目录 CONTENTS

Comchips

# KX6130
# Module Data sheet

目录 CONTENTS

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# Module Data sheet

**Website: www.comchips.com**

Customer Approval

| | |
|---|---|
| Company | |
| Title | |
| Signature | |
| Date | |
| FTY | |

目录 CONTENTS

# Version Update Record

| Version approval | Date | Revision Content | Editorialstaff |
|---|---|---|---|
| V1.0 | 2021/5/12 | The first version | |

# CONTENTS

目录 CONTENTS

# 1 Overview

## 1.1 Introduction

The KX6130 is a highly integrated single-chip 802.11n Wireless LAN (WLAN) network SDIO interface (SDIO 1.1/ 2.0/ 3.0 compliant) controller. It is a WLAN MAC, a 1T1R capable WLAN baseband, and WLAN RF in a single chip. The RTL8189ETV provides a complete solution for a high throughput performance integrated wireless LAN device.

The KX6130 WLAN Baseband implements Orthogonal Frequency Division Multiplexing (OFDM) with 1 transmit and 1 receive path and is compatible with the IEEE 802.11n specification.

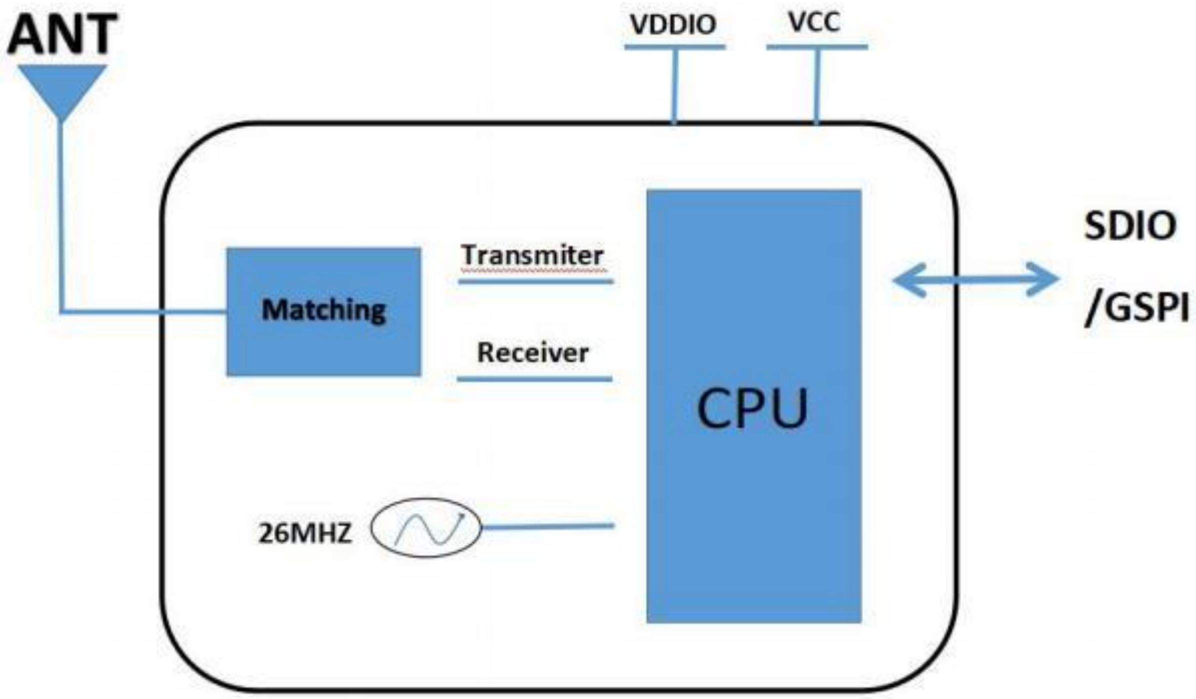
The KX6130 WLAN Controller supports fast receiver Automatic Gain Control (AGC) with synchronous and asynchronous control loops among antennas, antenna diversity functions, and adaptive transmit power control function to obtain the better performance in the analog portions of the transceiver.

