

FT1733BUV1 Module Datasheet

FTY 飞腾云



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Customer Approval

Company _____

Title _____

Signature _____

Date _____

FTY _____

Version Update Record

Version	Date	Revision Content	Editorial Staff	Approval
V1.0	2022/12/06	The first version		
V1.1	2022/12/06	FT1733BU-23UW5BA11D1 Product name update		
V1.2	2023/08/18	Photo Updates	SRC	JQL

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1 Overview

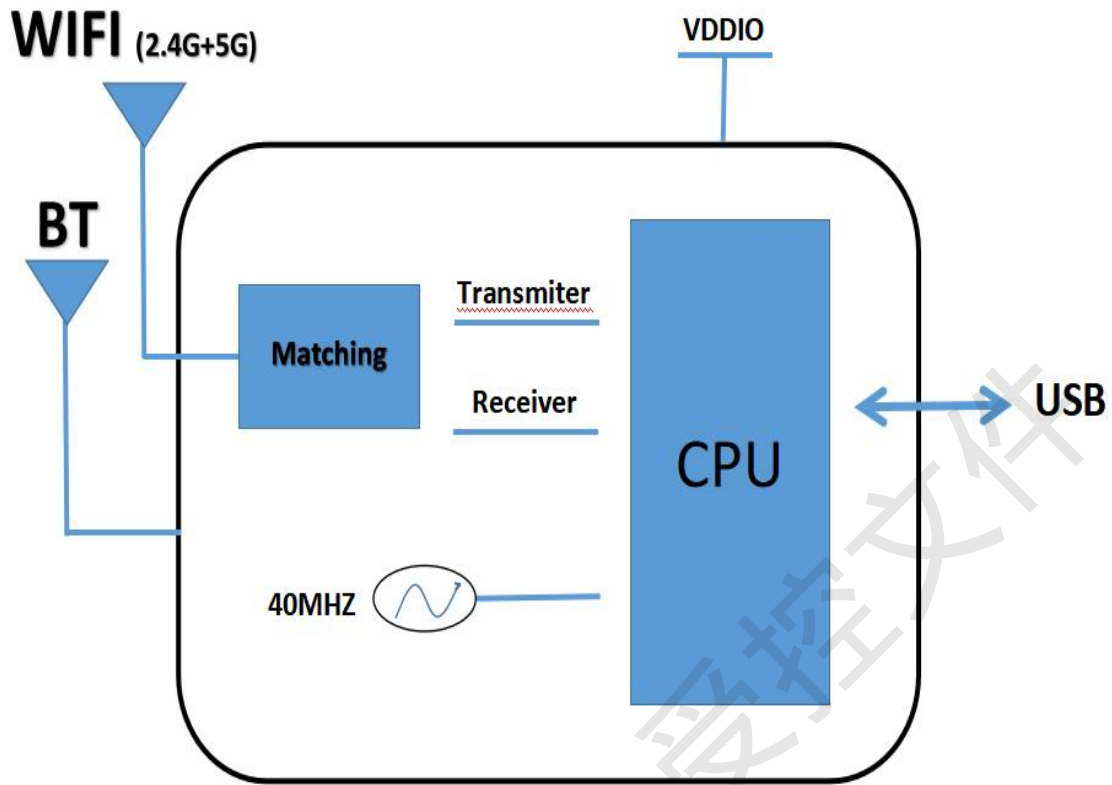
1.1 Introduction

FT1733BUV1 module support 802. 11a/b/g/n 1T1R WLAN, and an integrated Bluetooth 5.2 combo with USB 2.0 multi-function. It combines a WLAN MAC, a 1 T1R capable WLAN baseband, BT Protocol Stack (LM, LL, and LE), BT Baseband, modem, and WLAN/BT RF in a combo chip. The FT1733BUV1 provides a complete solution for a high-performance integrated wireless LAN and Bluetooth controller. The FT1733BUV1 WLAN baseband implements Orthogonal Frequency Division Multiplexing (OFDM) with 1transmit and 1receive 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 40 MHZ bandwidth.

