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Comchips

KX6214
Module Data sheet

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Website: www.comchips.com

Customer Approval

Company _____

Title _____

Signature _____

Date _____

FTY _____

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Version	Date	Revision Content	Editorial staff	approval
V1.0	2021/09/22	The first version		

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1 Overview

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1.1 Introduction

The KX6214 is a highly integrated single-chip 802.11b/g/n 1T1R WLAN, and an integrated Bluetooth 2.1/4.2 single chip with USB 2.0 multi-function. It combines a WLAN MAC, a 1T1R capable WLAN baseband, BT Protocol Stack (LM, LL, and LE), BT Baseband, modem, and WLAN/BT RF in a single chip. The KX6214 provides a complete solution for a high-performance integrated wireless LAN and Bluetooth controller. The KX6214 WLAN baseband implements Orthogonal Frequency Division Multiplexing (OFDM) with 1 transmit and 1 receive path and is compatible with the 802.11n specification. Features include one spatial stream transmission, short guard interval (GI) of 400ns, spatial spreading, and transmission over 20MHz and 40MHz bandwidth.

1.2 Features

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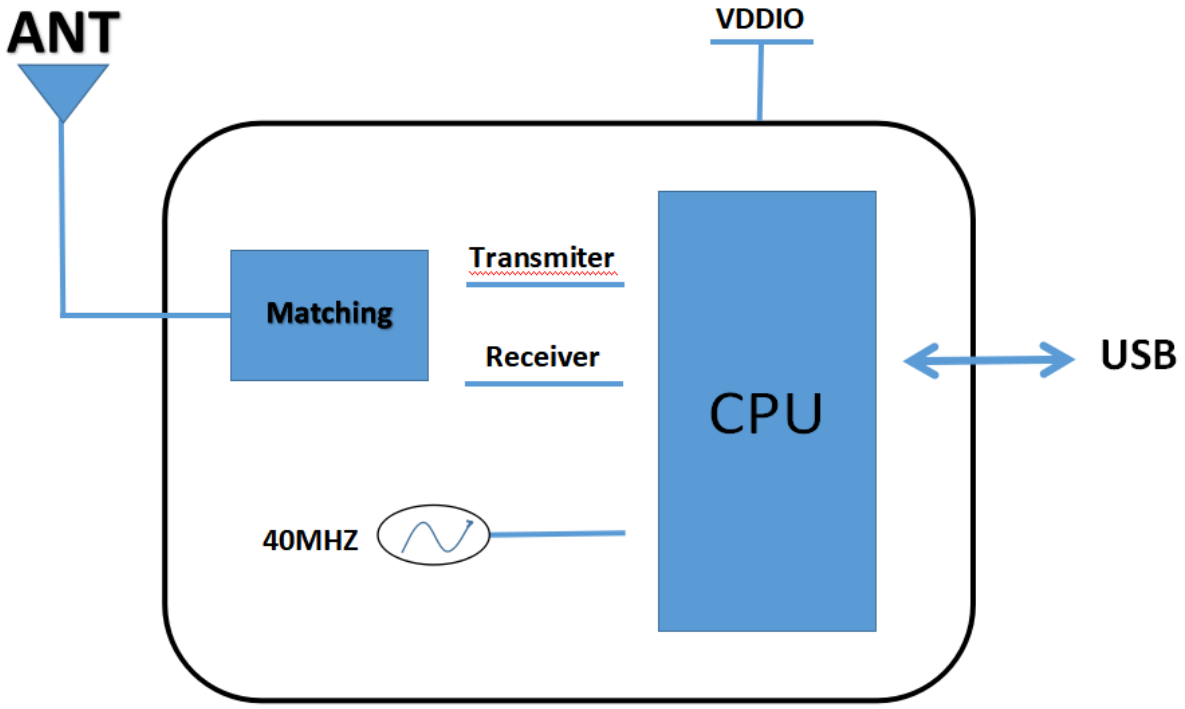
- 802.11b/g/n 1T1R WLAN and Bluetooth single chip
- Complies with USB2.0 for WLAN and BT controller
- CMOS MAC, Baseband PHY, and RF in a single chip for 802.11b/g/n compatible WLAN
- Backward compatible with 802.11b/g devices while operating in 802.11n mode
- Backward compatible with 802.11b/g devices while operating in 802.11n mode
- 802.11i (WPA, WPA2). Open, shared key, and pair-wise key authentication services
- Compatible with Bluetooth v2.1, v4.2Systems
- Supports Bluetooth 4.0 Low Energy(BLE)
- Enhanced BT/WIFI Coexistence Control to improve transmission quality in different profiles
- Bluetooth 4.0 Dual Mode support: Simultaneous LE and BR/EDR

