

PRODUCT SPECIFICATION

6192A-SF

Wi-Fi Single-band 2x2 11n Module Datasheet

Version:v1.6



6192A-SF Module Datasheet

Ordering Information	Part NO.	Description
	FG6192ASFX-00	RTL8192FS,b/g/n,Wi-Fi,2T2R,12X12mm,SDIO,with shielding, PCB V1.0
	FG6192ASFX-01	RTL8192FS,b/g/n,Wi-Fi,2T2R,12X12mm,SDIO,no shielding, PCB V1.0

Customer: _____

Customer P/N: _____

Signature: _____

Date: _____

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CONTENTS

Update Marking Description	4
1. General Description	5
1.1 Introduction	5
1.2 Description	5
2. Features	5
3. Block Diagram	6
4. General Specification	6
4.1 WI-FI Specification	6
5. ID setting information	8
6. Pin Definition	8
6.1 Pin Outline	8
6.2 Pin Definition details	9
7. Electrical Specifications	10
7.1 Power Supply DC Characteristics	10
7.2 Interface Circuit time series	11
7.2.1 SDIO interface timing	11
7.2.2 SDIO Pin Description	12
7.2.3 SDIO Timing Diagram	13
8. Size reference	13
8.1 Module Picture	13
8.2 Marking Description	14
8.3 List of certified information	14
8.4 Physical Dimensions	15
8.5 Layout Recommendation	16
9. The Key Material List	16
10. Reference Design	17
11. Recommended Reflow Profile	18
12. RoHS compliance	18
13. Package	19
13.1 Reel	19
13.2 Carrier Tape Detail	19
13.3 Packaging Detail	20
13.4 Tray	21
14. Moisture sensitivity	21

Revision History

[illegible]

1. General Description

1.1 Introduction

6192A-SF base on RTL8192FS complied with IEEE 802.11 b/g/n standard from 2.4G-2.4835GHz. Support 300Mbps high speed wireless network connection with SDIO interface (1.1/2.0/3.0 compliant).

1.2 Description

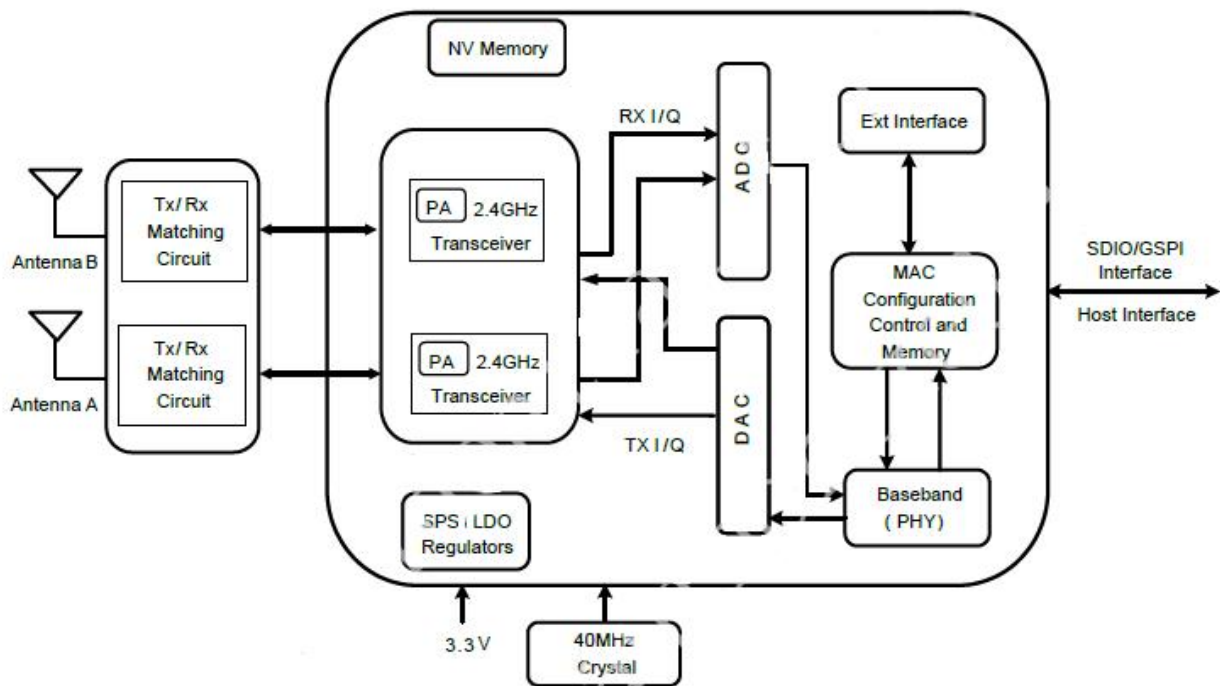
Model Name	6192A-SF
Product Description	Support Wi-Fi functionalities
Dimension	L x W x H: 12 x 12 x 1.6 mm
Wi-Fi Interface	Support SDIO V1.1/2.0/3.0
OS supported	Android /Linux/ Win CE /XP/WIN7/WIN10
Operating temperature	0°C to 70°C
Storage temperature	-40°C to 85°C

2. Features

General

- 12x12mm, 44pin, 3.3V power in
- RTL8192FS.
- Complete 802.11n 2x2 MIMO solution for 2.4GHz, maximum data rate up to 300Mbps using 40Mhz bandwidth
- Complies with SDIO 1.1/2.0/3.0 for WLAN with clock rate up to 100Mhz