The KX6130 provides simple legacy and 20MHz/40MHz co-existence mechanisms to ensure backward and network compatibility.

## 1.2 Features

- CMOS MAC, Baseband PHY, and RF in a single chip for IEEE 802.11b/g/n compatible WLAN
- Complete 802.11n solution for 2.4GHz band
- 72.2Mbps receive PHY rate and 72.2Mbps transmit PHY rate using 20MHz bandwidth
- 150Mbps receive PHY rate and 150Mbps transmit PHY rate using 40MHz bandwidth
- Complies with SDIO 1.1/ 2.0/ 3.0 for WLAN with clock rate up to 100MHz
- Frame aggregation for increased MAC efficiency (A-MSDU, A-MPDU)
- Low latency immediate High-Throughput Block Acknowledgement (HT-BA)
- Channel management and co-existence
- One Transmit and one Receive path (1T1R)
- 20MHz and 40MHz bandwidth transmission
- DSSS with DBPSK and DQPSK, CCK modulation with long and short preamble
- OFDM with BPSK, QPSK, 16QAM, and 64QAM modulation. Convolutional Coding Rate: 1/2, 2/3, 3/4,and 5/6
- Maximum data rate 54Mbps in 802.11g and 150Mbps in 802.11n

## 1.3 Block Diagra



## 1.4 General Specification

| | |
|---|---|
| Model Name | KX6130 |
| Product Description | Support WIFI:IEEE802.11 11b/g/n |
| Dimension | L x W x H: 12 x 12 x 1.6mm |
| Wi-Fi Interface | Support:GSPI/SDIO |
| 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 RoHS directive |

## 1.5 DC Characteristics

目 录 CONTENTS

(1) Power Supply Characteristics

| Symbol | Parameter | Minimum | Typical | Maximum | Units |
|---|---|---|---|---|---|
| VDD33 | 3.3V Power Supply Voltage | 3.0 | 3.3 | 3.6 | V |
| IDD33 | 3.3V Rating Current | / | / | 600 | mA |

# 2 RF Specifications

| Features | Description |
|---|---|
| WLAN Standard | WLAN 11b/g/n |
| Frequency Range | 2.400 ~ 2.483 GHz |
| Operating Channel | 11: (Ch. 1-11) – United States<br>13: (Ch. 1-13) – Europe<br>14: (Ch. 1-14) – Japan |
| Network Architecture | Ad-hoc mode (Peer-to-Peer )<br>Infrastructure mode<br>Scatter Net |
| Security | WPA,WPA-PSK,WPA2,WPA2-PSK,WEP64bit&128bit,IEEE802.11x, IEEE 802.11i |
| OS Support | Windows XP/Win7/Linux/Android |