1.2 Features

- Support 2.4G/5G WLAN
- IEEE 802.11a/b/g/n WLAN
- Compatible with Bluetooth v2.1+EDR and v5.2 Systems
- Supports Bluetooth 4.0 Low Energy (BLE)
- USB interface
- 150Mbps receive PHY rate and 150Mbps transmit PHY rate using 40MHz bandwidth
- Connect to external antenna through half hole

1.3 Block Diagram



1.4 General Specification

Model Name	FT1733BUV1
Product Description	WIFI4 and Bluetooth USB Module
Dimension	L x W x H: 12.2x12.9x1.6 (± 0.3) mm
Wi-Fi Interface	Support USB2.0
BT Interface	Support USB2.0
Operating Temperature	0°C to +70°C
Storage Temperature	-55°C to 125°C

1.5 DC Characteristics

Power Supply Characteristics

Symbol	Min.	Typ.	Max.	Unit
VCC33	3.15	3.3	3.45	V
VDDIO	1.7	1.8 or 3.3	3.45	V
Power Consumption	VCC33=3.3V(Unit:mA)			
	Wi-Fi on Mode	168		
	TX (2.4G HT20)	175		
	RX (2.4G HT20)	98		
	TX (2.4G HT40)	186		
	RX (2.4G HT40)	98		

2 RF Specifications

2.1 2.4GHz RF Specification

Features	Description		
WLAN Standard	802.11b/g/n		
Frequency Range	2.4~2.4835GHz (2.4GHz ISM Band)		
Number of Channel	WiFi 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	≤-70dBm		10%
802.11n@BW20_MCS7	≤-65dBm		10%
802.11n@BW40_MCS7	≤-65dBm		10%

2.2 5GHz RF Specification

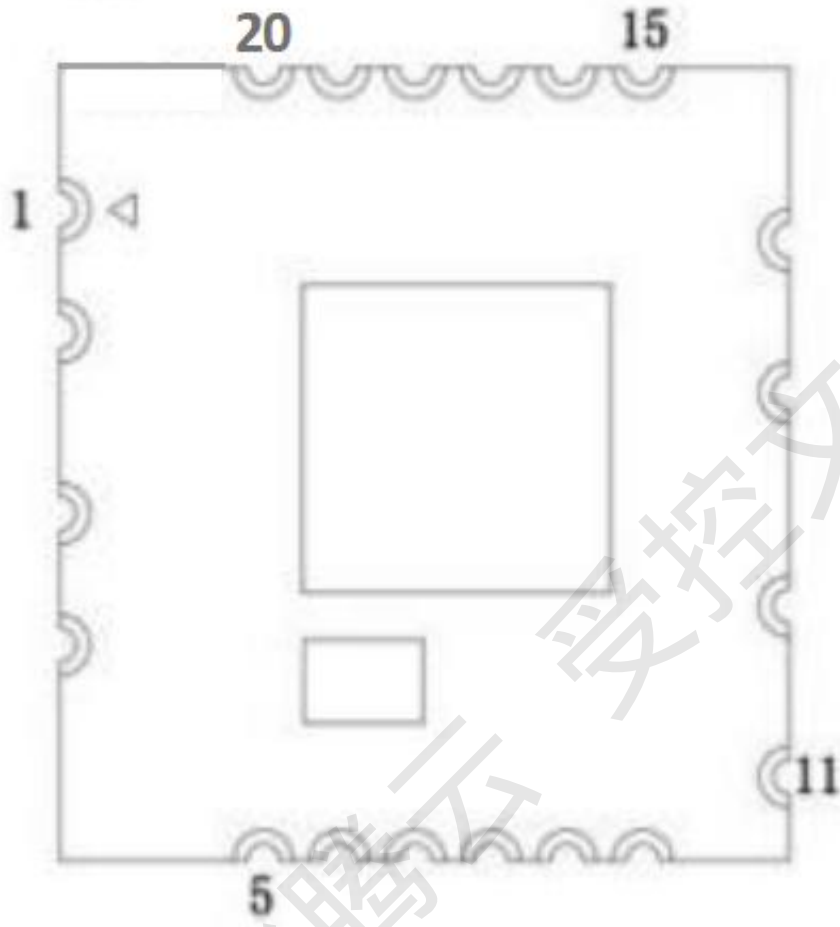
Features	Description		
WLAN Standard	IEEE802.11a/n		
Frequency Range	5.15GHz ~ 5.85GHz (5GHz ISM Band)		
5G Transmitter Specifications			
TX Rate	TX Power	TX Power Tolerance	EVM
802.11a@54 Mbps	13dBm	±2dBm	≤-25dB
802.11n@BW40_MCS7	12dBm	±2dBm	≤-28dB
5G Receiver Specifications			
RX Rate	Standard Value		PER
802.11a@54Mbps	≤-70dBm		<10%
802.11n@BW40_MCS7	≤-60dBm		< 10%

