Comchips

KX6356
Module Data sheet

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Website: www.comchips.com

Customer Approval

Company _____

Title _____

Signature _____

Date _____

FTY _____

Version Update Record

Version	Date	Revision Content	Editorial staff	approval
V1.0	2021/06/18	The first version		

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1 Overview

1.1 Introduction

KX6356 is highly integrated single chip which features a low power 2x2 11a/b/g/n/ac dual-band Wi-Fi subsystem and a Bluetooth subsystem. The Wi-Fi subsystem contains the 802.11a/b/g/n/ac radio, baseband, and MAC that are designed to meet both the low power and high throughput application.

KX6356 has a 32-bit RISC MCU that handles Wi-Fi and Bluetooth tasks, and an ARM Cortex-R4 MCU that could offload data frame processing in Wi-Fi host driver. The Bluetooth subsystem contains the Bluetooth radio, baseband, link controller. It also uses the 32-bit RISC MCU for the Bluetooth protocols.

1.2 Features

- IEEE 802.11 a/b/g/n/ac compliant
- USB device fully compliant to USB v3.0 specification
- MT7668AUN data rate up to 600Mbps with USB3.0
- Support 20MHz, 40MHz, 80Mhz bandwidth in 2.4GHz band 5GHz band
- Dual-band 2T2R mode
- Bluetooth specification 2.1+EDR
- Bluetooth 4.2 Low Energy (LE) Bluetooth 5.0
- Support wide-band speech and hardware accelerated SBC codec for A2DP streaming

1.3 Block Diagram

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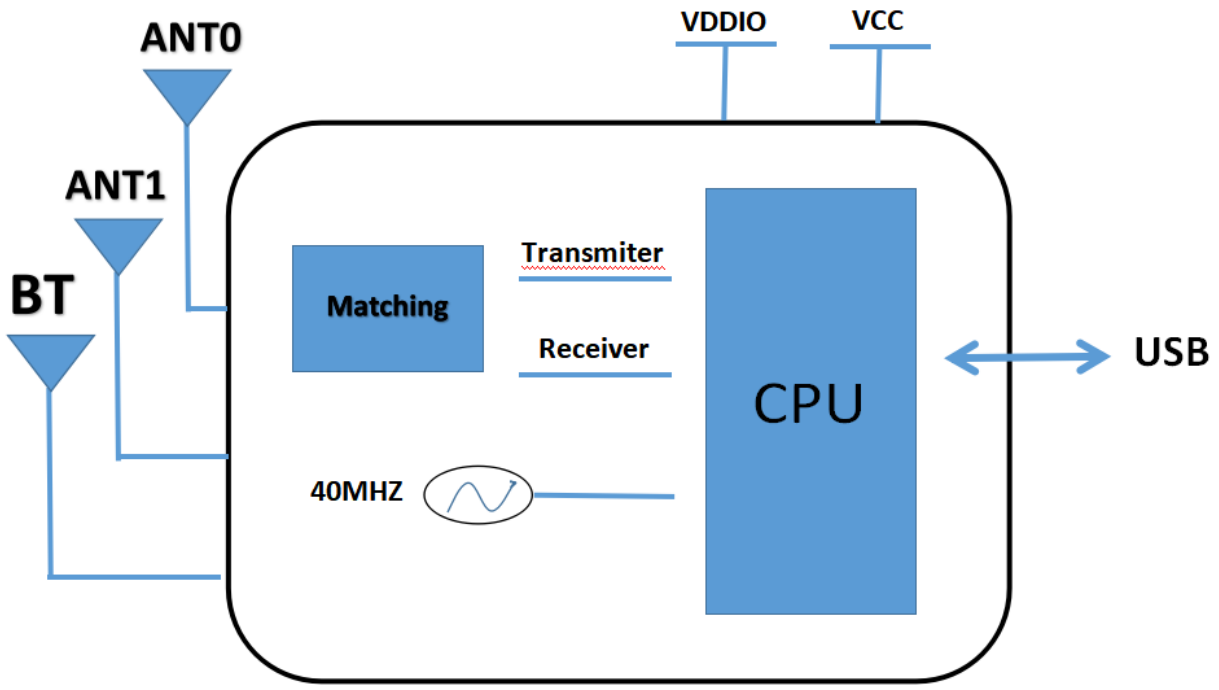