2.4G Transmitter Specifications

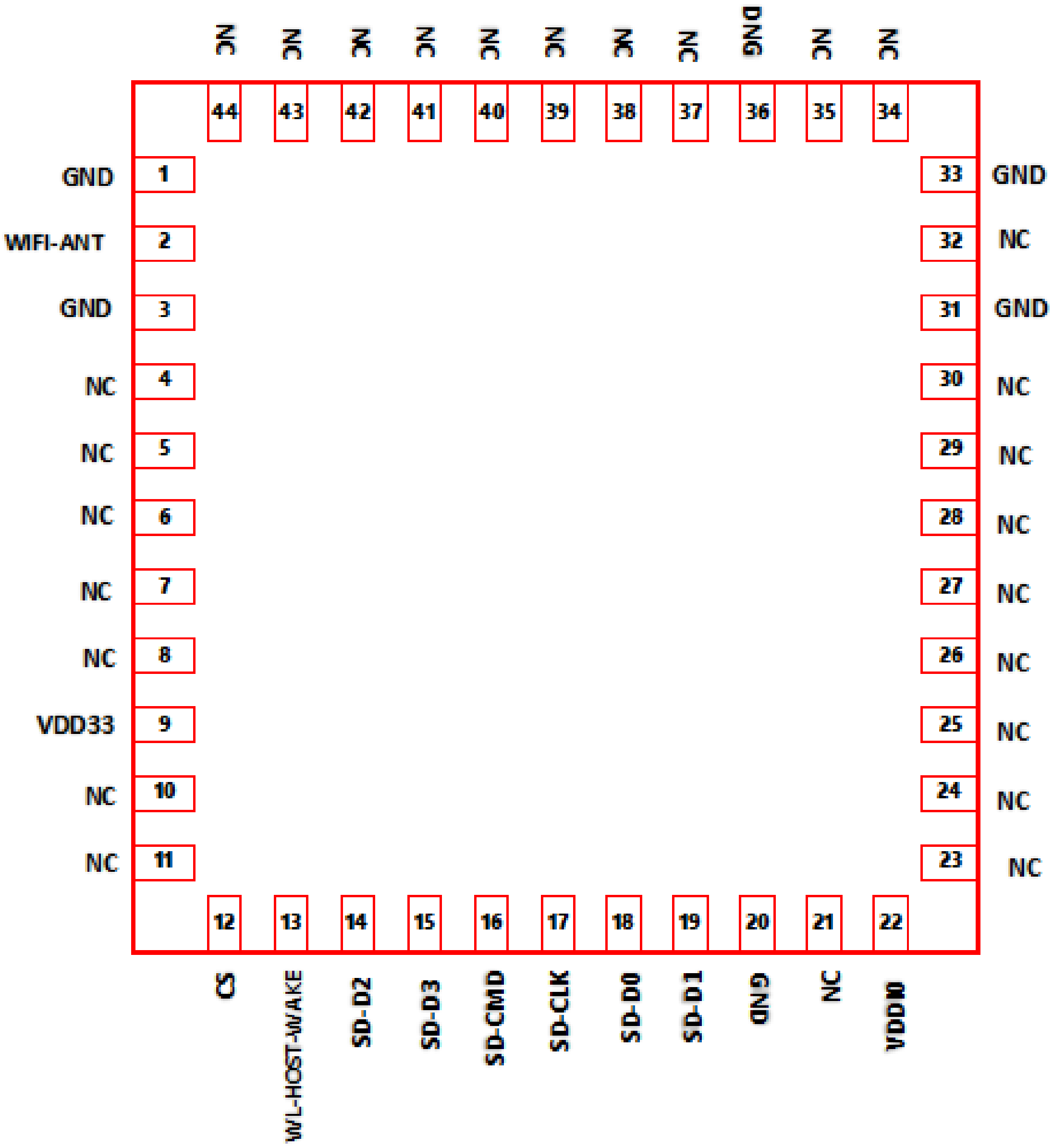
| **TX Rate** | **TX Power** | **TX Power Tolerance** | **EVM** |
|---|---|---|---|
| 802.11b @ 11 Mbps | 17dBm | ±2dBm | ≤-13dB |
| 802.11g@54Mbps | 14dBm | ±2dBm | ≤-25dB |
| 802.11n@HT20_MCS7 | 13dBrn | ±2dBm | ≤-28dB |
| 802.11n@HT40_MCS7 | 13dBrn | ±2dBm | ≤-28dB |

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@HT20_MCS7 | -66dBrn | -66dBrn | 10% |
| 802.11n@HT40_MCS7 | -65dBrn | -65dBrn | 10% |

