

# N200E-UU

**Wi-Fi single-band 1X1 11ax +BT5.0**

**Combo Module Datasheet**



## N200E-UU Module Datasheet

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	_____	Title
	_____	Signature
	_____	Date
	_____	Fn-Link

## Revision History

Version	Date	Revision Content	Draft	Approved
1.0	2021/07/29	First release	LXY	QJP
1.1	2021/08/19	Update module photo	LXY	QJP
1.2	2021/09/27	Update 11b power to 20dbm	LXY	QJP

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# 1 Overview

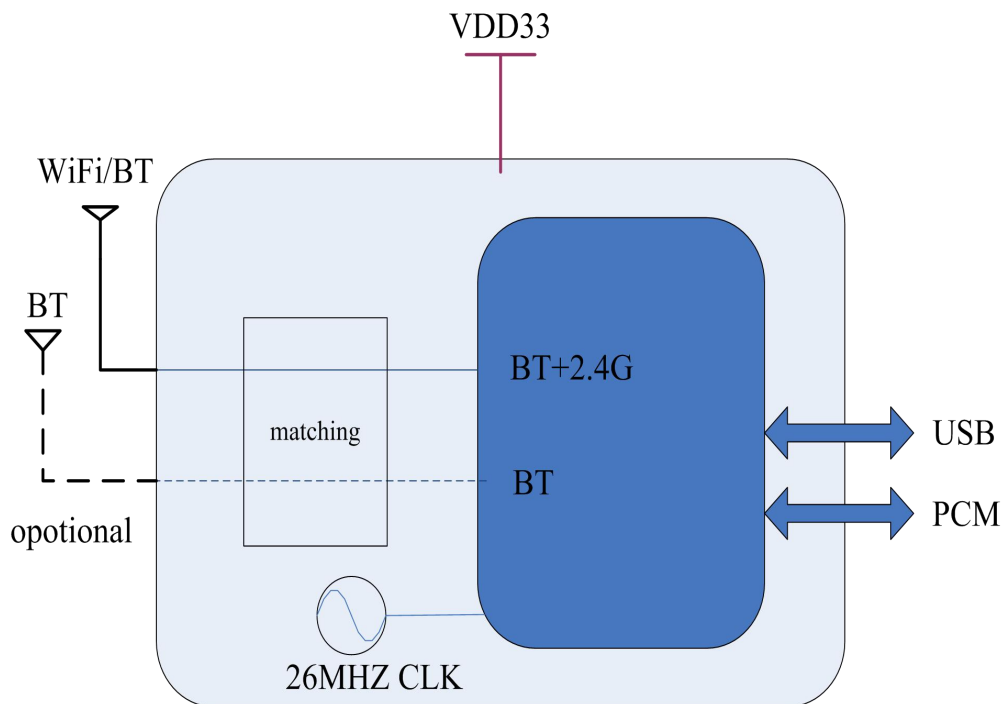
## 1.1 Introduction

N200E-UU is a low-cost and low-power consumption module which has Wi-Fi 6 (2.4G 802.11b/g/n/ac/ax) and Bluetooth 5.0 functionalities. Its WLAN function supports the USB 2.0 interface, and BT function supports the PCM interface. The module provides simple legacy and 20MHz/40MHz co-existence mechanism to ensure backward and network compatibility. The wireless module complies with IEEE 802.11 b/g/n/ac/ax standard and the PHY rate can achieve up to 229Mbps.

## 1.2 Features

- Compliant with IEEE 802.11b/g/n/ac/ax
- Up to 229Mbps PHY rate using 40MHz bandwidth
- Wi-Fi Security WEP / WPA / WPA2/WPA3-SAE Personal, MFP
- Support STA, SoftAP, Wi-Fi Direct modes concurrently
- Support STBC, beamforming
- Support Wi-Fi 6 TWT
- Support USB2.0, PCM
- Supports WLAN-Bluetooth coexistence

### Block Diagram:



### 1.3 General Specification

Model Name	N200E-UU
Product Description	Support Wi-Fi/BT functionalities
Dimension	L x W x H: 13 x 12.2 x1.7 mm
Wi-Fi Interface	USB 2.0
BT Interface	USB 2.0
Operating temperature	-20°C to 80°C
Storage temperature	-55°C to 85°C
RoHS	All hardware components are fully compliant with EU RoHS directive

