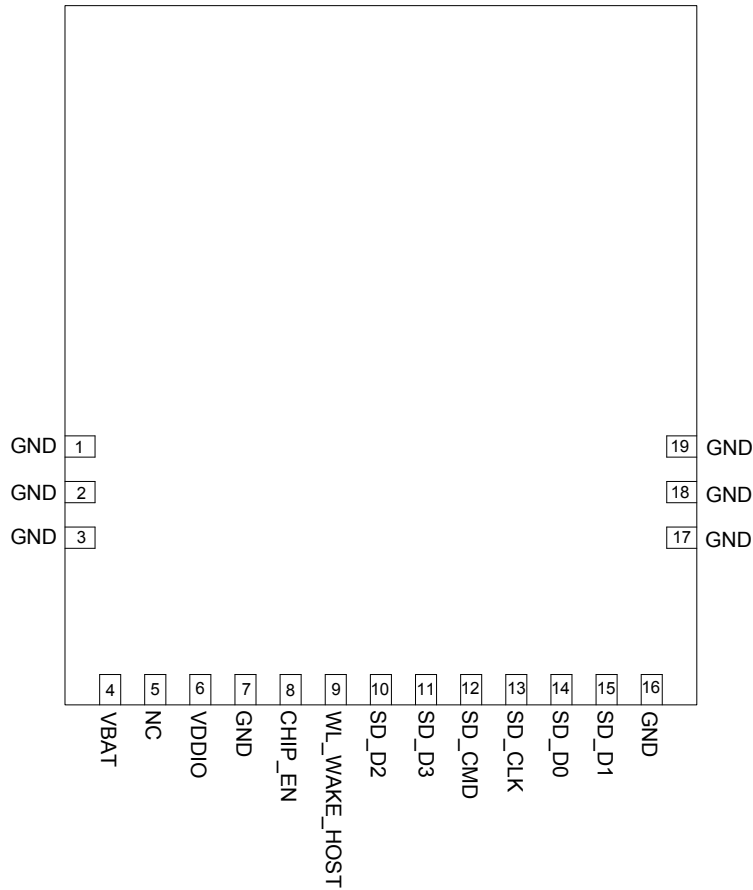
Features	Descriptions
Main Chipset	Realtek RTL8189FTV-VC-CG
Operating Frequency	2.400~2.4835GHz
Operating Voltage	3.3Vdc $\pm$ 10% I/O supply voltage
Host Interface	SDIO/GSPI
WIFI Standard	Wi-Fi: IEEE 802.11b, IEEE 802.11g, IEEE 802.11n,
Modulation	Wi-Fi: 802.11b: CCK(11, 5.5Mbps), QPSK(2Mbps), BPSK(1Mbps), 802.11 g/n: OFDM

PHY Data rates	Wi-Fi: 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	Wi-Fi: 802.11b@11Mbps 15±2dBm 802.11g@54Mbps 14±2dBm 802.11n@65Mbps 14±2dBm Other rate power control by power by rate.
EVM	802.11b /11Mbps: EVM $\leq$ -9dB 802.11g /54Mbps: EVM $\leq$ -25dB 802.11n /65Mbps: EVM $\leq$ -28dB
Receiver Sensitivity (HT20)	802.11b@8% PER 11Mbps < -82dBm
	802.11g@10% PER 54Mbps < -71dBm
	802.11n@10% PER MCS 7 < -67dBm
Operating Channel	Wi-Fi 2.4GHz: 11: (Ch. 1-11) – United States(North America) 13: (Ch. 1-13) – Europe 14: (Ch. 1-14) – Japan
Media Access Control	Wi-Fi: CSMA/CA with ACK
Network Architecture	Wi-Fi: Ad-hoc mode (Peer-to-Peer ) Infrastructure mode Software AP Wi-Fi Direct
Security	Wi-Fi: WPA, WPA-PSK, WPA2, WPA2-PSK, WEP 64bit & 128bit,
Antenna	On Board antenna
OS Supported	Android /Linux/ Win CE /iOS /XP/WIN7
Dimension	Typical L x W x H 23x21x4.8mm

