Comchips

KX6212
Module Data sheet

KX6212
Module Data sheet

Website: www.comchips.com

Customer Approval

Company _____

Title _____

Signature _____

Date _____

FTY _____

Version Update Record

Version	Date	Revision Content	Editorial staff	approval
V1.0	2021/09/27	The first version		

CONTENTS

1 Overview

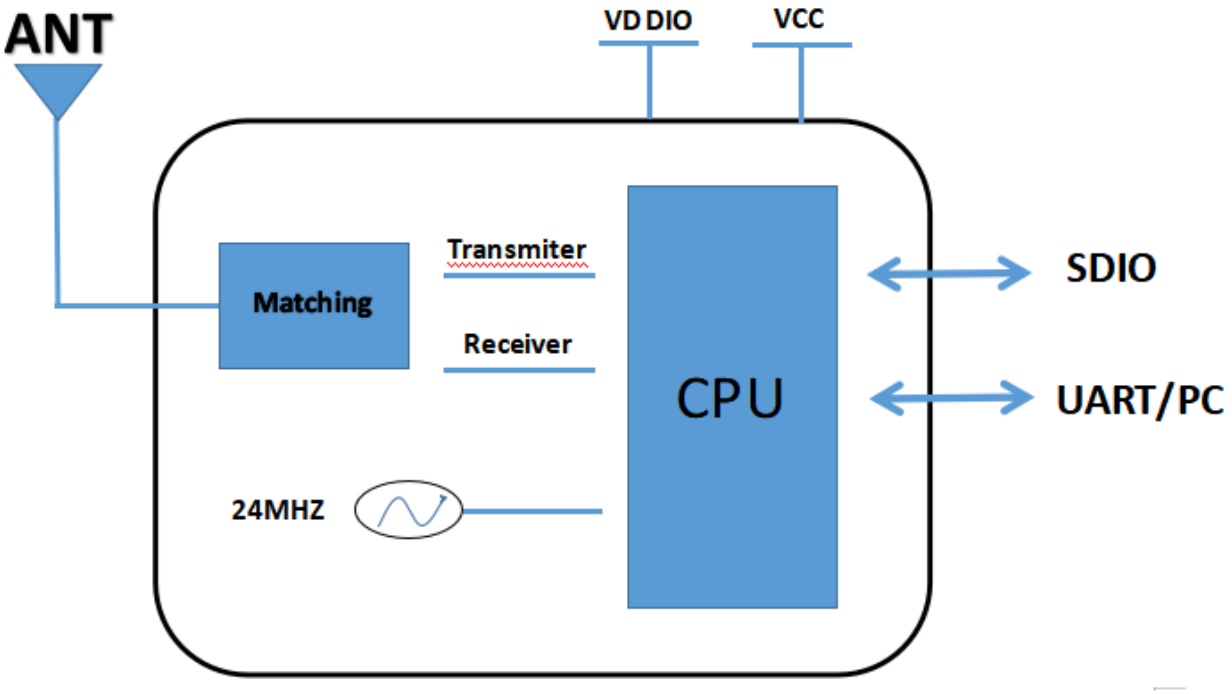
1.1 Introduction

KX6212 is a small size and low profile of WiFi+BT combo module with LGA (Land-Grid Array) footprint, board size is 12mm*12mm with module height of 1.6mm. It can be easily manufactured on SMT process and highly suitable for tablet PC, ultra book, mobile device and consumer products. It provides GSPI/SDIO interface for WiFi to connect with host processor and high speed UART interface for BT.It also has a PCM interface for audio data transmission with direct link to external audio codec via BT controller. The WiFi throughput can go up to 150Mbps in theory by using 1x1 802.11n b/g/n MIMO technology and Bluetooth can support BT2.1+EDR/and BT4.2。