## 1.4 Recommended Operating Rating

	Min.	Typ.	Max.	Unit
Operating Temperature	-20	25	80	deg.C
VCC33	3.15	3.3	3.45	V

## 1.5 Power consumption

	Test condition: VBAT=3.3V	
	Current @ TX	Current @ RX
	Max. (mA)	Max. (mA)
11b@20dbm	226.6	49.05
11g@18dbm	173.5	49.06
HT20-mcs7@16dbm	148.9	49.04
HT40-mcs7@16dbm	13.9.2	49.2
VHT20-mcs8@16dbm	161.6	49.1
VHT40-mcs9@16dbm	151.8	49.1
HE20-mcs9@16dbm	147.1	49.2
HE40-mcs9@16dbm	140.8	49.1
HE20-mcs11@14dbm	138.1	/
HE40-mcs11@14dbm	137.5	/
BT	32.6	39.1

## ※1.6 EEPROM Information

Wi-Fi

Vendor ID	TBD
Product ID	

## 2 Wi-Fi RF Specification

### 2.1 2.4GHz RF Specification

Feature	Description
WLAN Standard	IEEE 802.11b/g/n/ac/ax, Wi-Fi compliant
Frequency Range	2.400 GHz ~ 2.4835 GHz (2.4 GHz ISM Band)
Number of Channels	2.4GHz : Ch1 ~ Ch14

Output Power <sup>1</sup>	802.11b /11M : 20 dBm ± 2 dB @ EVM ≤ -9dB	
	802.11g /54M : 14 dBm ± 2 dB @ EVM ≤ -26dB	
	802.11n /MCS7 : 14 dBm ± 2 dB @ EVM ≤ -28dB	
	802.11ac /MCS9: 14 dBm ± 2 dB @ EVM ≤ -32dB	
	802.11ax /MCS9: 14 dBm ± 2 dB @ EVM ≤ -32dB	
	802.11ax /MCS11: 14 dBm ± 2 dB @ EVM ≤ -35dB	
	Tx power control by driver userconfig file.Power index setting as below: [0] =8 (ofdm1lowrate) [1] =8 (ofdm64qam) [2] =8 (ofdm256qam) [3] =8 (ofdm1024qam) [4] =9 (dsss) recommanded DSSS level setting to 8 for certification. MCS10,MCS11 only TX,not support RX.	
Spectrum Mask	Meet with IEEE standard	
Freq. Tolerance	±20 ppm	
<b>Items</b>	<b>Typical Value</b>	<b>Standard</b>
Receive Sensitivity (11b) @8% PER	- 1Mbps PER @ -92 dBm, typical	≤-85
	- 11Mbps PER @ -86 dBm, typical	≤-76
Receive Sensitivity (11g) @10% PER	- 6Mbps PER @ -89 dBm, typical	≤-85
	- 54Mbps PER @ -73 dBm, typical	≤-68
Receive Sensitivity (11n,20MHz) @10% PER	- MCS=0 PER @ -89 dBm, typical	≤-85
	- MCS=7 PER @ -71 dBm, typical	≤-67



Receive Sensitivity (11n,40MHz) @10% PER	- MCS=0 PER @ -87 dBm, typical	≤-82
	- MCS=7 PER @ -67 dBm, typical	≤-64
Receive Sensitivity (11ac,20MHz) @10% PER	- MCS=0 PER @ -85 dBm, typical	≤-81
	- MCS=8 PER @ -68 dBm, typical	≤-59
Receive Sensitivity (11ac,40MHz) @10% PER	- MCS=0 PER @ -83 dBm, typical	≤-79
	- MCS=9 PER @ -64 dBm, typical	≤-54
Receive Sensitivity (11ax,20MHz) @10% PER	- MCS=0 PER @ -82 dBm, typical	≤-78
	- MCS=9 PER @ -68 dBm, typical	≤-57
Receive Sensitivity (11ax,40MHz) @10% PER	- MCS=0 PER @ -81 dBm, typical	≤-78
	- MCS=9 PER @ -65 dBm, typical	≤-54
Maximum input level	802.11b: -10 dBm 802.11g/n: -20 dBm 802.11ac: -20 dBm 802.11ax: -20 dBm	
Antenna Reference	Small antennas with 0~2 dBi peak gain	