## 3 Pin Assignments

### 3.1 Pin Outline

<TOP>



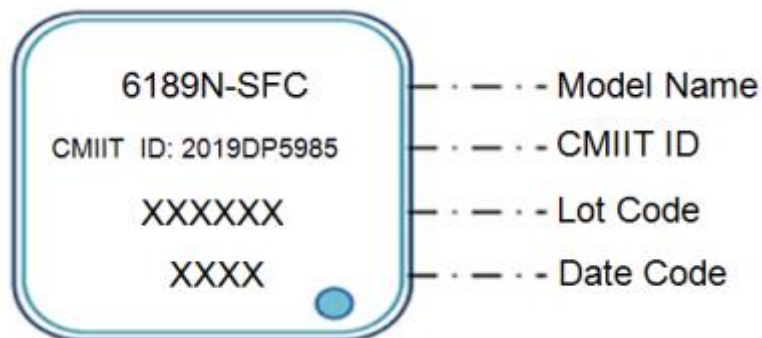
### 3.2 Pin Definition

NO.	Name	Type	Description	Voltage
1	GND		Ground connections	
2	GND		Ground connections	
3	GND		Ground connections	
4	VBAT	P	Supply 3.3V	3.3V
5	NC		Floating (Don't connected to ground)	
6	VDDIO	P	I/O Voltage supply input 1.8V to 3.3V	1.8V ~ 3.3V
7	GND		Ground connections	
8	CHIP_EN	I	Wi-Fi enable pin, default pull high	3.3V
9	WL_WAKE_HOST	I/O	WLAN to wake-up HOST	1.8V ~ 3.3V
10	SD_D2	I/O	SDIO Data line 2	1.8V ~ 3.3V
11	SD_D3	I/O	SDIO Data line 3	1.8V ~ 3.3V
12	SD_CMD	I/O	SDIO Command Input	1.8V ~ 3.3V
13	SD_CLK	I	SDIO Clock Input	1.8V ~ 3.3V