3. Block Diagram



4. General Specification

4.1 WI-FI Specification

Feature	Description	
WLAN Standard	IEEE 802.11 b/g/n Wi-Fi compliant	
Frequency Range	2.400 GHz ~ 2.4835 GHz (2.4 GHz ISM Band)	
Number of Channels	2.4GHz: Ch1 ~ Ch14	
Modulation	DBPSK/DQPSK/CCK(DSSS) BPSK/QPSK/16QAM/64QAM(OFDM)	
Test Items	Typical Value	EVM
Output Power	802.11b /11Mbps : 18dBm ± 2 dB	EVM ≤ -9dB
	802.11g /54Mbps : 16dBm ± 2 dB	EVM ≤ -26dB
	802.11n /MCS7 : 15dBm ± 2 dB	EVM ≤ -28dB
Spectrum Mask	Meet with IEEE standard	

Freq. Tolerance	$\pm 20\text{ppm}$		
Receive Sensitivity (11b,20MHz) @8% PER	- 1Mbps	PER @ -88 dBm	≤ -83
	- 2Mbps	PER @ -87 dBm	≤ -80
	- 5.5Mbps	PER @ -85 dBm	≤ -79
	- 11Mbps	PER @ -82 dBm	≤ -76
Receive Sensitivity (11g,20MHz) @10% PER	- 6Mbps	PER @ -86 dBm	≤ -85
	- 9Mbps	PER @ -85 dBm	≤ -84
	- 12Mbps	PER @ -84 dBm	≤ -82
	- 18Mbps	PER @ -82 dBm	≤ -80
	- 24Mbps	PER @ -80 dBm	≤ -77
	- 36Mbps	PER @ -77 dBm	≤ -73
	- 48Mbps	PER @ -73 dBm	≤ -69
	- 54Mbps	PER @ -71 dBm	≤ -65
Receive Sensitivity (11n,20MHz) @10% PER	- MCS=0	PER @ -83 dBm	≤ -82
	- MCS=1	PER @ -82 dBm	≤ -79
	- MCS=2	PER @ -80 dBm	≤ -77
	- MCS=3	PER @ -78 dBm	≤ -74
	- MCS=4	PER @ -75 dBm	≤ -70
	- MCS=5	PER @ -71 dBm	≤ -66
	- MCS=6	PER @ -69 dBm	≤ -65
	- MCS=7	PER @ -67 dBm	≤ -64
Receive Sensitivity (11n,40MHz) @10% PER	- MCS=0	PER @ -82 dBm	≤ -79
	- MCS=1	PER @ -81 dBm	≤ -76
	- MCS=2	PER @ -80 dBm	≤ -74
	- MCS=3	PER @ -76 dBm	≤ -71
	- MCS=4	PER @ -72 dBm	≤ -67
	- MCS=5	PER @ -68 dBm	≤ -63
	- MCS=6	PER @ -66 dBm	≤ -62
	- MCS=7	PER @ -65 dBm	≤ -61