1.3 Block Diagram



1.4 General Specification

Model Name	KX6214
Product Description	Support WLAN-Bluetooth coexistence
Dimension	L x W x H: 12x 13(±0.2) mm
Wi-Fi Interface	Support USB
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

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1.5 DC Characteristics

Power Supply Characteristics

Symbol	Parameter	Minimum	Typical	Maximum	Units
VBAT	3.3V I/O Supply Voltage	3.0	3.3	3.6	V
IDD33	3.3V Rating Current	-	-	600	mA

2 RF Specifications

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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 (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
802.1 1b @ 11 Mbps	17dBm	±2dBm	≤-13dB
802.11g@54Mbps	14dBm	±2dBm	≤-25dB
802.11n@BW20_MCS7	13dBrn	±2dBm	≤-28dB
802.11n@BW40_MCS7	13dBrn	±2dBm	≤-28dB

2.4G Receiver Specifications

RX Rate	Min Input Level(Typ)	Max Input Level(Typ)	PER
802.11b@11Mbps	-85dBm	-85dBm	<8%
802.11g@54Mbps	-68dBm	-68dBm	< 10%
802.11n@BW20_MCS7	-66dBrn	-66dBrn	< 10%
802.11n@BW40_MCS7	-65dBrn	-65dBrn	< 10%

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2.2 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	5 dBm	10dBm
Power(EDF：π /4-DQPSK/2Mbps)	0dBm	5 dBm	10dBm
Power (BLE：GFSK/1Mbps)	0dBm	5 dBm	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

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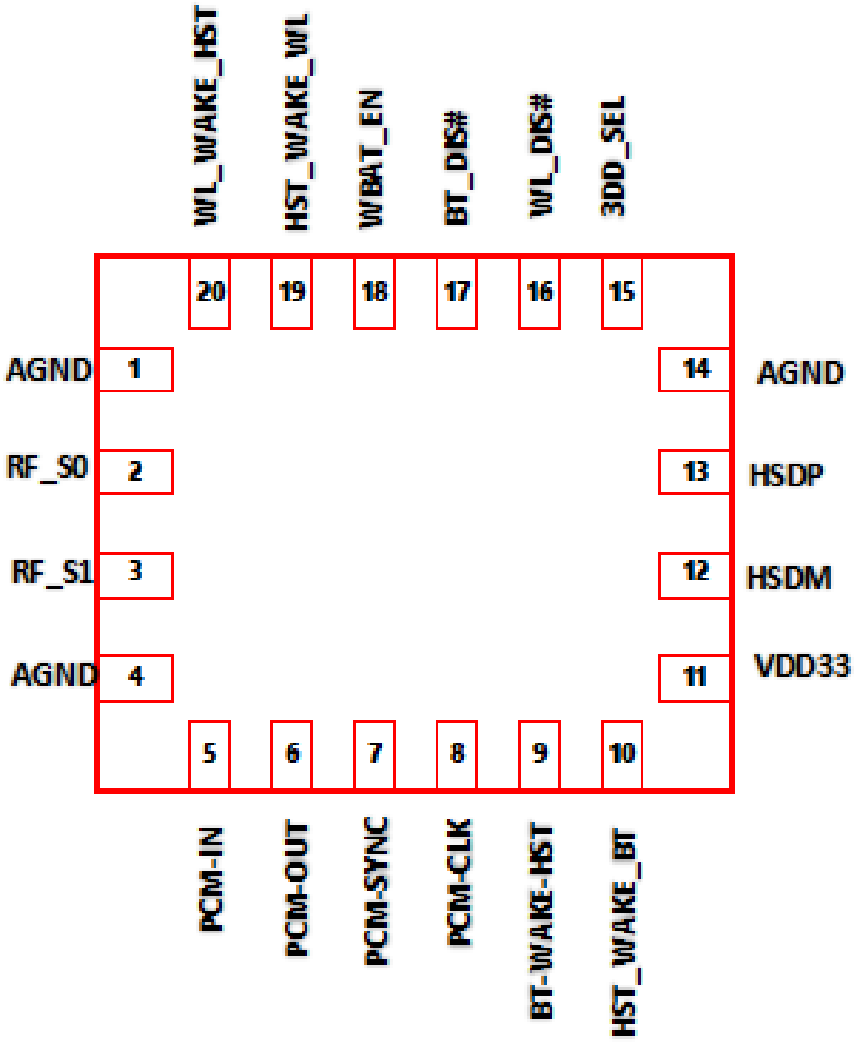
3.1 Pin Outline



