

PRODUCT SPECIFICATION

6188E-UF

Wi-Fi Single-band 1x1 Combo Datasheet

Version:v1.9



6188E-UF Module Datasheet

	Part NO.	Description
Ordering Information	FG6188EUFX-00	RTL8188FTV-VQ1, b/g/n, Wi-Fi, 1T1R, 12.2X13mm, USB, 天线座, PCB V1.0
	FG6188EUFX-02	RTL8188FTV-VQ0, b/g/n, Wi-Fi, 1T1R, 12.2X13mm, USB, 从天线座焊外接天线, PCB V1.0
	FG6188EUFX-03	RTL8188FTV-VQ1, b/g/n, Wi-Fi, 1T1R, 12.2X13mm, USB, 邮票孔, PCB V1.0,with shielding

Customer: _____

Customer P/N: _____

Signature: _____

Date: _____

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Revision History

Version	Date	Contents of Revision Change	Draft	Checked	Approved
V1.0	2020/04/26	New version	Lzm	Lzm	Jacky
V1.1	2018/11/29	Add main chipset	Lzm	Lzm	Jacky
V1.2	2018/12/18	Modify the telephone number	Lzm	Lzm	Lxy
V1.3	2018/12/25	Modify the office and TEL	Lzm	Lzm	Lxy
V1.4	2019/01/08	Add Carrier Tape Detail	Lzm	Lzm	Lxy
V1.5	2019/01/08	Del H40 rate	Wdd	Wdd	Szs
V1.6	2021/06/10	Update formate	Lxy	Lxy	LGP
V1.7	2021/11/15	added crystal info. in last file	Lxy	Lxy	QJP
V1.8	2022/02/22	1.Update the specification format 2.Added an encryption standard to the feature 3.The RF index was changed to ± 2 dbm 4.00&02&03 merge into a module datasheet	Fc	Tzq	QJP
V1.9	2022/03/30	Updating recommended reflow profile	FC	LXY	QJP

1. General Description

1.1 Introduction

FN-Link Technology would like to announce a low-cost and low-power consumption module which has all of the Wi-Fi functionalities. It is a highly-integrated IEEE 802.11 a/b/g/n MAC/Baseband/RF WLAN single chip. For Wireless LAN(WLAN)operation. The integrated module provides USB interface for Wi-Fi . The module provides simple legacy and 20MHz co-existence mechanisms to ensure backward and network compatibility. 6188E-UF uses highly integrated Wi-Fi single chip based on advanced COMS process.

6188E-UF integrates whole Wi-Fi function blocks into a chip, such as USB/PCM, MAC, BB, AFE, RFE, PA, EEPROM and LDO/SWR, except fewer passive components remained on PCB.

This compact module is a total solution for Wi-Fi technology. The module is specifically developed for Smart phones and Portable devices.

1.2 Description

Model Name	6188E-UF
Product Description	Support Wi-Fi functionalities
Dimension	L x W x H: 12.2 x 13 x1.5mm (typical)
Wi-Fi Interface	Support USB2.0
OS supported	Android /Linux/ Win CE /iOS /XP/WIN7/WIN10
Operating temperature	0°C to 70°C
Storage temperature	-40°C to 125°C