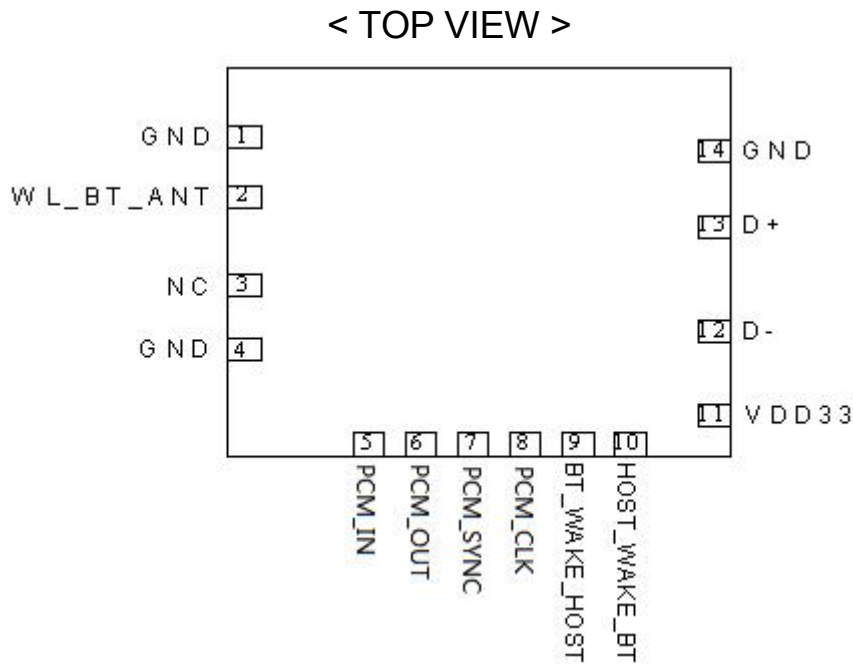
## 3 Bluetooth Specification

### 3.1 Bluetooth Specification

Feature	Description		
<b>General Specification</b>			
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	GFSK, $\pi/4$ -DQPSK, 8DPSK		
<b>RF Specification</b>			
	<b>Min.</b>	<b>Typical.</b>	<b>Max.</b>
Output Power (BT combo)	5dBm	13dBm	16dBm
Output Power (BT only)	-3dBm	5dBm	8dBm
Sensitivity @ BER=0.1% for GFSK (1Mbps)		-88 dBm	
Sensitivity @ BER=0.01% for $\pi/4$ -DQPSK (2Mbps)		-85 dBm	
Sensitivity @ BER=0.01% for 8DPSK (3Mbps)		-81 dBm	
Maximum Input Level	GFSK (1Mbps):-20dBm		
	$\pi/4$ -DQPSK (2Mbps) :-20dBm		
	8DPSK (3Mbps) :-20dBm		

## 4 Pin Assignments

### 4.1 Pin Outline



### 4.2 Pin Definition

NO	Name	Type	Description	Voltage
1	GND	-	Ground connections	
2	WL_BT_ANT	I/O	2.4G Wi-Fi & BT ANT	
3	NC	-	Floating (Don't connected to ground)	
4	GND	-	Ground connections	
5	PCM_IN	I	PCM_IN	3.3V
6	PCM_OUT	O	PCM_OUT	3.3V
7	PCM_SYNC	I/O	PCM_SYNC	3.3V
8	PCM_CLK	I/O	PCM_CLK	3.3V
9	BT_WAKE_HOST	O	Bluetooth device to wake-up HOST	3.3V
10	HOST_WAKE_BT	I	HOST to wake-up Bluetooth device	3.3V
11	VDD33	P	3.3V input	3.3V

