



KX6254 Module Data sheet

KX6254

Module Data sheet

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Customer Approval

Company

Title

Signature

Date

FTY

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1 Overview

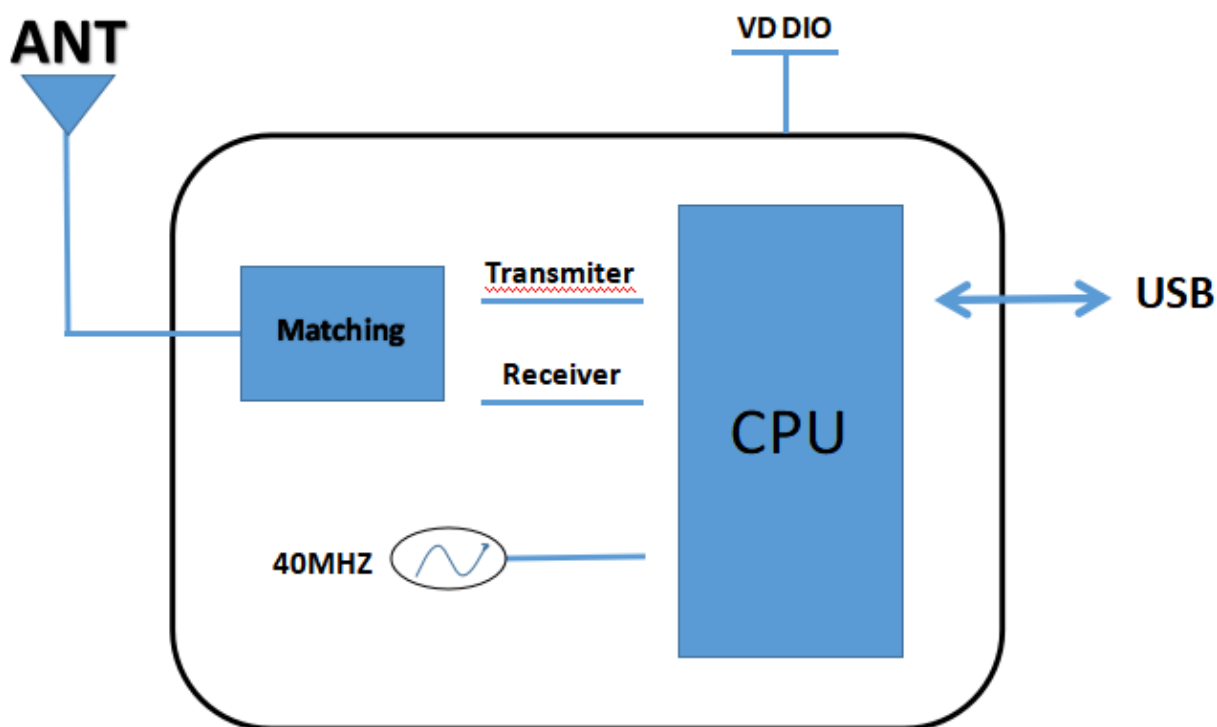
1.1 Introduction

KX6254 is a highly integrated IEEE 802.11a/B /g/ N/AC MAC/ baseband /RF WLAN module ,for wireless Local area Network (WLAN) operation, which supports 1-stream 802.11AC solutions with multi-user MIMO STA mode,N138 also provides a spatial stream space-time block code to extend the transmission range. The module supports all IEEE 802.11a, The 802.11b and 802.11g data rate, modules are built with an enhanced signal detector, an adaptive frequency domain equalizer, and a soft decision Vitbi decoder, to mitigate severe multipath effects and receive multi-stream mutual interference,KX6254 MAC Supports 802.11e for multimedia applications, 802.11i and WAPI, for security, and 802.11n/ AC for MAC efficiency, KX6254 provides simple legacy and 20MHz/ 40MHz/ 80MHz co-existence, mechanisms to ensure backward and network compatibility

