Comchips

KX6573
Module Data sheet

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Customer Approval

Company _____

Title _____

Signature _____

Date _____

FTY _____

Version Update Record

Version	Date	Revision Content	Editorialstaff	approval
V1.0	2022/3/22	The first version		

CONTENTS

1 Overview

1.1 Introduction

The KX6573 is a highly integrated single-chip that support 2-stream 802.11ax solutions with Multi-user MIMO (Multiple-Input, Multiple-Output) with Wireless LAN (WLAN) PCI Express network interface controller with integrated Bluetooth 5 USB interface controller. It combines a WLAN MAC, a 2T2R capable WLAN baseband, and RF in a single chip. The RTL8852BE provides a complete solution for a high-performance integrated wireless and Bluetooth device.

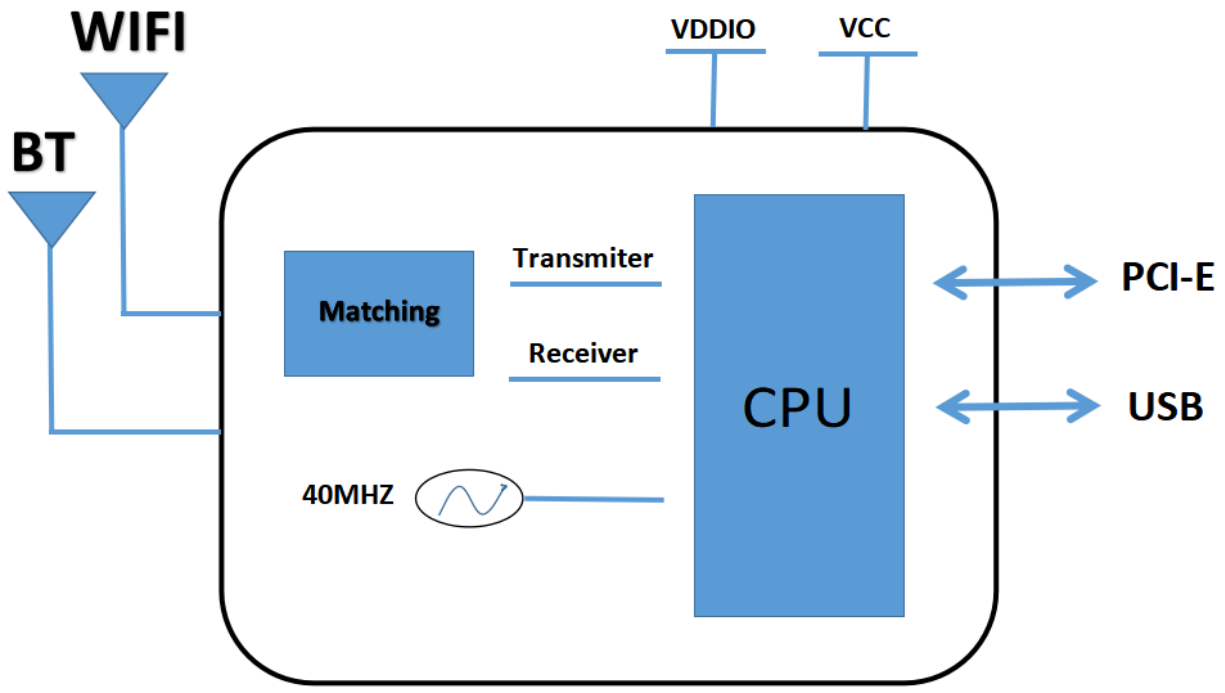
The KX6573 baseband implements Multi-user Multiple Input, Multiple Output (MU-MIMO) Orthogonal Frequency Division Multiplexing (OFDM) with two transmit and two receive paths (2T2R). Features include two spatial stream transmissions, short Guard Interval (GI), spatial spreading, and support for variant channel bandwidth. Moreover, KX6573 provides one spatial stream space-time block code (STBC), Transmit Beamforming (TxBF) and Low Density Parity Check (LDPC) to extend the range of transmission. At the receiver, extended range and good minimum sensitivity is achieved by having receiver diversity up to 2 antennas. As the recipient, the KX6573 also supports explicit sounding packet feedback that helps senders with beamforming capability.

