FN-LINK欧智通

PRODUCT SPECIFICATION

6233N-UUB

Wi-Fi Dual-band 1T1R 802.11a/b/g/n + Bluetooth 5.2

Combo Module

Version:v1.0

6233N-UUB Module Datasheet

Ordering Information	Part NO.	Description
	FG6233NUUB-00	RTL8733BU-CG/802.11a/b/g/n/ WiFi+BT5.2, 1T1R, USB, 30X45mm

Customer: _____

Customer P/N: _____

Signature: _____

Date: _____

Office: 14th floor, Block B, phoenix zhigu, Xixiang Street, Baoan District, Shenzhen

Factory: NO.8, Litong RD., Liuyang Economic & Technical Development Zone, Changsha, CHINA

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Revision History

Version	Date	Contents of Revision Change	Draft	Checked	Approved
V1.0	2021/02/18	New version	TZQ	TZQ	QJP

1. General Description

1.1 Introduction

6233N-UUB is a highly integrated module with Realtek 8733BU-CG single-chip 802.11a/b/g/n 1T1R WLAN, and an integrated Bluetooth 5.2 combo chip with USB 2.0 multi-function. The highly integrated module makes the possibilities of web browsing,VoIP, video stream applications. With seamless roaming capabilities and advanced security, also could interact with different vendors' 802.11a/b/g/n 1x1 Access Points in the wireless LAN.

The wireless module complies with IEEE 802.11 a/b/g/n standard and it can achieve up to a speed of 150Mbps when using 40MHz bandwidth. The integrated module provides USB2.0 interface for Wi-Fi.

1.2 Description

Model Name	6233N-UUB
Product Description	Support Wi-Fi/Bluetooth functionalities
Dimension	L x W x H: 30 x 45 x 7.70 mm
Wi-Fi Interface	Support USB 2.0
BT Interface	USB
Operating temperature	0°C to 70°C
Storage temperature	-40°C to 85°C

2. Features

General Features

- 802.11a/b/g/n 1T1R WLAN and Bluetooth 5.2 combo chip
- Complete 802.11n solution for both 2.4GHz and 5GHz 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
- Maximum data rate 54Mbps in 802.11g; and 150Mbps in 802.11n

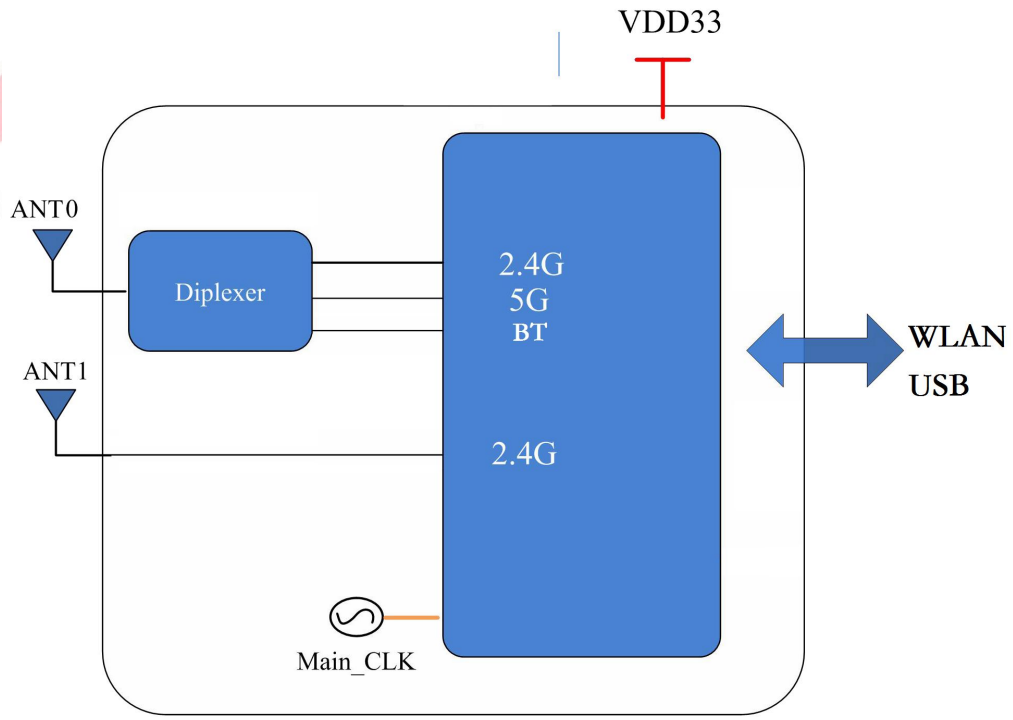
WLAN Interface

- USB Multi-Function for both BT (USB function 0) and WLAN (USB function 1)