1.2 Features

- CMOS MAC, Baseband PHY and RF in a single chip for IEEE 802.11a/b/g/n/ac compatible WLAN
- Support 802.11ac 1x1, Wave-2 compliant with MU-MIMO STA mode
- Complete 802.11n MIMO solution for 2.4GHz and 5GHz band
- Complies with USB 2.0 for WLAN controller
- IEEE 802.11a/b/g/n/ac compatible WLAN
- Cisco Compatible Extensions (CCX) for WLAN devices
- Channel management and co-existence
- Multiple BSSID feature allows the RTL8811CU-CG to assume multiple MAC identities when used as a wireless bridge
- WiFi Direct supports wireless peer to peer applications.
- WiFi NAN (Neighborhood Area Network) support
- IEEE 802.11ac OFDM
- IEEE 802.11n OFDM
- One Transmit and One Receive path
- Support 2.4GHz and 5GHz band channels
- WiFi TDLS (Tunneled Direct Link Setup) Supported

1.3 Block Diagram



1.4 General Specification

Model Name	KX6254
Product Description	Support WIFI:IEEE802.11 11b/g/n
Dimension	L x W x H: 12.5 x 13 (±0.2) mm
Wi-Fi Interface	Support USB2.0
BT interface	N/C
Operating temperature	0 to +70° C
Storage temperature	-55°C to 125°C
RoHS	All hardware components are fully compliant with EU RoHSDirective

1.5 DC Characteristics

Power Supply Characteristics

Symbol	Parameter	Minimum	Typical	Maximum	Units
VDD33	3.3V I/O Supply Voltage	3.0	3.3	3.6	V
VD10	1.05V Core Supply Voltage	0.945	1.05	1.155	V

2 RF Specifications

2.1 2.4GHz RF Specification

Features	Description
WLAN Standard	802.11a/b/g/n/ac
Frequency Range	2.412 ~ 2.484 GHz
Modulation Method	DSSS, DBPSK, DQPSK, CCK and OFDM (BPSK, QPSK, 16QAM, 64QAM and 256-QAM)
Number of Channel	WiFi 2.4GHz: 11: (Ch. 1-11) – United States; 13: (Ch. 1-13) – Europe ; 14: (Ch. 1-14) – Japan
OS Support	Linux/Android/Windows32,64

2.4G Transmitter Specifications

TX Rate	TX Power	TX Power Tolerance	EVM
802.11b @ 11 Mbps	17dBm	±2dBm	≤-13dB
802.11g@54Mbps	14dBm	±2dBm	≤-25dB
802.11n@BW20_MC S7	13dBm	±2dBm	≤-28dB
802.11n@BW40_MC S7	13dBm	±2dBm	≤-28dB

2.4G Receiver Specifications

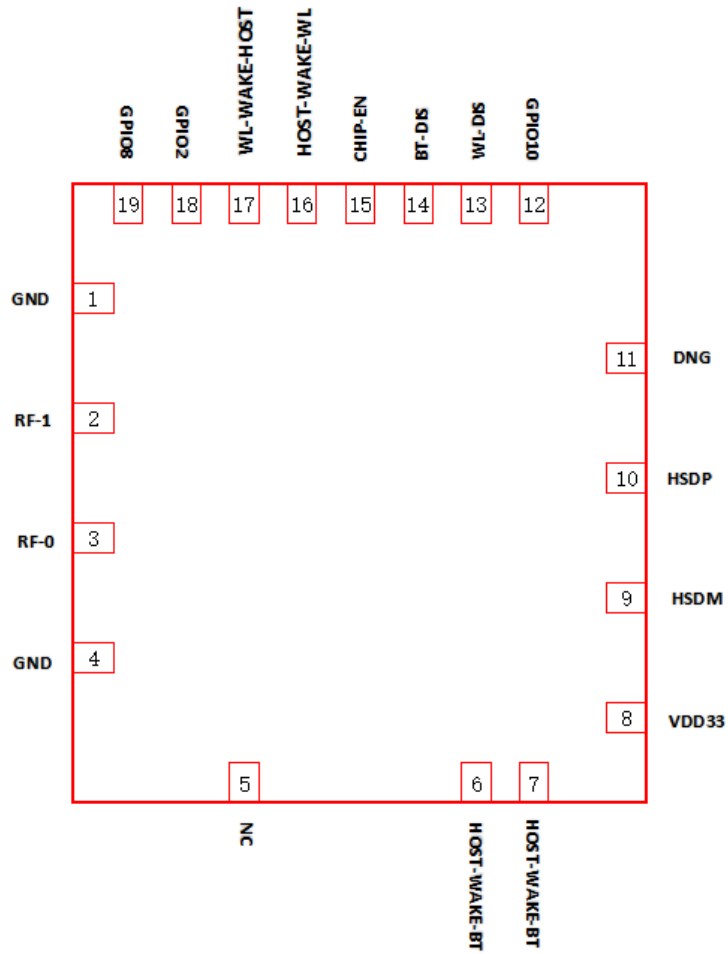
RX Rate	Min Input Level(Typ)	Max Input Level(Typ)	PER
802.11b @ 11 Mbps	-85dBm	-85dBm	8%
802.11g@54Mbps	-68dBm	-68dBm	10%
802.11n@BW20_MC S7	-66dBm	-66dBm	10%
802.11n@BW40_MC S7	-65dBm	-65dBm	10%