# 3 Pin Assignments

## 3.1 Pin Outline



## 3.2 Pin Definition

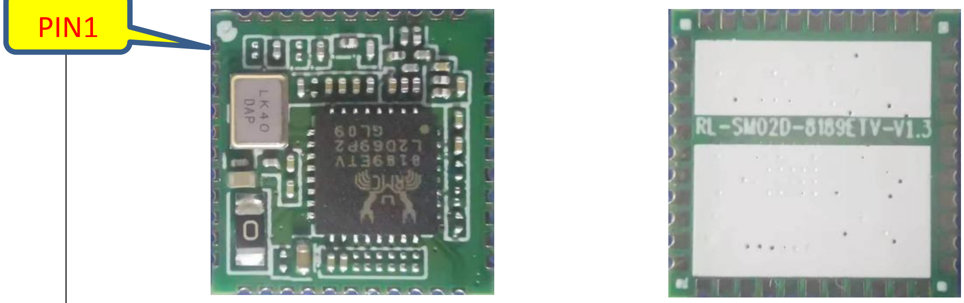
| Pin | Function | Description |
|---|---|---|
| 1 | GND | GND |
| 2 | WIFI_ANT | RF RX&TX Signal |
| 3 | GND | GND |
| 4-8 | NC | NC |
| 9 | VDD33 | Power supply for system（3.3V±0.3V） |
| 10-11 | NC | NC |
| 12 | CS | Chip select， Activity high； Internal pull high to 3.3V at 100KΩ |
| 13 | WL_HOST_WAKE | For WLAN wake-up HOST, Internal pull high to 3.3V at 100KΩ |
| 14 | SD_D2 | SDIO Data Line 2 |
| 15 | SD_D3 | SDIO Data Line 3 |
| 16 | SD_CMD | SDIO Command Input |
| 17 | SD_CLK | SDIO Clock Input |
| 18 | SD_D0 | SDIO Data Line 0 |
| 19 | SD_D1 | SDIO Data Line 1 |
| 20 | GND | GND |
| 21 | NC | NC |
| 22 | VDDIO | VDD for SDIO Pin, the power supply is same as the signal level of SDIO bus (3.3V ~ 1.8V) |
| 23-30 | NC | NC |
| 31 | GND | GND |
| 32 | NC | NC |
| 33 | GND | GND |
| 34-35 | NC | NC |
| 36 | GND | GND |
| 37-44 | NC | NC |