2. Features

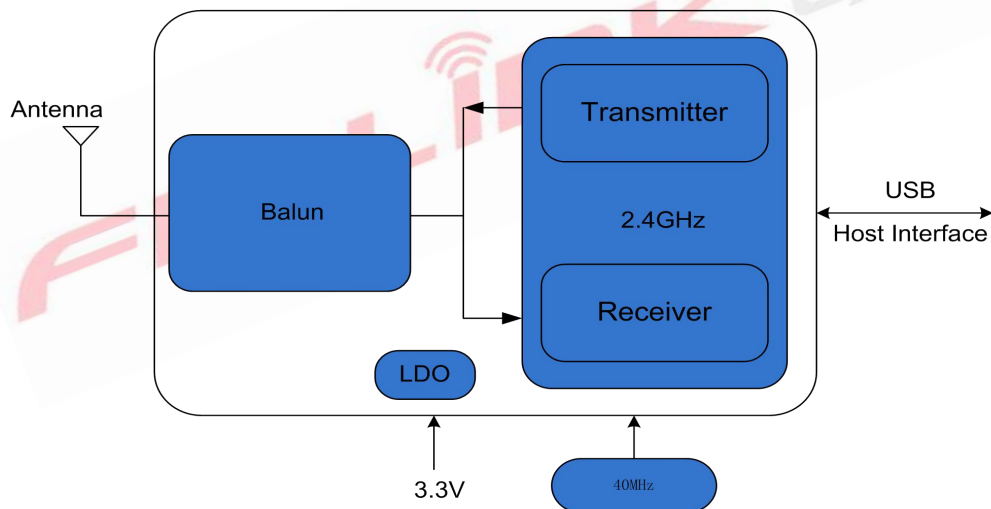
General Features

- Operate at ISM frequency bands (2.4GHz)
- IEEE standards support: IEEE 802.11b, IEEE 802.11g, IEEE 802.11n, IEEE 802.11d, IEEE 802.11e, IEEE 802.11h, IEEE 802.11i
- Enterprise level security which can apply WPA/WPA2 certification for Wi-Fi
- Wi-Fi 1 transmitter and 1 receiver allow data rates supporting up to 72.2 Mbps downstream and 72.2 Mbps upstream PHY rates
- 802.11i (WPA, WPA2, WPA3). Open, shared key, and pair-wise key authentication services

WLAN Interface

- USB for Wi-Fi

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	
Test Items	Typical Value	EVM
Output Power	802.11b /11Mbps : 16dBm ± 2 dB	EVM ≤ -10dB
	802.11g /54Mbps : 14dBm ± 2 dB	EVM ≤ -25dB
	802.11n /MCS7 : 13dBm ± 2 dB	EVM ≤ -28dB
Spectrum Mask	Meet with IEEE standard	
Freq. Tolerance	± 20ppm	
Test Items	TYP Test Value	Standard Value
Receive Sensitivity (11b,20MHz) @8% PER	- 1Mbps PER @ -91 dBm	≤-83
	- 2Mbps PER @ -89 dBm	≤-80
	- 5.5Mbps PER @ -87 dBm	≤-79
	- 11Mbps PER @ -85 dBm	≤-76
Receive Sensitivity (11g,20MHz) @10% PER	- 6Mbps PER @ -87 dBm	≤-85
	- 9Mbps PER @ -86 dBm	≤-84
	- 12Mbps PER @ -84 dBm	≤-82
	- 18Mbps PER @ -82 dBm	≤-80
	- 24Mbps PER @ -79 dBm	≤-77
	- 36Mbps PER @ -75 dBm	≤-73
	- 48Mbps PER @ -71 dBm	≤-69
	- 54Mbps PER @ -70 dBm	≤-68
Receive Sensitivity (11n,20MHz) @10% PER	- MCS=0 PER @ -87 dBm	≤-85
	- MCS=1 PER @ -84 dBm	≤-82
	- MCS=2 PER @ -82 dBm	≤-80
	- MCS=3 PER @ -79 dBm	≤-77
	- MCS=4 PER @ -75 dBm	≤-73
	- MCS=5 PER @ -71 dBm	≤-69
	- MCS=6 PER @ -70 dBm	≤-68
	- MCS=7 PER @ -69 dBm	≤-67
Maximum Input Level	802.11b : ≤-8 dBm	
	802.11g/n : ≤-20 dBm	

5. ID setting information

WI-FI

Vendor ID	0BDAh
Product ID	F179h

6. Pin Definition

6.1 Pin Outline

< TOP VIEW >



6.2 Pin Definition details

NO.	Name	Type	Description	Voltage
1	GND	—	Ground connections	
2	ANT 0	I/O	RF I/O port	
3	VDD33	—	Main power voltage source input 3.3V	3.3V
4	USB_DM	I/O	USB2.0 differential pair for WLAN	
5	USB_DP	I/O	USB2.0 differential pair for WLAN	
6	GND	—	Ground connections	