1.4 General Specification

Model Name	KX6356
Product Description	Support WLAN-Bluetooth coexistence
Dimension	L x W x H: 13.x 15 (±0.2) mm
Wi-Fi Interface	Support USB 3.0
BT interface	Support USB 3.0
Operating temperature	0 to +70° C
Storage temperature	-20° C ~ 85°C
RoHS	All hardware components are fully compliant with EU RoHS directive

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1.5 DC Characteristics

Power Supply Characteristics

（1）Power Supply Characteristics

symbol	Para eter	Minimum	Typical	Maximum	Units
VCC	3.3V supply voltage	3.135	3.3	3.465	V
VDDIO	I/O supply voltage	1.71	1.8 or 3.3	3.46	V
VCC	3.3V rating current	--	--	1000	mA

2 RF Specifications

2.1 2.4GHz RF Specification

Features	Description
WLAN Standard	IEEE802.11a/b/g/n/ac/e/i/h
Frequency Range	2.4~2.4835GHz (2.4GHz ISM Band)
Modulation Method	DSSS,DBPSK, DQPSK, CCK and OFDM (BPSK, QPSK, 16QAM,64QAM and 256-QAM)
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 @ 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%

2.2 5GHz RF Specification

Features	Description
WLAN Standard	IEEE802.11a/b/g/n/ac/e/i/h
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@54Mbps	15dBm	±2dBm	≤-27dB
802.11n@BW20_MCS7	14dBm	±2dBm	≤-30dB
802.11n@BW40_MCS7	14dBm	±2dBm	≤-32dB
802.11ac@BW80_MCS9	14dBrn	±2dBm	≤-32dB

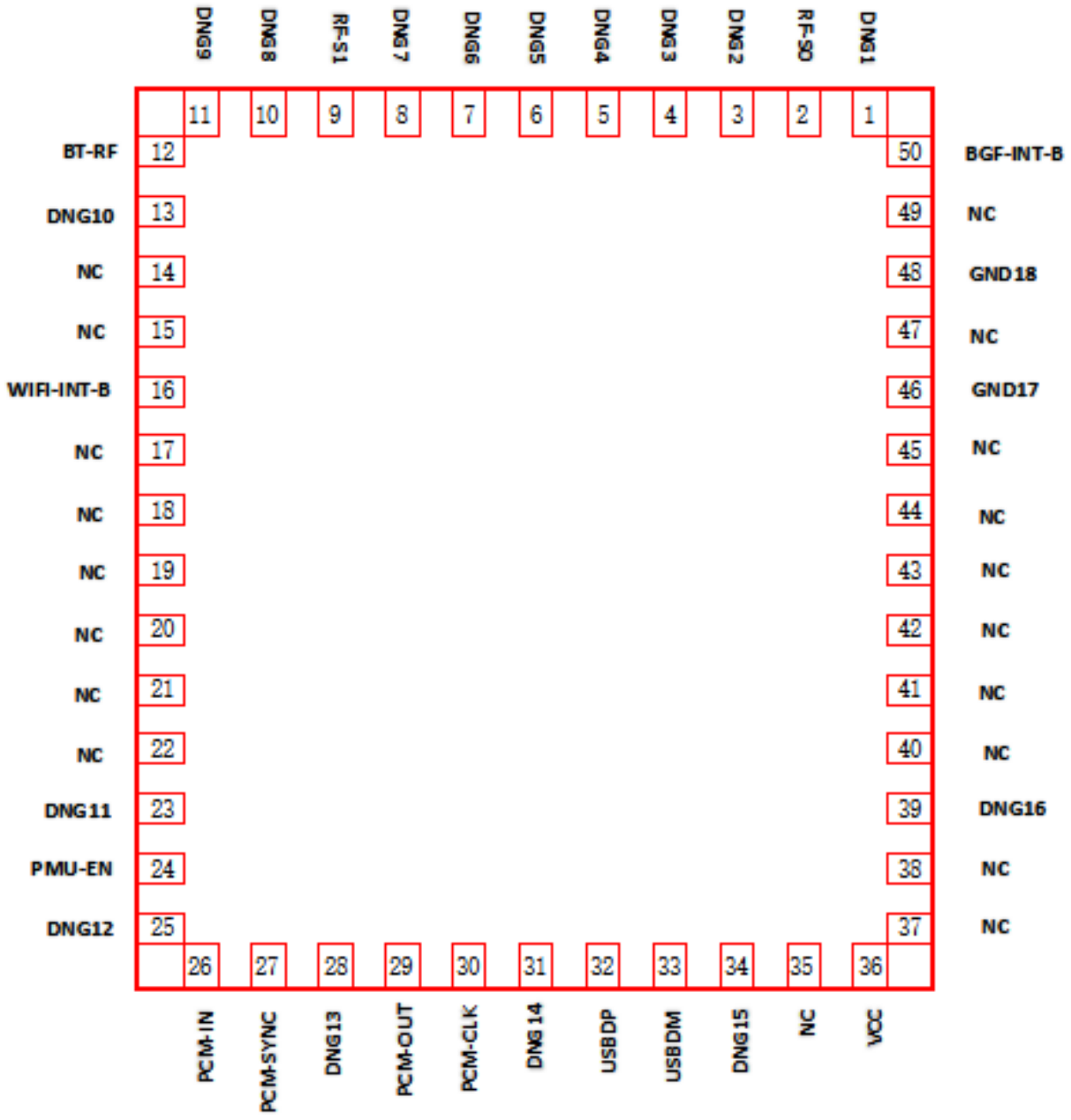
5G Receiver Specifications			
RX Rate	**Min Input Level(Typ)**	**Max Input Level(Typ)**	**PER**
8802.11a@54Mbps	-78dBm	-72dBm	<10%
802.11n@BW20_MCS7	-75dBm	-70dBm	<10%
802.11n@BW40_MCS7	-72dBm	-68dBm	< 10%
802.11ac@BW80_MCS9	-63dBm	-58dBm	< 10%

