6192E-UC

Wi-Fi Single-band 2X2 11n

Module Datasheet

6192E-UC Module Datasheet

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Customer Approval :

_____ Company

_____ Customer P/N

_____ Signature

_____ Date

Revision History

Version	Date	Revision Content	Draft	Approved
1.0	2020/08/13	New version	LXY	LGP
1.1	2021/06/24	Revise TX power spec.	LXY	QJP

CONTENTS

1 Overview

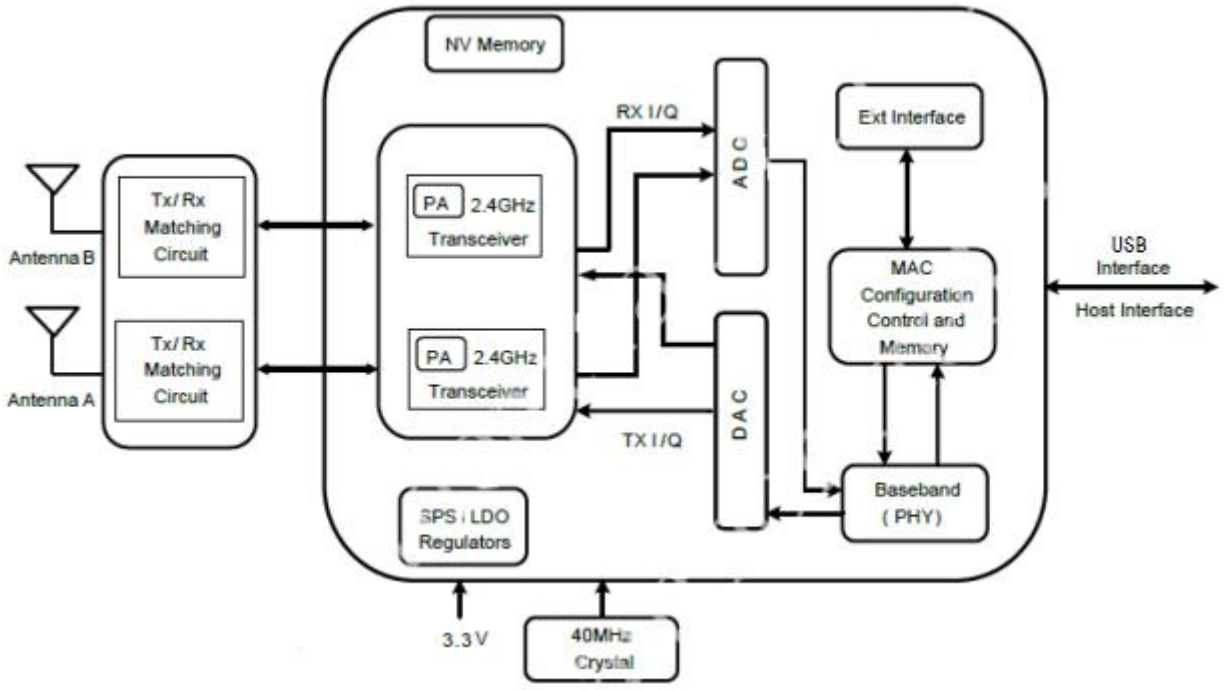
1.1 Introduction

6192E-UC base on RTL8192FC complied with IEEE 802.11 b/g/n standard from 2.4G-2.5GHz. Support 300Mbps high speed wireless network connection with USB interface.

1.2 Features

- 12.2x12.9mm, 3.3V power in.
- RTL8192FC.
- Complete 802.11n 2x2 MIMO solution for 2.4GHz, maximum data rate up to 300Mbps using 40Mhz bandwidth.
- Complies with USB2.0 for WLAN.