1.2 Features

- Operate at ISM frequency bands (2.4GHz)
- GSPI/SDIO for Wi-Fi and UART for Bluetooth
- IEEE standards support: IEEE 802.11b, IEEE 802.11g, IEEE 802.11n, IEEE 802.11d, IEEE 802.11e, IEEE 802.11h, IEEE 802.11i
- Fully Qualified for Bluetooth 2.1 + EDR 4.2 Supports Bluetooth 4.2 Low Energy(BLE)
- HS-UART interface for Bluetooth data
- Enterprise level security which can apply WPA/WPA2 certification for Wi-Fi.
- Wi-Fi one transmitter and one receiver allow data rates supporting up to 150 Mbps downstream and 150 Mbps upstream PHY rates

1.3 Block Diagram



1.4 General Specification

Model Name	KX6212
Product Description	Support WLAN-Bluetooth coexistence
Dimension	L x W x H: 12.x 12 x 1.6 mm
Wi-Fi Interface	Support GSPI/SDIO
BT interface	Support UART
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	Para eter	Minimum	Typical	Maximum	Units
VCC	3.3V supply voltage	3.0	3.3	3.6	V
VDDIO	I/O supply voltage	1.75	3.3	3.6	V
VCC	3.3V rating current	--	--	600	mA
VCC	3.3V Current Consumption (linking)	--	--	150	mA

2 RF Specifications

2.1 2.4GHz RF Specification

Features	Description
WLAN Standard	WLAN 11b/g/n
Frequency Range	2.412 ~ 2.483 GHz
Data Transfer Rate	1,2,5.5,6,11,12,18,22,24,30,36,48,54,60,90,120 and maximum of 150Mbps
Modulation Method	BPSK/ QPSK/ 16-QAM/ 64-QAM
Spread Spectrum	IEEE 802.11b: DSSS (Direct Sequence Spread Spectrum) IEEE 802.11g/n:OFDM (Orthogonal Frequency Division Multiplexing)
OS Support	Windows 2000,XP32-64,Vista 32/64,Win7 32/64,Linux,Mac, Android, WIN CE

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@135Mbps	13dBrn	±2dBm	≤-28dB

2.4G Receiver Specifications

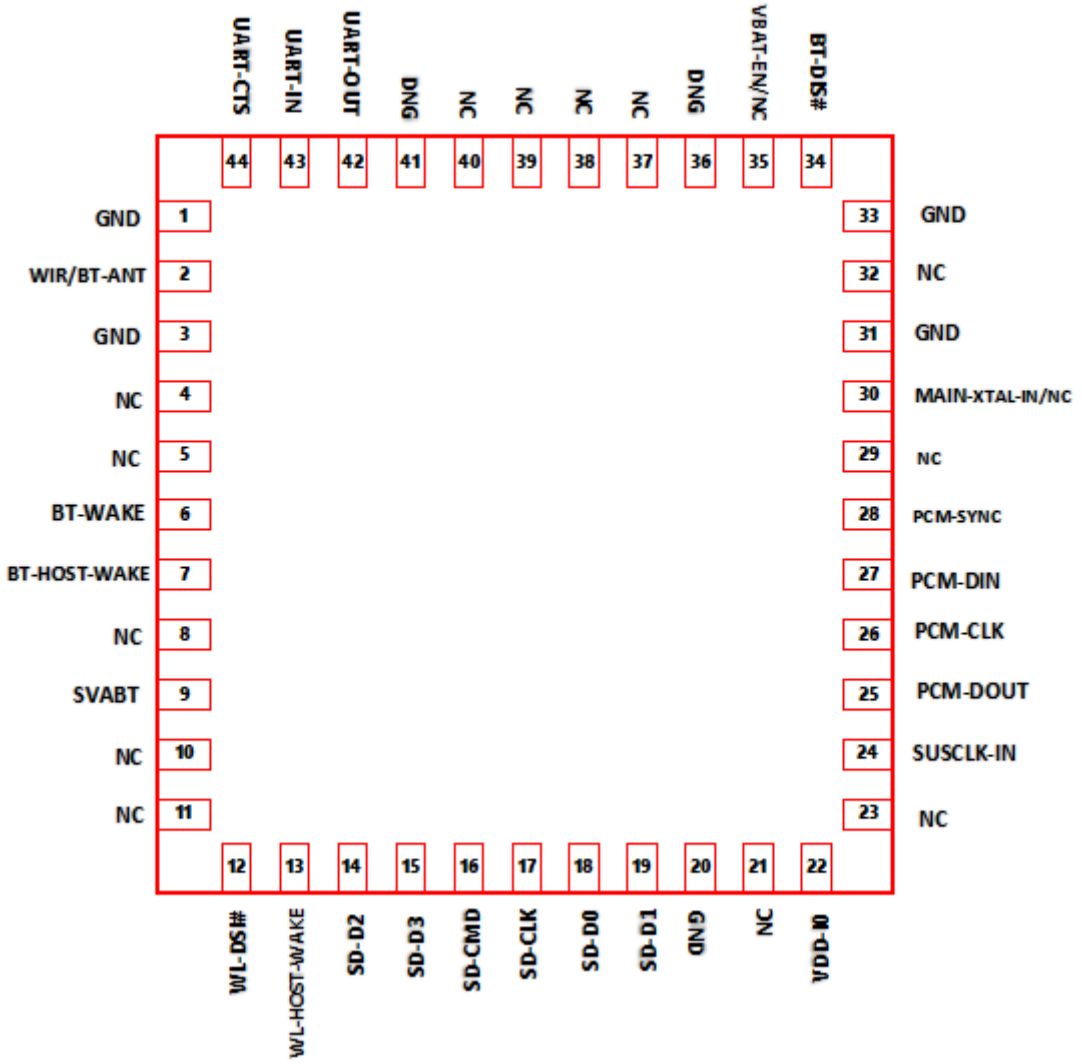
RX Rate	Min Input Level(Typ)	Max Input Level(Typ)	PER
802.1 1b @ 11 Mbps	-85dBm	-85dBm	8%
802.11g@54Mbps	-68dBm	-68dBm	10%
802.11n@135Mbps	-66dBrn	-66dBrn	10%