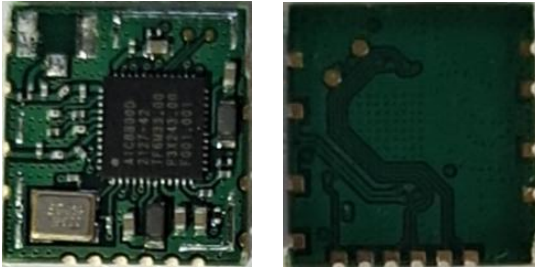
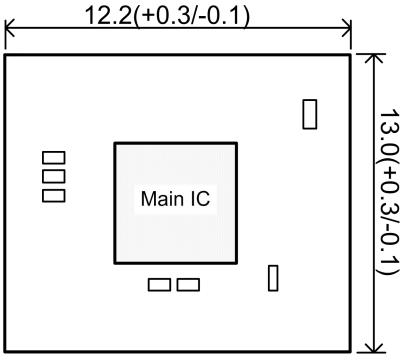
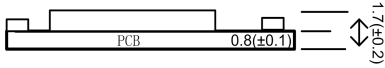
12	D-	I/O	USB DATA -	
13	D+	I/O	USB DATA +	
14	GND	-	Ground connections	

P:POWER I:INPUT O:OUTPUT

## 5 Dimensions

### 5.1 Physical Dimensions and Module Photo

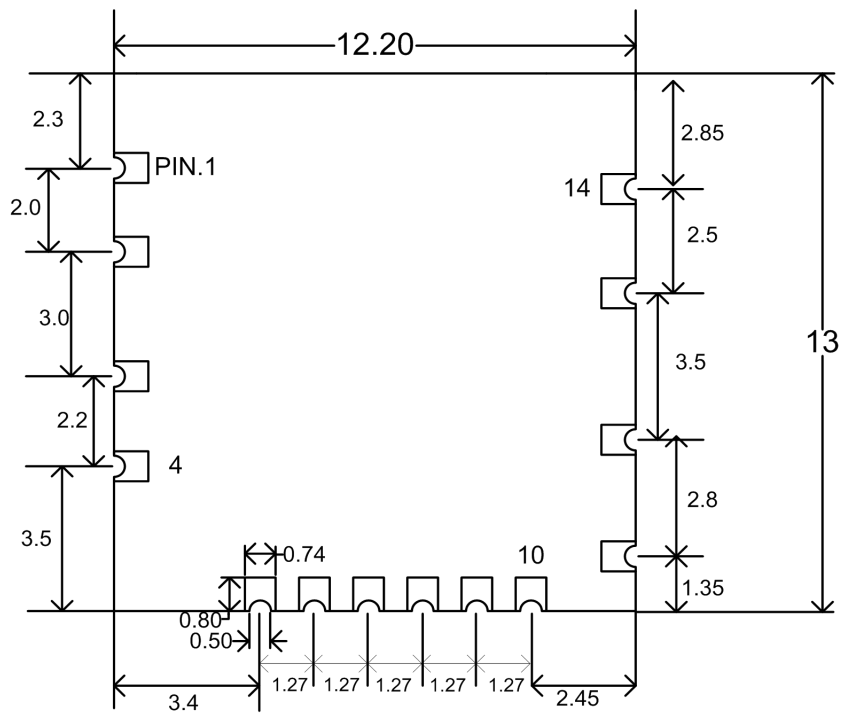
(Unit: mm)

<p>L x W : 13 x 12.2</p> 	<p>&lt; TOP VIEW &gt;</p> 
<p>H: 1.7</p>	<p>&lt; Side View &gt;</p> 
<p>Weight</p>	<p>0.47g</p>

### 5.2 Module Physical Dimensions

(Unit: mm)