Bluetooth Features

- Supports Bluetooth muptiple Low Energy states
- Bluetooth 5.2 Dual Mode support: Simultaneous LE and BR/EDR
- Small SMT package

3. Block Diagram



4. General Specification

4.1 WI-FI 2.4GHz RF Specification

Feature	Description	
WLAN Standard	IEEE 802.11 b/g/n Wi-Fi compliant	
Frequency Range	2.400 GHz ~ 2.4835 GHz (2.4 GHz ISM Band)	
Number of Channels	2.4GHz：Ch1 ~ Ch14	
Test Items	**Typical Value**	**EVM**
Output Power	802.11b /11Mbps : 17dBm ± 2 dB	EVM ≤ -9dB
	802.11g /54Mbps : 15dBm ± 2 dB	EVM ≤ -25dB
	802.11n /MCS7 : 14dBm ± 2 dB	EVM ≤ -28dB
Spectrum Mask	Meet with IEEE standard	
Freq. Tolerance	±20ppm	
Test Items	**TYP Test Value**	**Standard Value**
SISO Receive Sensitivity (11b,20MHz) @8% PER	- 11Mbps PER @ -85 dBm	≤-81
SISO Receive Sensitivity (11g,20MHz) @10% PER	- 54Mbps PER @ -71 dBm	≤-67
SISO Receive Sensitivity (11n,20MHz) @10% PER	- MCS=7 PER @ -68 dBm	≤-65
SISO Receive Sensitivity (11n,40MHz) @10% PER	- MCS=7, PER @ -65 dBm	≤-62
Maximum Input Level	802.11b : -10 dBm	
	802.11g/n : -20 dBm	

Note: Other data rates transmit power are controlled by Power-by-Rate function of the driver.

4.2 WI-FI 5GHz RF Specification

Feature	Description
WLAN Standard	IEEE 802.11 a/n Wi-Fi compliant
Frequency Range	5.150 GHz ~ 5.850 GHz (5.0 GHz Band)
Number of Channels	5.0GHz：Please see the following table1

Test Items	Typical Value	EVM
Output Power	802.11a /54Mbps : 15dBm ± 2 dB	EVM ≤ -25dB
	802.11n /MCS7 : 14dBm ± 2 dB	EVM ≤ -28dB
Spectrum Mask	Meet with IEEE standard	
Freq. Tolerance	±20ppm	
Test Items	**TYP Test Value**	**Standard Value**
SISO Receive Sensitivity (11a,20MHz) @10% PER	- 54Mbps PER @ -71 dBm	≤-68
SISO Receive Sensitivity (11n,20MHz) @10% PER	- MCS=7 PER @ -68 dBm	≤-65
SISO Receive Sensitivity (11n,40MHz) @10% PER	- MCS=7, PER @ -65 dBm	≤-62
Maximum Input Level	802.11a/n : -10 dBm	
Antenna Reference	Small antennas with 0~2 dBi peak gain	

Note: Other data rates transmit power are controlled by Power-by-Rate function of the driver.

[1]5GHz(20MHz) Channel table

Band range	Operating Channel Numbers	Channel center frequencies(MHz)
5150MHz~5250MHz	36	5180
	40	5200
	44	5220
	48	5240
5250MHz~5350MHz	52	5260
	56	5280
	60	5300
	64	5320
5470MHz~5725MHz	100	5500
	104	5520
	108	5540
	112	5560
	116	5580
	120	5600
	124	5620
	128	5640
	132	5660
	136	5680

	140	5700
5725MHz~5850MHz	149	5745
	153	5765
	157	5785
	161	5805
	165	5825

4.3 Bluetooth Specification

Feature	**Description**		
General Specification			
Bluetooth Standard	Bluetooth		
Host Interface	USB		
Antenna Reference	Small antennas with 0~2 dBi peak gain		
Frequency Band	2400 MHz ~ 2483.5 MHz		
Number of Channels	79 channels		
Modulation	GFSK, π/4-DQPSK, 8-DPSK		
RF Specification			
	Min(dBm)	**Typical**(dBm)	**Max**(dBm)
Output Power (Class 1)	2	4	10
Sensitivity @ BER=0.1% for GFSK (1Mbps)			-70
Sensitivity @ BER=0.01% for π/4-DQPSK (2Mbps)			-70
Sensitivity @ BER=0.01% for 8DPSK (3Mbps)			-70
Maximum Input Level	GFSK (1Mbps):-20dBm		
	π/4-DQPSK (2Mbps) :-20dBm		
	8DPSK (3Mbps) :-20dBm		