2.3 Bluetooth Section:

Feature	**Description**		
General Specification			
Bluetooth Standard	Bluetooth V5.0 of 1, 2 and 3 Mbps.		
Host Interface	USB		
Antenna Reference	Small antennas with 0~2 dBi peak gain		
Frequency Band	2402 MHz ~ 2480 MHz		
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

3.1 Pin Outline



3.2 Pin Definition

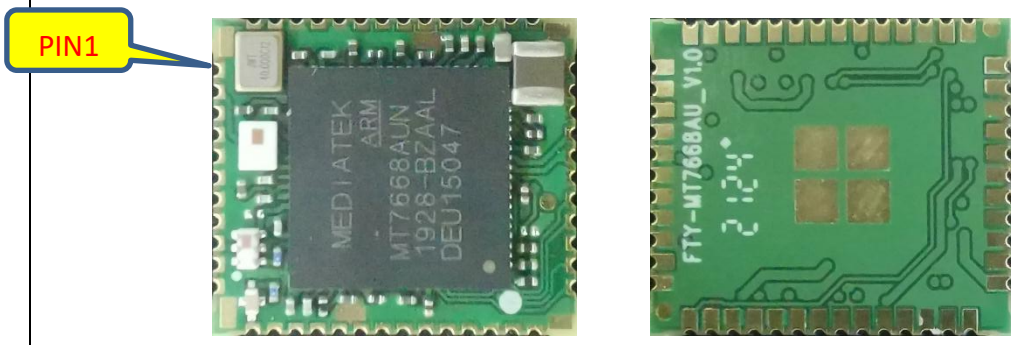
NO.	Name	Type	Descripti n
1	GND	—	Ground connections
2	RF_S0	I/O	ANT0
3	GND	—	Ground connections
4	GND	—	Ground connections
5	GND	—	Ground connections
6	GND	—	Ground connections
7	GND	—	Ground connections
8	GND	—	Ground connections
9	RT_S1	I/O	ANT1
10	GND	—	Ground connections
11	GND	—	Ground connections
12	BT RF	I/O	BT ANT
13	GND	—	Ground connections
14	NC	—	No connect
15	NC	—	No connect
16	WIFI-INT-B	O	WLAN to wake-up HOST
17	NC	—	No connect
18	NC	—	No connect
19	NC	—	No connect
20	NC	—	No connect
21	NC	—	No connect
22	NC	—	No connect
23	GND	—	Ground connections
24	PMU-EN	I	PMU-EN
25	GND	—	Ground connections
26	PCM-IN	—	PCM interface input data