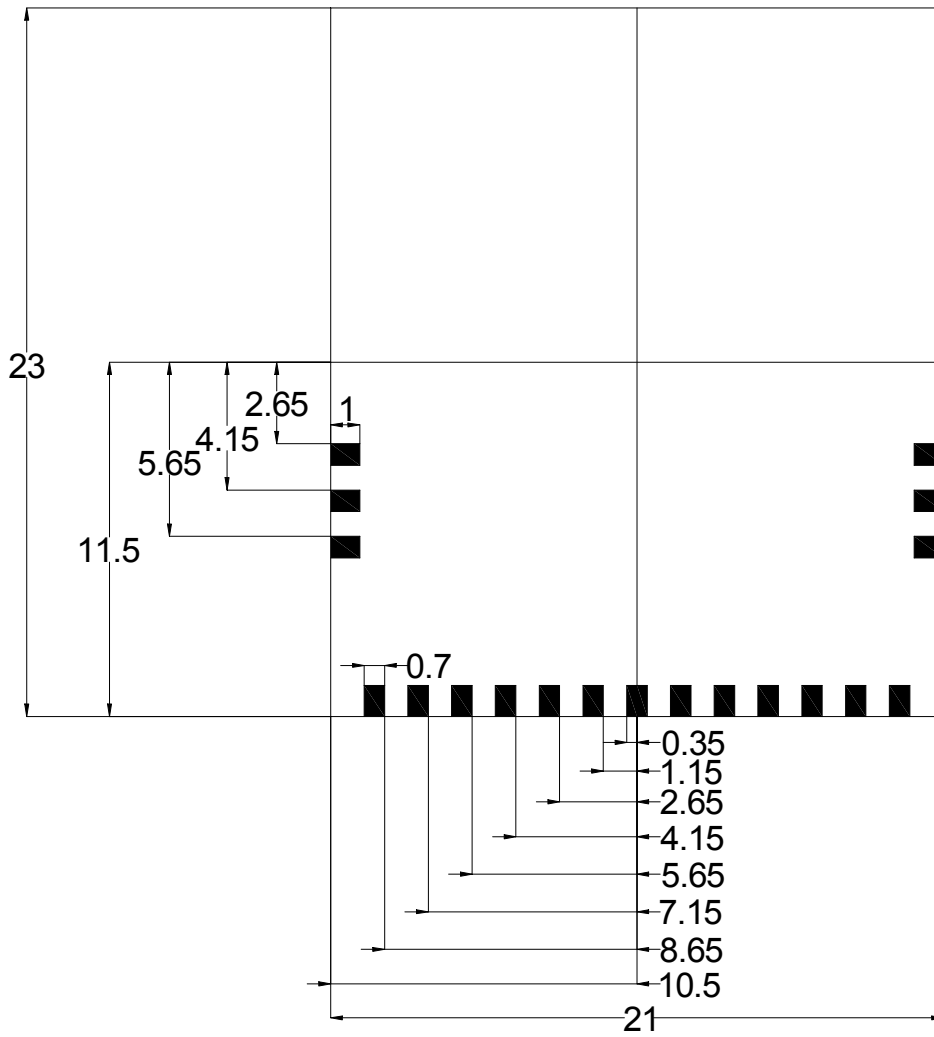


14	SD_D0	I/O	SDIO Data line 0	1.8V ~ 3.3V
15	SD_D1	I/O	SDIO Data line 1	1.8V ~ 3.3V
16	GND		Ground connections	
17	GND		Ground connections	
18	GND		Ground connections	
19	GND		Ground connections	