5. ID setting information

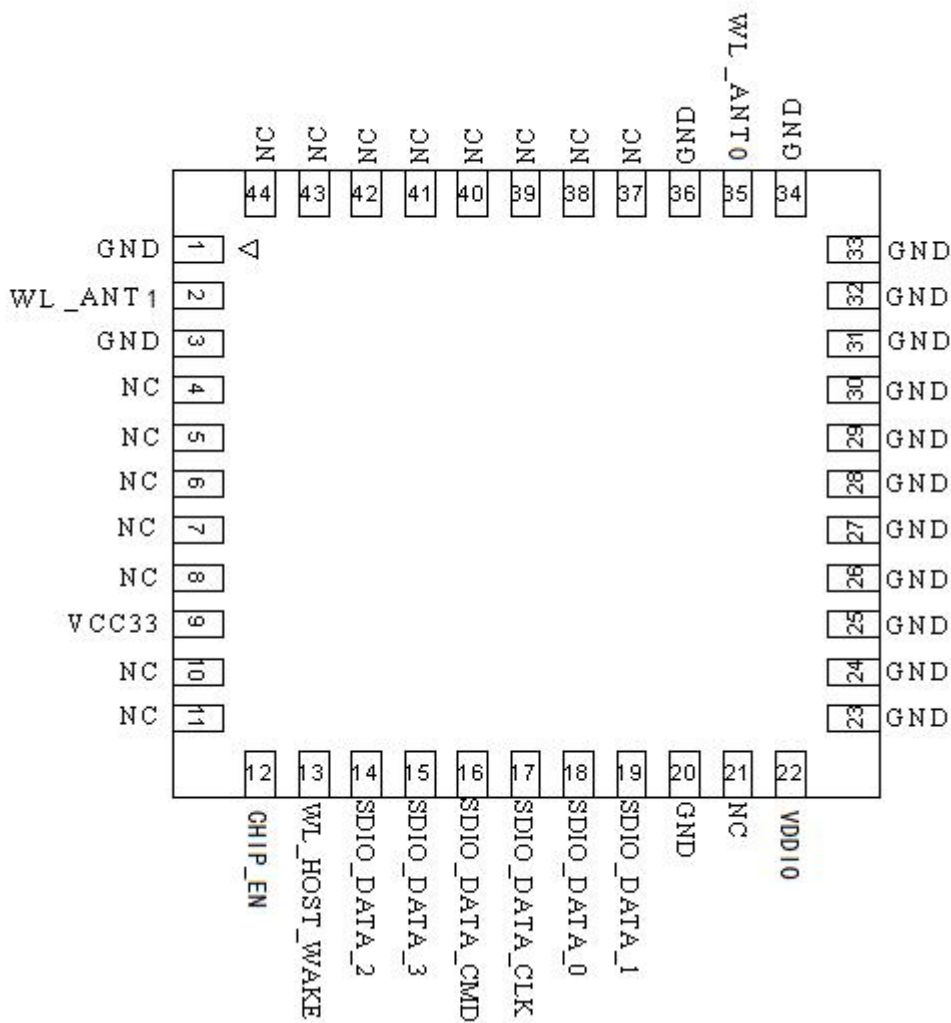
WI-FI

Vendor ID	-
Product ID	-

6. Pin Definition

6.1 Pin Outline

< TOP VIEW



6.2 Pin Definition details

NO.	Name	Type	Description	Voltage
1	GND	—	Ground connections	
2	WL_ANT 1	I/O	RF I/O port1	
3	GND	—	Ground connections	
4	NC	—	Floating (Don't connected to ground)	
5	NC	—	Floating (Don't connected to ground)	
6	NC	—	Floating (Don't connected to ground)	
7	NC	—	Floating (Don't connected to ground)	
8	NC	—	Floating (Don't connected to ground)	
9	VCC33	P	Main power voltage source input 3.3V	3.3V
10	NC	—	Floating (Don't connected to ground)	
11	NC	—	Floating (Don't connected to ground)	
12	CHIP_EN	I	Enable pin for Chip ON: default pull high ; OFF: external pull low	3.3V
13	WLAN_HOST_WAKE	O	wake-up function	3.3V
14	SDIO_DATA_2	I/O	SDIO data line 2	VDDIO
15	SDIO_DATA_3	I/O	SDIO data line 3	VDDIO
16	SDIO_DATA_CMD	I/O	SDIO command line	VDDIO
17	SDIO_DATA_CLK	I/O	SDIO clock line	VDDIO
18	SDIO_DATA_0	I/O	SDIO data line 0	VDDIO
19	SDIO_DATA_1	I/O	SDIO data line 1	VDDIO
20	GND	—	Ground connections	
21	NC	—	Floating (Don't connected to ground)	
22	VDDIO	I	VDDIO power	1.8V or 3.3V
23	GND	—	Ground connections	
24	GND	—	Ground connections	
25	GND	—	Ground connections	
26	GND	—	Ground connections	
27	GND	—	Ground connections	
28	GND	—	Ground connections	
29	GND	—	Ground connections	
30	GND	—	Ground connections	
31	GND	—	Ground connections	
32	GND	—	Ground connections	
33	GND	—	Ground connections	
34	GND	—	Ground connections	

35	WL_ANT 0	—	RF I/O port0	
36	GND	—	Ground connections	
37	NC	—	Floating (Don't connected to ground)	
38	NC	—	Floating (Don't connected to ground)	
39	NC	—	Floating (Don't connected to ground)	
40	NC	—	Floating (Don't connected to ground)	
41	NC	—	Floating (Don't connected to ground)	
42	NC	—	Floating (Don't connected to ground)	
43	NC	—	Floating (Don't connected to ground)	
44	NC	—	Floating (Don't connected to ground)	

P:POWER I:INPUT O:OUTPUT VDDIO:1.8V or 3.3V

7. Electrical Specifications

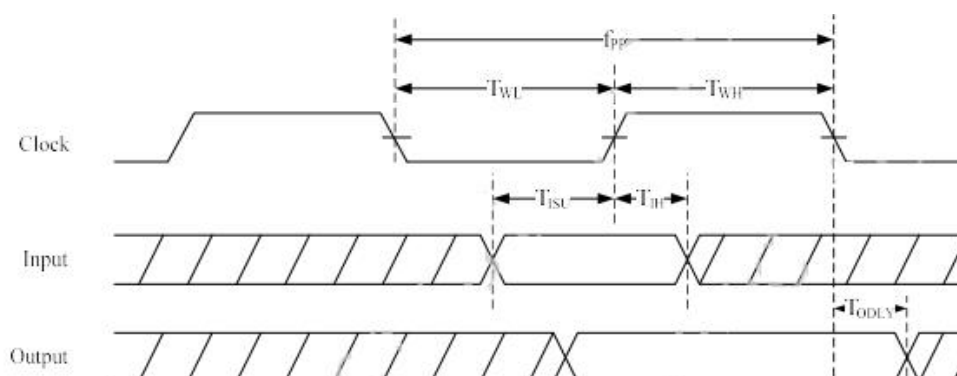
7.1 Power Supply DC Characteristics

The digital IO supports VDD33 or VDD18 application.