2.2 5GHz RF Specification

Features	Description		
WLAN Standard	802.11a/b/g/n/ac		
Frequency Range	4.9GHz ~ 6.0GHz (5GHz ISM Band)		
Modulation Method	DSSS, DBPSK, DQPSK, CCK and OFDM (BPSK, QPSK, 16QAM, 64QAM and 256-QAM)		
5G Transmitter Specifications			
TX Rate	TX Power	TX Power Tolerance	EVM
802.11a @ 54 Mbps	13dBm	±2dBm	≤ -25dB
802.11n@BW20_MC S7	12dBm	±2dBm	≤ -28dB
802.11n@BW40_MC S7	12dBm	±2dBm	≤ -30dB
802.11ac@BW80_M CS9	10dBm	±2dBm	≤ -32dB
5G Receiver Specifications			
RX Rate	Min Input Level(Typ)	Max Input Level(Typ)	PER
802.11a@54Mbps	-70dBm	-70dBm	<10%
802.11n@BW20_MC S7	-65dBm	-65dBm	< 10%
802.11n@BW40_MC S7	-60dBm	-60dBm	< 10%
802.11ac@BW80_M CS9	-57dBm	-57dBm	< 10%

3 Pin Assignments

3.1 Pin Outline

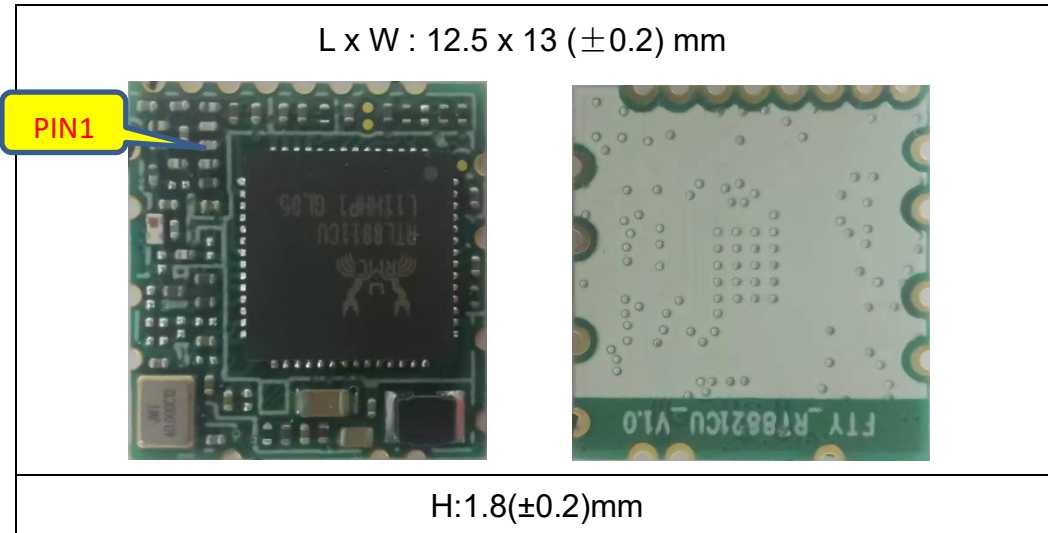


3.2 Pin Definition

Pin	Definition	Description
1	GND	GND
2	RF1	WIFI 2.4G ANT /BT&5G ANT
3	RF0	NC
4	GND	GND
5	NC	NC
6	BT_WAKE_HOST	GPIO14
7	HOST_WAKE_BT	GPIO13
8	VDD33	3.3V
9	HSDM	High-Speed USB D- Signal
10	HSDP	High-Speed USB D+ Signal
11	GND	GND