2.2 Bluetooth Section:

Feature	Description		
General Specification			
Bluetooth Standard	Bluetooth BLE4.0,Compatible with Bluetooth v2.1+EDR and v4.2 Systems		
Host Interface	UART		
Antenna Reference	Small antennas with 0~2 dBi peak gain		
Frequency Band	2402 MHz ~ 2484 MHz		
Number of Channels	0~78 channels		
Modulation	GFSK, DPSK, DQPSK		
RF Specification			
Power (BDR：GFSK/1Mbps)	2dBm	5 dBm	8dBm
Power(EDF：π/4-DQPSK/2Mbps)	2dBm	5 dBm	8dBm
Power (BLE：GFSK/1Mbps)	2dBm	5 dBm	8dBm
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		

3 Pin Assignments

3.1 Pin Outline



3.2 Pin Definition

PIN	Function	Description
1	GND	Ground
2	WIFI/BT_ANT	WIFI/BT_ANT
3	GND	Ground
4	NC	NC
5	NC	NC
6	BT_WAKE	HOST wake-up Bluetooth device
7	BT_HOST_WAKE	Bluetooth device to wake-up HOST
8	NC	NC
9	VABT	3.3V
10	NC	NC
11	NC	NC
12	WL_DSI#	Shared with GPIO11 This Pin CanExternally Shutdown the RTL8723DS WLAN WL_DISn is Pulled Low. When this pin deasserted, SDIO interface will be disabled. This pin can also support the WLAN Ra-dio off function with host interface remaining connected.
13	WL_HOST_WAKE	WLAN to wake-up HOST
14	SD_D2	SDIO data line 2
15	SD_D3	SDIO data line 3
16	SD_CMD	SDIO command line
17	SD_CLK	SDIO CLK line
18	SD_D0	SDIO data line 0
19	SD_D1	SDIO data line 1
20	GND	Ground

