

## PRODUCT SPECIFICATION

# N200ASRL

Wi-Fi 1T1R Single band+ BLE 5.2

Combo Module

Version:v1.2

Customer: \_\_\_\_\_

Customer P/N: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

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

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## N200ASRL Module Datasheet

Ordering Information	Part NO.	Description
	FGN200ASRL-02	AIC8800DL-H3,b/g/n/ax 2.4G Wi-Fi6,SDIO,1T1R.IPEX,12x12mm,V1.0LDO



## CONTENTS

<b>1. General Description .....</b>	<b>5</b>
1.1 Introduction .....	5
1.2 Description .....	5
<b>2. Features .....</b>	<b>5</b>
<b>3. General Specification .....</b>	<b>6</b>
3.1 2.4GHz RF Specification .....	6
3.2 Bluetooth Specification .....	7
<b>4. ID setting information .....</b>	<b>8</b>
<b>5. Pin Definition .....</b>	<b>8</b>
5.1 Pin Outline .....	8
5.2 Pin Definition details .....	9
<b>6. Electrical Specifications .....</b>	<b>10</b>
6.1 Power Supply DC Characteristics .....	10
6.2 Power Consumption .....	10
<b>7. Size reference .....</b>	<b>11</b>
7.1 Module Picture .....	11
7.2 Physical Dimensions .....	12
7.3 Layout Recommendation .....	13
<b>8. The Key Material List .....</b>	<b>13</b>
<b>9. Recommended Reflow Profile .....</b>	<b>14</b>
<b>10. RoHS compliance .....</b>	<b>14</b>
<b>11. Package .....</b>	<b>15</b>
11.1 Reel .....	15
11.2 Carrier Tape Detail .....	15
11.3 Packaging Detail .....	16
11.4 Tray .....	17
<b>12. Moisture sensitivity .....</b>	<b>17</b>

## Revision History

[illegible]

# 1. General Description

## 1.1 Introduction

N200ASRL is a highly integrated chip with dual band Wi-Fi6, BLE5.2 for wireless application.

## 1.2 Description

Model Name	N200ASRL
Product Description	Support Wi-Fi /BT functionalities
Dimension	L x W x H: 12 x 12 x 2.3 mm (no shielding)
Wi-Fi Interface	Support SDIO
OS supported	Android /Linux/ Windows
Operating temperature	-20°C to 80°C
Storage temperature	-40°C to 125°C

# 2. Features

## General

- Compliant with IEEE 802.11 b/g/n/ax
- Support 2.4GHz Wi - Fi6
- Support 20/40MHz bandwidth
- Data rates up to 286.8Mbps@TX and 229.4Mbps@RX
- Support STA, AP, Wi - Fi Direct modes concurrentl
- Support STBC, beamforming
- Support Wi - Fi6 TWT
- Support Two NAV, Buffer Report, Spatial reuse, Multi - BSSID, intra - PPDU power save
- Support WEP/WPA/WPA2/WPA3 - SAE Personal, MFP

## Bluetooth Features

- Supports all the mandatory and optional features of Bluetooth Low Energy
- Supports advanced master and slave topologies
- Use an optimization method to assess channel quality, AFH enhancement

### 3. General Specification

#### 3.1 2.4GHz RF Specification

Feature	Description	
WLAN Standard	IEEE 802.11b/g/n/ax, Wi-Fi compliant	
Frequency Range	2.400 GHz ~ 2.4835 GHz (2.4 GHz ISM Band)	
Number of Channels	2.4GHz: Ch1 ~ Ch11	
Modulation	DBPSK/DQPSK/CCK(DSSS)、BPSK/QPSK/16QAM/64QAM(OF DM)	
Test Items	Typical Value	EVM
Output Power	802.11b /11Mbps : 20dBm ± 2 dBm	EVM ≤ -10dB
	802.11g /54Mbps : 16dBm ± 2 dBm	EVM ≤ -25dB
	802.11n /MCS7 : 16dBm ± 2 dBm	EVM ≤ -28dB
	802.11ax /MCS11 : 15dBm± 2 dBm	EVM ≤ -35dB
	fest mode power level must setting as below to meet above spec. pwrlvl 1 0 20 20 20 20 20 20 20 20 18 18 16 16 pwrlvl 1 1 20 20 20 20 18 18 16 16 16 16 pwrwl 1 2 20 20 20 20 18 18 16 16 16 16 15 15	
Spectrum Mask	Meet with IEEE standard	
Freq. Tolerance	± 20ppm	
Receive Sensitivity (11b,20MHz) @8% PER	- 11Mbps @-85dBm	≤-76dBm
Receive Sensitivity (11g,20MHz) @10% PER	- 54Mbps @-73dBm	≤-68dBm
Receive Sensitivity (11n,20MHz) @10% PER	- MCS=7 @-70dBm	≤-67dBm
Receive Sensitivity (11n,40MHz) @10% PER	- MCS=7 @-68dBm	≤-64dBm
Receive Sensitivity (11ax,20MHz) @10% PER	- MCS=11 @-63dBm	≤-52dBm
Receive Sensitivity (11ax,40MHz) @10% PER	- MCS=11 @61-dBm	≤-49dBm
Maximum Input Level	802.11b : -10 dBm	
	802.11g/n : -20 dBm	
Antenna Reference	Small antennas with 0~2 dBi peak gain	