27	PCM_SYNC	I/O	PCM sync signal
28	GND	—	Ground connections
29	PCM_OUT	I/O	PCM DATA OUTPUT
30	PCM_CLK	I/O	PCM CLK
31	GND	—	Ground connections
32	USBDP	—	USBDP
33	USBDM	—	USBDM
34	GND	—	Ground connections
35	NC	—	No connect
36	VCC	P	3.3V
37	NC	—	No connect
38	NC	—	No connect
39	GND	—	Ground connections
40	NC	—	No connect
41	NC	—	No connect
42	NC	—	No connect
43	NC	—	No connect
44	NC	—	No connect
45	NC	—	No connect
46	GND	—	Ground connections
47	NC	—	No connect
48	GND	—	Ground connections
49	NC	—	No connect
50	BGF-INT-B	O	BT host interrupt

4 Dimensions

4.1Module Picture

L x W : 15.2 x 13.2 (±0.2) mm

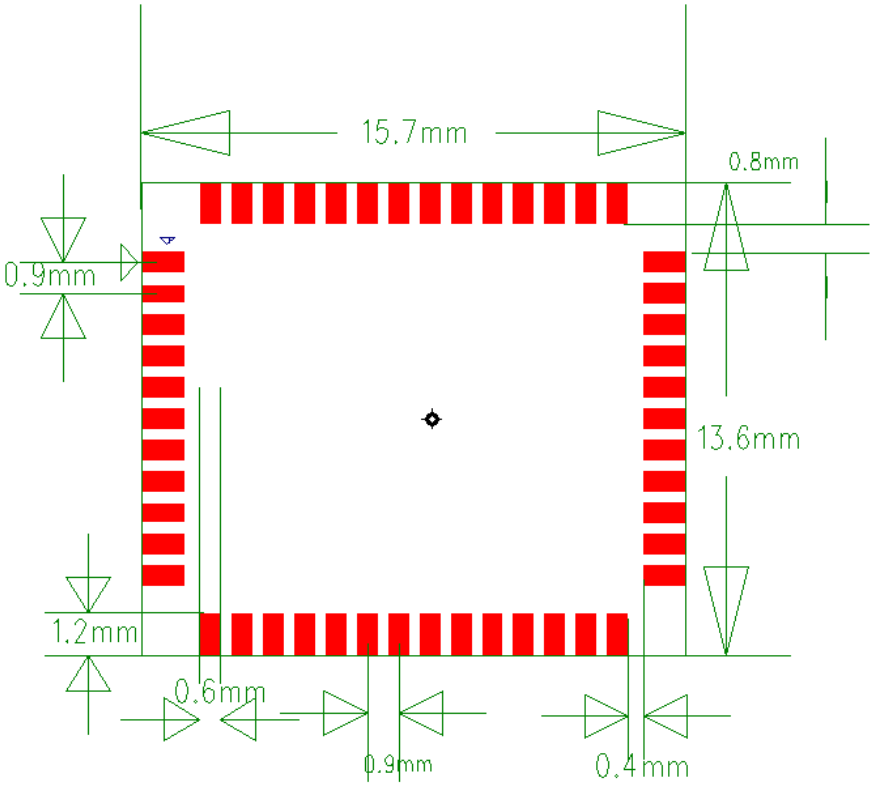


H:1.7(±0.2)mm