目录 CONTENTS

# 4 Dimensions

## 4.1Module Picture

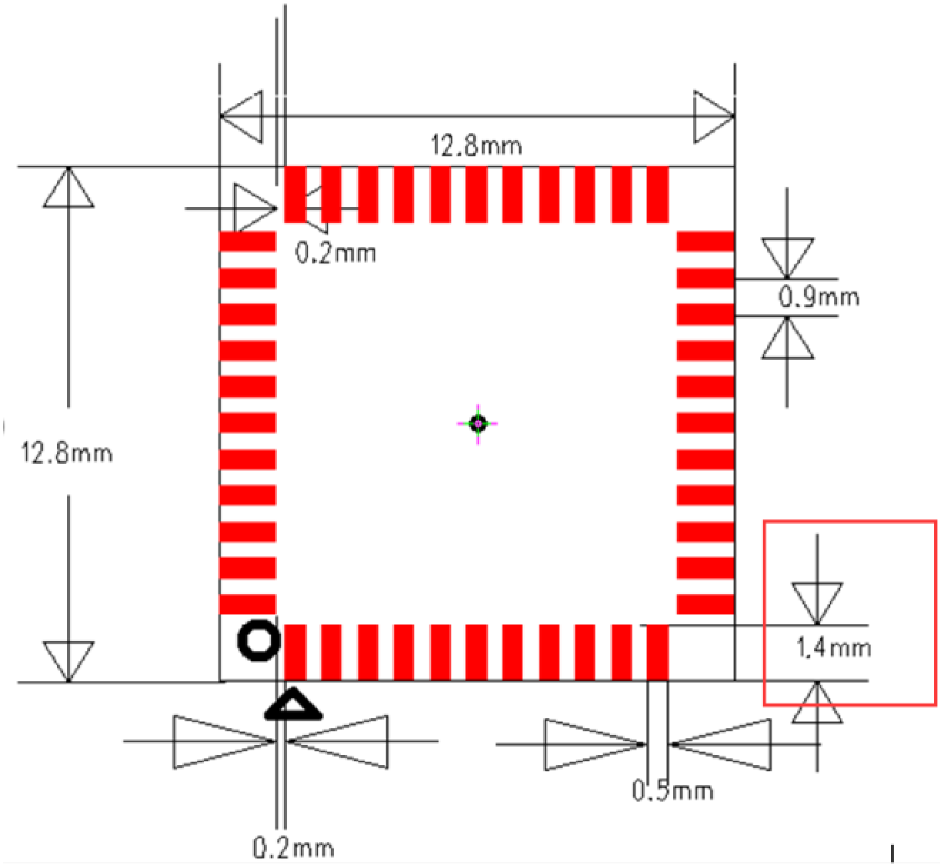
L x W：12 x 12.2 (±0.2) mm



## 4.2 Module Physical Dimensions

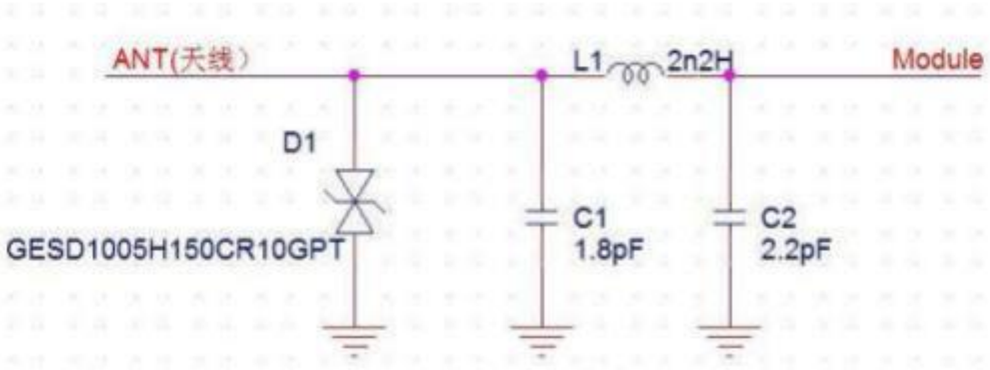
(Unit: mm)