## 4.2 Marking Description

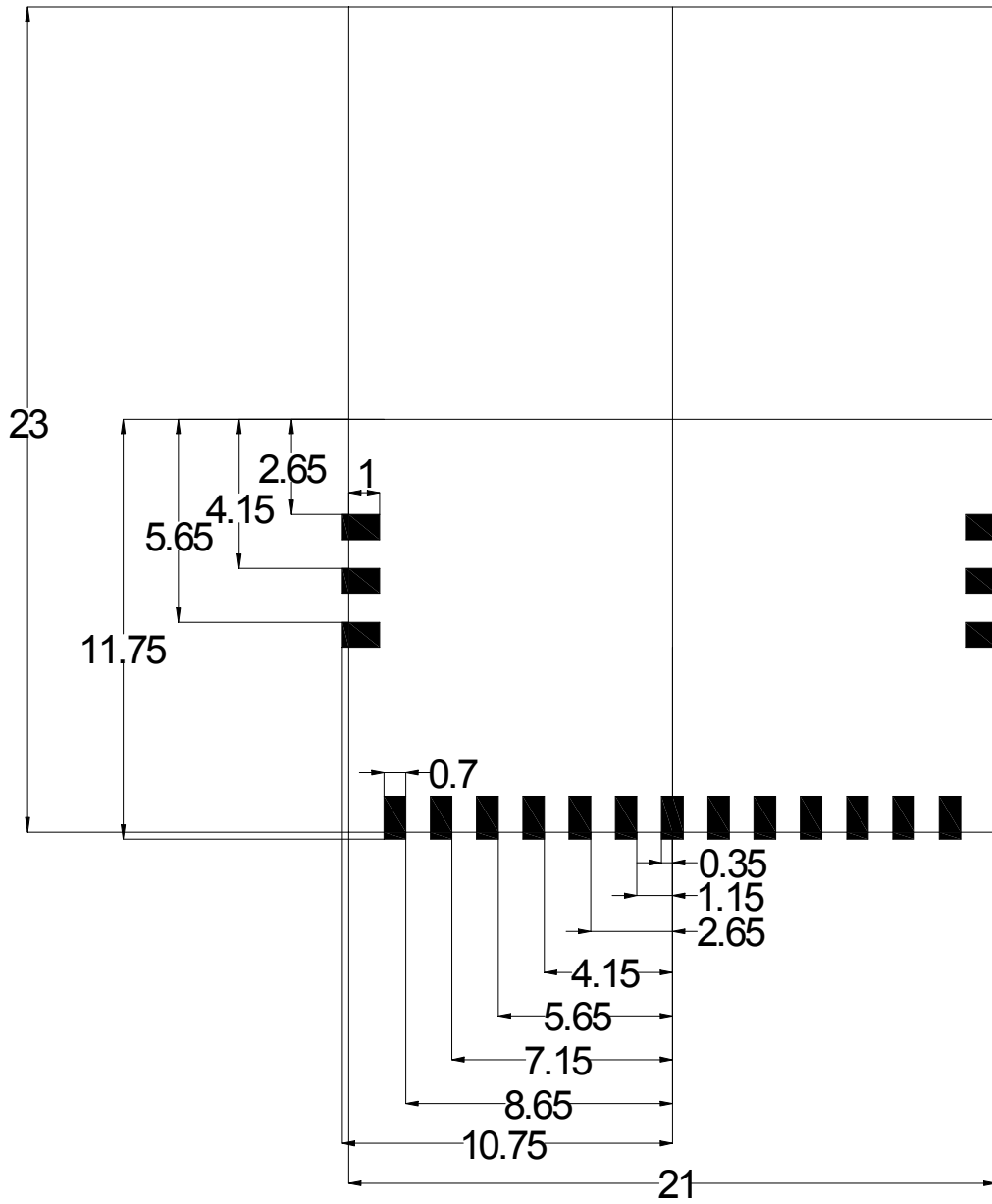


### 4.3 Module Physical Dimensions



## 4.4 Layout Reference

(unit: mm )



## 6 Host Interface Timing Diagram

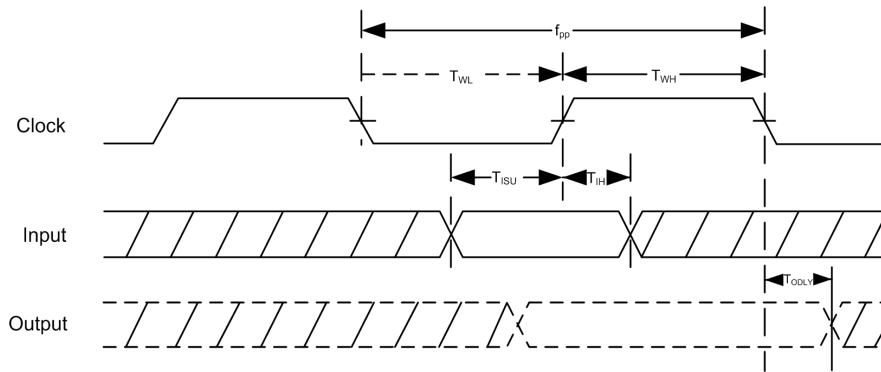
### 6.1 SDIO Pin Description

The module supports SDIO version 2.0 for all 1.8V 4-bit UHSI speeds: SDR12(25 Mbps), and SDR25(50Mbps) in addition to the 3.3V default speed(25MHz) and high speed (50 MHz). It has the ability to stop the SDIO clock and map the interrupt signal into a GPIO pin. This 'out-of-band' interrupt signal notifies the host when the WLAN device wants to turn on the SDIO interface. The ability to force the control of the gated clocks from within the WLAN chip is also provided.

SDIO Pin Description

<b>SD 4-Bit Mode</b>	
DATA0	Data Line 0
DATA1	Data Line 1 or Interrupt
DATA2	Data Line 2 or Read Wait
DATA3	Data Line 3
CLK	Clock
CMD	Command Line