2.3 Bluetooth Section:

Feature	Description
General Specification	
Bluetooth Standard	Bluetooth 5.2
Host Interface	USB2.0
Frequency Band	2400~2483.5MHz
Number of Channels	79 channels
Modulation	GFSK, DPSK, DQPSK
RF Specification	
Power (BDR:GFSK/1Mbps)	0dBm~10dBm
Power(EDR:π /4-DQPSK/2Mbps)	0dBm~10dBm
Power(EDR:DPSK/3Mbps)	0dBm~10dBm
Power (LE:GFSK/ 1Mbps)	0dBm~10dBm
Power (LE:GFSK/ 2Mbps)	0dBm~10dBm
Sensitivity@BER=0.1%for(BDR:GFSK/1Mbps)	-91 dBm
Sensitivity@BER=0.1%for(EDR:π/4-DQPSK/2Mbps)	-88 dBm
Sensitivity@BER=0.1%for(EDR:DPSK/3Mbps)	-85 dBm
Sensitivity@BER=30.8%for(BLE:GFSK/ 1Mbps)	-91 dBm
Sensitivity@BER=30.8%for(BLE:GFSK/ 2Mbps)	-90 dBm
Carrier frequency drift	BDR:GFSK/1Mbps:±75KHZ
	EDF:π /4-DQPSK/2Mbps:±75KHZ
	EDR:DPSK/3Mbps:±75KHZ
	BLE:GFSK/ 1Mbps:±75KHZ
	BLE:GFSK/ 2Mbps:±75KHZ