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3.2 Pin Definition

PIN	Definition	Description
1	AGND	Ground
2	RF_S0	RF
3	RF_S1	NC
4	AGND	Ground
5	BT_PCM_IN	BT_PCM_IN
6	BT_PCM_OUT	BT_PCM_OUT
7	BT_PCM_SYNC	BT_PCM_SYNC
8	BT_PCM_CLK	BT_PCM_CLK
9	BT_WAKE_HST	Shared with GIPO14. Chip wakeup host pin
10	HST_WAKE_BT	Shared with GIPO13. Host wakeup chip pin
11	VDD	VDD3.3V
12	HSDM	High-Speed USB D- Signal
13	HSDP	High-Speed USB D+ Signal
14	AGND	Ground
15	3DD_SEL	General Purpose Input/Output Pin
16	WL_DIS#	Shared with GPIO9 This Pin Can Externally Shutdown the RTL8723DU-VC WLAN function when WL_DISn is Pulled Low. When This pin deasserted, USB interface will be disabled. This pin can also support the WLAN Radio-off function with host interface remaining connected.
17	BT_DIS#	Shared with GPIO11. This Pin Can Externally Shutdown the RTL8723DU-VC BT function when BT_DISn is Pulled Low. This pin can also support the BT Radio-off function with host interface Remaining connected.
18	VBAT_EN	VBAT_EN
19	HST_WAKE_WL	HST_WAKE_WL
20	WL_WAKE_HST	WL_WAKE_HST

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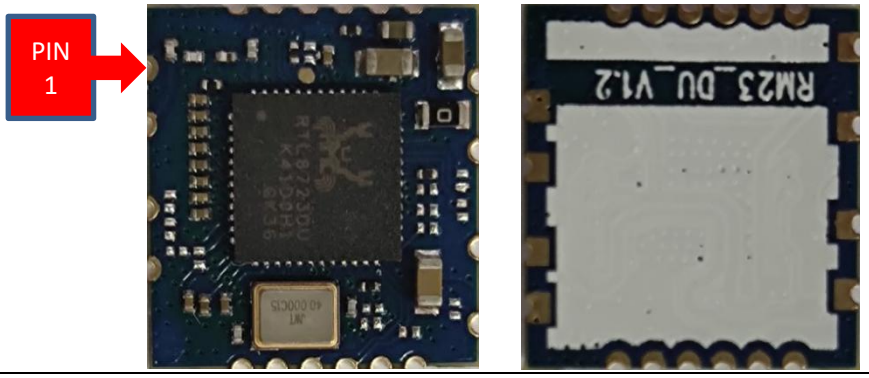
4 Dimensions