P:POWER I:INPUT O:OUTPUT

7. Electrical Specifications

7.1 Power Supply DC Characteristics

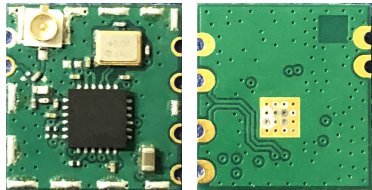
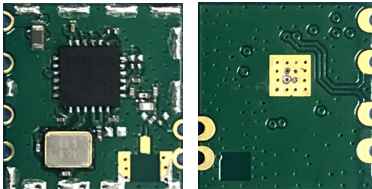
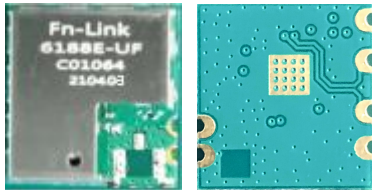
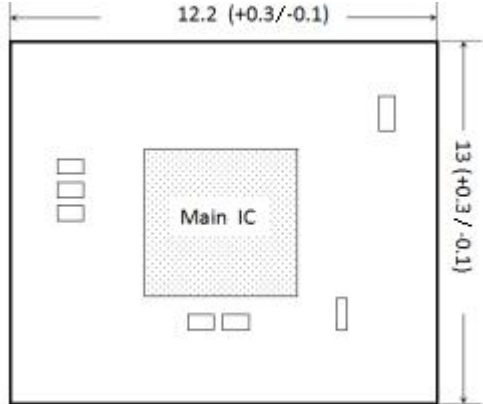
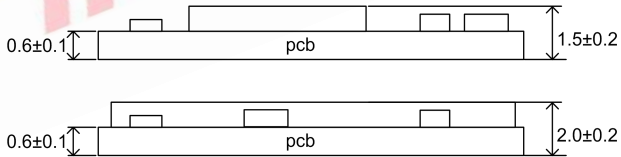
	MIN	TYP	MAX	Unit
Operating Temperature	0	25	70	deg.C
VCC33	3.15	3.3	3.45	V

7.2 Power Consumption

Power Consumption (Typical by using SWR)	TX Mode: (Throughput mode) 230mA (MCS7/BW20) RX Mode: (Throughput mode) 130mA (MCS7/BW20)
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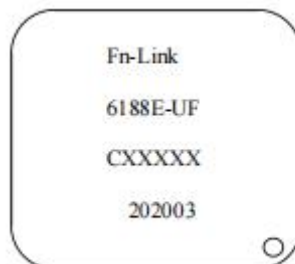
8. Size reference

8.1 Module Picture

<p>L x W : 12.2 x 13 (+0.3/-0.1) mm</p> <p>FG6188EUFX-00 :</p>  <p>FG6188EUFX-02:</p>  <p>FG6188EUFX-03</p> 	
<p>FG6188EUFX-00/02 H: 1.5 (±0.2) mm</p> <p>FG6188EUFX-03 H: 2.0 (±0.2)mm</p>	
<p>Weight</p>	<p>FG6188EUFX-00/02 : 0.37g(±0.2)</p> <p>FG6188EUFX-03 : 0.45g</p>