Block Diagram:



1.3 General Specification

Model Name	6192E-UC
Product Description	Support Wi-Fi functionalists
Dimension	L x W x T: 12.2 x 12.9 x 1.7 (typical) mm
Wi-Fi Interface	Support USB V1.0/1.1/2.0
BT Interface	-
Operating temperature	0°C to 70°C
Storage temperature	-40°C to 85°C
RoHS	All hardware components are fully compliant with EU RoHS directive

1.4 Recommended Operating Rating

		Min.	Typ.	Max.	Unit
Operating Temperature		0	25	70	deg.C
VCC33		3.0	3.3	3.6	V
Power Consumption		VCC33 = 3.3V(Unit:mA)			
	Wi-Fi on Mode	115			
	TX (2.4G 11b)	308.7			
	TX (2.4G HT20)	231			
	TX (2.4G HT40)	177			
	RX (2.4G HT40)	118.6			

※1.5 EEPROM Information

WI-FI

Vendor ID	-
Product ID	-

2 Wi-Fi RF Specification

2.1 2.4GHz RF Specification

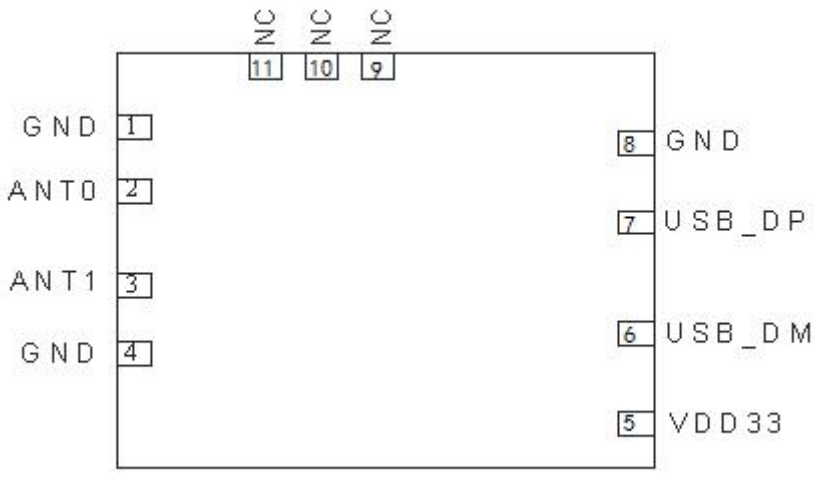
Feature	**Description**			
WLAN Standard	IEEE 802.11b/g/n, Wi-Fi compliant			
Frequency Range	2.400 GHz ~ 2.497 GHz (2.4 GHz ISM Band)			
Number of Channels	2.4GHz：Ch1 ~ Ch14			
Modulation	DBPSK/DQPSK/CCK(DSSS) BPSK/QPSK/16QAM/64QAM(OFDM)			
Spectrum Mask	Min. b/g/n	Typ. b/g/n	Max. b/g/n	Unit b/g/n
1st side lobes(to fc ± 11MHZ)	-	-41/-32/-42	-	dBr
2st side lobes(to fc ± 22MHZ)	-	-50/-31/-52	-	dBr
Freq. Tolerance	-20/-20/-20	-	20/20/20	ppm
Output Power	802.11b /11Mbps	: 17 dBm ± 1.5 dB @ EVM ≤ -9dB		
	802.11g /54Mbps	: 16 dBm ± 1.5 dB @ EVM ≤ -25dB		
	802.11n /MCS7	: 16 dBm ± 1.5 dB @ EVM ≤ -28dB		
Test Items	**Typical Value**		**Standard Value**	
Receive Sensitivity (11b) @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) @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 dBml	≤-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