21	NC	NC
22	VDD_IO	1.8V / 3.3V
23	NC	NC
24	SUSCLK_IN	Shared with GPIO8. External 32K or RTC clock input with.
25	PCM_DOUT	PCM Data output
26	PCM_CLK	PCM Clock
27	PCM_DIN	PCM data input
28	PCM_SYNC	PCM sync signal
29	NC	NC
30	MAIN_XTAL_IN/NC	MAIN_XTAL_IN/NC
31	GND	Ground
32	NC	NC
33	GND	Ground
34	BT_DIS#	General Purpose Input/Output Pin
35	VBAT_EN/NC	VBAT_EN/NC
36	GND	Ground
37	NC	NC
38	NC	NC
39	NC	NC
40	NC	NC
41	GND	Ground
42	UART_OUT	HOST Data output
43	UART_IN	HOST Data input
44	UART_CTS	HOST_CTS

4 Dimensions

4.1Module Picture

L x W : 12 x 12 (±0.2) mm

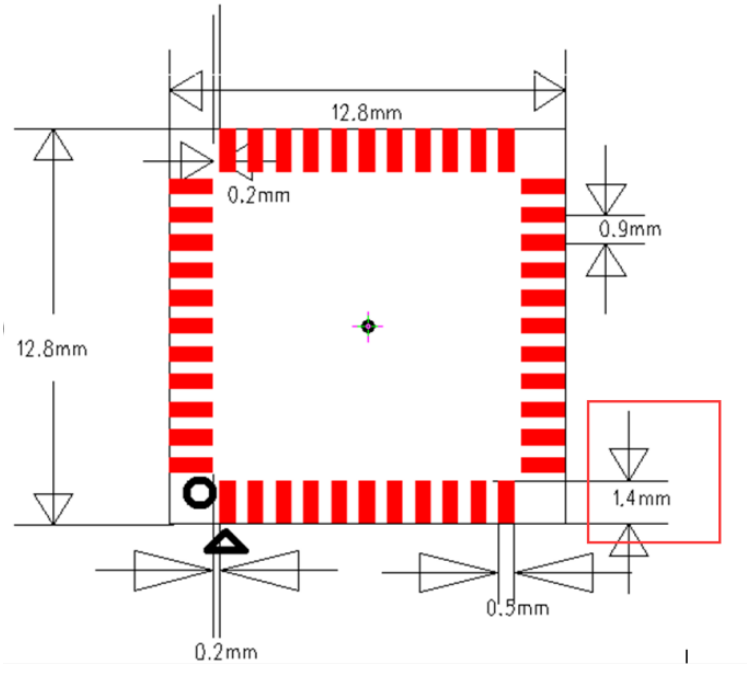
PIN1

H:2.1(±0.2)mm

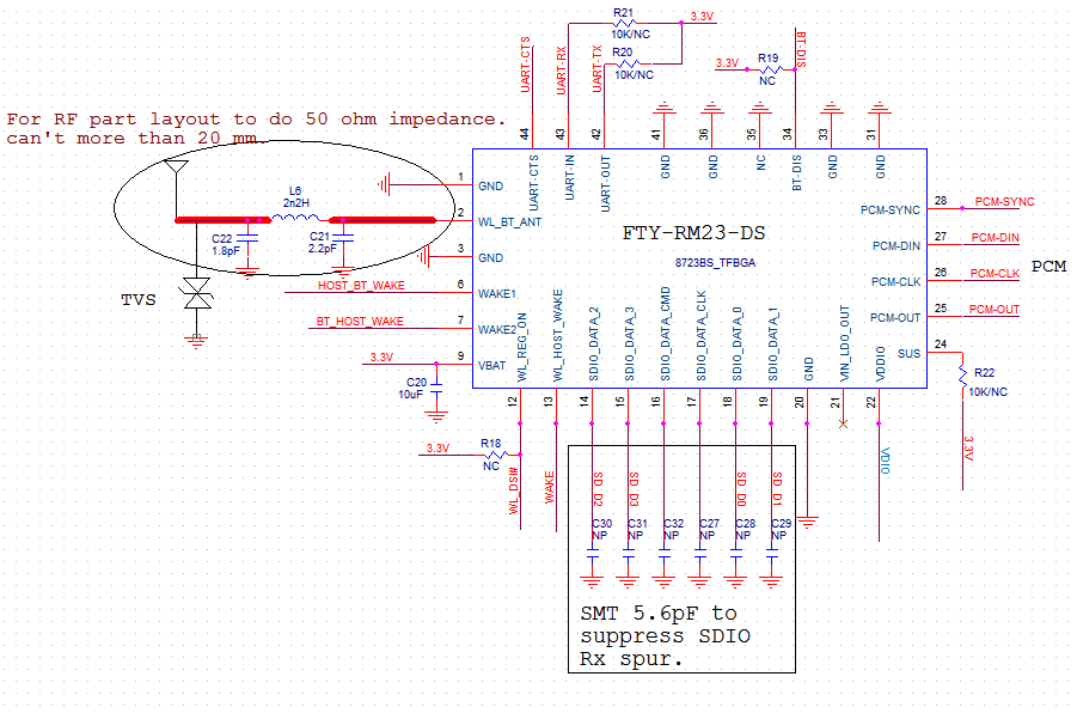
4.2 Module Physical Dimensions

(Unit: mm)

< TOP VIEW >



5 Reference Design



Note:

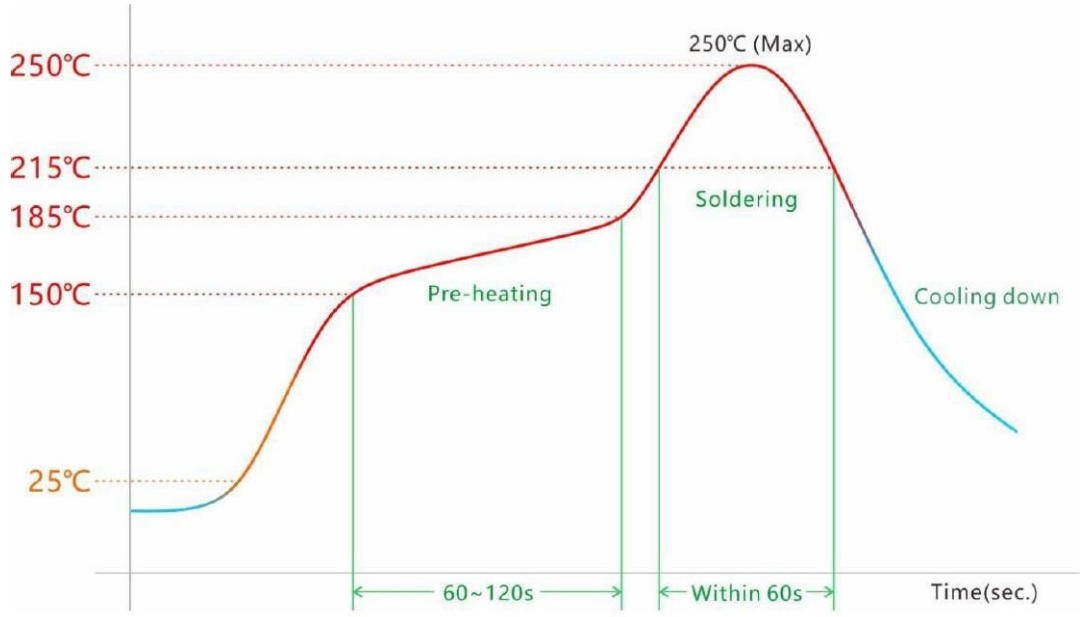
1. ANT_A, ANT_B are all support 2.4G/5G function, ANT_B is support Bluetooth also;
2. The module requires independent power supply, supply capacity ≥ 1000mA and ripple less than 150mV;
3. Do not share power with amplifier, camera, etc.