	MIN	TYP	MAX	Unit
Operating Temperature	0	25	70	deg.C
VCC33	3.0	3.3	3.6	V
VDDIO	1.7	1.8 or 3.3	3.6	V

7.2 Interface Circuit time series

7.2.1 SDIO interface timing



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

SDIO Bus during Power On Sequence

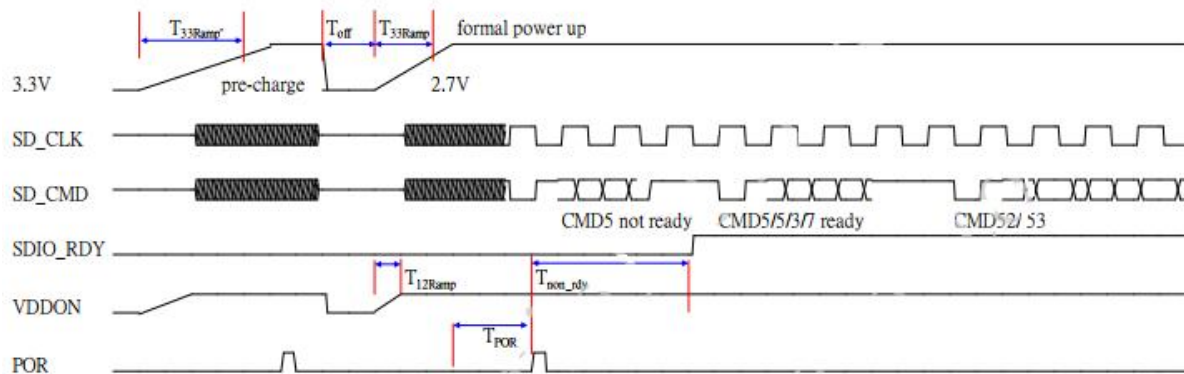


Figure 3. RTL8192FS SDIO Bus Power On Sequence

T_{33ramp'}: The 3.3V power pre-charge ramp up duration before formal power up. It is recommended that a 3.3V power on and then power off sequence is executed by host controller before the formal power on sequence. This procedure can eliminate the host card detection issue when power ramp up duration is too long or the system warm reboot failure issue.

T_{off}: The duration the 3.3V is cut off before formal power up.

T_{33ramp}: The 3.3V main power ramp up duration

T_{12ramp}: The internal 1.2V ramp up duration.

T_{por}: The duration the power on reset releases and power management unit executes power on tasks. The power on reset will detect both 3.3V and 1.2V power ramp up and after a predetermined duration.

T_{non_rdy}: SDIO not ready duration, in this state, card may respond command without ready bit set. After ready bit set, host will initiate complete card detection procedure.

Table 10. The typical timing range

	Min	Typical	Max	Unit
T _{33ramp'}	0.2	0.5	2.5	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

7.2.2 SDIO Pin Description

The module supports SDIO version 3.0, signal level ranges from 1.8V to 3.3V.

SDIO Pin Description

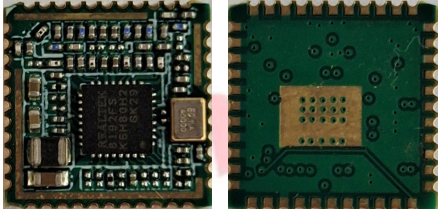
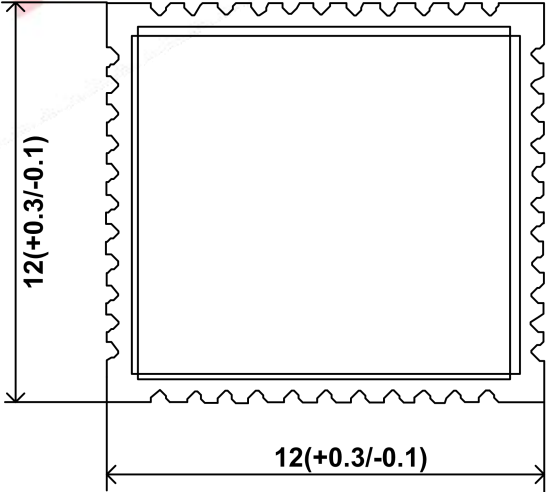
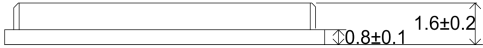
SD 4-Bit Mode	
DATA0	Data Line 0
DATA1	Data Line 1 or Interrupt
DATA2	Data Line 2 or Read Wait
DATA3	Data Line 3
CLK	Clock
CMD	Command Line

7.2.3 SDIO Timing Diagram

For timing criteria, please check specification in “SD specification Part1 Physical Layer Specification Version 3.01”

8. Size reference

8.1 Module Picture

L x W : 12 x 12 (+0.3/-0.1) mm -01  -00 	
H: 1.6 (±0.2) mm H:2.35 (±0.2) mm ---with shielding	
Weight	0.54g

8.2 Marking Description



备注：

二维码内容：112233445566;FG6192ASFX-00

1. Fn-Link 商标 logo

2. 机型：6192A-SF

3. 二维码：编码规则为“wifi mac 地址;成品料号”