3 Pin Assignments

3.1 Pin Outline



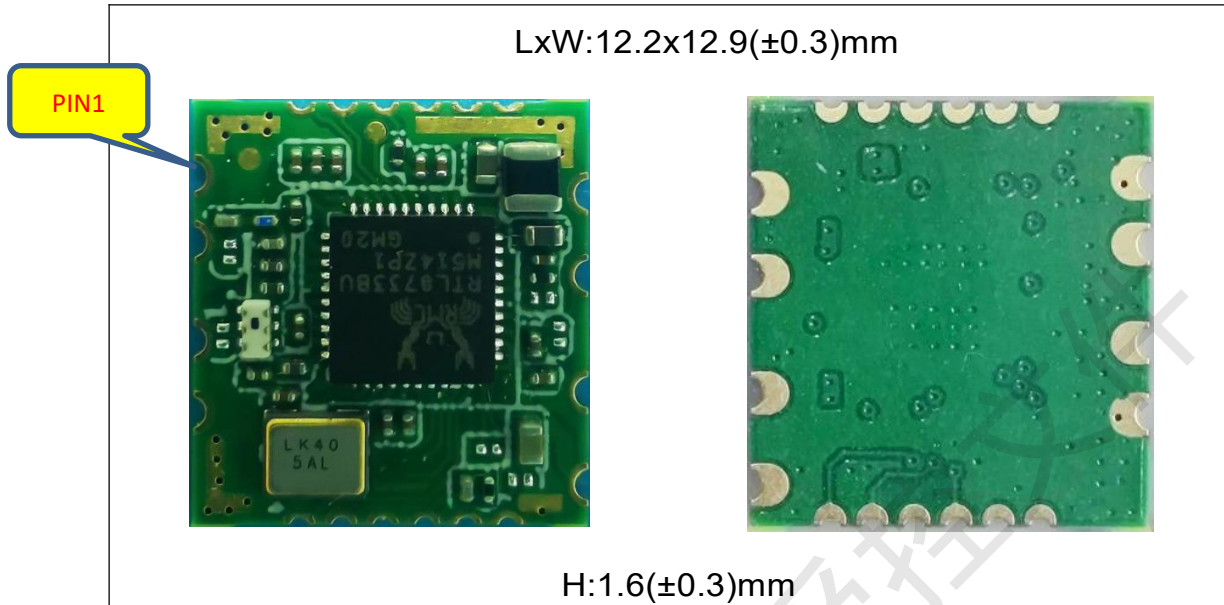
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3.2 Pin Definition

NO	Name	Type	Description	Voltage
1	GND	—	Ground	
2	ANT0	RF	BT ANT	
3	ANT1	RF	2G/5G WIFI ANT	
4	GND	—	Ground	
5	GPIO0	I/O	TEST_MODE_SEL	
6	GPIO1	I/O	SPS_LDO_SEL	
7	GPIO2	I/O	EEPROM_SEL	
8	GPIO3	I/O	General Purpose Input/Output Pin	
9	BT_WAKE_HST	—	General Purpose Input/Output Pin	
10	HST_WAKE_BT	—	General Purpose Input/Output Pin	
11	VBAT	P	VCC 3.3V	VCC
12	HSDM	I/O	High-Speed USB D- Signal	
13	HSDP	I/O	High-Speed USB D+ Signal	
14	GND	P	Ground	
15	NC	—	No connection(floating)	
16	NC	—	No connection(floating)	
17	NC	—	No connection(floating)	
18	CHIP_EN	I	This PIN can externally shut down module (active low, internal pull high)	VDDIO
19	HST_WAKE_WL	I/O	GPIO7 (Host wake up WIFI, input signal control by software)	
20	WL_WAKE_HST	I/O	GPIO6 (WIFI to wake up host, output signal control by software)	