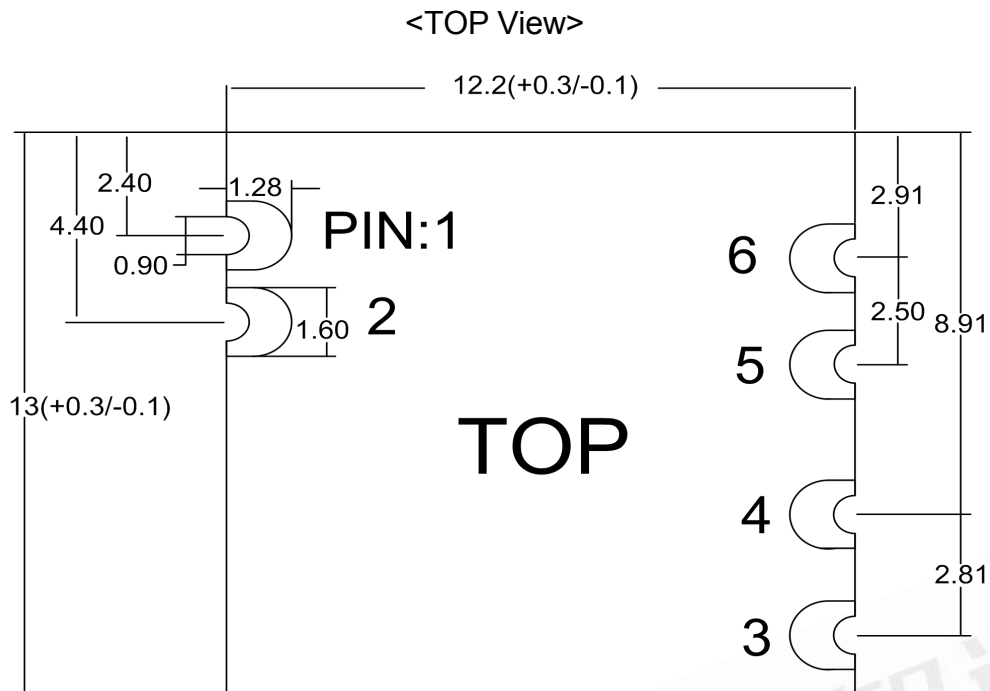
8.2 Marking Description

< TOP VIEW >

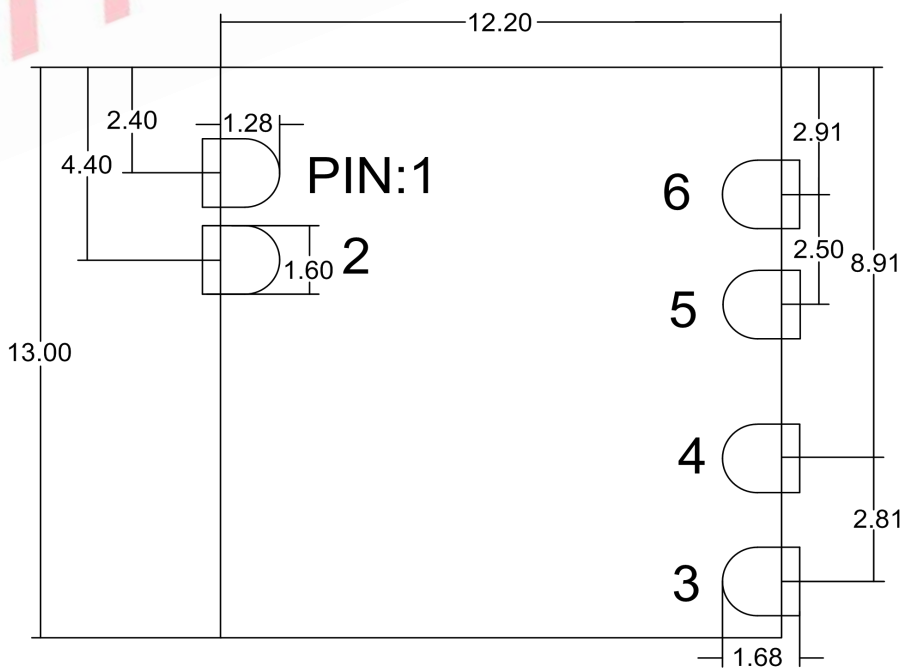


Note: 07 indicates model, FG6188EUFX-03:03

8.3 Physical Dimensions



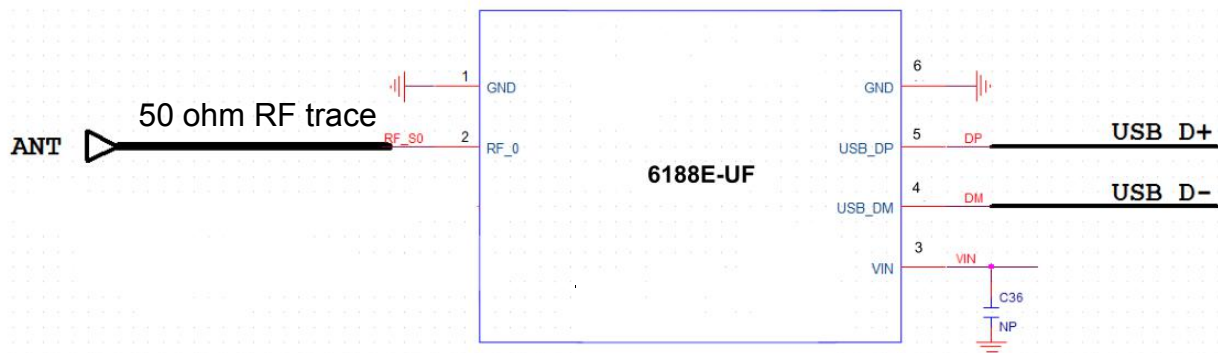
8.4 Layout Recommendation



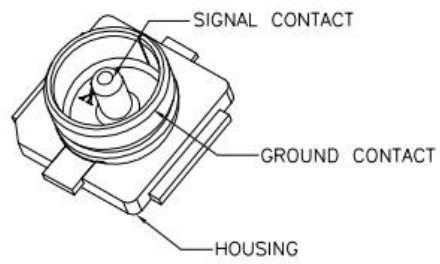
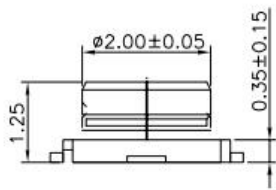
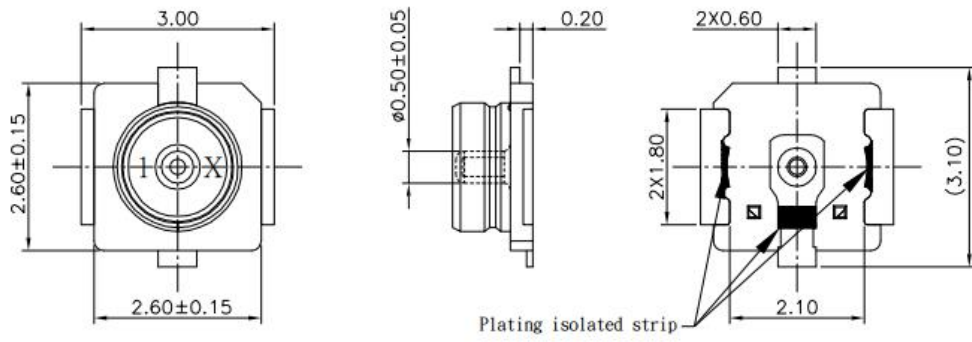
9. The Key Material List

Item	Part Name	Description	Manufacturer
1	PCB	6188G-U green, 4L, FR4, Au, 12.2 x13 x 0.6mm	Xy-pcb, sl-pcb, kx-pcb, Sunlord