4 Pin Assignments

4.1 Pin Outline

< TOP VIEW >



4.2 Pin Definition

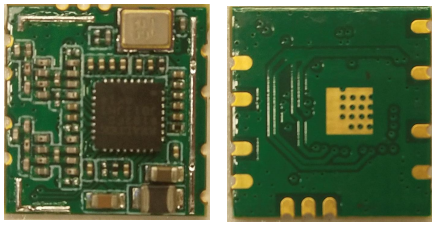
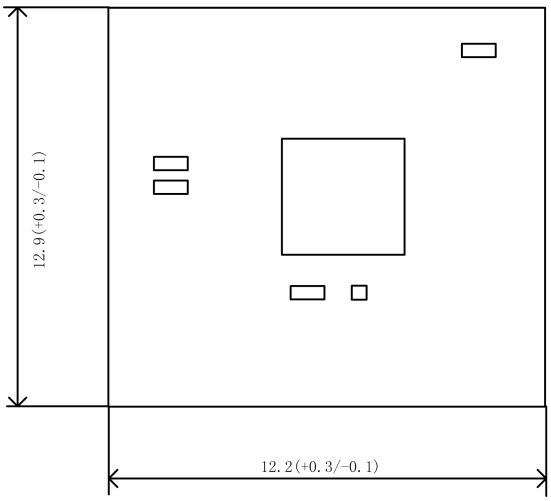
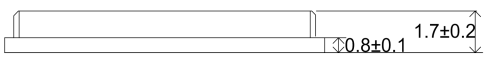
NO	Name	Type	Description	Voltage
1	GND	—	Ground connections	
2	ANT 0	I/O	RF I/O port0	
3	ANT 1	I/O	RF I/O port1	
4	GND	—	Ground connections	
5	VDD33	P	Main power voltage source input 3.3V	3.3V
6	USB_DM	I/O	USB D-	
7	USB_DP	I/O	USB D+	
8	GND	—	Ground connections	
9	NC	—	Floating (Don't connected to ground)	
10	NC	—	Floating (Don't connected to ground)	
11	NC	—	Floating (Don't connected to ground)	

P:POWER I:INPUT O:OUTPUT

5 Dimensions

5.1 Module Picture

(Unit: mm)

<table>
<tr><td>L x W : 12.2 x 12.9 (+0.3/-0.1) mm
  </td><td> 
</td></tr>
<tr><td>H: 1.7 (±0.2) mm</td><td> 
</td></tr>
<tr><td>Weight</td><td>0.44g</td></tr>
</table>