4.2 Module Physical Dimensions

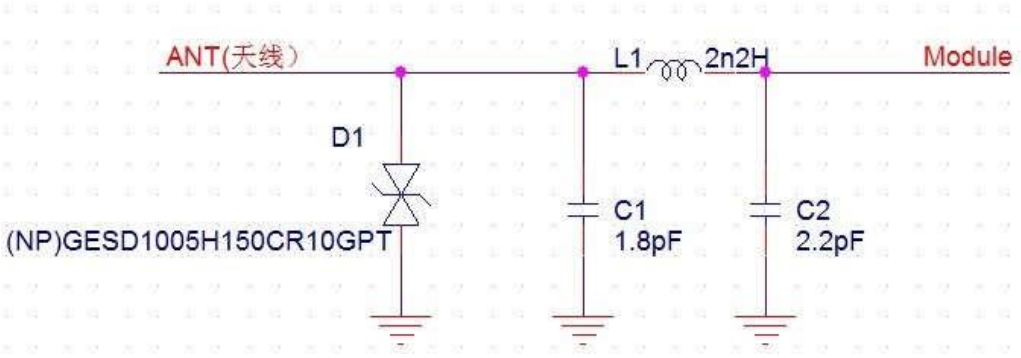
(Unit: mm)

< TOP VIEW >



5 Reference Design

5.1WIFI RF Circuit reference pictures

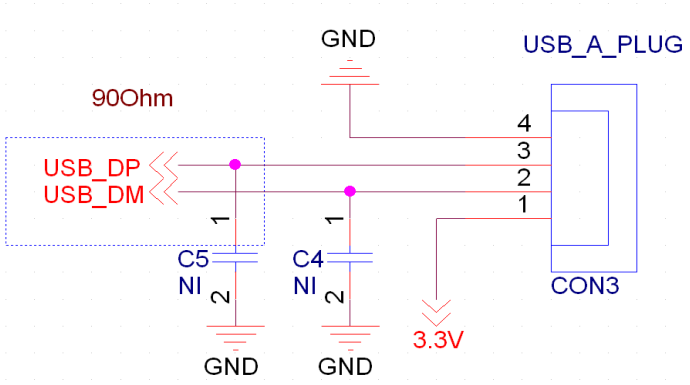


1. Above the dotted box part of the antenna matching is needed, the actual antenna matching electronic parameters shall prevail.

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

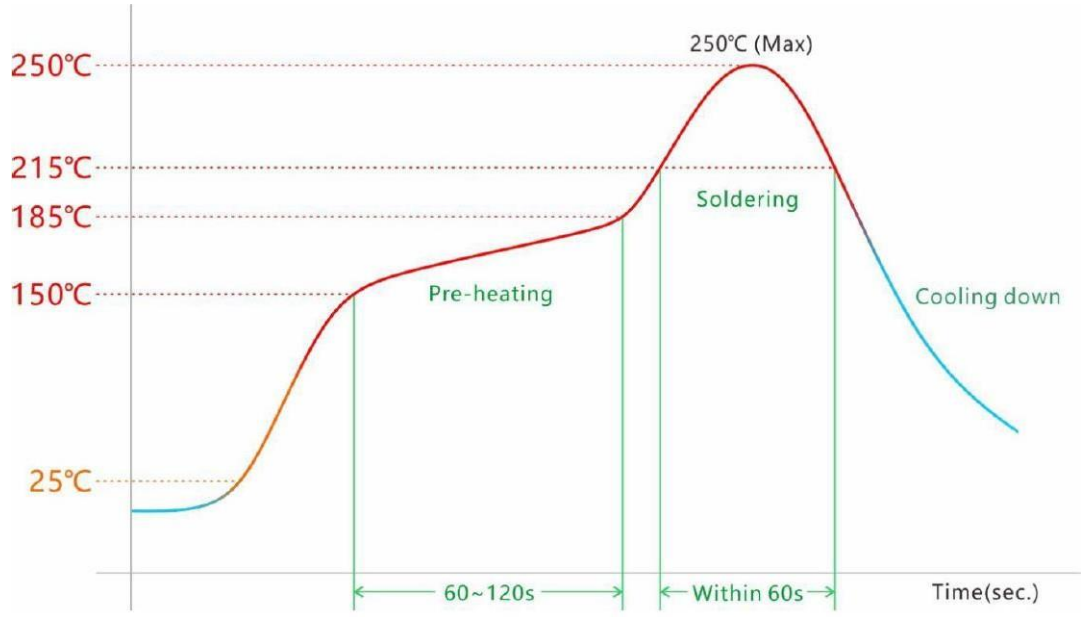
2.It is recommended to keep a power switch at the input end of the power supply. Each time the card is opened or closed, it can be used for power on and power off. WIFI can be reset, so that there will be no error phenomenon of not opening WIFI.