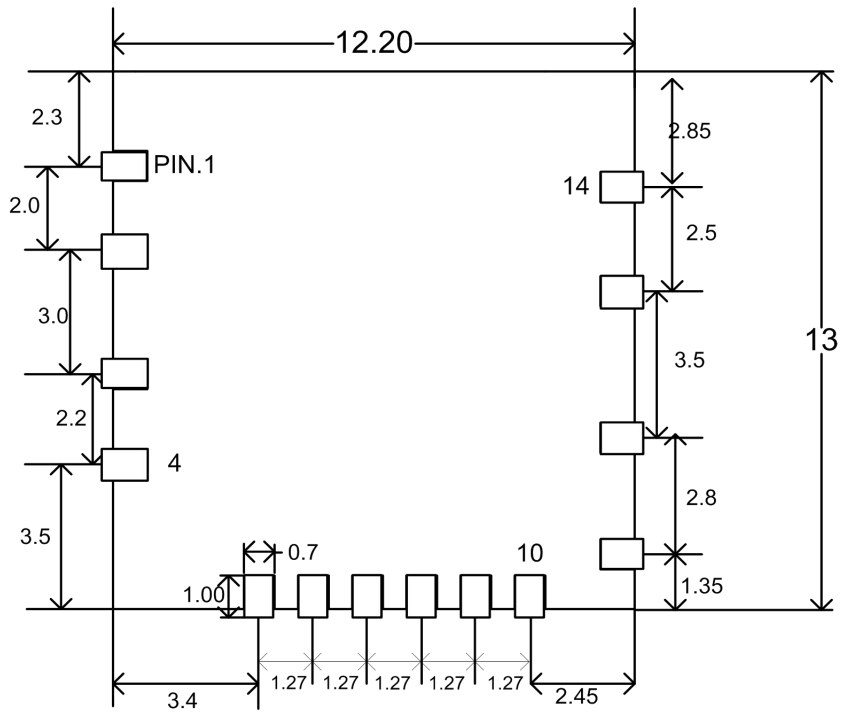
< TOP VIEW >



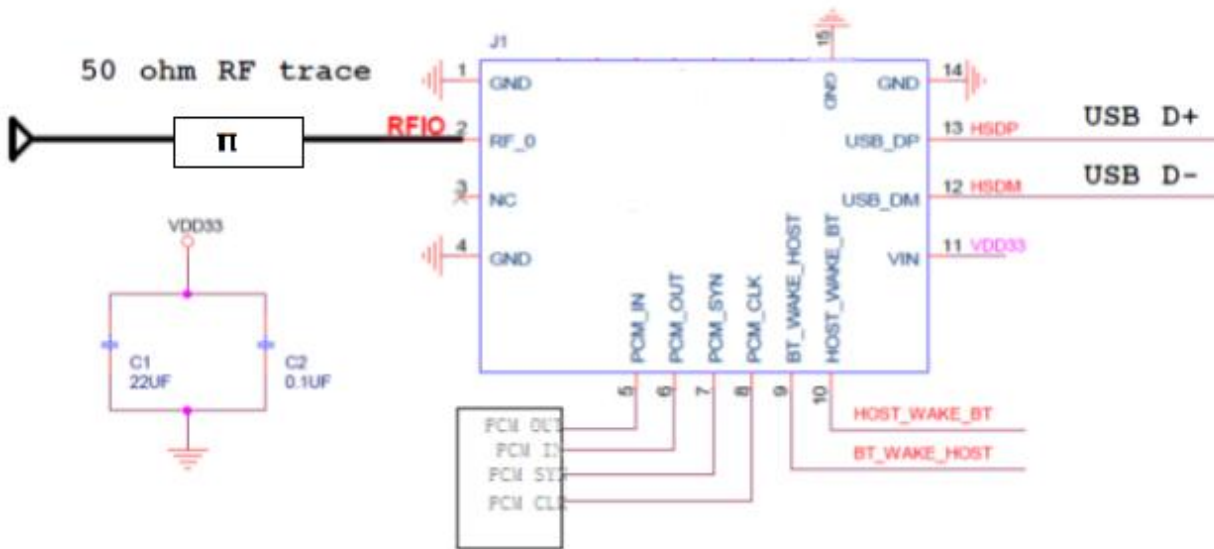
### 5.3 Layout Recommendation

(Unit: mm)

< TOP VIEW >



## 6 Reference Design



### Note:

- Module requires independent power supply , supply capacity greater than 600mA and ripple less than 100mv;
- Do not share power with amplifier, infrared device, camera, etc.

## 7 Ordering Information

Part No.	Description
FGN200EUUX-00	N200E-UU 802.11a/b/g/n/ac/ax 1T1R+BT5.0, Single antenna, USB2.0,With PCM interface