1.2 Features

- CMOS MAC, Baseband PHY and RF in a single chip for IEEE 802.11a/b/g/n/ac/ax compatible WLAN
- Support Bluetooth 5 system (BT 5.2 Logo Compliant)
- Complete 802.11n MIMO solution for 2.4GHz and 5Ghz band
- Maximum PHY data rate up to 286.8 Mbps using 20MHz bandwidth, 573.5Mbps using 40MHz bandwidth, and 1201Mbps using 80MHz bandwidth
- Backward compatible with 802.11a/b/g devices while operating at 802.11n data rates
- Backward compatible with 802.11a/n/ac devices while operating at 802.11ax data rates
- Compliance with Windows operating system host-implemented FIPS 140-2 security requirements
- Support 20/40/80MHz 5GHz
- supports WLAN-Bluetooth coexistence
- supports low power Bluetooth
- Support Bluetooth 5 system (BT 5.2 Logo Compliant)

Compatible with Bluetooth v2.1+EDR

1.3 Block Diagra



1.4 General Specification

Model Name	KX6573
Product Description	Support WLAN-Bluetooth coexistence
Dimension	L x W x H: 16.1.x 12.1 .x 2.4 (±0.3) mm
Wi-Fi Interface	Support PCIE
BT interface	Support USB
Operating temperature	0 to +70° C
Storage temperature	-55°C to 125°C
RoHS	All hardware components are fully compliant with EU RoHS directive

1.5 DC Characteristics

Power Supply Characteristics

Symbol	Parameter	Minimum	Typical	Maximum	Units
VDD33	3.3V I/O Supply Voltage	3.1	3.3	3.5	V
VD09	0.9V Core Supply Voltage	0.84	0.9	0.99	V
VD13	1.35V Analog Supply Voltage	1.35	1.4	1.485	V

2 RF Specifications

2.1 2.4GHz RF Specification

Features	Description
WLAN Standard	IEEE802.11b/g/n
Frequency Range	2.4~2.4835GHz (2.4GHz ISM Band)
Modulation Method	DSSS,DBPSK, DQPSK, CCK and OFDM with BPSK, QPSK, 16QAM, 64QAM,)
Number of Channel	2.4GHz: 11: (Ch. 1-11) – United States 13: (Ch. 1-13) – Europe 14: (Ch. 1-14) – Japan

2.4G Transmitter Specifications

TX Rate	TX Power	TX Power Tolerance	EVM
802.11b@11Mbps	17dBm	±2dBm	≤-13dB
802.11g@54Mbps	14dBm	±2dBm	≤-25dB
802.11n@BW20_MCS7	13dBm	±2dBm	≤-28dB
802.11n@BW40_MCS7	13dBm	±2dBm	≤-28dB

Frequency Error：±12PPM

2.4G Receiver Specifications

RX Rate	Standard Value	PER
802.11b@11Mbps	-85dBm	<8%
802.11g@54Mbps	-68dBm	< 10%
802.11n@BW20_MCS7	-66dBm	< 10%
802.11n@BW40_MCS7	-65dBm	< 10%

2.2 5GHz RF Specification

Features	Description
WLAN Standard	IEEE802.11a/n/ac/ax
Frequency Range	4.9GHz ~ 6.0GHz (5GHz ISM Band)
Modulation Method	OFDM (BPSK, QPSK, 16QAM,64QAM and 256-QAM)

5G Transmitter Specifications

TX Rate	TX Power	TX Power Tolerance	EVM
802.11a@ 54Mbps	13dBm	±2dBm	≤-25dB
802. 11n@BW40_MCS7	12dBm	±2dBm	≤-28dB
802.11ac@BW80_MCS9	10dBm	±2dBm	≤-32dB
802.11ax@BW80_MCS11	10dBm	±2dBm	≤-35dB