5. ID setting information

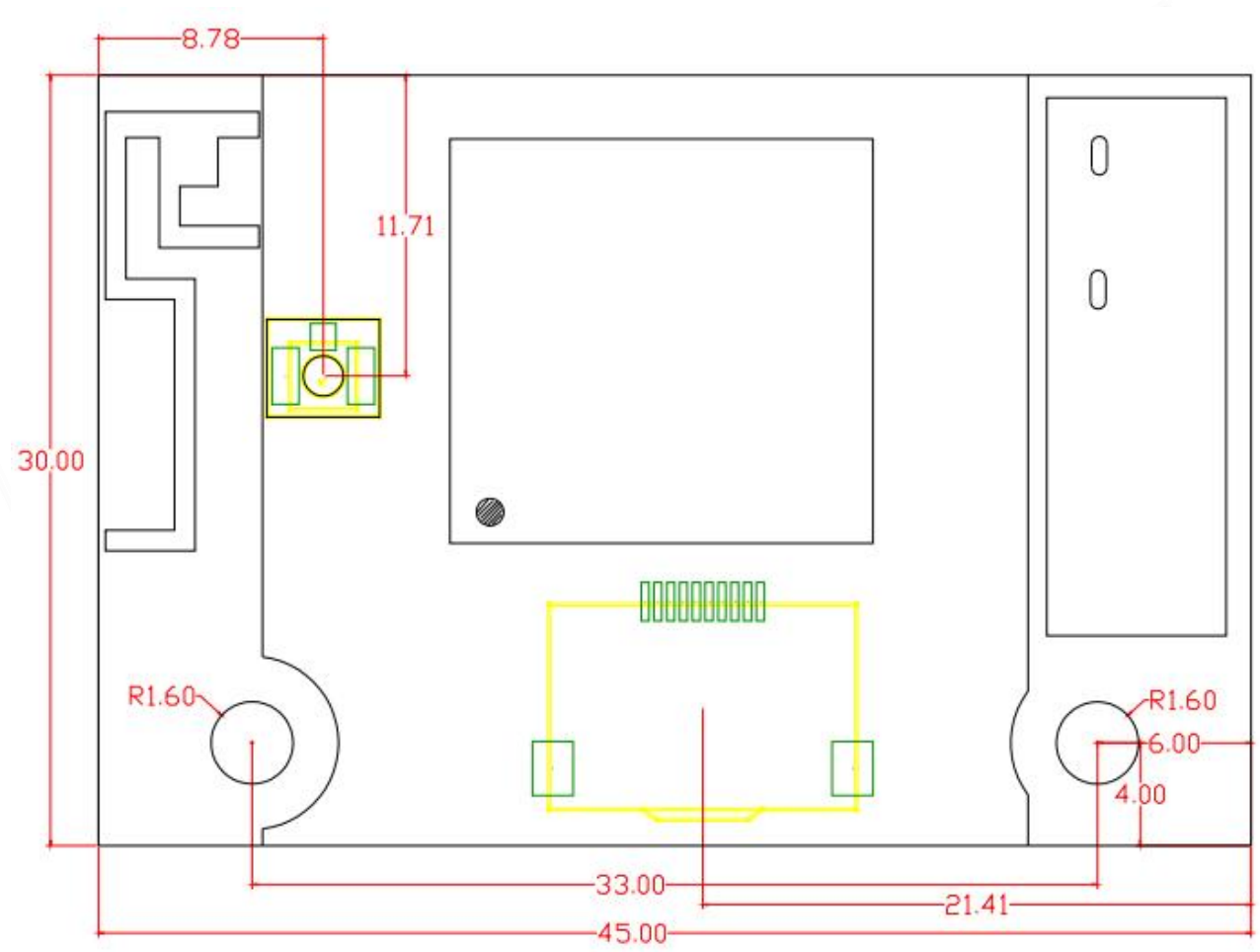
WI-FI

Vendor ID	-
Product ID	-

6. Pin Definition

6.1 Pin Outline

< TOP VIEW >



6.2 Pin Definition details

NO	Name	Type	Description	Voltage
1	GND	P	Ground connections	
2	USB_DP	I/O	USB2.0 differential pair for WLAN	
3	USB_DM	I/O	USB2.0 differential pair for WLAN	
4	+5V	P	5V	
5	+5V	P	5V	
6	+5V	P	5V	
7	WL_WAKE HOST	O	WIFI WAKE HOST, 10K pull low on module side	3.3V
8	CHIP EN	I	External pull low shut down module, default pull high	3.3V
9	BT_WAKE HOST	O	WIFI WAKE HOST, 10K pull low on module side	3.3V
10	GND	P	Ground connections	