## 6.2 SDIO Default Mode Timing Diagram

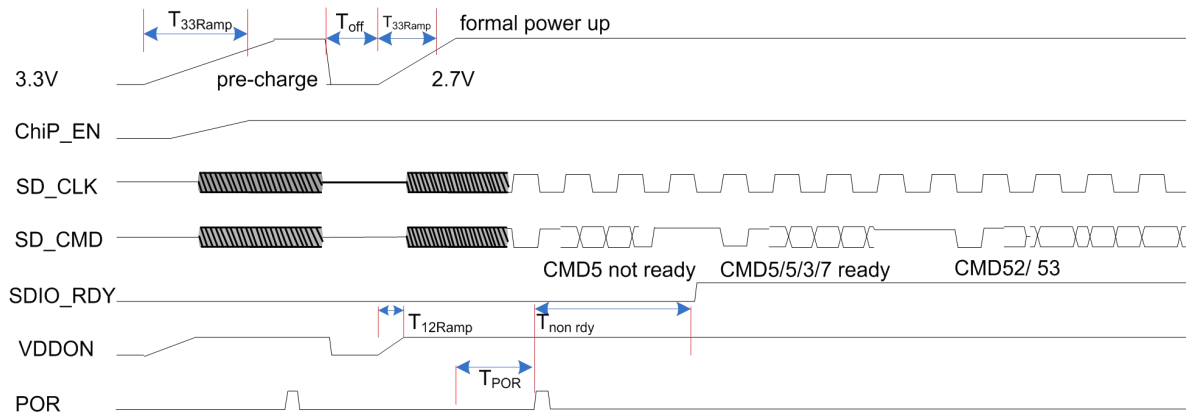


SDIO Interface Timing

SDIO Interface Timing Parameters

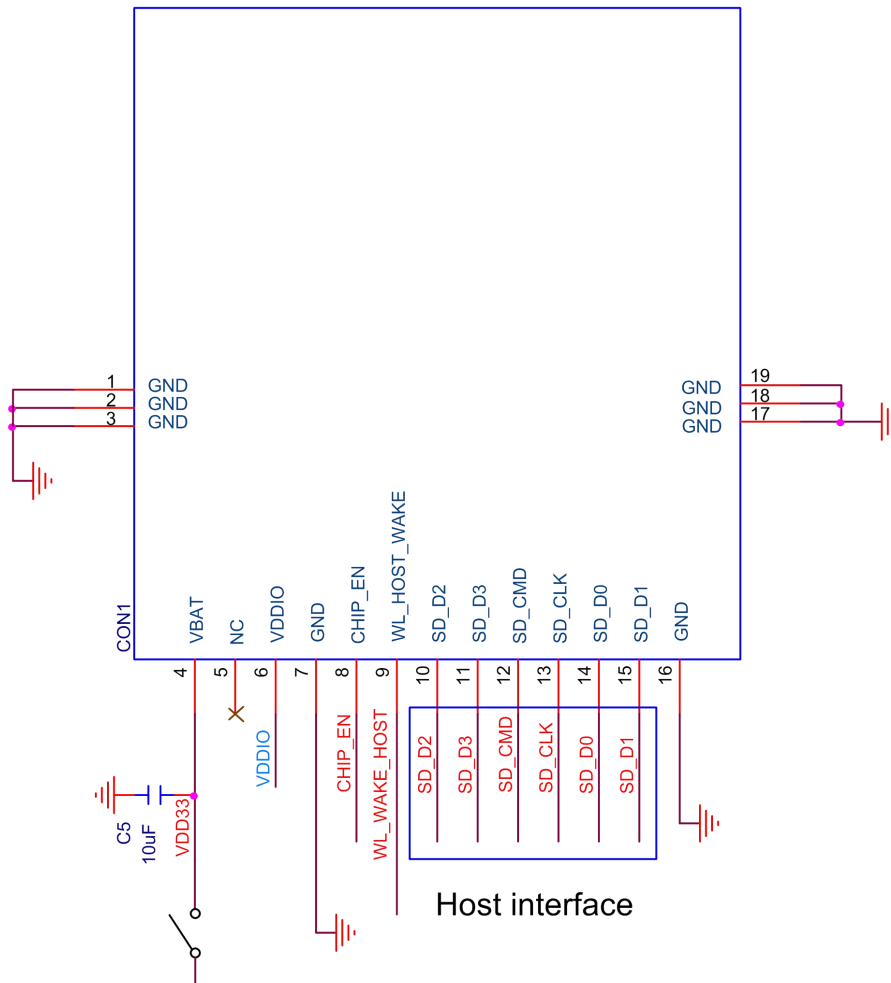
NO	Parameter	Mode	MIN	MAX	Unit
$f_{pp}$	Clock Frequency	Default	0	25	MHz
		HS	0	50	MHz
$T_{WL}$	Clock Low Time	DEF	10	-	ns
		HS	7	-	ns
$T_{WH}$	Clock High Time	DEF	10	-	ns
		HS	7	-	ns
$T_{ISU}$	Input Setup Time	DEF	5	-	ns
		HS	6	-	ns
$T_{IH}$	Input Hold Time	DEF	5	-	ns
		HS	2	-	ns
$T_{ODLY}$	Output Delay Time	DEF	-	14	ns
		HS	-	14	ns

## 6.3 SDIO Power-on sequence



Symbol	Min	Typical	Max	Unit
$T_{33ramp}$	0.2	-	No Limit	ms
$T_{off}$	250	500	1000	ms
$T_{33ramp}$	0.2	0.5	2.5	ms
$T_{12ramp}$	0.1	0.5	1.5	ms
$T_{POR}$	2	2	8	ms
$T_{non\_rdy}$	1	2	10	ms

## 7 Reference Design



Note:

1. chip\_EN could not use for module power off, please switch the 3.3V power for module on/off.
2. please keep the antenna on no metal area.