5G Receiver Specifications

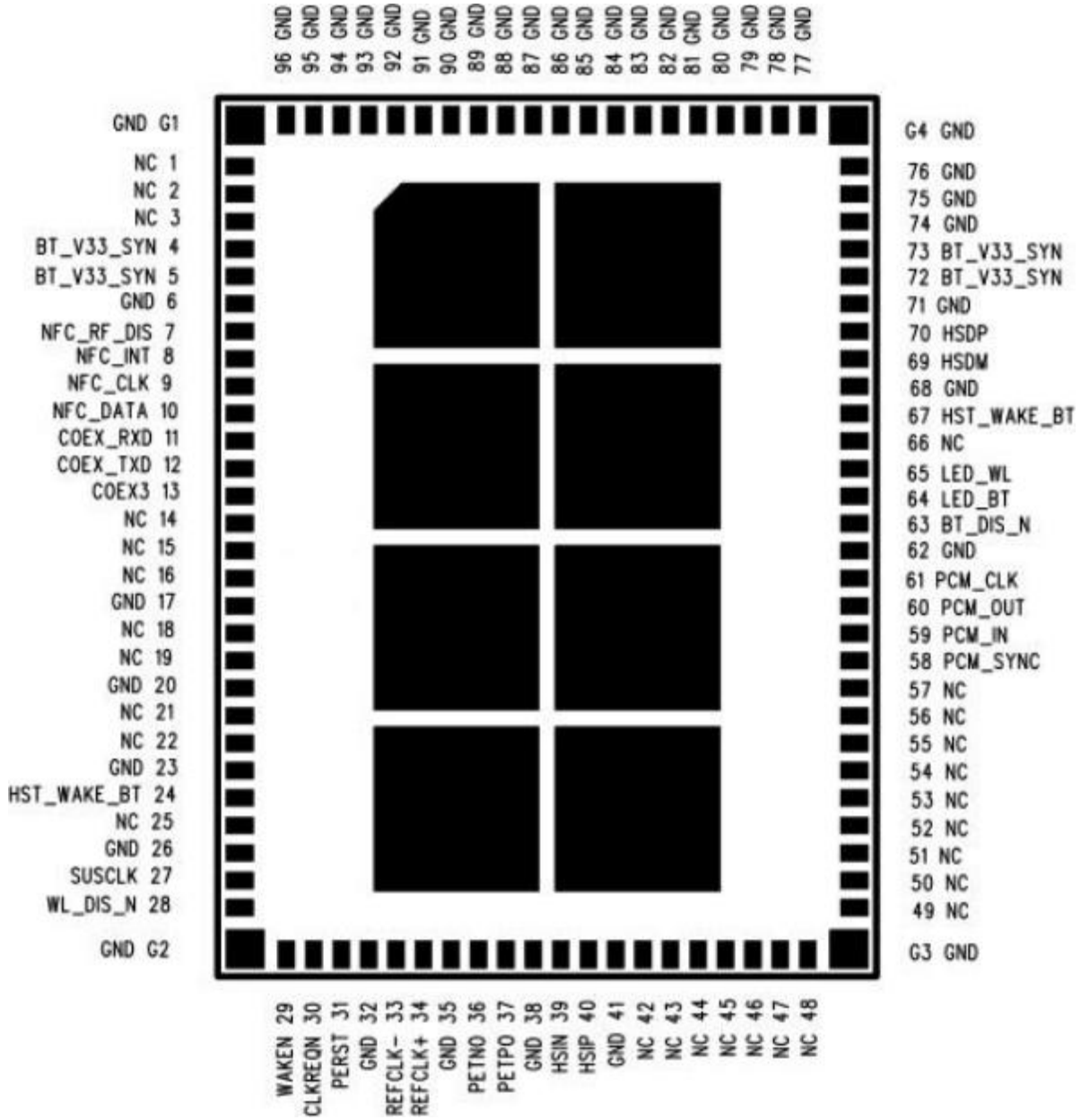
RX Rate	Standard Value	PER
802.11a@54Mbps	-70dBm	<10%
802. 11n@BW40_MCS7	-65dBm	< 10%
802.11ac@BW80_MCS9	-56dBm	< 10%
802.11ax@BW80_MCS11	-57dBm	< 10%

2.3 Bluetooth Specification

Feature	Description		
General Specification			
Bluetooth Standard	Bluetooth V3.3 of 1, 2 and 3 Mbps		
Host Interface	USB 2.0		
Antenna Reference	Small antennas with 0~2 dBi peak gain		
Frequency Band	2.400 GHz ~ 2483.5 GHz		
Number of Channels	79 channels		
Modulation	FHSS, GFSK, DPSK, DQPSK		
RF Specification			
Power (BDR：GFSK/1Mbps)	0dBm	——	10dBm
Power(EDF：π /4-DQPSK/2Mbps)	0dBm	——	10dBm
Power (BLE：GFSK/1Mbps)	0dBm	——	10dBm
Sensitivity @ BER=0.1% for (BDR：GFSK/1Mbps)		-85 dBm	
Sensitivity @ BER=0.1% for(EDF：π /4-DQPSK/2Mbps)		-85 dBm	
Sensitivity @ BER=0.1% for (BLE：GFSK/1Mbps)		-85 dBm	
Initial Freq Error	BDR：GFSK/1Mbps:±75KHZ		
	EDF：π /4-DQPSK/2Mbps :±75KHZ		
	BLE：GFSK/1Mbps :±75KHZ		