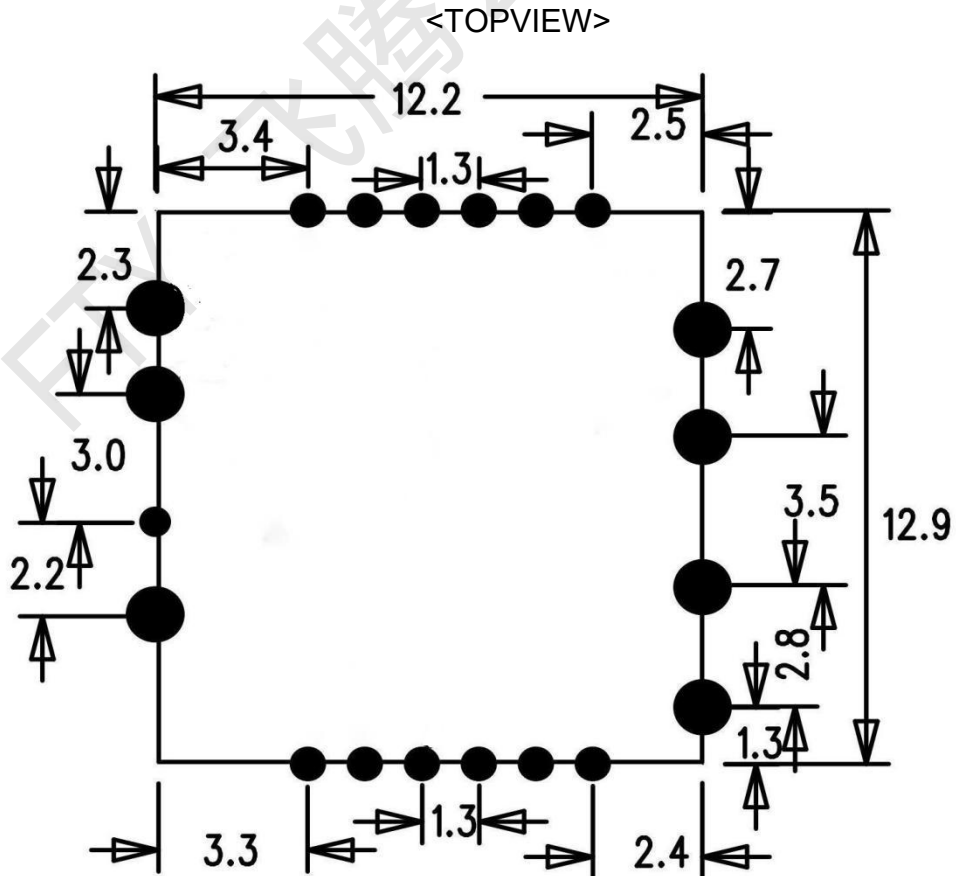
4 Dimensions

4.1 Module Picture

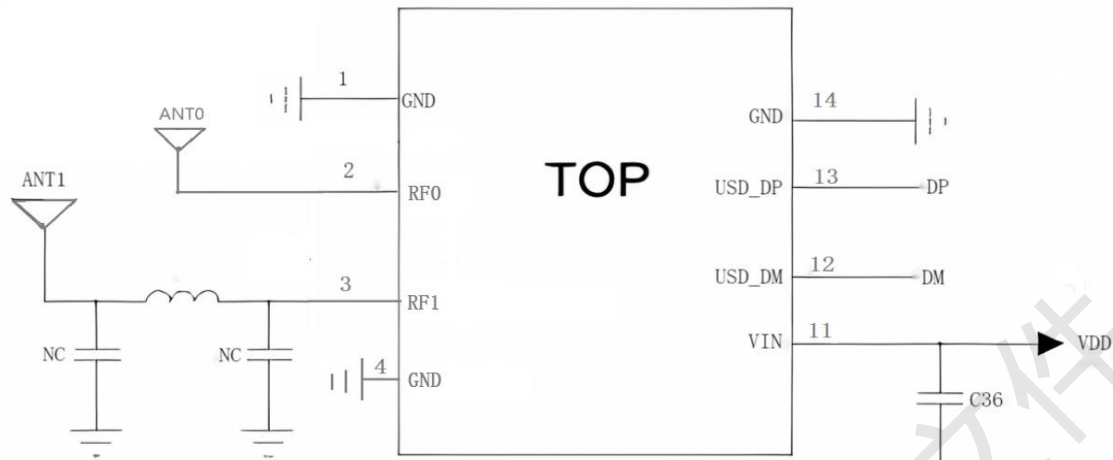


4.2 Module Physical Dimensions

(Unit: mm)