P:POWER I:INPUT O:OUTPUT

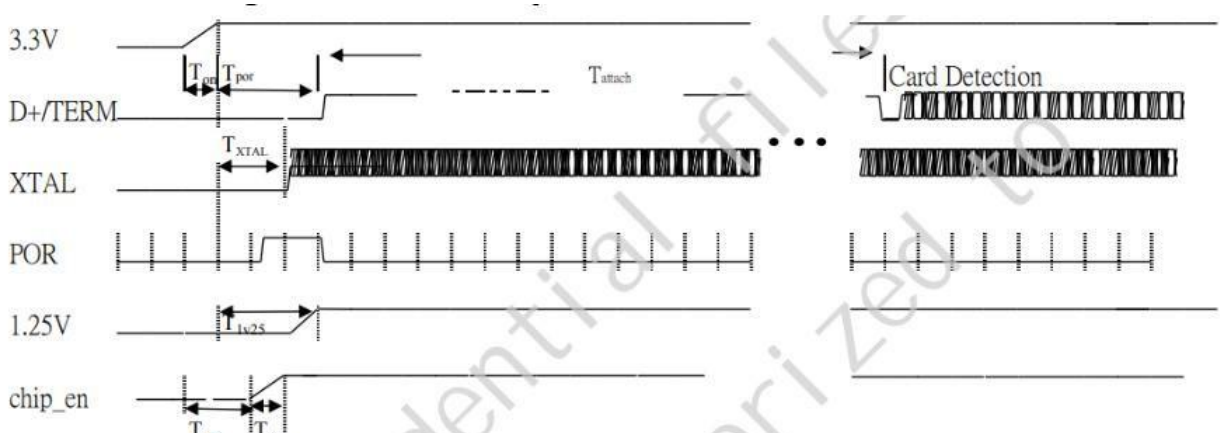
7. Electrical Specifications

7.1 Power Supply DC Characteristics

	MIN	TYP	MAX	Unit
Operating Temperature	0	25	70	deg.C
VDD33	5.3	5V	5.6	V

7.2 Interface Circuit time series

7.2.1 USB Bus Timing during Power On Sequence



Ton: The main power ramp up duration

Ten: Interval between the rising point of 3.3V and chip_en

Tgate: Interval of 3.3V to be gated when chip_en voltage level < 2V

Tattach: USB attach state. The duration from resistor attached to USB host starting card detection procedure

Txtal: XTAL starts

The power on flow Description:

The power on flow description : After main 3.3V ramp up, the internal power on reset is released by power ready detection circuit and the power management unit will be enabled. The power management unit enables the internal regulator and clock circuits.

The power management unit also enables the USB circuits.

USB analog circuits attach resisters to indicate the insertion of the USB device.

	Unit	Min	Typical	Max
T_{on}	ms	0.2	1.5	5
Tpor	ms	--	2	10
Txtal	ms	--	1.5	8
T_{attach}	ms	100	250	-
T_{1v25}	ms	0	0	5

7.2.2 Power off by 3.3V power sequence

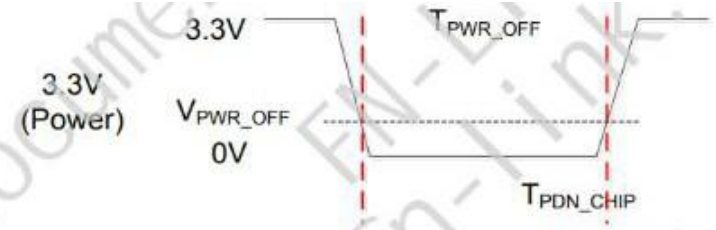


Figure 6. RTL8731BU-CG Power Off by 3.3V power Sequence

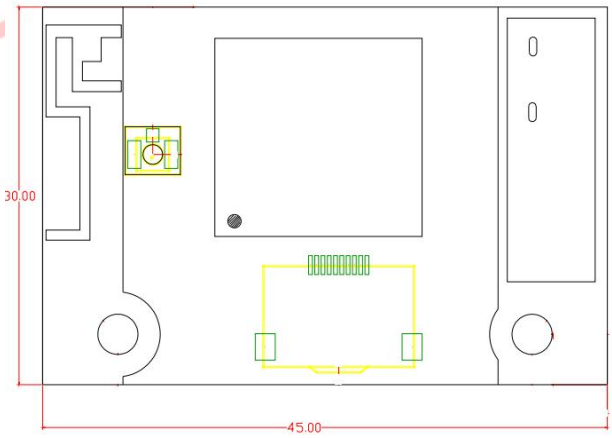
Table 14. RTL8731BU-CG Power Off by 3.3V power Timing Parameters