2	Crystal	3225, 40MHz, CL=15pF, 10ppm	TKD, Honsonic, TST, SIWARD, ECEC,JWT
3	Chipset	RTL8188FTV QFN24	Realtek
4	Shielding	6188G-U Shielding	信太, 精力通
5	ESD	0402, 5.5V, 0.1pF	Sunlord, Murata,Way-on
6	IPEX	1 generation UFLR-MINIPCL, MRF IRECEPTACLE, MRFR2- 0000320	JIAWO,CHANGDIER
7	TVS	0402 4V 0.05pF 15KV	Murata,Sunlord,Wayon

10. Reference Design



1. RF trace between module and antenna better put π circuit for matching



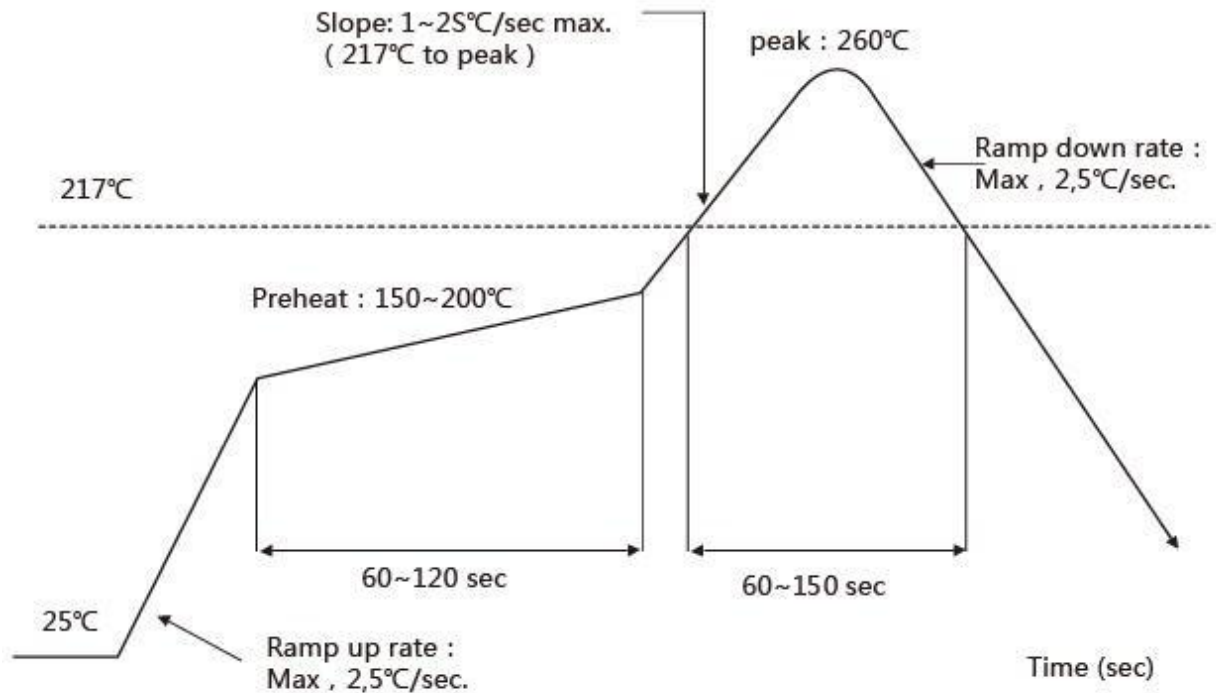
11. Recommended Reflow Profile

Referred to IPC/JEDEC standard.