12	GPIO1	PCM data Out, shared with GPIO1
13	WL_DIS	Shared with GPIO9. This pin can externally shut down the RTL8821CU-CG WLAN function when WL_DIS# is pulled low. When this pin is pulled low, USB interface will be disabled. This pin can also be configured as the WLAN Radio-offfunction with host interface remaining connected.
14	BT_DIS	Shared with GPIO11. This pin can externally shut down the RTL8821CU-CG BT function when BT_DIS# is pulled Low. When this pin is pulled low, USB interface will be also disabled. This pin can be also defined as the BT Radio-off function with host interface remaining connected.
15	CHIP_EN	This Pin Can externally shut down the RTL8821CU-CG (No Extra Power Switch Required). When this function is not required, external pull high is required
16	HOST_WAKE_WL	GPIO7
17	WL_WAKE_HOST	GPIO6
18	GPIO2	PCM Synchronization control, shared with GPIO2
19	GPIO8	GPIO8

4 Dimensions

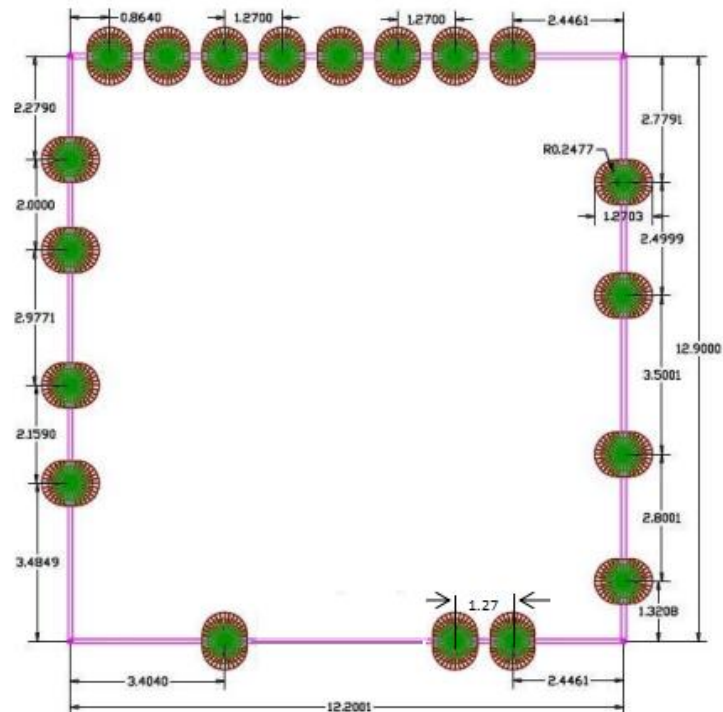
4.1 Module Picture



4.2 Module Physical Dimensions

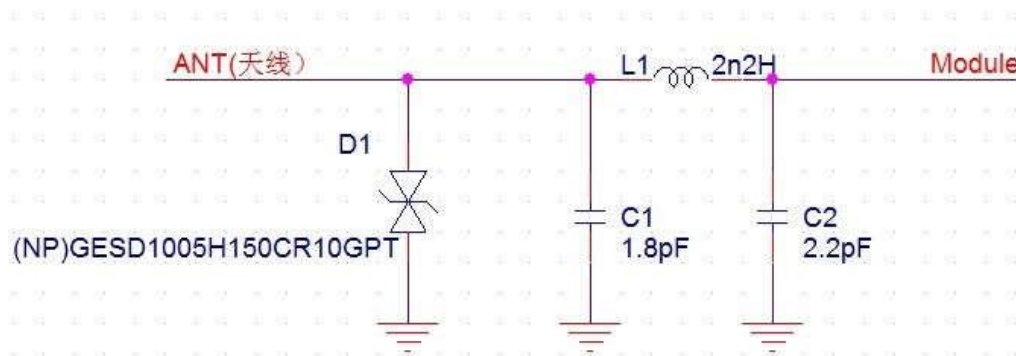
(Unit: mm)