例如：112233445566;FG6192ASFX-00（MAC 地址以实际为准）

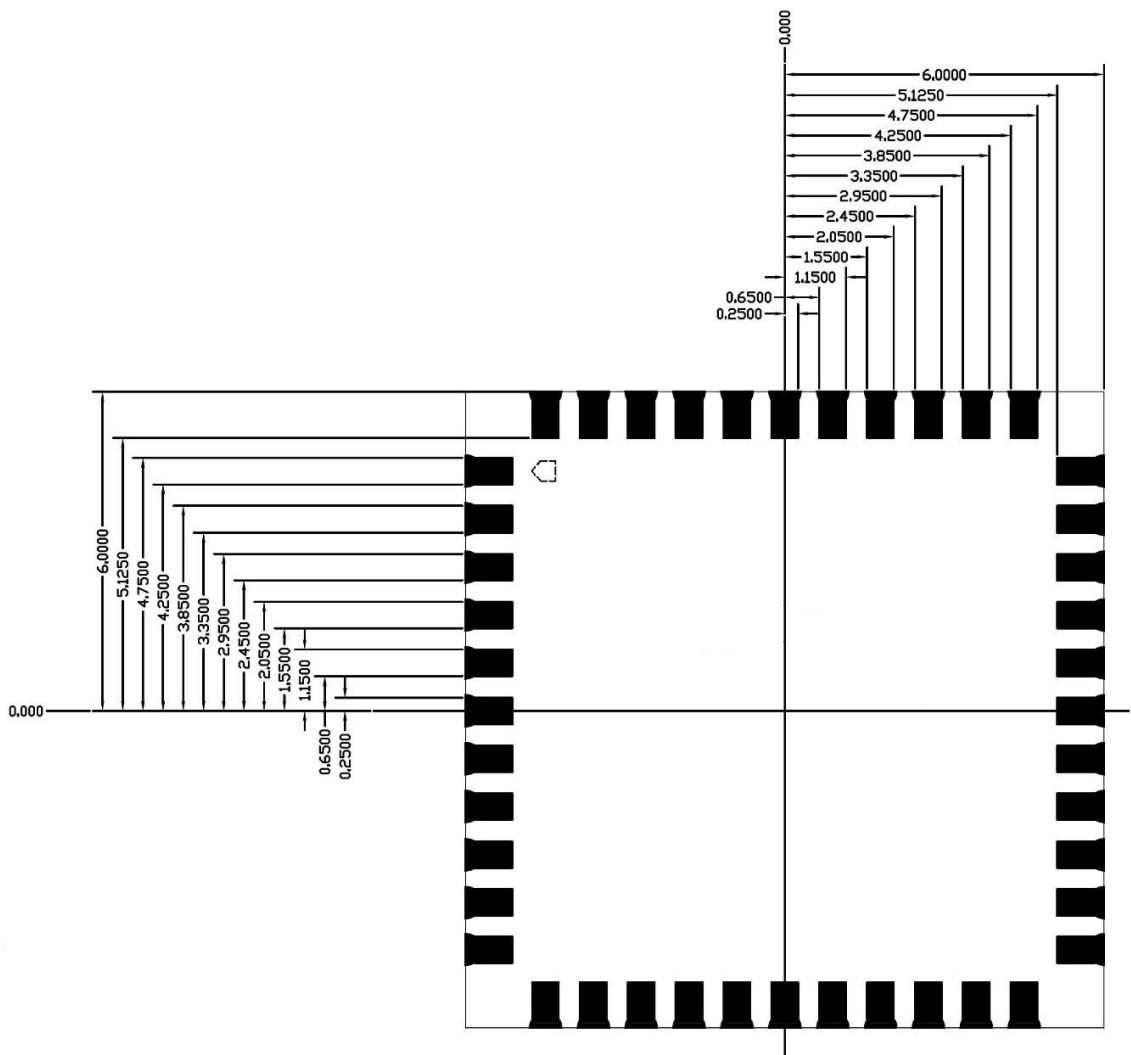
4. V/N 00(V/N 到 00 之间为两个空格，00 为成品料号后缀，与二维码右对齐。)