4.1 Module Picture

L x W : 12.1 x 13.1 (±0.2) mm

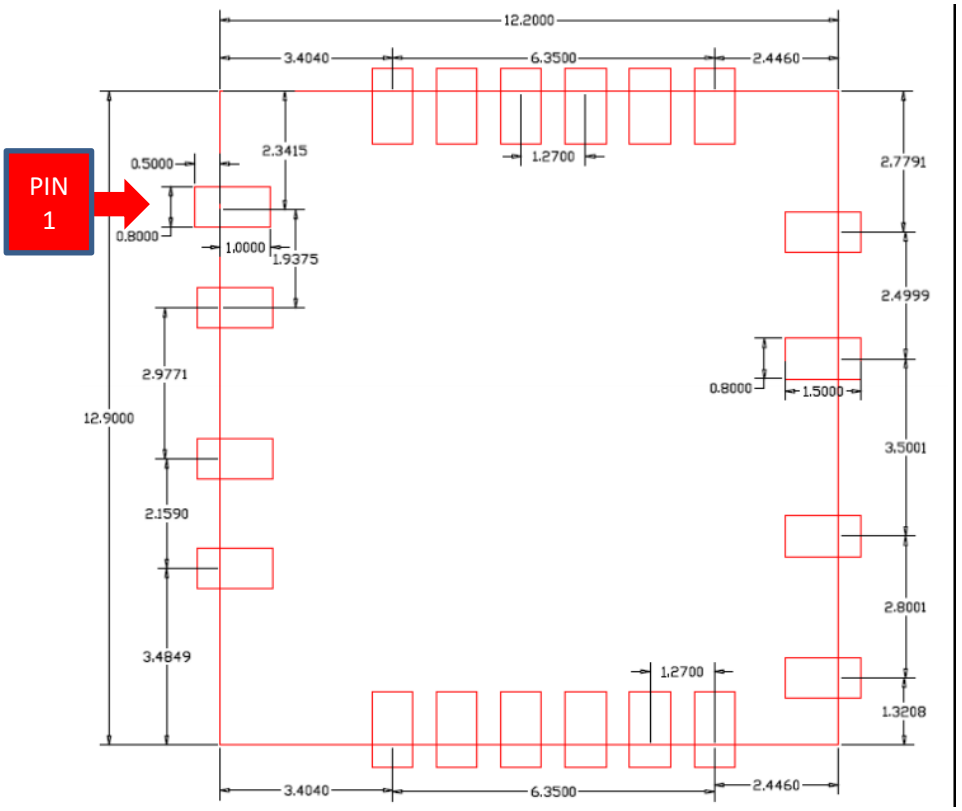


H:1.5(±0.2)mm

4.2 Module Physical Dimensions

(Unit: mm)

< TOP VIEW >



5 Reference Design

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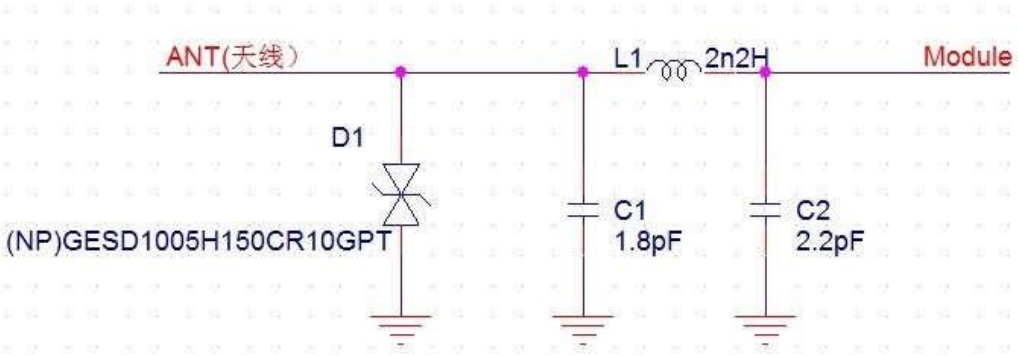
5.1 WIFI RF Circuit reference pictures