6 The Key Material List

No.	Parts	Specification	Manufacturer	Note
1	Chipset	RTL8723DS-CG/QFN48	Realtek Semiconductor Corp	
2	PCB	FTY_RM23_DS_V1.0	Shenzhen xiangyu circuit co., LTD	
3	PCB	FTY_RM23_DS_V1.0	Shenzhen Kexiang Precision Circuit Technology Co., LTD	
4	Crystal oscillator	2520/24MHZ/ 10PPM/15PF/(-20to+85 度)	hefei jing wei Electronics Co. Ltd.	
5	Crystal oscillator	2520/24MHZ/ 10PPM/15PF/(-20to+85 度)	ZhejiangLanjingxin Microelectronics Co., LTD.	

7 Recommended Reflow Profile

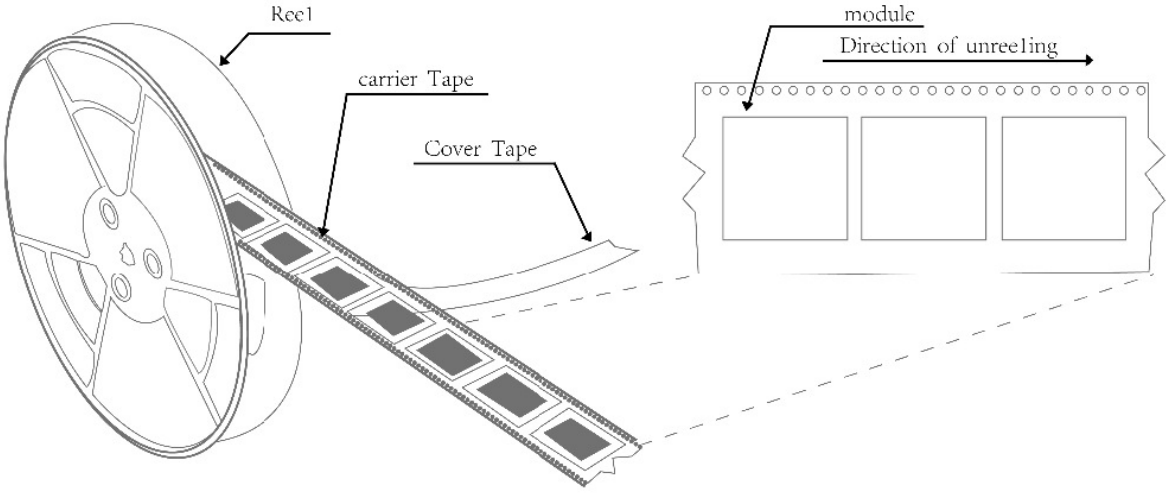
Referred to IPC/JEDEC standard.
Peak Temperature : <250° C
Number of Times : ≤2 times