8.3 List of certified information

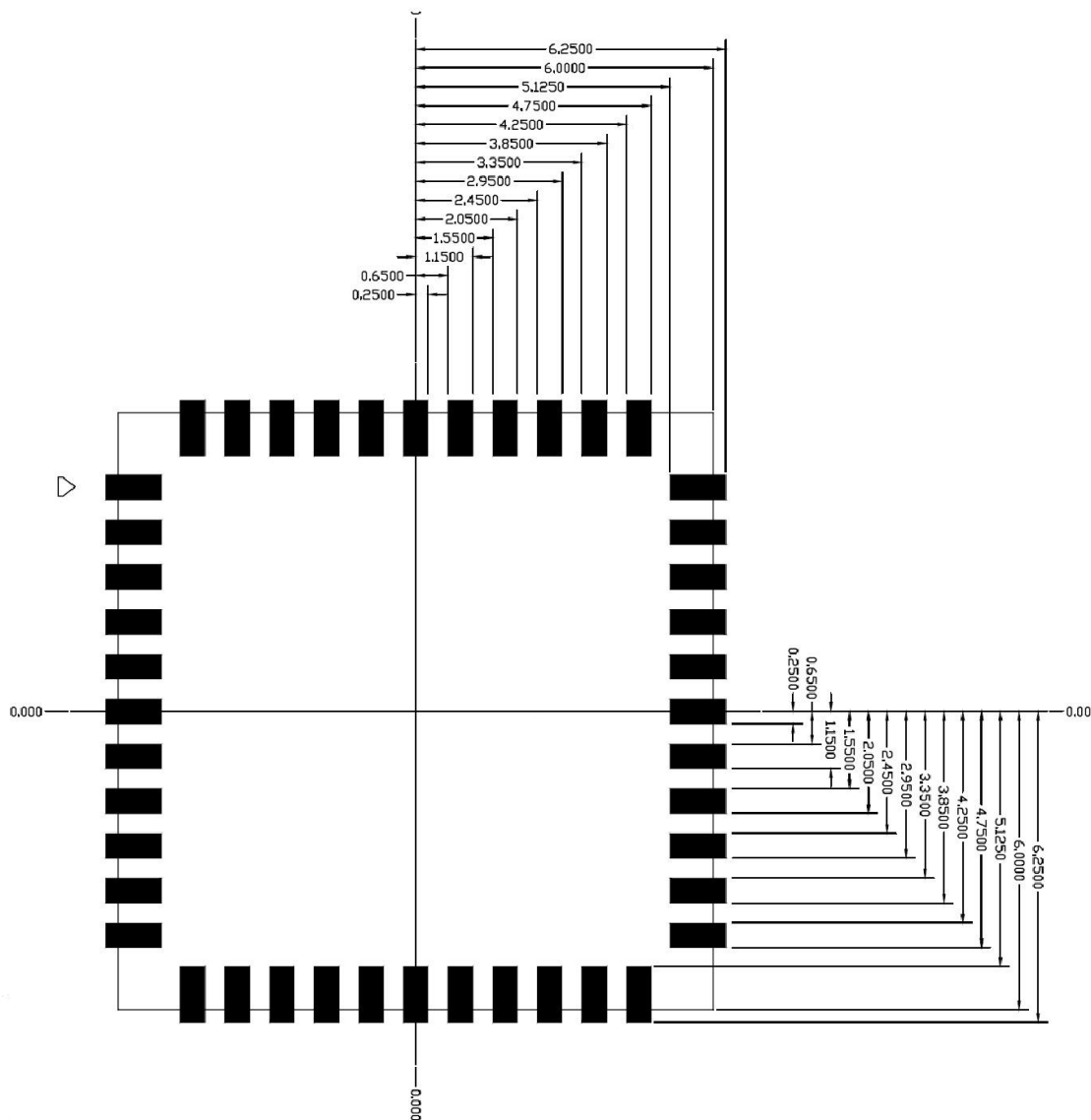
Certification project	Certificate number
SRRC	23J43T23A002(M)
FCC	TBD
CE	TBD
IC	TBD
NCC	TBD
KCC	TBD
TELEC	TBD
Brazil	TBD
Argentina	TBD
Japan	TBD
WPC	TBD