< TOP VIEW >

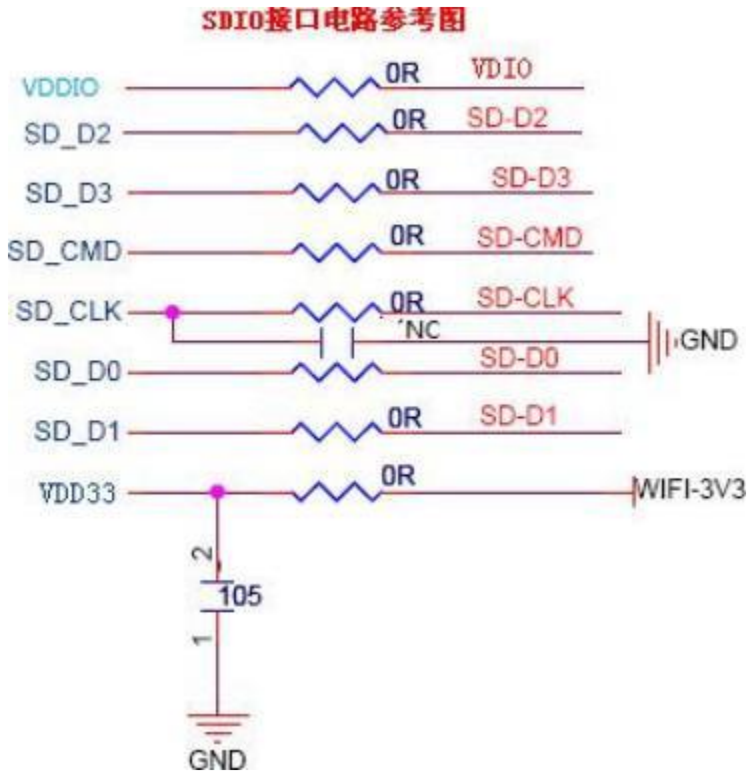


# 5 Reference Design

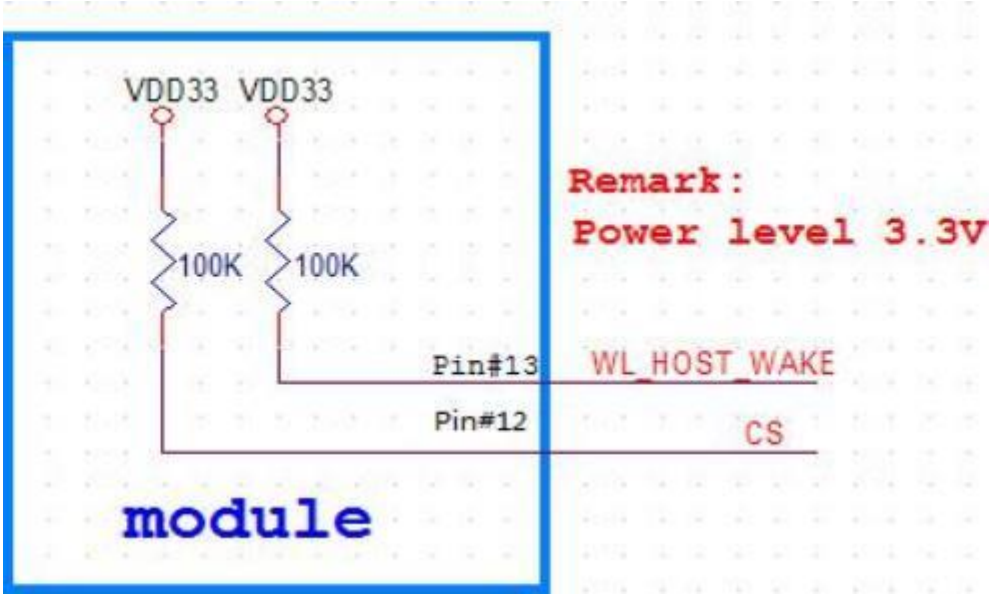
## 5.1 Circuit reference pictures



## 5.2 SDIO interface Circuit reference pictures



## 5.3 CS WAKE Reference circuits.



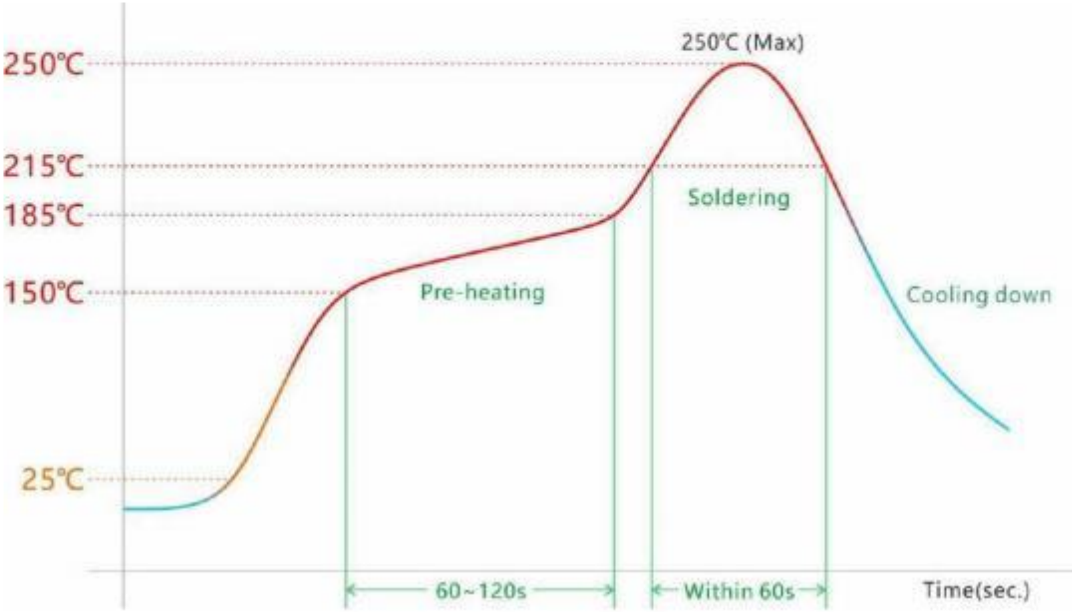
# 6 The Key Material List

| No. | Parts | Specification | Manufacturer | Note |
|---|---|---|---|---|
| 1 | Chipset | RL8189ETV | Realtek Semiconductor Corp | |
| 2 | PCB | FTY-8189ETV | Shenzhen xiangyu circuit co., LTD | |