5 Reference Design



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6 The Key Material List

No.	Parts	Specification	Manufacturer	Note
1	Chipset	RTL8733BU-CG	Realtek Semiconductor Corp	
2	PCB	FT1733BU-23	Shenzhen Fuzhixiang Electronics Co., Ltd	
3	PCB	FT1733BU-23	Shenzhen Kexiang Precision Circuit Technology Co., Ltd	
4	Crystal oscillator	3225 40MHZ 12PF +/-10PPM -20~+85 度	Hefei Jing Wei Te Electronics Co. Ltd	
5	Crystal oscillator	3225 40MHZ 12PF +/-10PPM -20~+85 度	Zhejiang Lanjing Micro electronics Co., Ltd	
6	duplexer	1.6×0.8mm 6P 2.4GHz/5GHz RFDIP160806BLM6T25 华新科	Shenzhen gangxinda Electronic Technology Co., Ltd	
7	duplexer	1.6×0.8mm 6P 2.4GHz/5GHz -40_+85° FLT18D254959D-3266C 飞特尔科技	Shenzhen Feiteer Technology Co., Ltd	

7 Recommended Reflow Profile

Constant temperature and reflow soldering

The heating/reflow phase generates liquid phase temperatures above 216-221°C. Sudden temperature increases need to be prevented as they increase the risk of solder paste collapse.

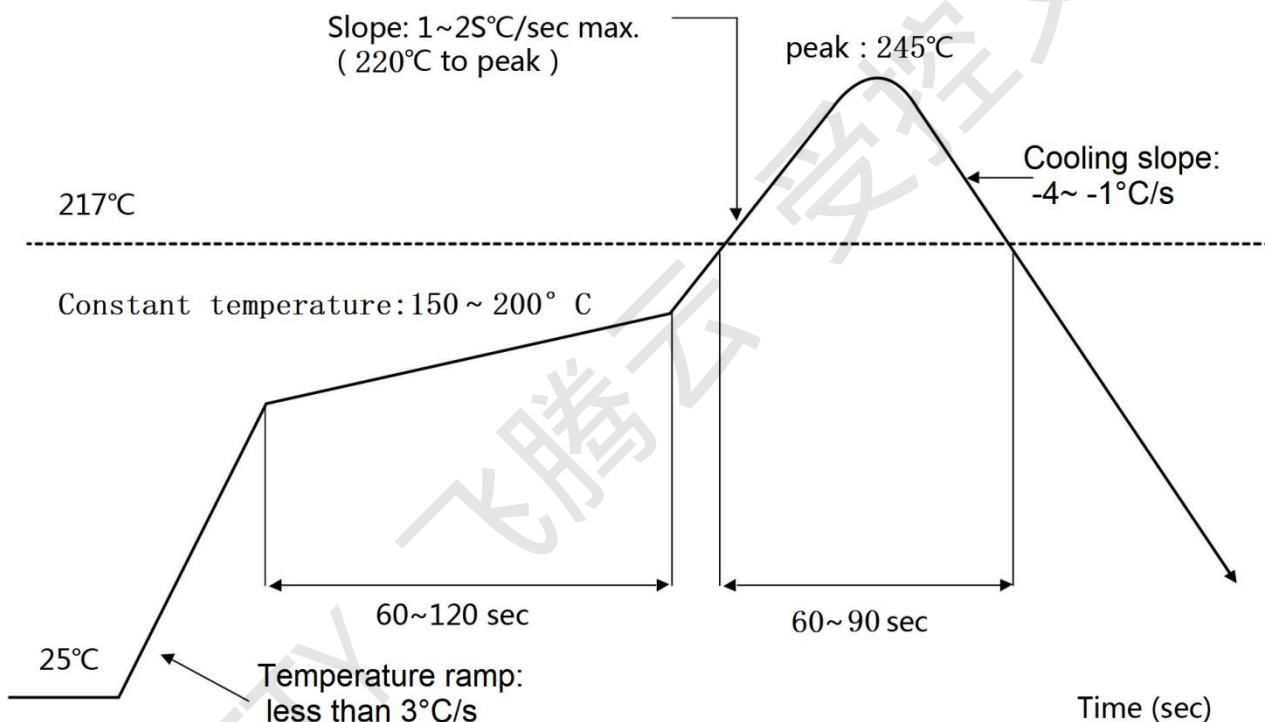
Liquid phase temperature time above 220°C: 60-90 seconds.

Peak reflow temperature: 235~245°C.