3.Pin Assignments

3.1Pin Outline



3.2 Pin Definition

Pin	Definition	Description
G1	GND	Ground
1	NC	NC
2~3	NC	NC
4	VDD33	3.3V
5	VDD33	3.3V
6	GND	Ground
7	NFC_RF_DIS	NC
8	NFC_INT	NC
9	NFC_CLK	NC
10	NFC_DATA	NC
11	COEX_RXD	GPIO6
12	COEX_TXD	GPIO12
13	COEX3	GPIO7
14~16	NC	NC
17	GND	Ground
18~19	NC	NC
20	GND	Ground
21~22	NC	NC
23	GND	Ground
24	HST_WAKE_DEV	GPIO13
25	NC	NC
26	GND	GND
27	SUSCLK	Shared with EECS. External 32K or RTC clock input
28	WL_DIS_N	GPIO9
G2	GND	Ground
29	WAKE_N	GND.
30	CLKREQ	GND

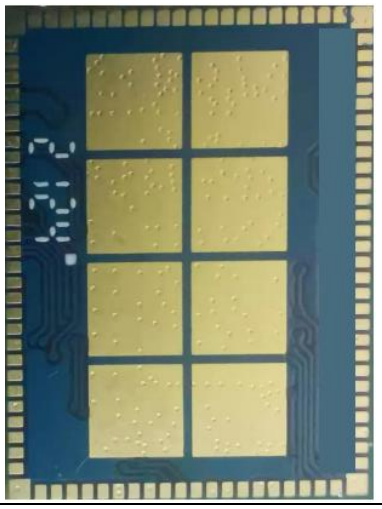
31	PERSTB	PCI Express Reset Signal: active low.When the PERST# is asserted at power-on state, the RTL8821CE returns to a pre-defined reset state and is ready for initialization and configuration after the de-assertion of the PERST#.
32	GND	Ground
33	REFCLK N	PCI Express Differential Reference Clock Source: 100MHz±300ppm
34	REFCLK P	PCI Express Differentia Reference Clock Source: 100MHz±300ppm
35	GND	Ground
36	HSON	PCI Express Transmit Differential Pair
37	HSOP	PCI Express Transmit Differential Pair
38	GND	Ground
39	HSIN	PCI Express Receive Differential Pair
40	HSIP	PCI Express Receive Differential Pair
41	GND	Ground
42~48	NC	NC
G3	GND	Ground
49~56	NC	NC
57	GND	Ground
58	PCM SYNC	GPIO2
59	PCM IN	GPIO0
60	PCM OUT	GPIO1
61	PCM CLK	GPIO3
62	GND	Ground
63	BT DIS	GPIO11
64	BT LED	LED1
65	WL LED	LED2
66	NC	NC
67	HOST WAKE BT	GPIO13
68	GND	Ground
69	HSDM	High-Speed USB D- Signal