	Min	Typical	Max	Unit	Description
T_{PWR_OFF}	100	200	--	ms	3.3V power off time
V_{PWR_OFF}	--	--	0.7	V	3.3V power off voltage

When 3.3V power off and on afterward, the voltage of 3.3V power must keep lower than VPWR_OFF , and the 3.3V power keeping off duration must be more than TPWR_OFF

8. Size reference

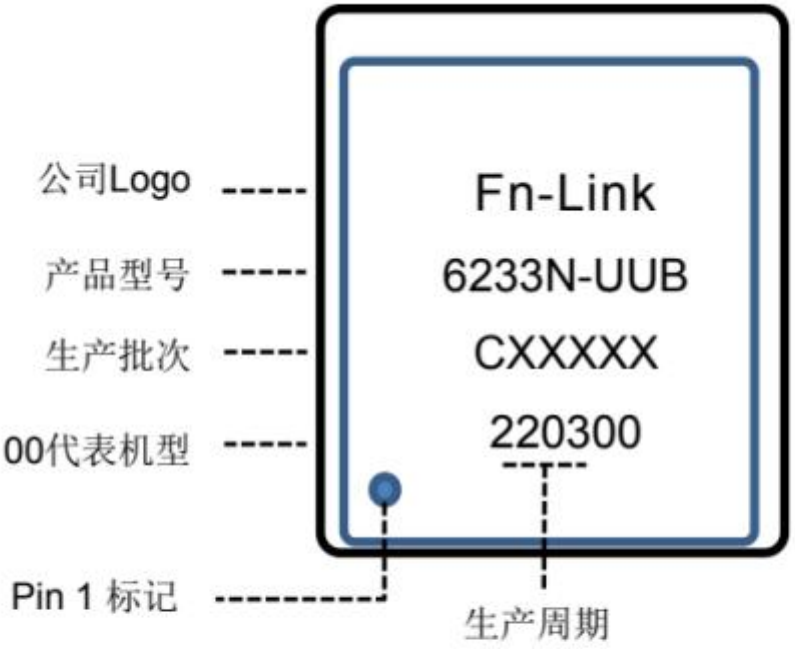
8.1 Module Picture

<table>
<tr><td>L x W : 30 x 45 (+0.3/-0.1) mm
  </td><td>  </td></tr>
<tr><td>H: 7.70 (±0.2) mm</td><td></td></tr>
<tr><td>Weight</td><td>5.0g</td></tr>
</table>