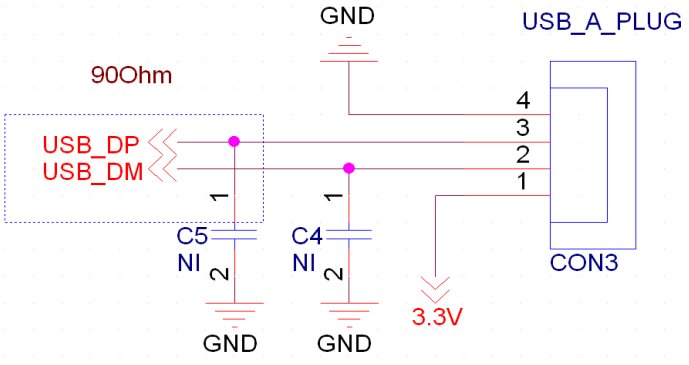


1. Above the dotted box part of the antenna matching is needed, the actual antenna matching electronic parameters shall prevail.

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

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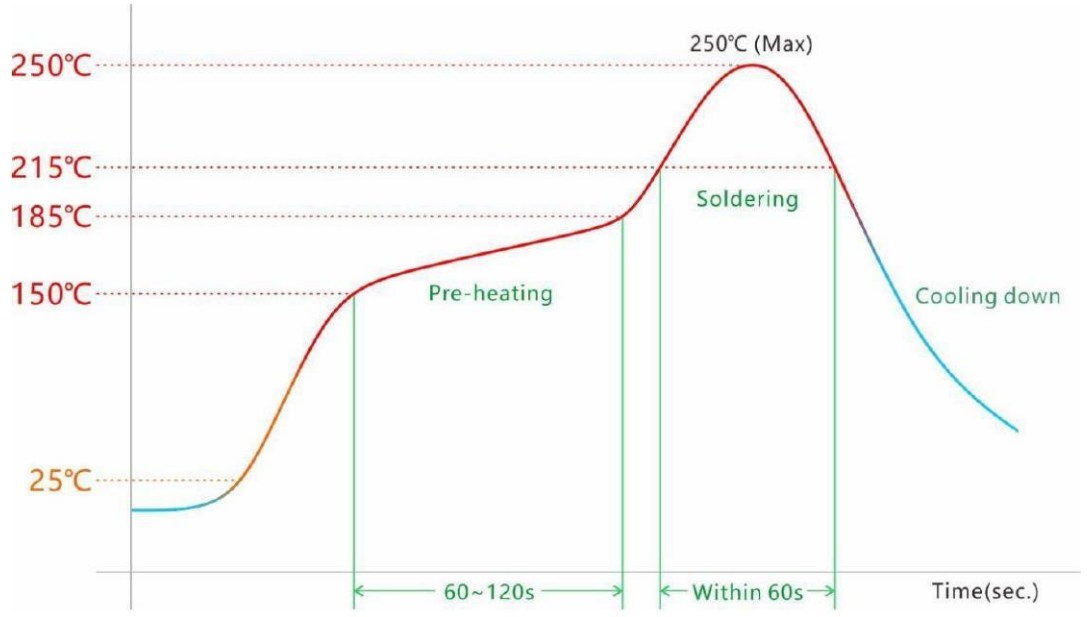
No.	Parts	Specification	Manufacturer	Note
1	Chipset	RTL8723DU QFN48	Realtek Semiconductor Corp	
2	PCB	RM23_DU_V1.2	Shenzhen xiangyu circuit co., LTD	
3	PCB	RM23_DU_V1.2	Shenzhen Kexiang Precision Circuit Technology Co., LTD	
4	Crystal oscillator	3225 40MHZ 15PF ± 10PPM -30~+85℃	hefei jing wei Electronics Co. Ltd.	
5	Crystal oscillator	40M000MHZ10PPM 15PF/32*25 -20+85℃	Zhejiang Lan jing xin Microelectronics Co., LTD	