70	HSDP	High-Speed USB D+ Signal
71	GND	GND
72	VDD33	3.3V
73	VDD33	3.3V
74~76	GND	Ground
G4	GND	Ground
77~96	GND	Ground

3 Dimensions

4.1 Module Picture

L x W：16.1.x 12.1 (±0.3) mm

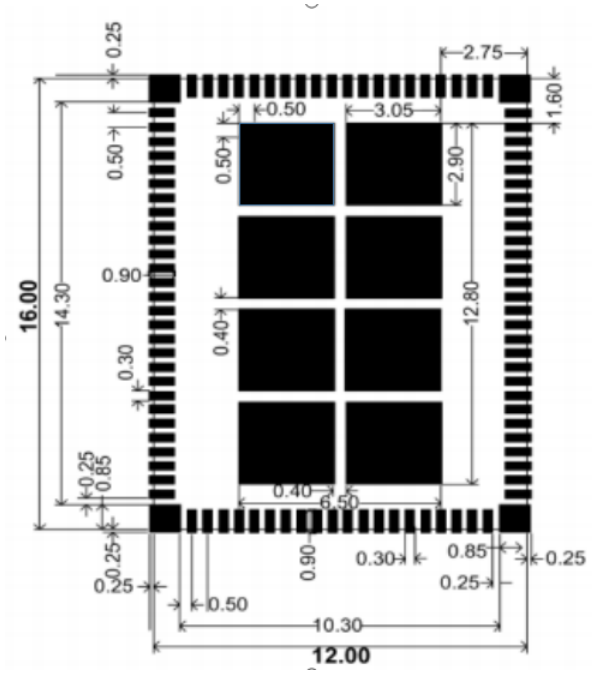


H:2.4(±0.3)mm

3.2 Module Physical Dimensions

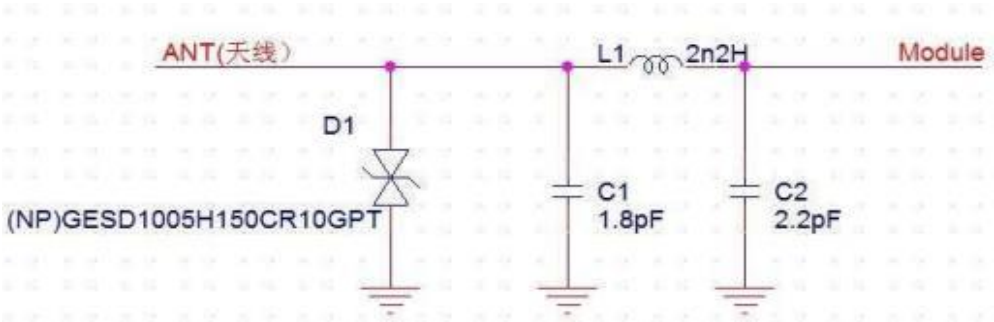
(Unit: mm)

< TOP VIEW >



4 Reference Design

5.1 WIFI RF Circuit reference pictures

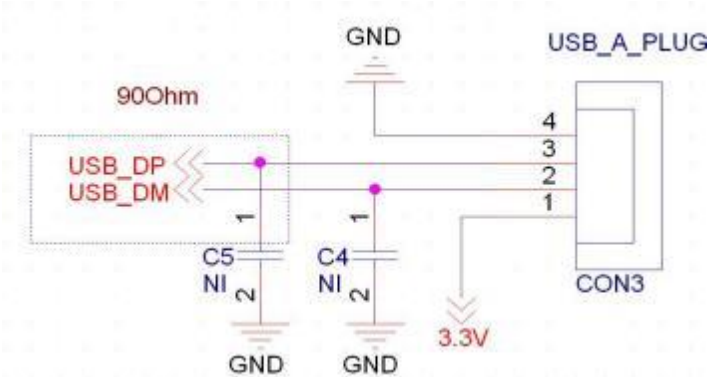


1. Above the dotted box part of the antenna matching is needed, the actual antenna matching electronic parameters shallprevail.

2.For RF part layout to do 50 ohm impedance. can't go on 90°of layout .The line length can't more than20 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

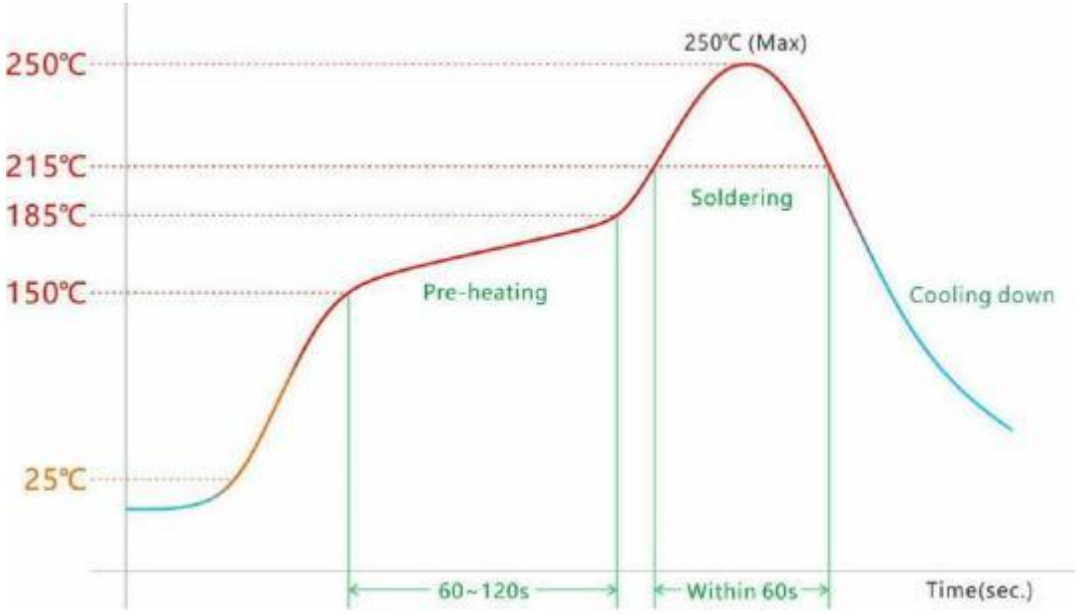
2.It is recommended to keep a power switch at the input end of the power supply. Each time the card is opened or closed, it can be used for power on and power off. WIFI can be reset, so that there will be no error phenomenon of not opening WIFI.