8.4 Physical Dimensions

<TOP View>



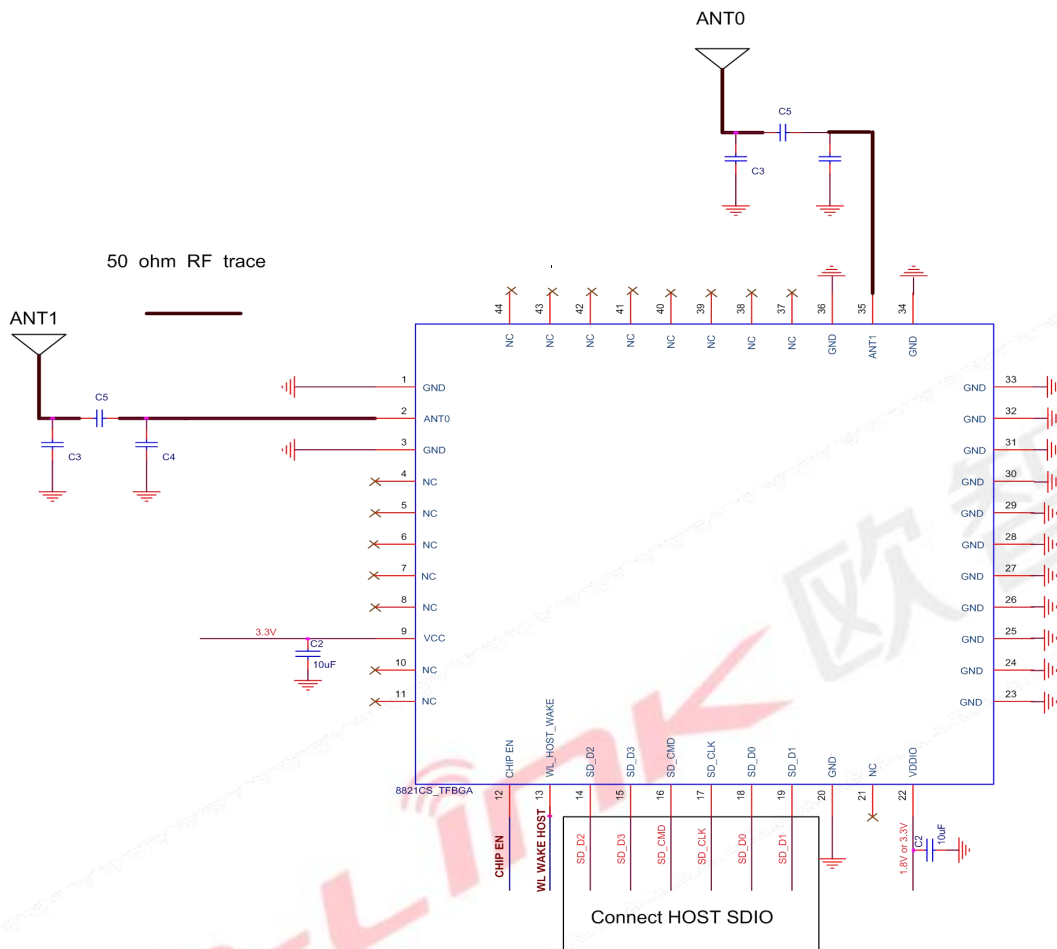
8.5 Layout Recommendation



9. The Key Material List

Name	specification	supplier
Chipset	RTL8192FS-CG QFN-32	Realtek
PCB	6192A-SF 12X12X0.8mm 4L	XY-PCB,KX-PCB,SL-PCB,Sunlord
Crystal	2520 40MHz 10ppm 12PF	TST,HOSONIC,TKD,ECEC,JWT
Inductor	0806 2.2uH, $\pm 20\%$, 1200mA	Microgate,sunlord,cenke,ceaiya

10. Reference Design

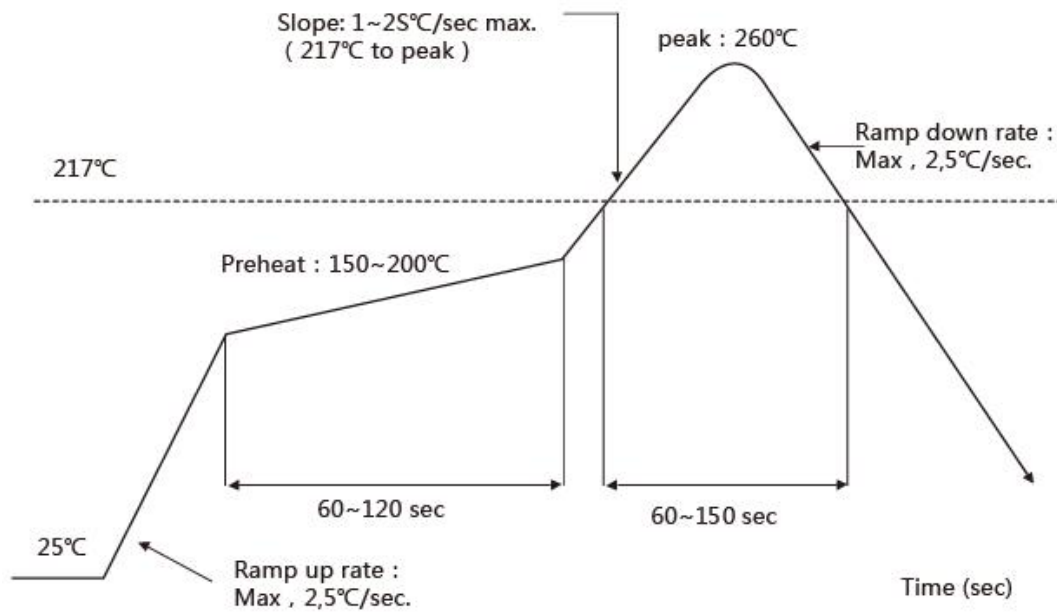


11. Recommended Reflow Profile

Referred to IPC/JEDEC standard.