7 Recommended Reflow Profile

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



8 Package Information

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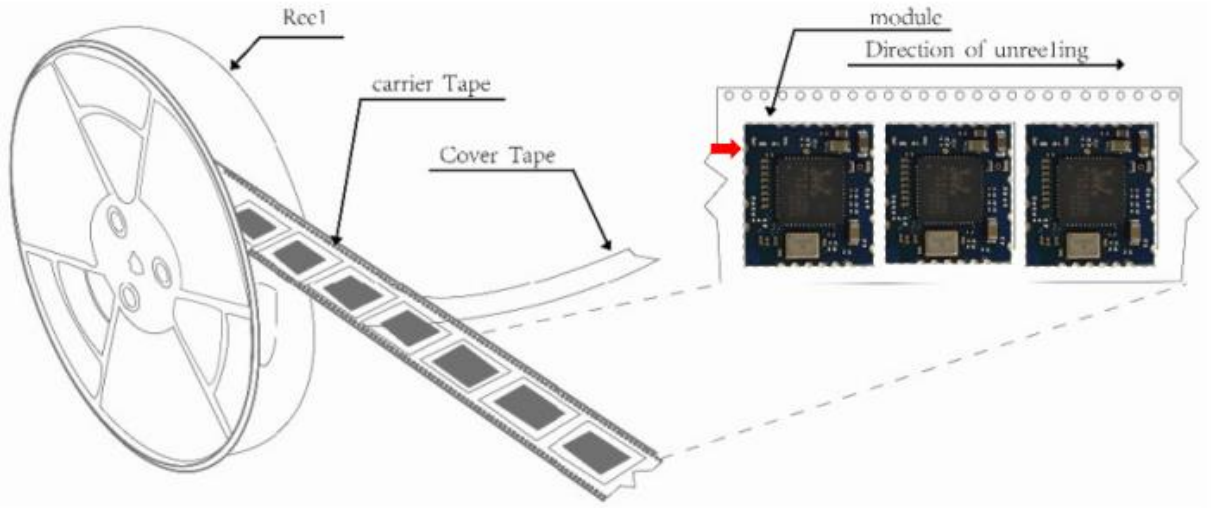
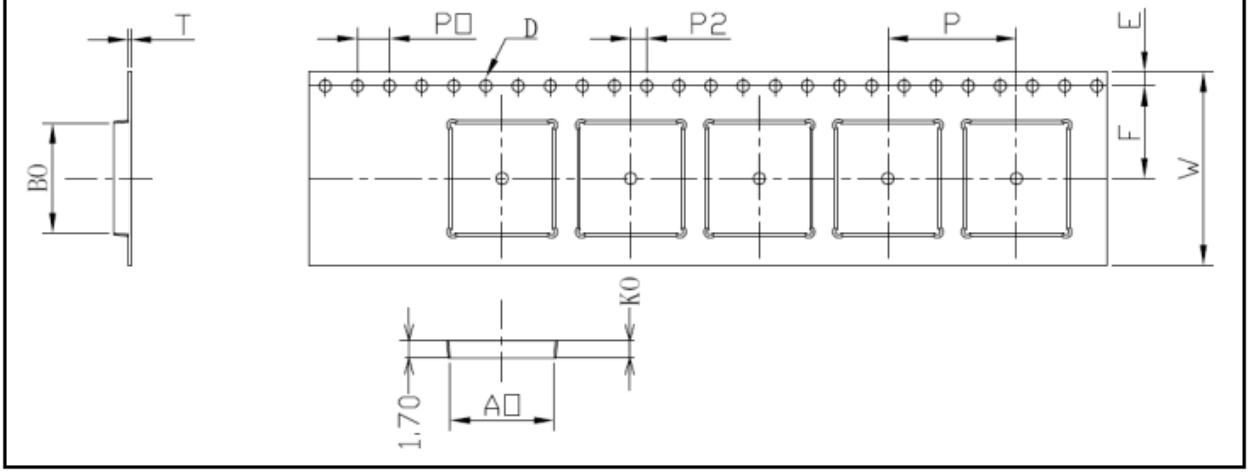
8.1Reel