6 The Key Material List

No.	Parts	Specification	Manufacturer	Note
1	Chipset	MT7668U QFN76 9X9mm SMD P0.4	MTK Semiconductor Corp	
2	PCB	FTY-MT7668AU_V1.0	Shenzhen xiangyu circuit co., LTD	
3	PCB	FTY-MT7668AU_V1.0	Shenzhen Kexiang Precision Circuit Technology Co., LTD	
4	Crystal oscillator	2520/40MHZ/10PPM/12PF/-20to+85°C	hefei jing wei Electronics Co. Ltd.	
5	Crystal oscillator	2520/40MHZ/10PPM/12PF/-20to+85°C	ZhejiangLanjingxin Microelectronics Co., LTD	

7 Recommended Reflow Profile

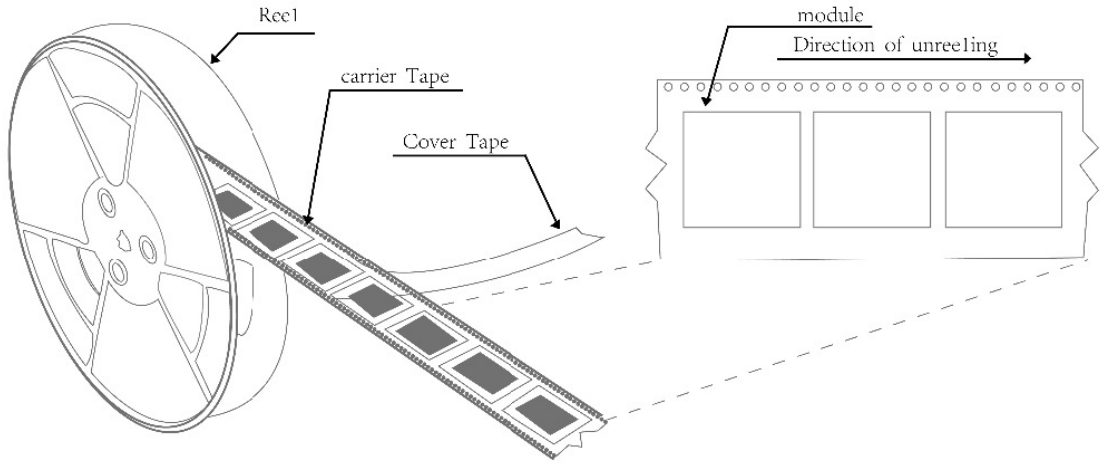
Referred to IPC/JEDEC standard.
Peak Temperature : <250° C
Number of Times : ≤2 times