8 Package Information

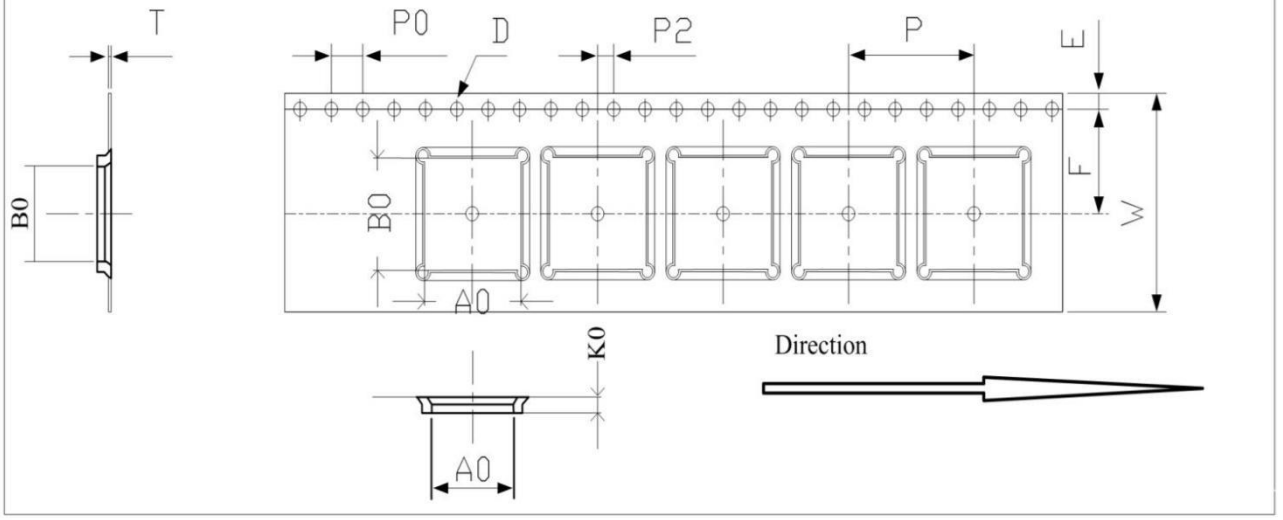
8.1Reel

A roll of 2000pcs

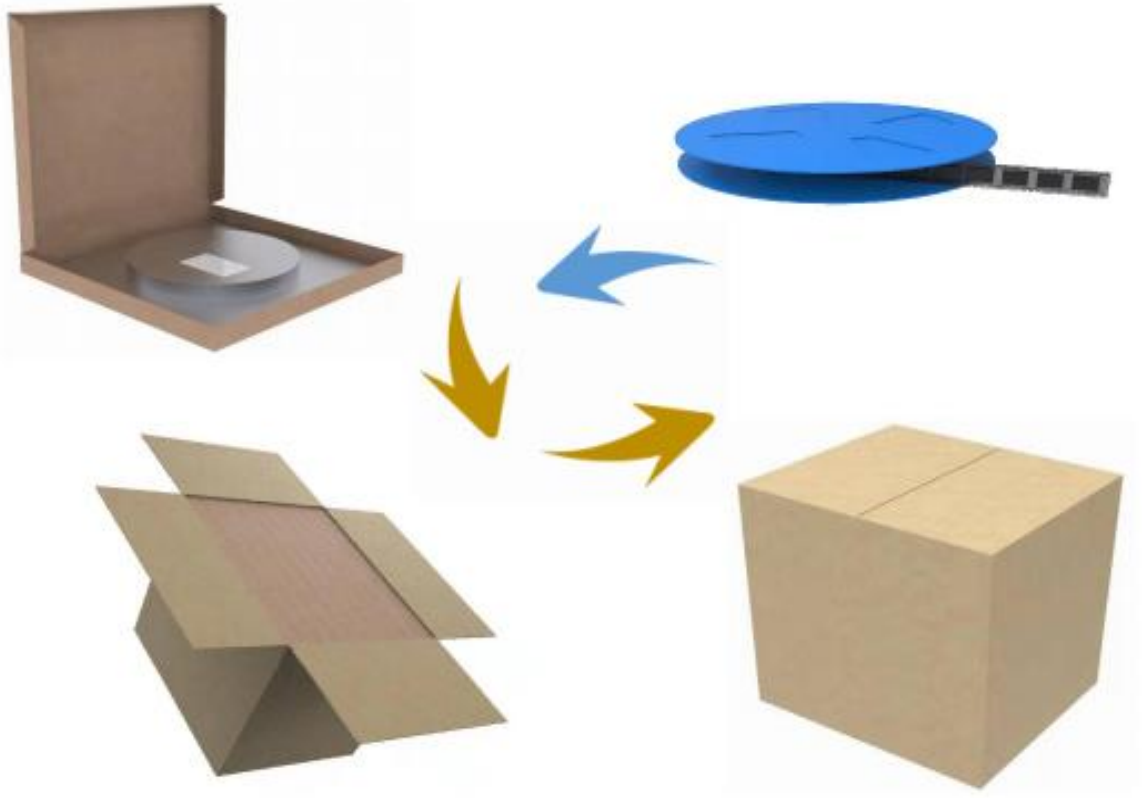


8.2 Carrier Tape Detail

ITEM	W	A0	B0	D	F	E	K0	P0	P2	P	T
DIM	24	12.40	12.40	1.50	11.5	1.75	1.70	4.0	2.0	16.0	0.30
TOLE	+0.3 -0.3	±0.10	±0.10	+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