A roll of 2000pcs

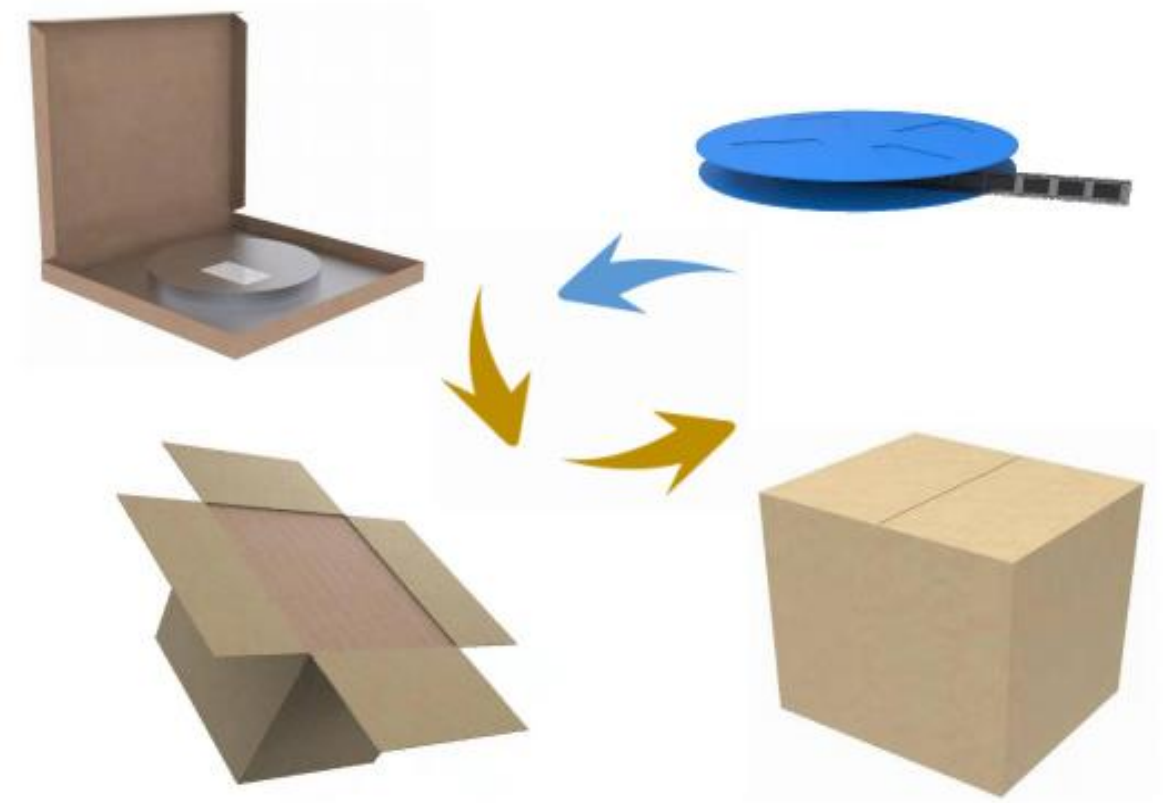


8.2 Carrier Tape Detail

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