8 Package Information

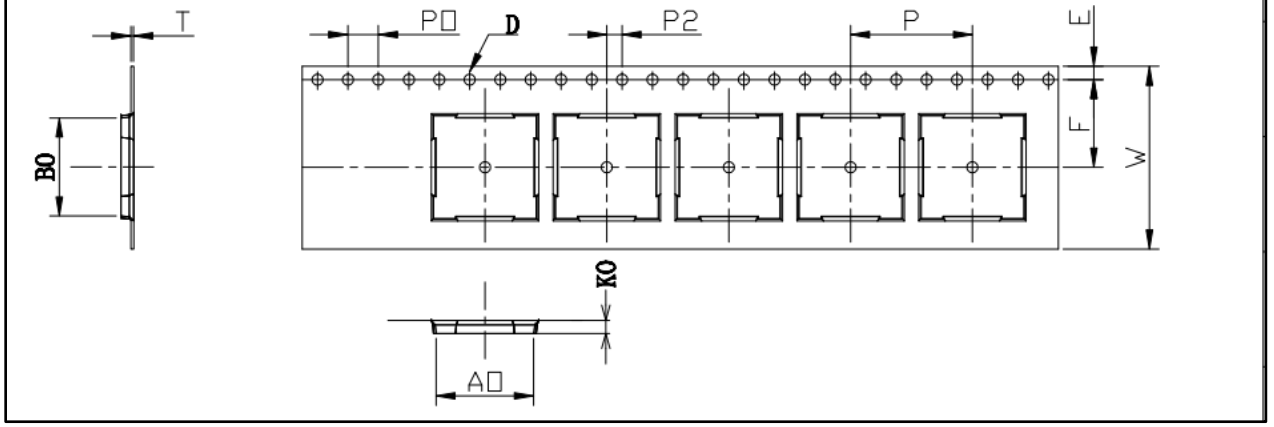
8.1 Reel

A roll of 1500pcs

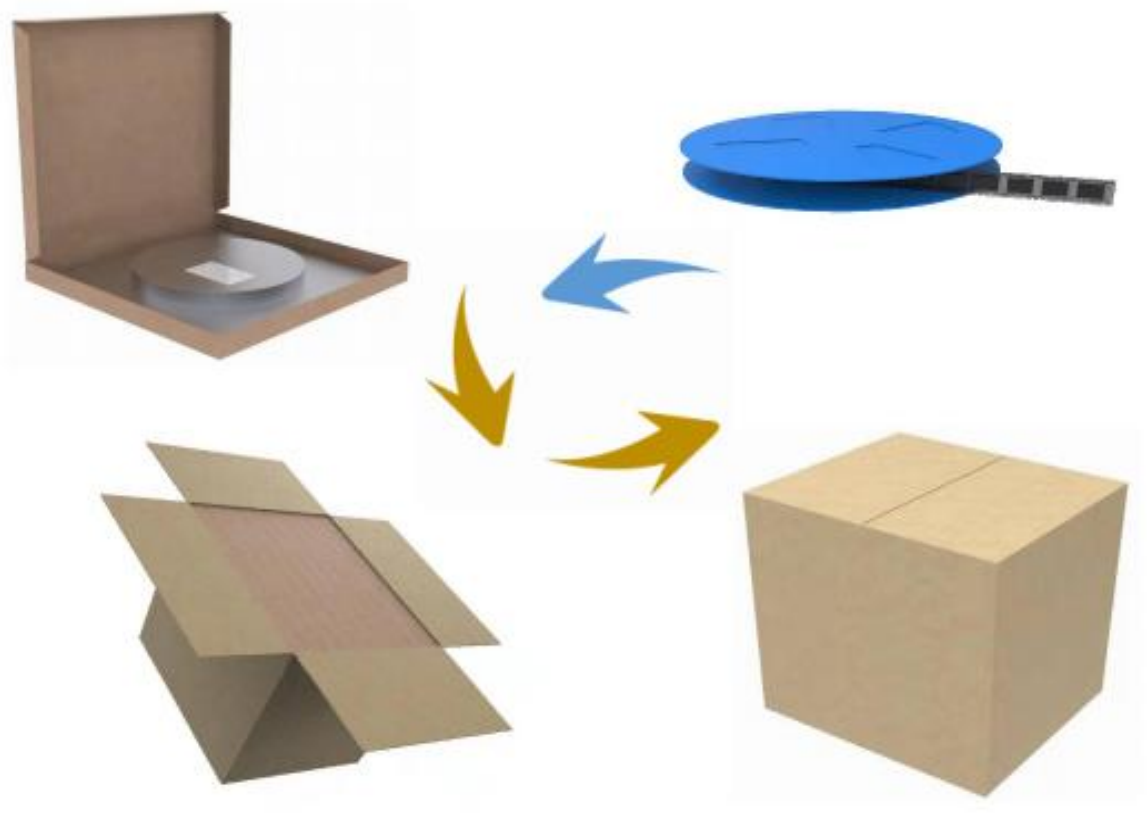


8.2 Carrier Tape Detail

ITEM	W	A0	B0	D	F	E	K0	P0	P2	P	T
DIM	24	12.47	12.47	1.50	11.5	1.75	1.90	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