## 8 The Key Material List

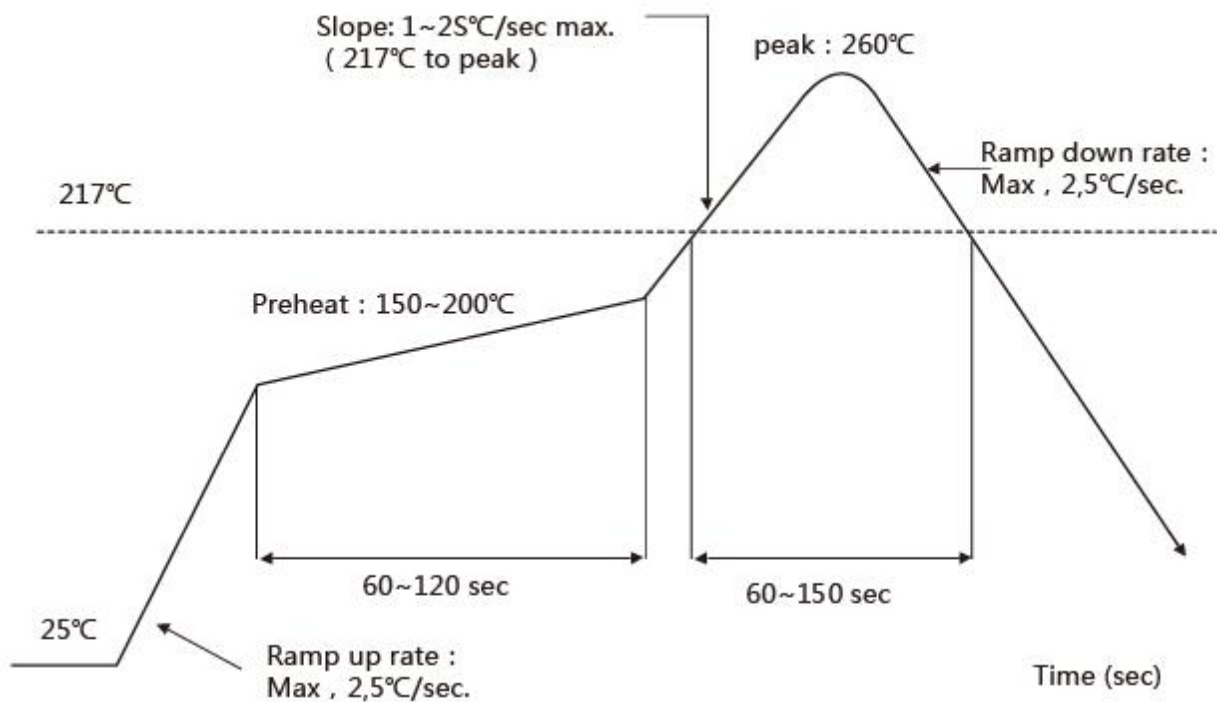
Item	Part Name	Description	Manufacturer
1	Inductor	1608 4.7uH, ±20%	Sunlord,Ceaiya,Cenker, Taiyo
2	Crystal	3225 26MHz ±10ppm	ECEC, TKD, Hosonic, JWT, TXC
3	Chipset	AIC8800D	AIC
4	PCB	FR4, 4 LAYER, GREEN	XY-PCB,GDKX,Sunlord, SL-PCB

## 9 Recommended Reflow Profile

Referred to IPC/JEDEC standard.