Peak Temperature : $<260^{\circ}\text{C}$

Number of Times : ≤ 2 times



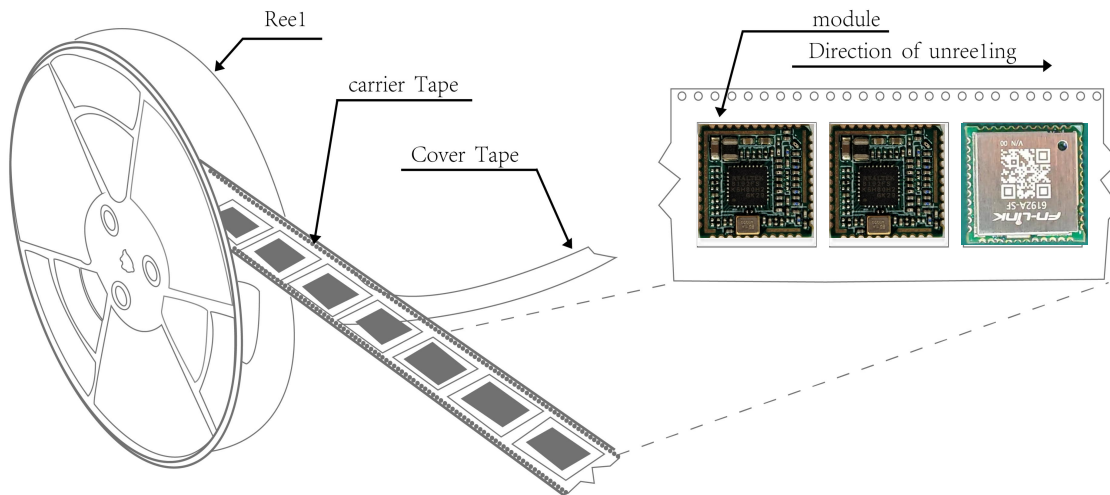
12. RoHS compliance

All hardware components are fully compliant with EU RoHS directive

13. Package

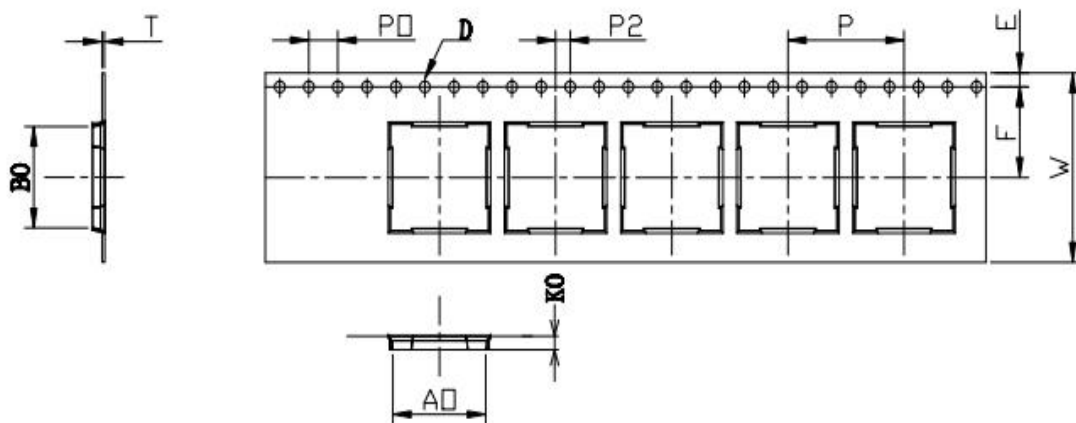
13.1 Reel

A roll of 1500pcs



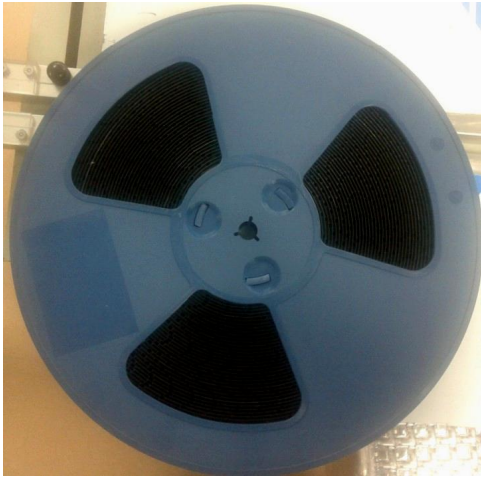
13.2 Carrier Tape Detail

ITEM	W	A0	B0	D	F	E	K0	P0	P2	P	T
DIM	24	12.45	12.45	1.50	11.5	1.75	2.60	4.0	2.0	16.0	0.30
TOLE	$\begin{smallmatrix} +0.3 \\ -0.3 \end{smallmatrix}$	± 0.10	± 0.10	$\begin{smallmatrix} +0.1 \\ -0.0 \end{smallmatrix}$	$\begin{smallmatrix} +0.1 \\ -0.1 \end{smallmatrix}$	± 0.1	± 0.10	± 0.1	± 0.1	± 0.1	± 0.05



13.3 Packaging Detail

the take-up package



Using self-adhesive tape

Size of black tape: 24mm*32.6m the cover tape :21.3mm*32.6m

Color of plastic disc: blue



NY bag size:460mm*385mm



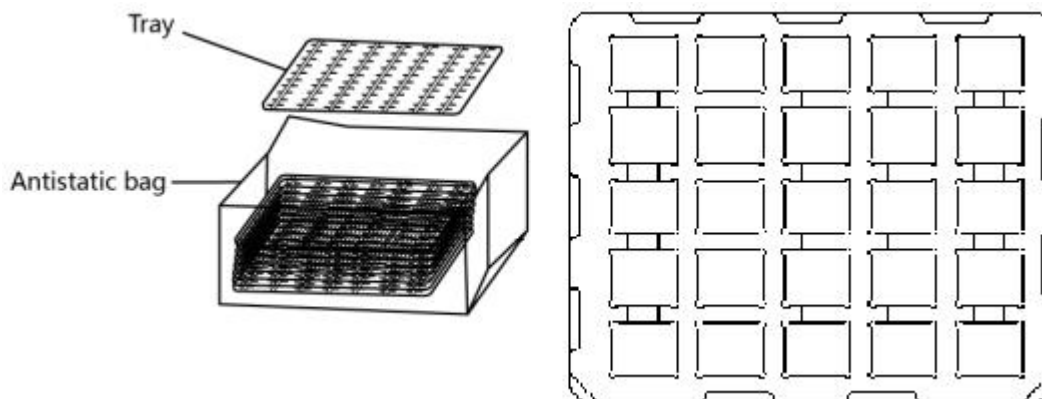
size : 350*350*35mm



The packing case size:350*210*370mm

13.4 Tray

Use pallet packaging for less than 300 pieces



14. Moisture sensitivity

The Modules is a Moisture Sensitive Device level 3, in according with standard IPC/JEDEC J-STD-020, take care

all the relatives requirements for using this kind of components.

Moreover, the customer has to take care of the following conditions:

- a) Calculated shelf life in sealed bag: 12 months at $<40^{\circ}\text{C}$ and $<90\%$ relative humidity (RH)
- b) Environmental condition during the production: 30°C / 60% RH according to IPC/JEDEC J-STD-033A paragraph 5
- c) The maximum time between the opening of the sealed bag and the reflow process must be 168 hours if condition b) "IPC/JEDEC J-STD-033A paragraph 5.2" is respected
- d) Baking is required if conditions b) or c) are not respected
- e) Baking is required if the humidity indicator inside the bag indicates 10% RH or more