Note:The module diagram will be updated in a future version

8.2 Marking Description

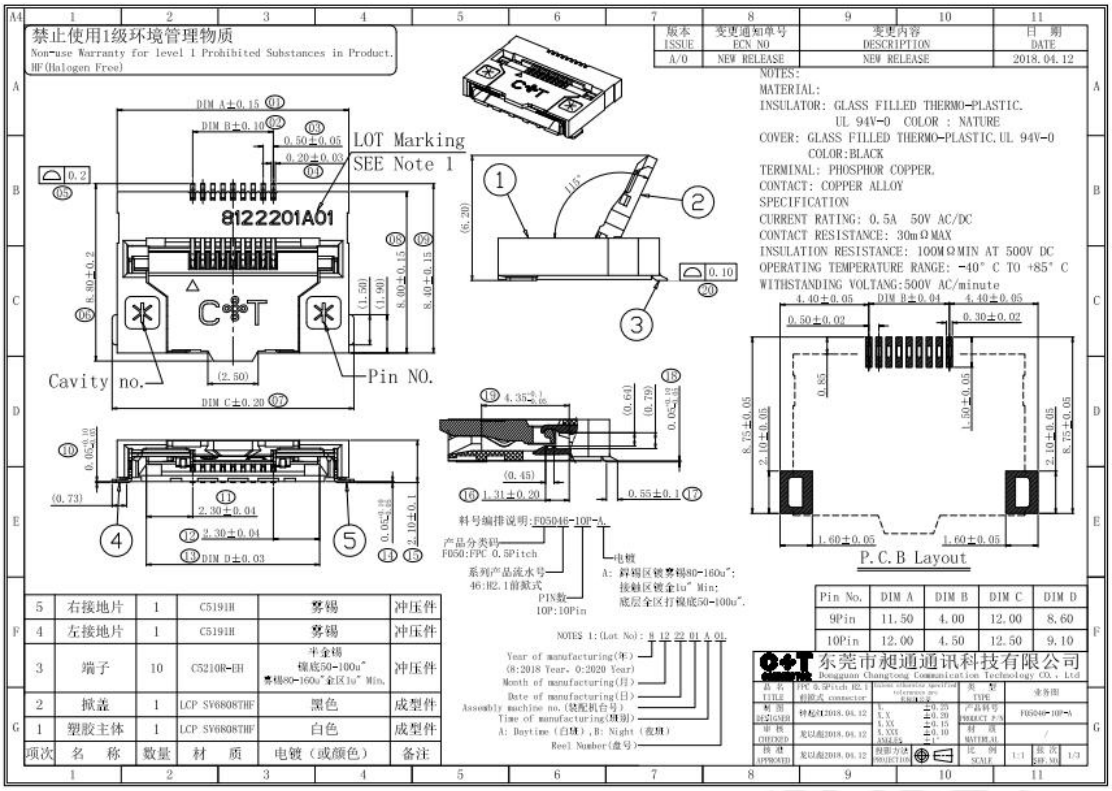
< TOP VIEW >

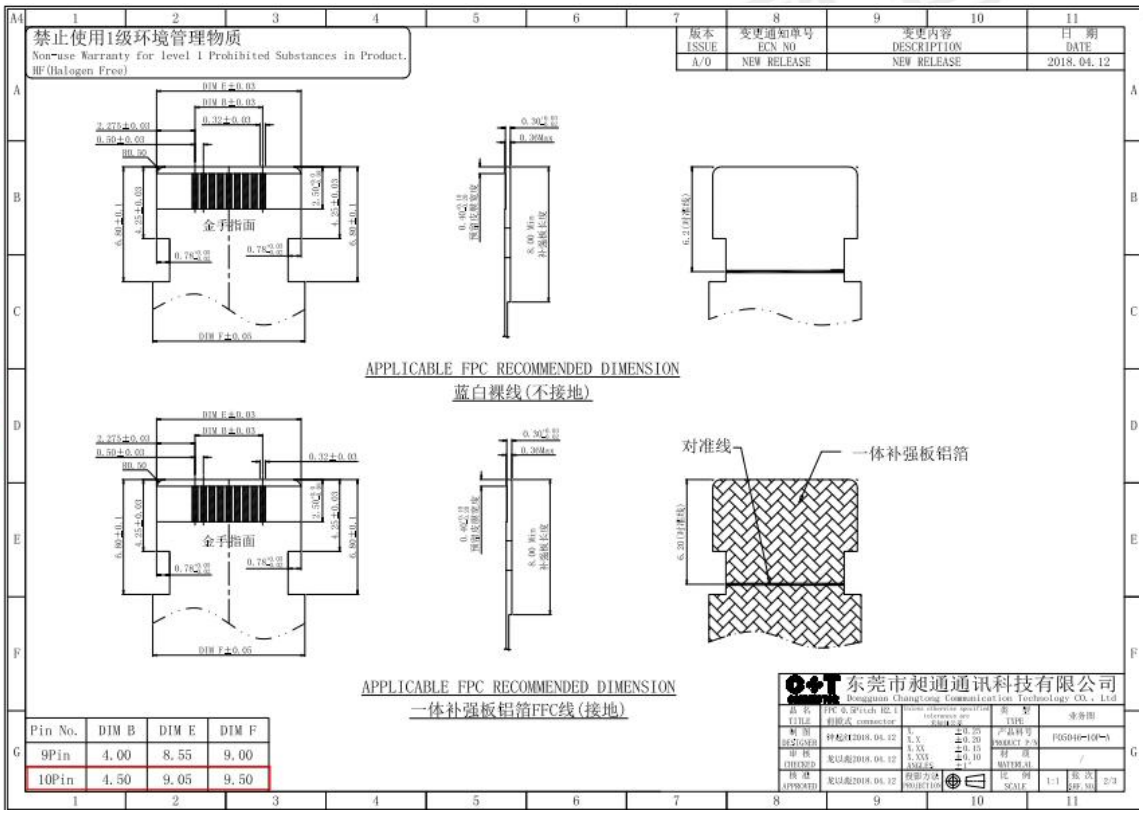


模组尺寸：30x45mm
屏蔽盖尺寸：15.95x16.71mm

8.3 Physical Dimensions

<TOPView>



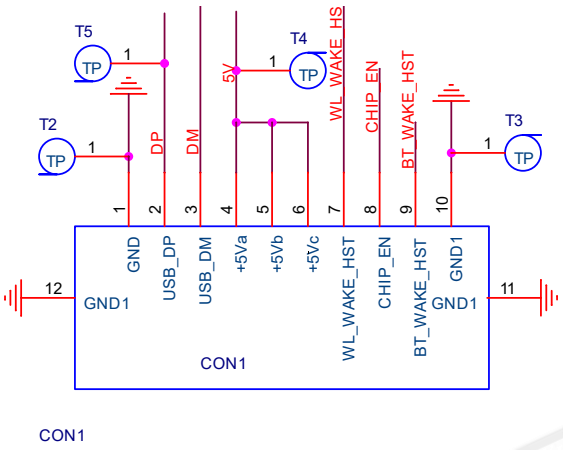


9. The Key Material List

Item	Part Name	Description	Manufacturer
1	PCB	6233N-UUB,4L,FR4,30X45X1.0mm	XY-PCB, GDKX, Sunlord, SLPCB

2	Crystal	3225 40MHz 10ppm 12PF	ECEC, Hosonic, TKD, JWT，Truly