< TOP VIEW >



5 Reference Design

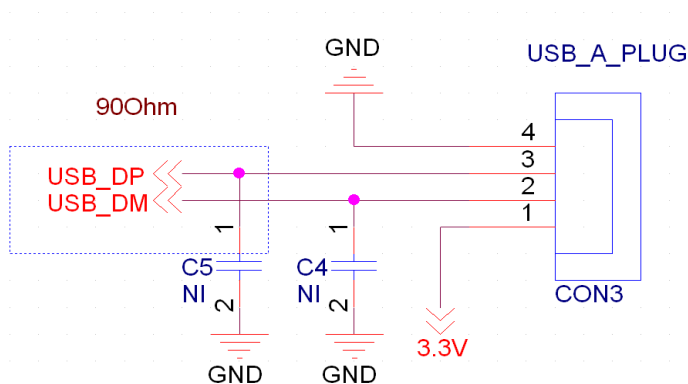
5.1 WIFI RF Circuit reference pictures



1. Above the dotted box part of the antenna matching is needed, the actual antenna matching electronic parameters shall prevail.
2. For RF part layout to do 50 ohm impedance. can't go on 90°of layout .The line length can't more than 20 mm.

Note: Please be sure to add a TVS tube at the end of the welding antenna to prevent ESD static electricity from damaging the WIFI module (as shown in the reference circuit above).

5.2 USB interface electrical characteristics



Note:

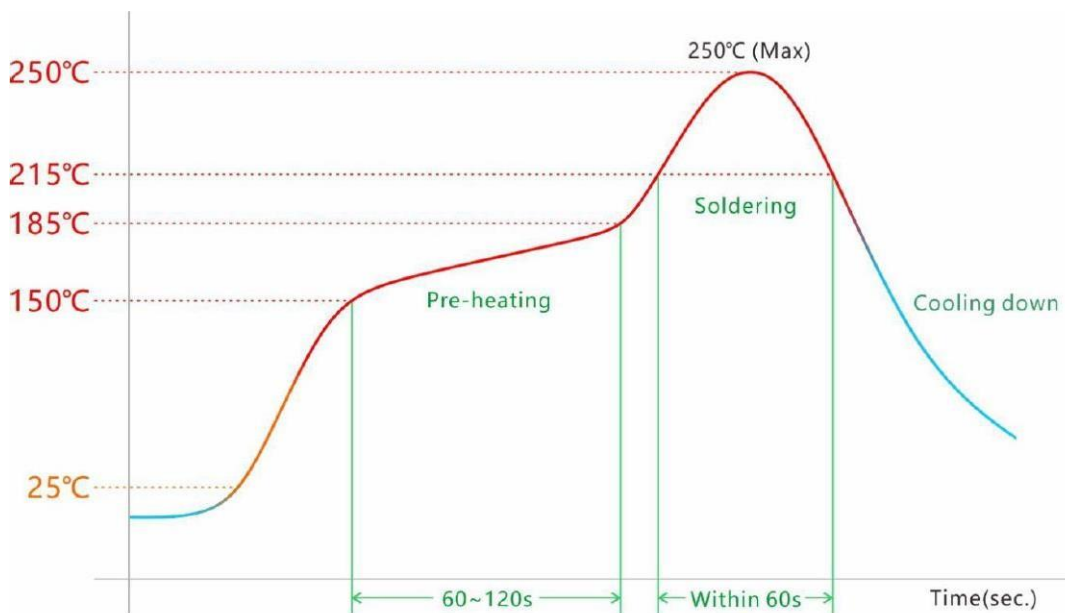
- 1.USB data cable need to do 90Ohm impedance
- 2.It is recommended to keep a power switch at the input end of the power supply. Each time the card is opened or closed, it can be used for power on and power off. WIFI can be reset, so that there will be no error phenomenon of not opening WIFI.

6 The Key Material List

No.	Parts	Specification	Manufacturer	Note
1	Chipset	RTL8811CU-CG_QFN56	Realtek Semiconductor Corp	
2	PCB	FTY_RT8821CU_V1.0	Shenzhen xiangyu circuit co., LTD	
3	PCB	FTY_RT8821CU_V1.0	Shenzhen Kexiang Precision Circuit Technology Co., LTD	
4	Crystal oscillator	40MHZ/12PF/10PPM/2520 /温度-20+85 度蓝 晶:L225S400L	Zhejiang Lanjingxin Microelectronics Co., LTD	
5	Crystal oscillator	40MHZ/12PF/10PPM/2520 /温度-20+85 度蓝 晶:L225S400L	ZhejiangLanjingxin Microelectronics Co., LTD.	