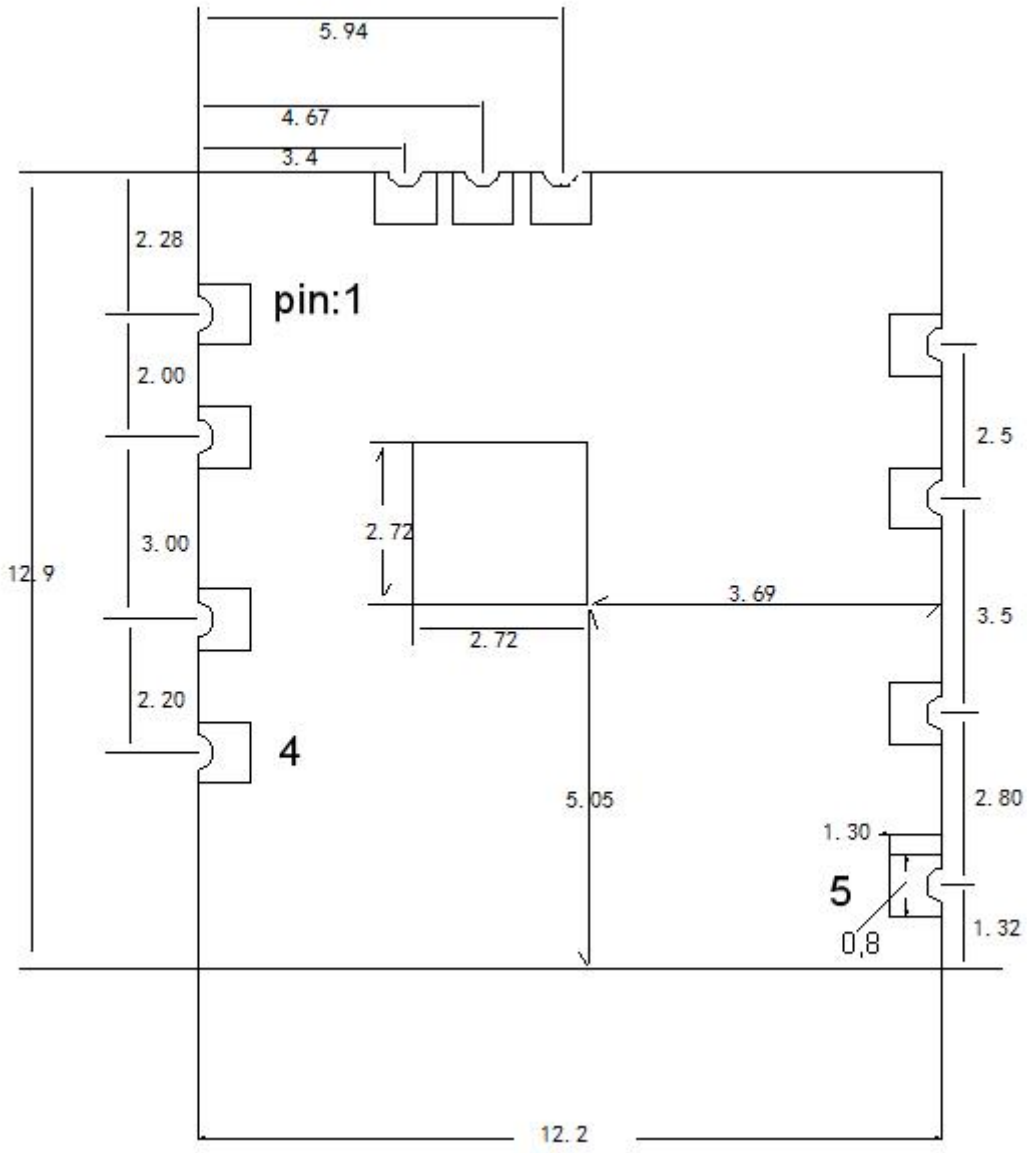
5.2 Marking Description

< None >

5.3 Module Physical Dimensions

(Unit: mm)