6.The Key Material List

No.	Parts	Specification	Manufacturer	Note
1	Chipset	RTL8852BE-CG	Realtek Semiconductor Corp	
2	PCB	T1900BE	Shenzhen xiangyu circuit co., LTD	
3	PCB	T1900BE	Shenzhen Kexiang Precision Circuit Technology Co., LTD	
4	Crystal oscillator	1612 40MHz ±10ppm 12pF(-20~85°C)	hefei jing wei Electronics Co. Ltd.	
5	Crystal oscillator	1612 40MHz ±10ppm 12pF(-20~85°C)	ZhejiangLanjingxin Microelectronics Co., LTD.	
No.	Parts	Specification	Manufacturer	Note
1	Chipset	RTL8852BE-CG	Realtek Semiconductor Corp	

7 Recommended Reflow Profile

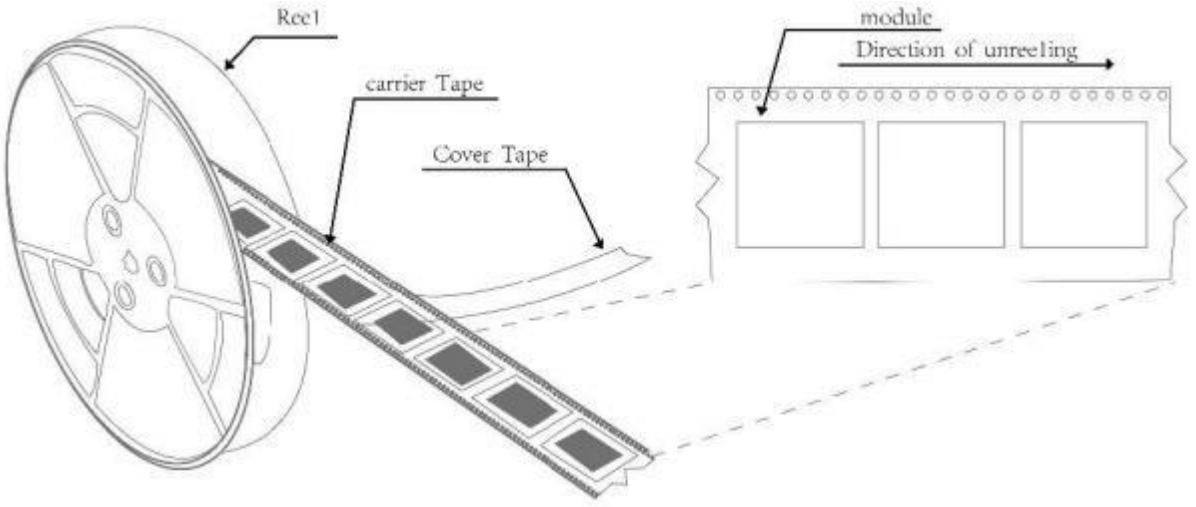
Referred to IPC/JEDEC standard.
Peak Temperature : <250° C
Number of Times : ≤2 times