7 Recommended Reflow Profile

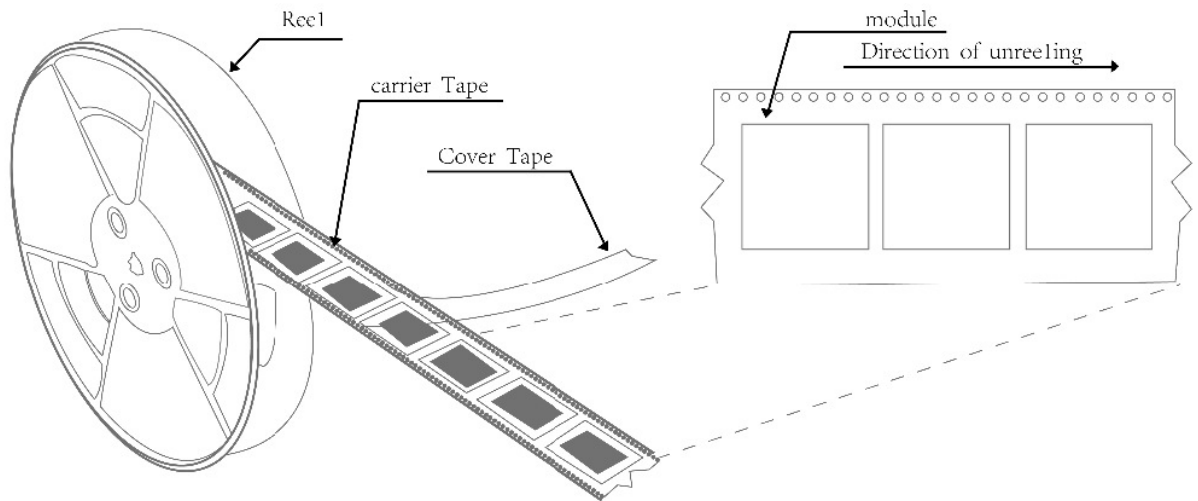
Referred to IPC/JEDEC standard.
 Peak Temperature : <250° C
 Number of Times : ≤2 times