Constant temperature time (170~220°C): 60~120 seconds.

Temperature ramp: less than 3°C/s.

Cooling slope: -4~ -1°C/s.



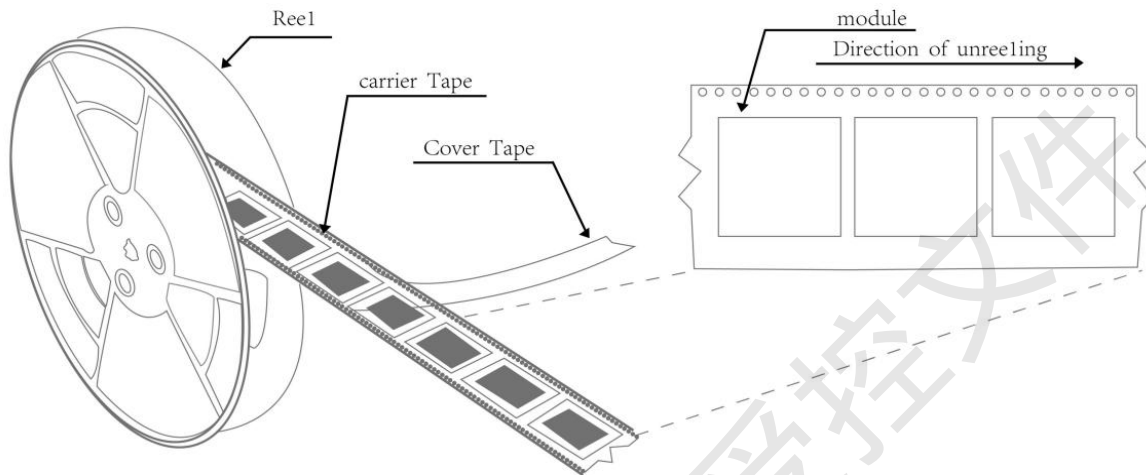
Notes:

The actual soldering temperature depends on other external factors such as the solder paste selected, the size and thickness of the substrate and the board design. If the maximum soldering temperature in the recommended soldering profile is exceeded, there is a risk of permanent damage to the module.