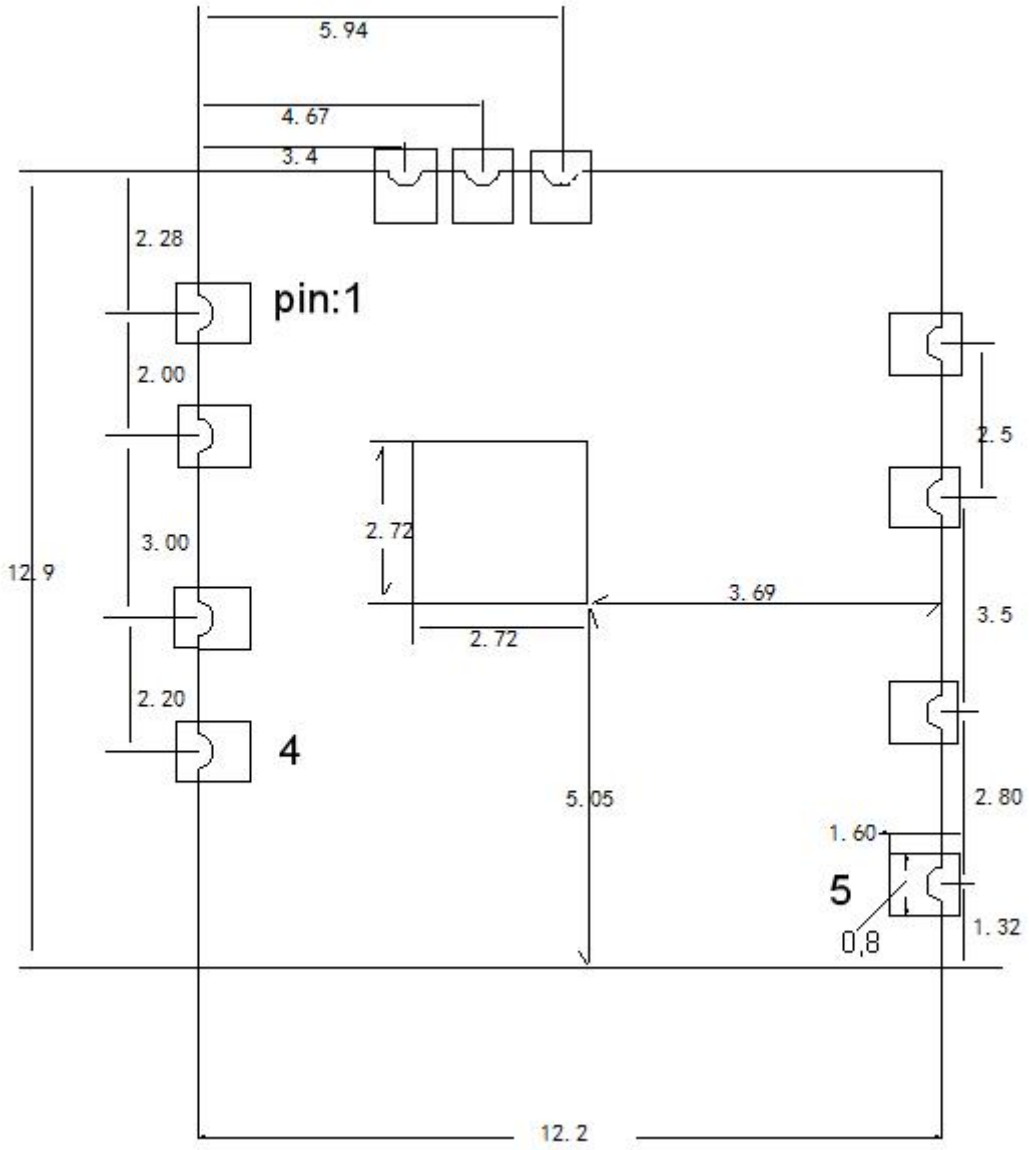
< TOP VIEW >



5.4 Layout Recommendation

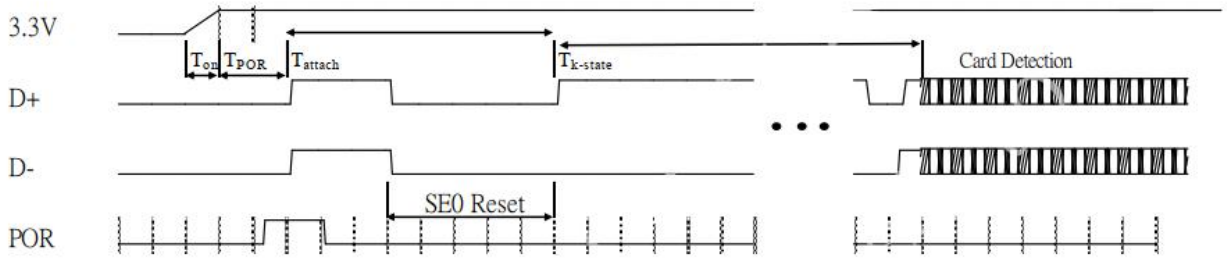
(Unit: mm)

< TOP VIEW >


5. 94
4. 67
3. 4
2. 28
pin:1
2. 00
3. 00
2. 20
4
12. 9
2. 72
2. 72
3. 69
2. 5
3. 5
2. 80
1. 60
5
0,8
1. 32
5. 05
12. 2

6 Host Interface Timing Diagram

6.0 USB power up timing



RTL8192FC USB Bus Power On Sequence

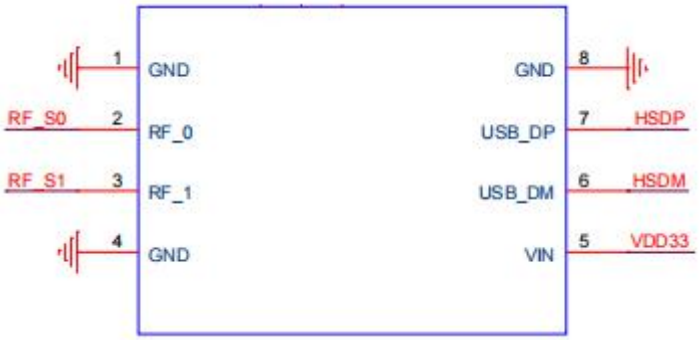
T_{on}: The main power ramp up duration
T_{por}: The power on reset releases and power management unit executes power on tasks
T_{attach}: USB attach state
$T_{k\text{-}state}$: the duration from resister attached to USB host starting card detection procedure

The power on flow description:
After main 3.3V ramp up, the internal power on reset is released by power ready detection circuit and the power management unit will be enabled. The power management unit enables the internal regulator and clock circuits.
The power management unit also enables the USB circuits.
USB analog circuits attach resisters to indicate the insertion of the USB device