| 3 | PCB | FTY-8189ETV | Shenzhen Kexiang Precision Circuit Technology Co., LTD | |
| 4 | Crystal oscillator | 40M000MHZ10PPM 15PF/32*25(蓝晶)-20+85℃ | Zhejiang Lan jing xin Microelectronics Co., LTD | |
| 5 | Crystal oscillator | 40M000MHZ10PPM 15PF/32*25 | hefei jing wei Electronics Co. Ltd. | |

目录 CONTENTS

# 7 Recommended Reflow Profile

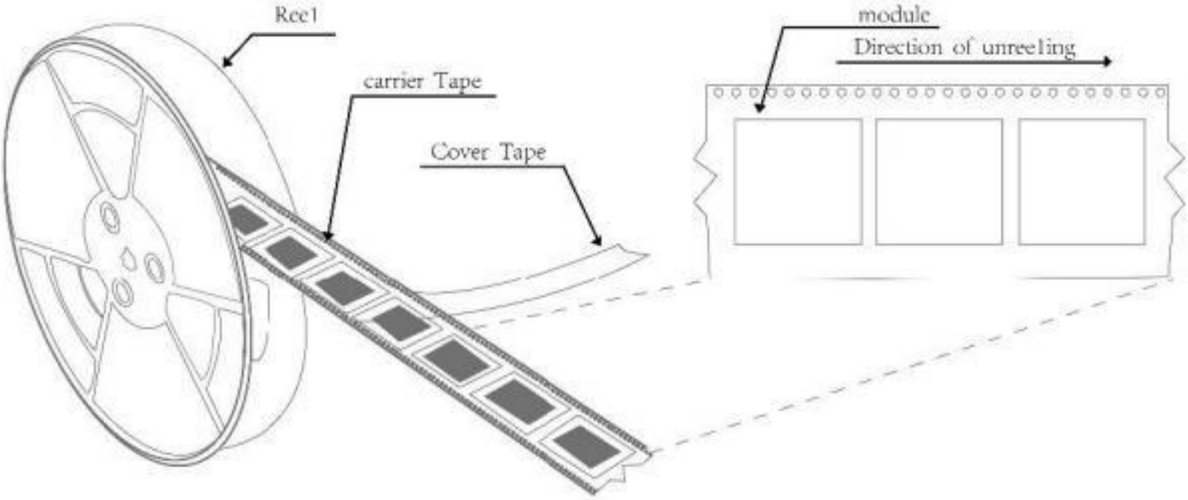
Referred to IPC/JEDEC standard.
Peak Temperature : <250° C
Number of Times : ≤2 times