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

Time within 5°C of peak temperature: $\geq 10\text{s}$

Number of Times: ≤ 2 times



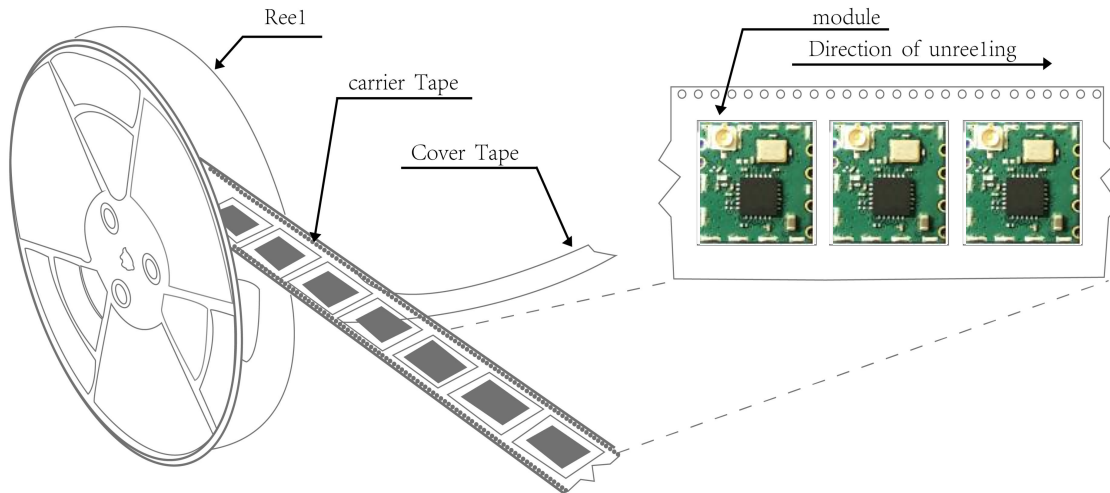
12. RoHS compliance

All hardware components are fully compliant with EU RoHS directive

13. Package

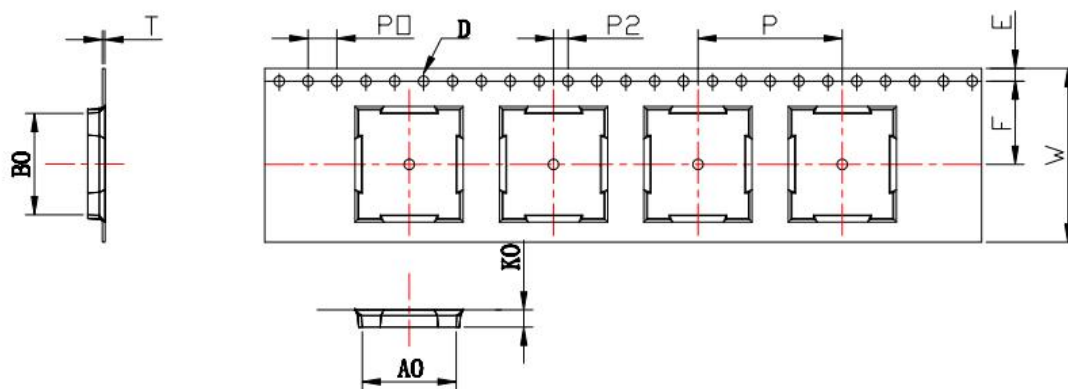
13.1 Reel

A roll of 1500pcs



13.2 Carrier Tape Detail

ITEM	W	AO	BO	D	F	E	KO	PO	P2	P	T
DIM	24	12.50	13.50	1.50	11.5	1.75	2.40	4.0	2.0	20.0	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



13.3 Packaging Detail

the take-up package



Using self-adhesive tape

Size of black tape: 24mm*32.6m the cover tape :21.33mm*32.6m

Color of plastic disc: blue



NY bag size:460mm*385mm



size : 350*350*35mm



The packing case size:350*210*370mmg

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 <math><40^{\circ}\text{C}</math> and <math><90\%</math> relative humidity (RH)
- b) Environmental condition during the production: - 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

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