The typical timing range

	Unit	Min	Typical	Max
T_{on}	ms	0.25	1.5	5
T_{por}	ms	--	2	10
T_{attach}	ms	2	7	15
$T_{k\text{-}state}$	ms	50	250	--

7 Reference Design



1. S0 /S1 2antenna trace as short as possible,better added π circuit for matching tunning ;

2. USB trace control as 90ohm impedance;
3. 3V3 power supply added 2 filter capacitor (10uf+0.1uf) ;

8 Ordering Information

Part No.	Description
FG6192EUCX-00	RTL8192FC,802.11b/g/n ,2T2R,12.2*12.9,USB2.0

9 The Key Material List

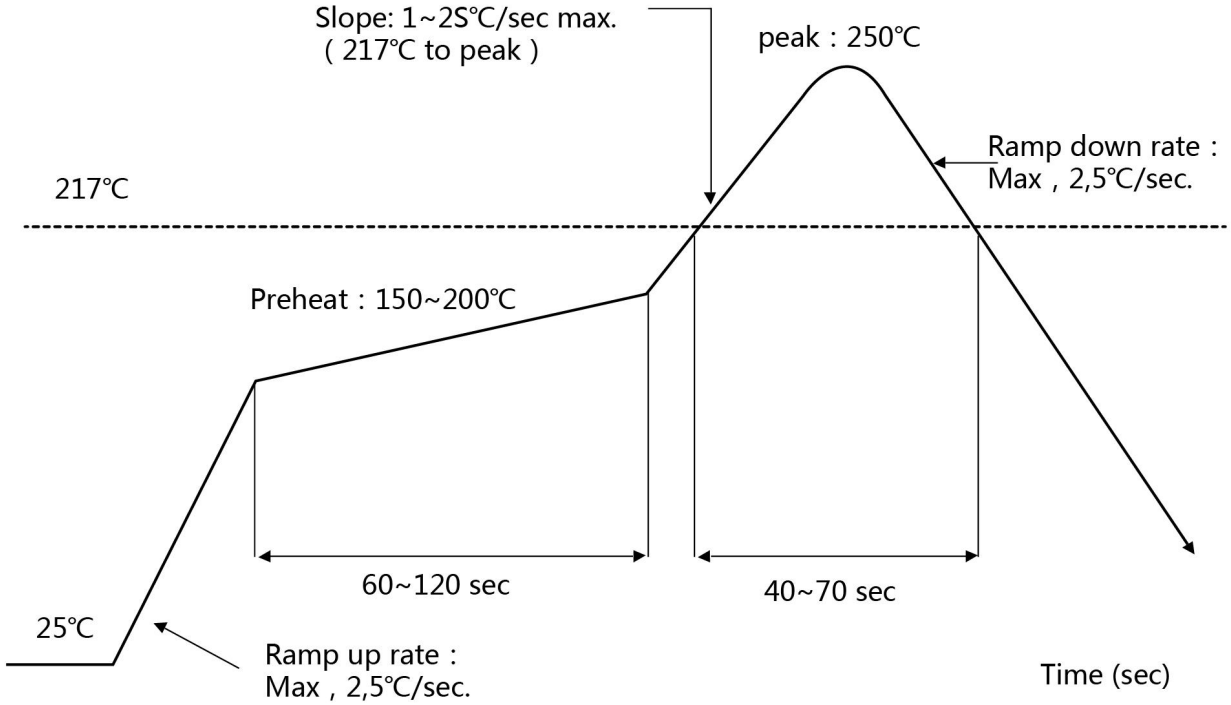
TVS	0201 4V 0.05pF 15KV TVS	Murata,Sunlord,WAYON
Inductor	0806 2.2uH,±20%,1200mA	Sunlord,Cenke,Ceaiya,
Crystal	SMD3.2X2.5,40MHz,CL=15pF, 10ppm	TKD,ECEC,Hosonic,JWT
Chipset	RTL8192FC-CG,QFN-32,4x4mm	Realtek
PCB	6192E-UC-V1.0 Green,4L,FR4,Au,12.2X12.9X0.8mm	XY-PCB,KX-PCB,SL-PCB,Sunlord

10 Recommended Reflow Profile

Referred to IPC/JEDEC standard.