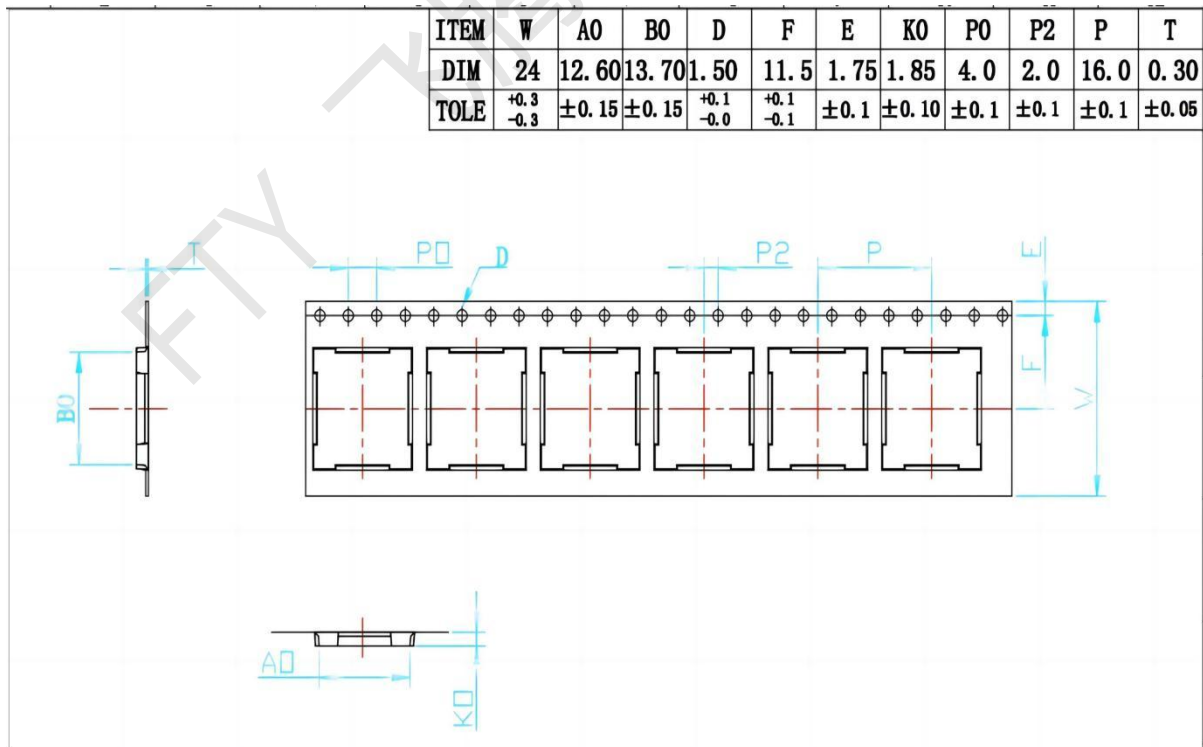
8 Package Information

8.1 Reel

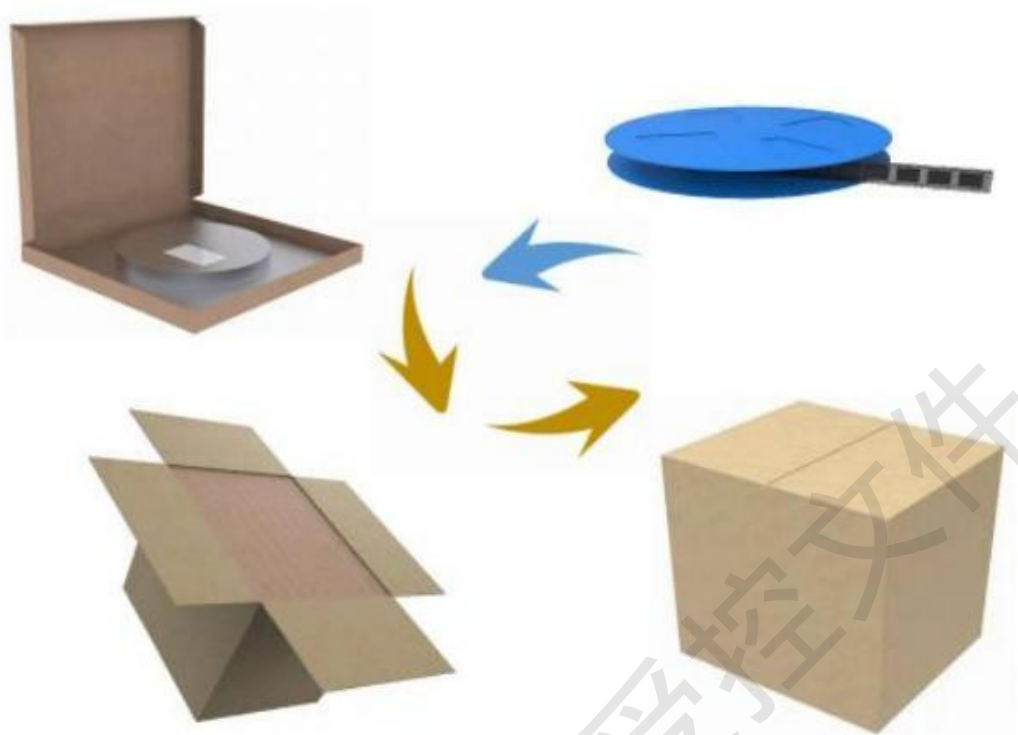
A roll of 2000pcs



8.2 Carrier Tape Detail



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-020B, 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 $<40^{\circ}\text{C}$ 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

d) "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