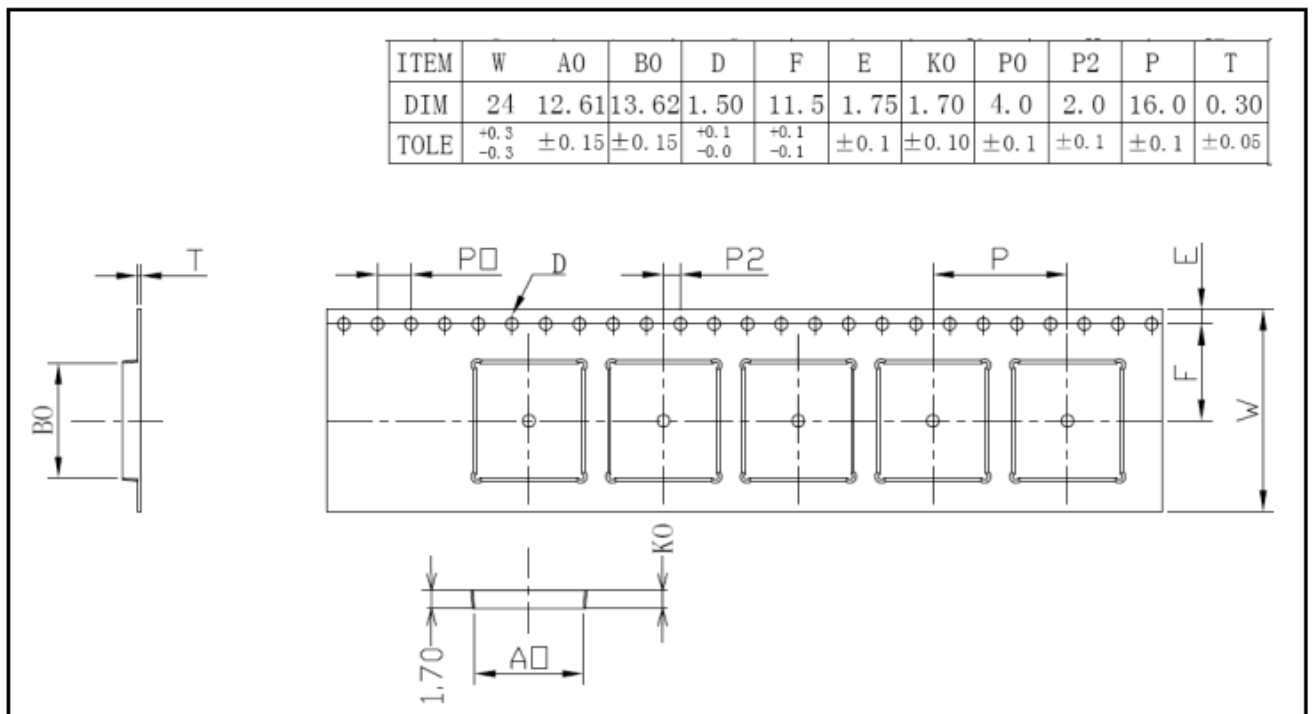
8 Package Information

8.1 Reel

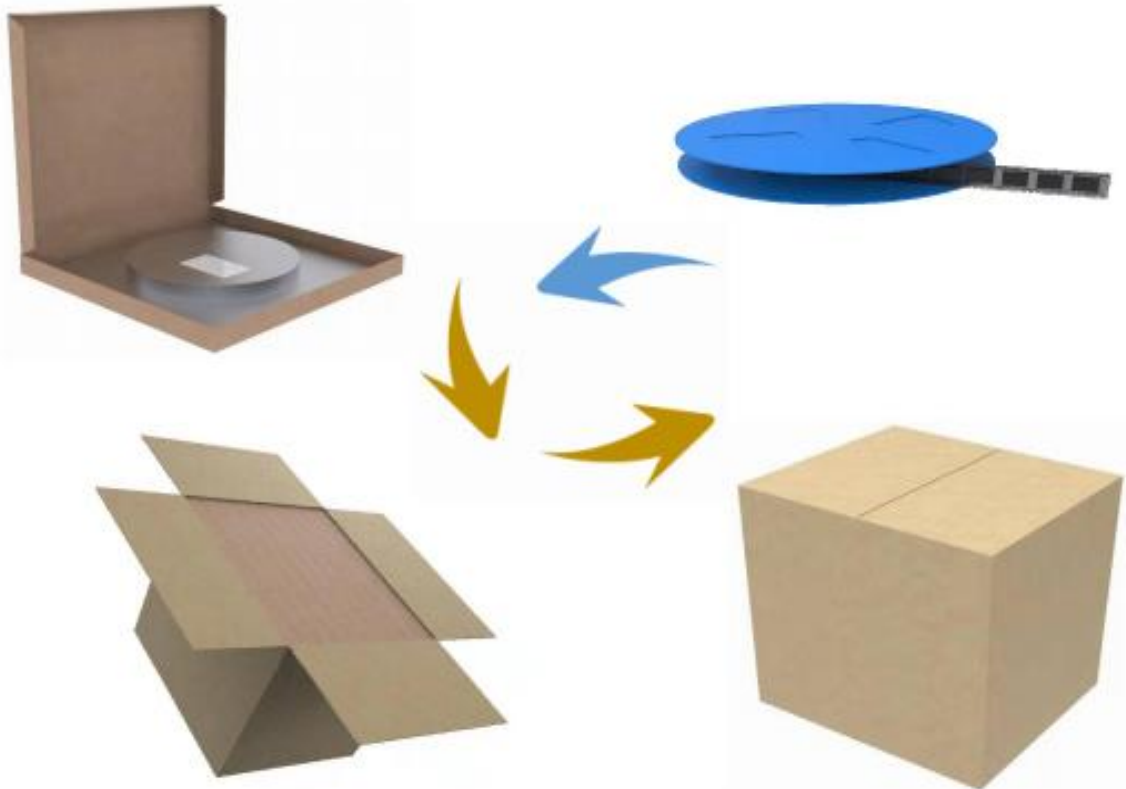
A roll of 2000pcs



8.2 Carrier Tape Detail



8.3 Packaging Detail



8.4 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 $<40^{\circ}\text{C}$ 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
- e) Baking is required if conditions b) or c) are not respected
- f) Baking is required if the humidity indicator inside the bag indicates 10% RH or more