## 8 Ordering Information

Part No.	Description
FG6189NSFC-00	RTL8189FTV-VC-CG b/g/n, Wi-Fi, 1T1R, 23X21mm, SDIO, PCB V1.0 with antenna

## 9 The Key Material List

Main	Shielding cover	6189N-SFC V1.0 Shielding cover no insulation layer 14.79x10.72-full height of 1.4 copper, no positioning pin
Main	Crystal	26mhz 3225 ±10ppm, 10.5pF, E3SB26E00002SE10C0BB (HOSONIC)
Main	ESD	0402 5.5V 0.1pF GESD1005H5R5CR10GPT(Sunlord)
Main	Chipset	RTL8189FTV-VC-CG

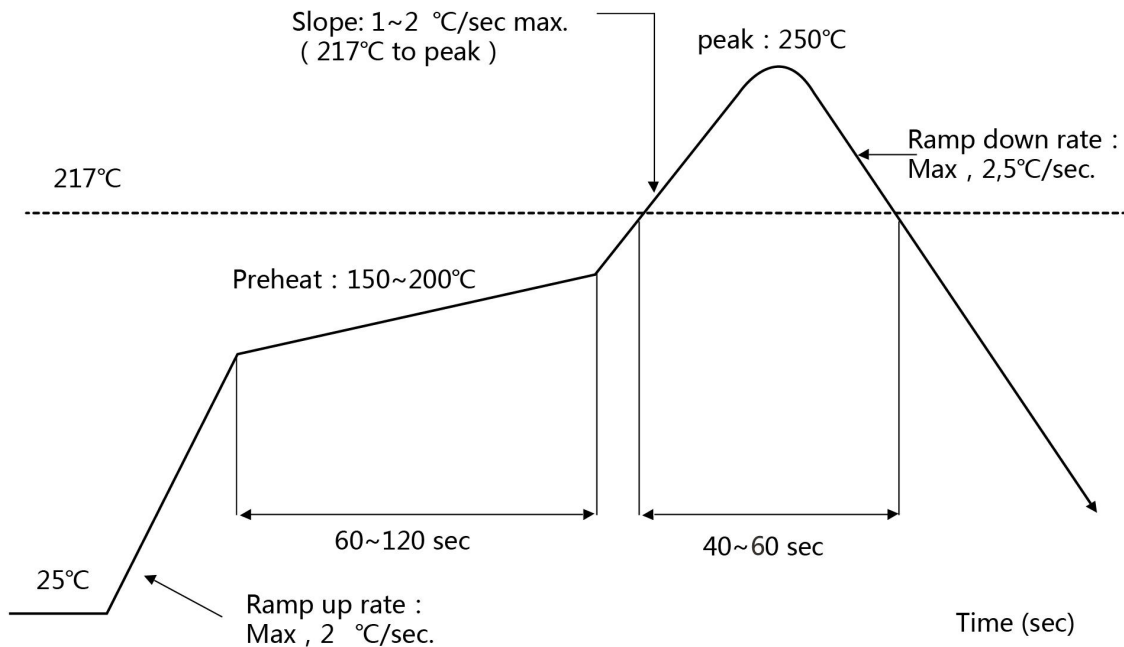
## 10 Environmental Requirements

### 10.1 Recommended Reflow Profile

Referred to IPC/JEDEC standard.

Peak Temperature : <250°C

Number of Times : ≤2 times



## 10.2 Patch Wi-Fi modules installed before the notice

Wi-Fi 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 °C 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 °C, 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:  $\leq -30$  °C,  $\leq 60\%$  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 °C, 8 hours.