8 Package Information

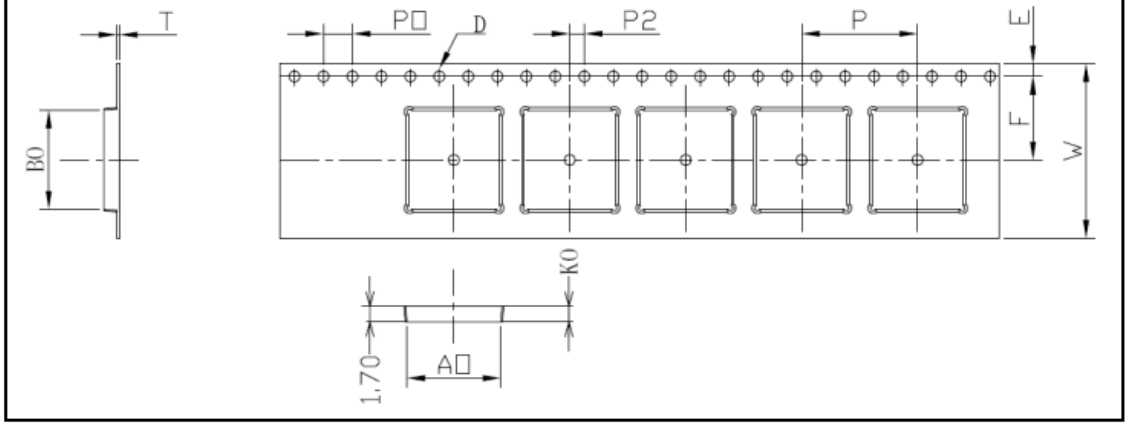
8.1Reel

A roll of 2000pcs

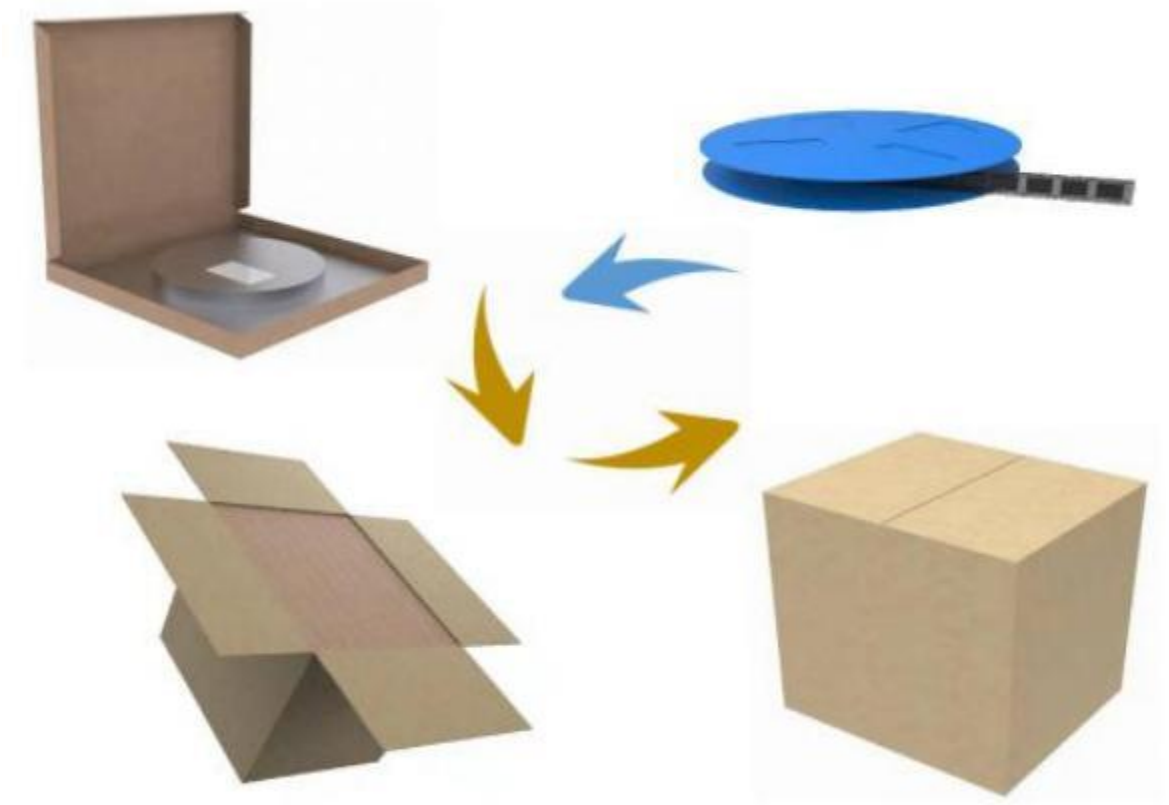


8.2 Carrier Tape Detail

ITEM	W	A0	B0	D	F	E	K0	P0	P2	P	T
DIM	24	12.61	13.62	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



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°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