3	Chipset	RTL8733BU-CG,QFN40	Realtek
4	Shielding	6233N-UUB Shielding	信太，精力通
5	Connector	卧贴排线座 Pitch 10Pin F05046-10P-A	昶通
6	Inductor	2520 2.2UH,±20%	MURATA,microgate,cenke,ceaiya

10. Reference Design



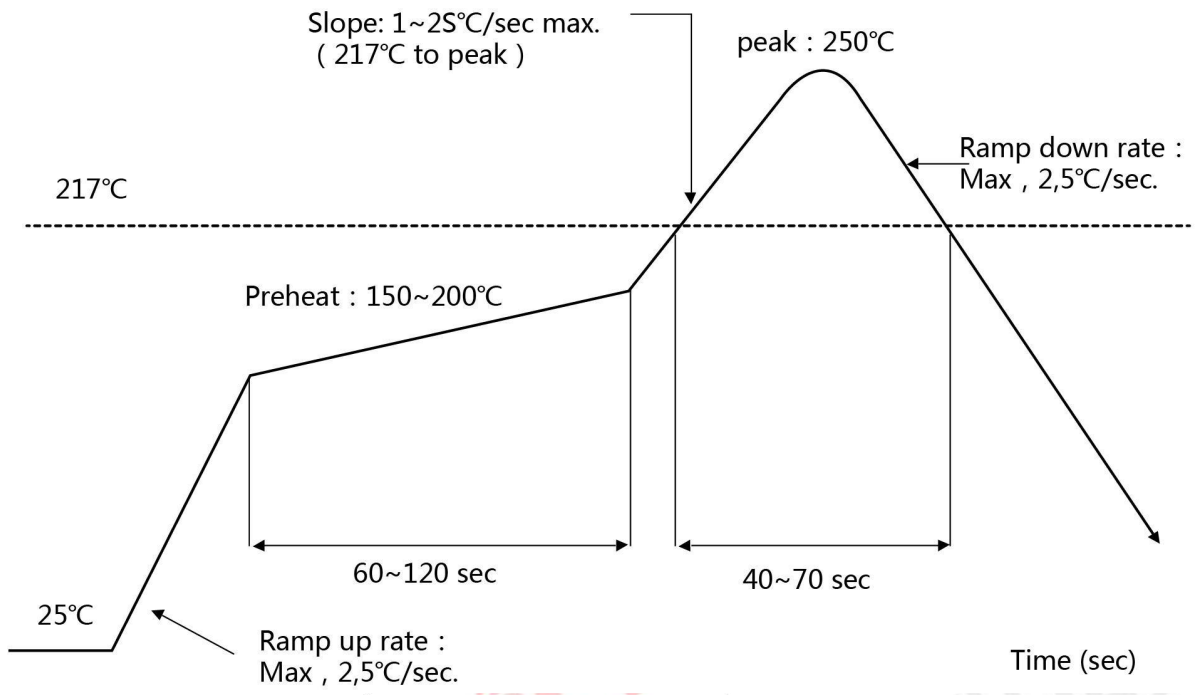
Note: Module requires independent power supply , supply capacity ≥ 1200mA and ripple less than 100mV; Do not share power with amplifier, infrared device, camera, etc. USB differential trace, please keep 90 ohm.