Peak Temperature : <260°C

Number of Times : ≤2 times

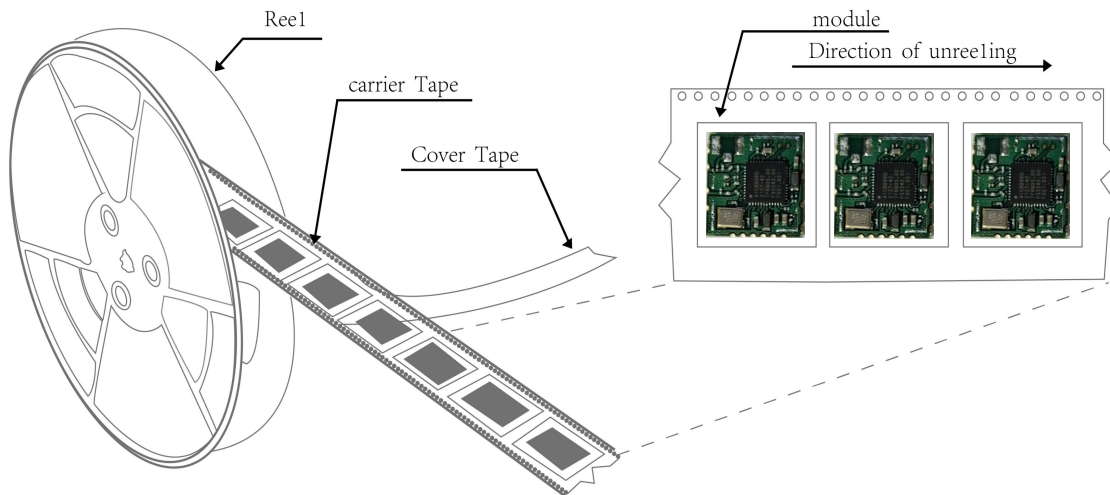




# 10 Package Information

## 10.1 Reel

A roll of 1500pcs



## 10.2 Packaging Detail

the take-up package



Using self-adhesive tape

Size of black tape: 24mm\*32.6m the cover tape: 21.3mm\*32.6m

Color of plastic disc:blue



NY bag size:460mm\*385mm

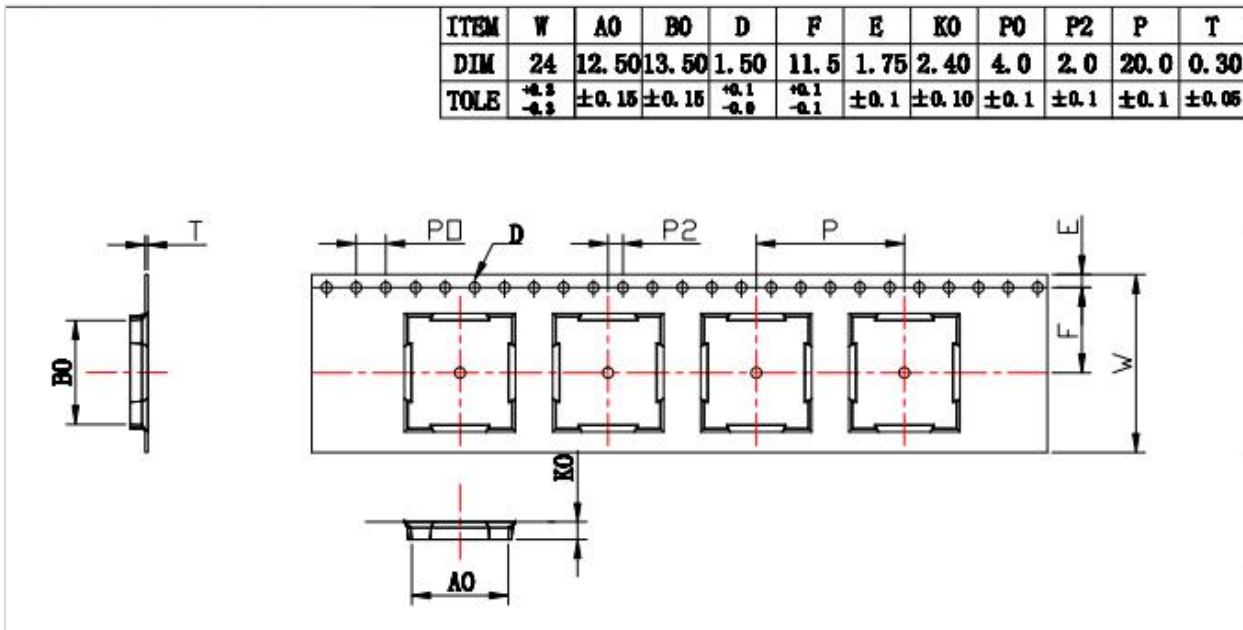


size : 350\*350\*35mm



The packing case size:350\*210\*370mm

## 10.3 Carrier Tape Detail



## 11.4 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:

- Calculated shelf life in sealed bag: 12 months at <math>40^{\circ}\text{C}</math> and <math>90\%</math> relative humidity (RH)
- Environmental condition during the production: <math>30^{\circ}\text{C}</math> / <math>60\%</math> RH according to IPC/JEDEC J-STD-033A paragraph 5
- The maximum time between the opening of the sealed bag and the reflow process must be 168 hours if condition
  - "IPC/JEDEC J-STD-033A paragraph 5.2" is respected
  - Baking is required if conditions b) or c) are not respected
  - Baking is required if the humidity indicator inside the bag indicates 10% RH or more

## 12 Certification Information

NA