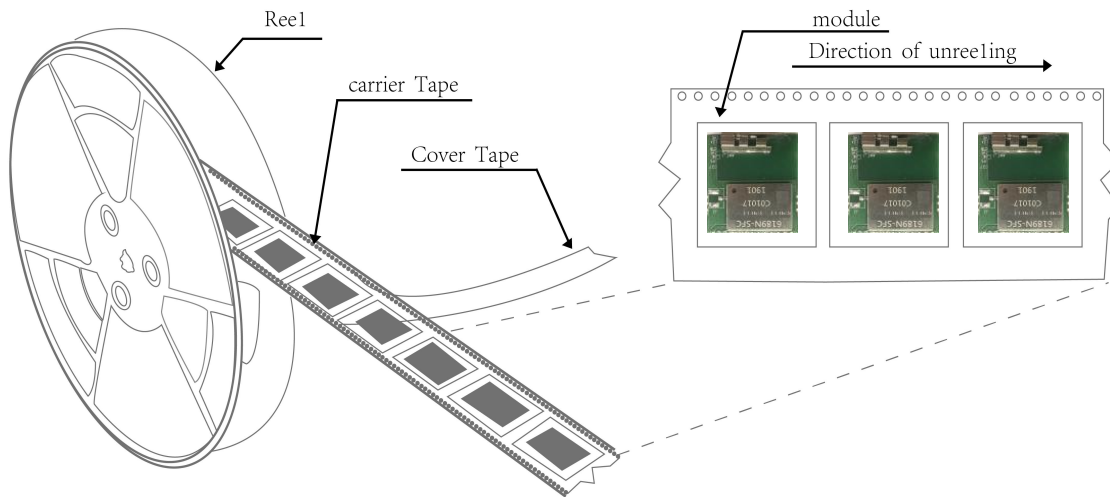
3). After baking, put the right amount of desiccant to seal packages.



## 11 Package

### 11.1 Reel

A roll of 350pcs



### 11.2 Packaging Detail

the take-up package



Using self-adhesive tape

Size of black tape: 44mm\*12.48m    the cover tape    : 37.5mm\*12.48m

Color of plastic disc: blue

A roll of 350pcs



NY bag size:420mm\*450mm



size : 335\*335\*55mm



The packing case size:335\*255\*360mm

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## RF Exposure Information and Statement

This equipment complies with FCC and IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

### 5、 FCC and IC Statement

This device complies with part 15 of the FCC rules and RSS-247 of Industry Canada. 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.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

**NOTE:** The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications 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
- This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

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## Instructions to the OEM/Integrator:

This module has been granted modular approval for mobile applications. OEM integrators for host products may use the module in their final products without additional FCC/ISED (Innovation, Science and Economic Development Canada) certification if they meet the following conditions. Otherwise, Additional FCC/IC approvals must be obtained.

- The OEM must comply with the FCC labeling requirements. If the module's label is not visible when installed, then an additional permanent label must be applied on the outside of the finished product which states: "Contains transmitter module FCC ID: 2ASV9-6189N". Additionally, the following statement should be included on the label and in the final product's user 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 interferences, and (2) this device must accept any interference received, including interference that may cause undesired operation."
- The user's manual for the host product must clearly indicate the operating requirements and conditions that must be observed to ensure compliance with current FCC / IC RF exposure guidelines.
- The final host / module combination may also need to be evaluated against the FCC Part 15B criteria for unintentional radiators in order to be properly authorized for operation as a Part 15 digital device.
- This Module is full modular approval, it is limited to OEM installation ONLY.
- The module is limited to installation in mobile application.
- A separate approval is required for all other operating configurations, including portable configurations with respect to Part 2.1093 and difference antenna configurations.
- The OEM integrator is responsible for ensuring that the end-user has no manual instruction to remove or install module.
- The Grantee will provide guidance to the Host Manufacturer for compliance with the Part 15B requirements if requested.
- **Any modifications made to the module will void the Grant of certification ,including antenna replacement ,the OEM integrator will be responsible for re-evaluating radiated emission of part 15C, and obtain a separate FCC authorization.**

IC labeling requirement for the final end product:

The final end product must be labeled in a visible area with the following "Contains IC: 24909-8188U1PS"

The Host Marketing Name (HMN) must be indicated at any location on the exterior of the host product or product packaging or product literature, which shall be available with the host product or online.

**Le produit final doit être noté dans une zone visible "Contains IC: 24909-6189N"**

**Le nom du présentateur (HMN) doit être indiqué dans toute location sur le nom du produit hôte ou du label ou de la littérature du produit,**

**Qui doit être disponible avec le produit hôte ou en ligne.**