11. Recommended Reflow Profile

Referred to IPC/JEDEC standard.

Peak Temperature : <250°C

Number of Times : ≤2 times



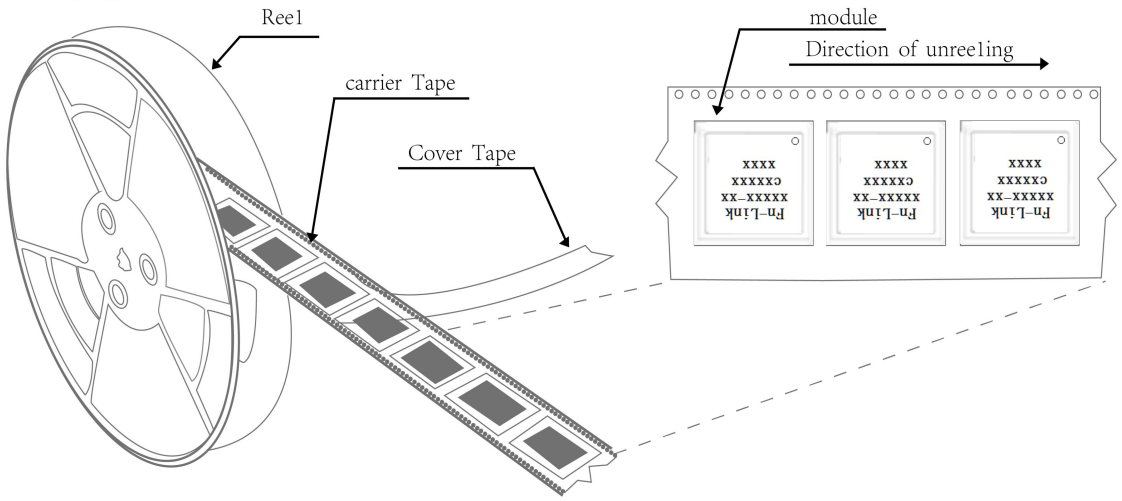
12. RoHS compliance

All hardware components are fully compliant with EU RoHS directive

13. Package

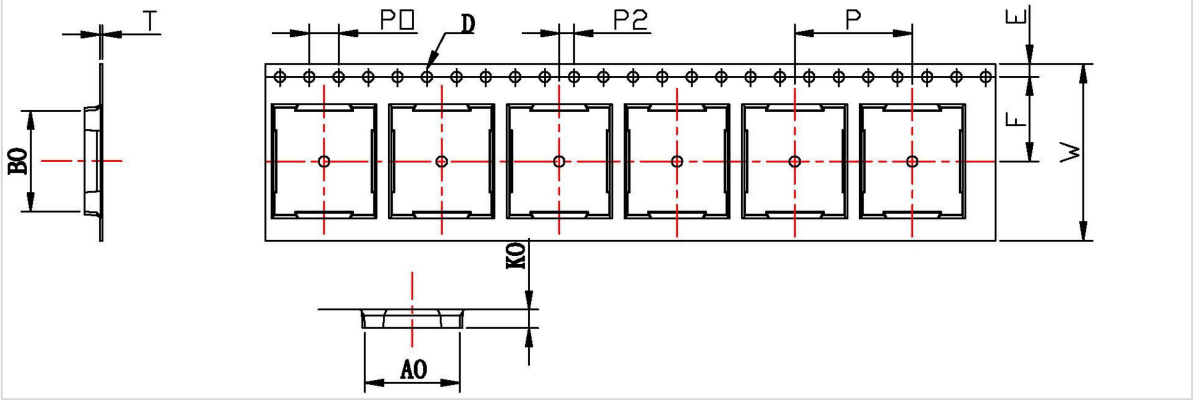
13.1 Reel

A roll of 1500pcs



13.2 Carrier Tape Detail

ITEM	W	A0	B0	D	F	E	K0	P0	P2	P	T
DIM	24	12.50	13.35	1.50	11.5	1.75	2.5	4.0	2.0	16.0	0.30
TOLE	+0.3 -0.3	±0.15	±0.15	+0.1 -0.0	+0.1 -0.1	±0.1	±0.10	±0.1	±0.1	±0.1	±0.05



13.3 Packaging Detail

the take-up package

Using self-adhesive tape

Size of black tape: 24mm*24.4m the cover tape :21.3mm*32.6m

Color of plastic disc: blue

NY bag size:450mm*415mm

size ： 350*350*35mm

The packing case size:360*210*370mmg

14. 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

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