# Package Information

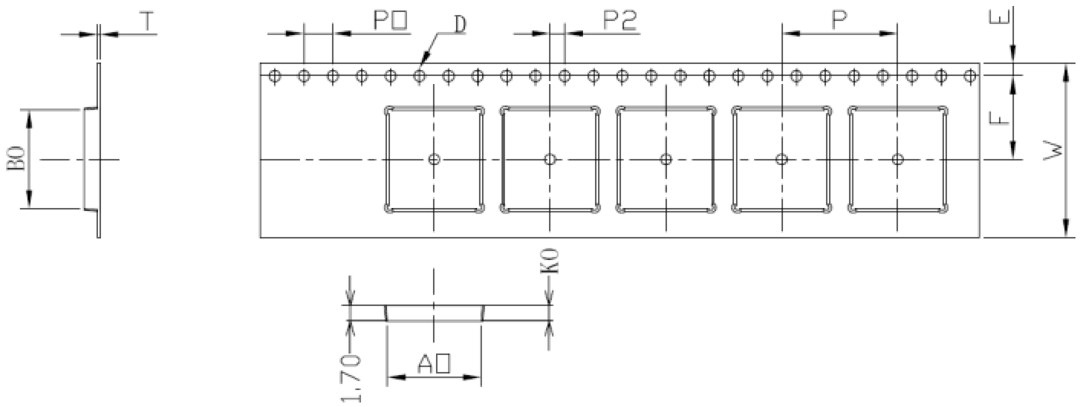
## 8.1Reel

A roll of 2000pcs

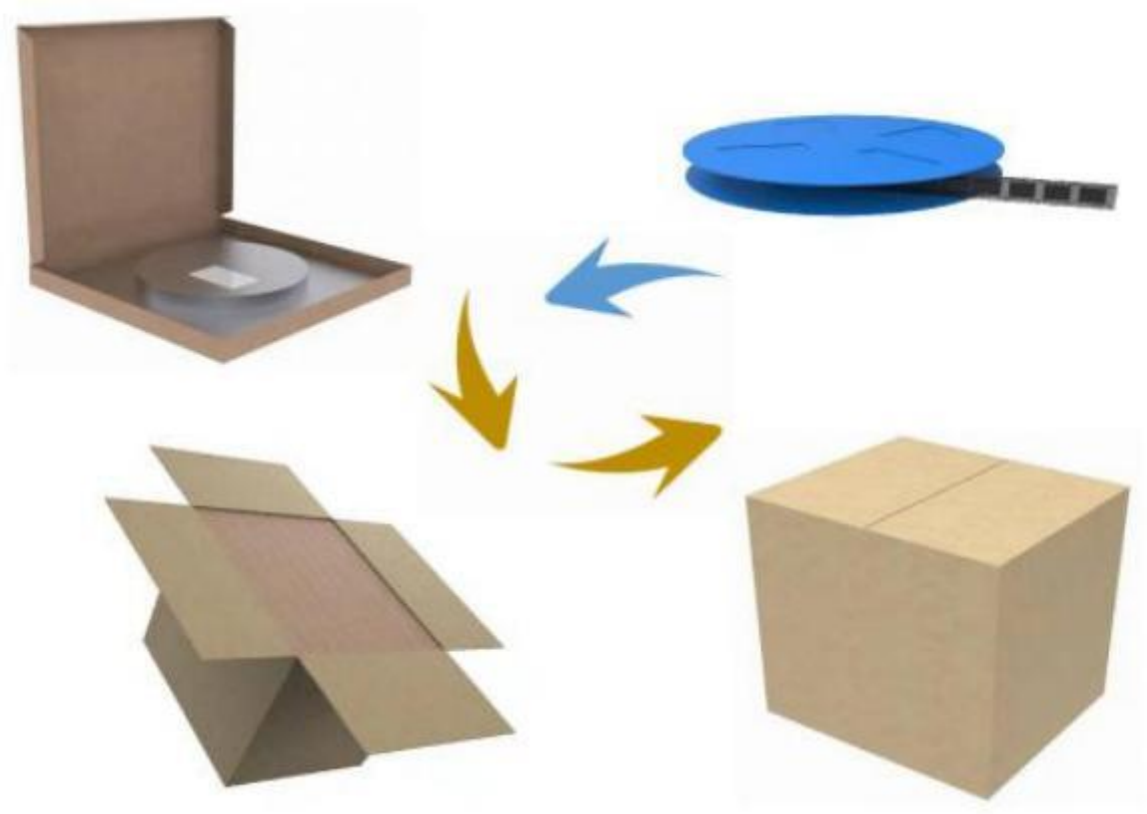


## 8.2 Carrier Tape Detail

| 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<br>-0.3 | ±0.15 | ±0.15 | +0.1<br>-0.0 | +0.1<br>-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