Peak Temperature : <250°C

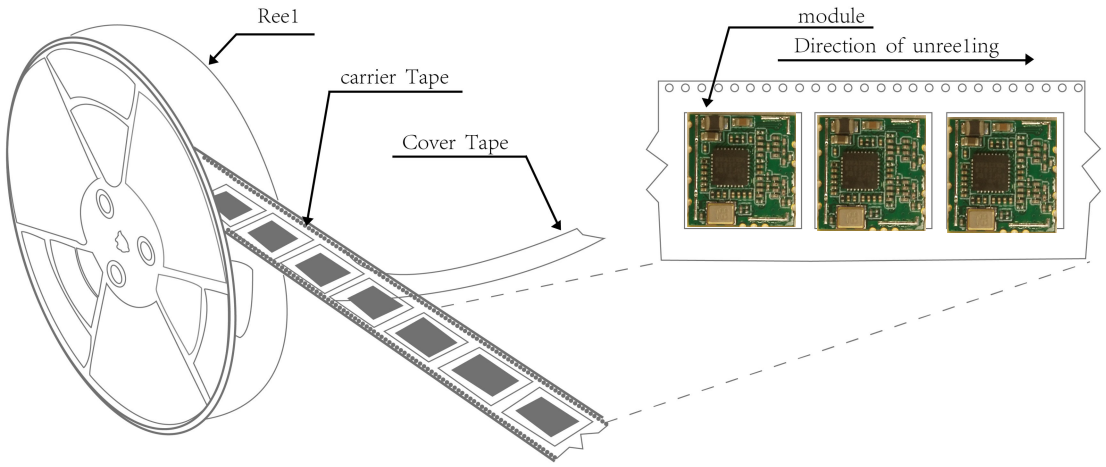
Number of Times : ≤2 times



11 Package Information

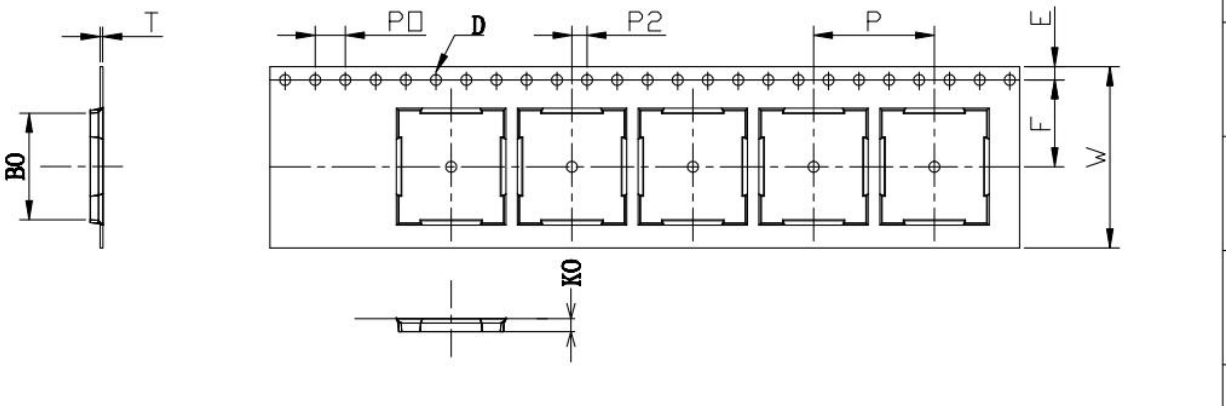
11.1 Reel

A roll of 2000pcs



11.2 Carrier Tape Detail

ITEM	W	AO	BO	D	F	E	KO	PO	P2	P	T
DIM	24	12.45	13.45	1.50	11.5	1.75	1.70	4.0	2.0	16.0	0.30
TOLE	+0.3 -0.3	±0.15	±0.15	+0.1 -0.0	+0.1 -0.1	±0.1	±0.10	±0.1	±0.1	±0.1	±0.05



11.3 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

A roll of 2000pcs

NY bag size:460mm*385mm

size ： 350*350*35mm

The packing case size:350*210*370mm

11.4 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°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