### 3.2 Bluetooth Specification

Feature	Description
<b>General Specification</b>	
Bluetooth Standard	LE(1Mbps)、LE(2Mbps)
Host Interface	UART
Frequency Band	2400 MHz ~ 2483.5 MHz
Number of Channels	40 channels for BLE
Modulation	GFSK,
<b>RF Specification</b>	
<b>Output Power , tolerance <math>\pm 3</math> dB</b>	
	<b>CL1(dBm)</b>
BDR Output Power	/
EDR Output Power	/
BLE Output Power	4
<b>Sensitivity, tolerance <math>\pm</math> dB</b>	
Sensitivity @ BER=0.1% for GFSK (1Mbps)	/
Sensitivity @ BER=0.01% for $\pi/4$ -DQPSK (2Mbps)	/
Sensitivity @ BER=0.01% for 8DPSK (3Mbps)	/
Sensitivity @ BER=30.8% for LE (1Mbps)	-85
Sensitivity @ BER=30.8% for LE (2Mbps)	-83
Maximum Input Level	GFSK :-20dBm

## 4. ID setting information

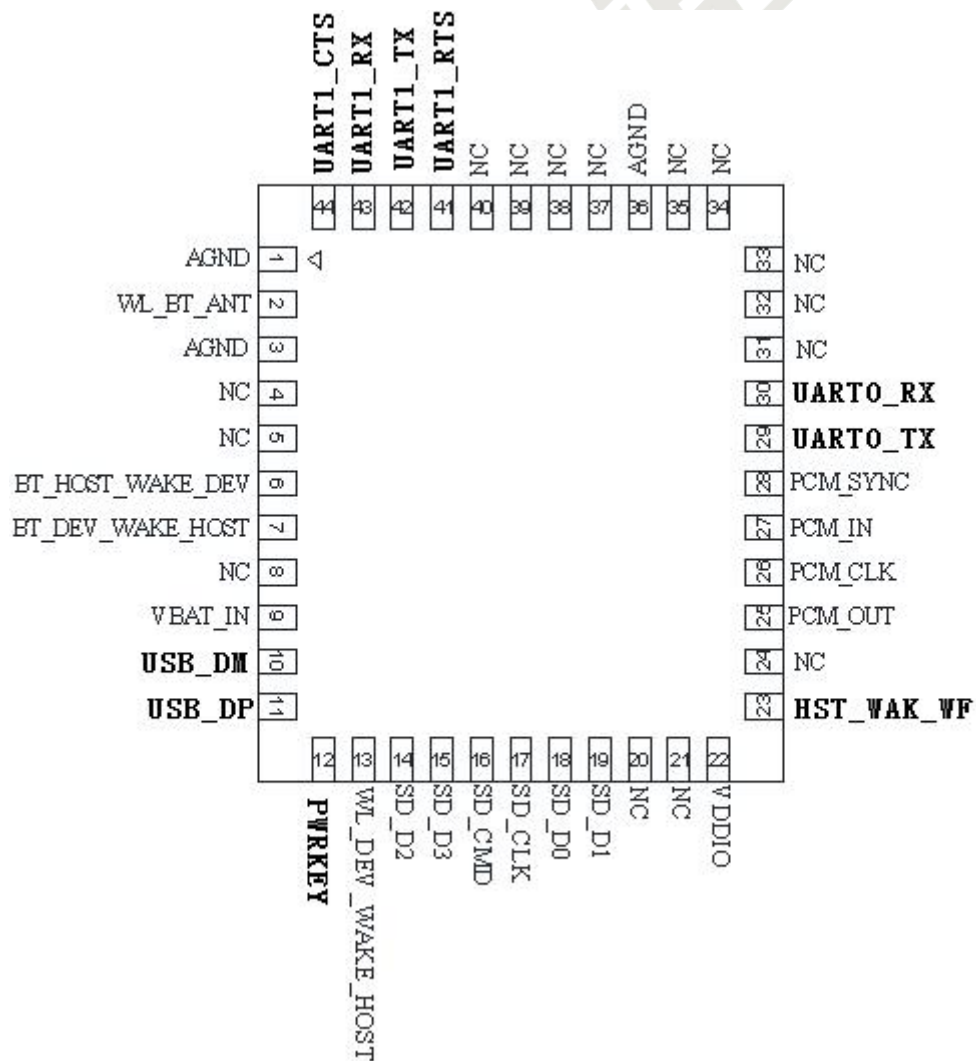
WI-FI

Vendor ID	TBD
Product ID	TBD

## 5. Pin Definition

### 5.1 Pin Outline

< TOP VIEW >





## 5.2 Pin Definition details

NO.	Name	Type	Description	Voltage
1	AGND		Ground connections	
2	WL_BT_ANT	I/O	RF I/O port	
3	AGND		Ground connections	
4	NC		Floating (NC)	
5	NC		Floating (NC)	
6	HOST_WAKE_BT	I	Host to wake up Bluetooth device	VDDIO
7	BT_WAKE_HOST	O	Bluetooth device to wake up host. (muti function for Test mode configuration. pull high to test mode ; pull low to normal mode .when wifi power on this pin must keep low )	VDDIO
8	NC		Floating (NC)	
9	VBAT_IN	P	3.3±10% V Main power voltage source input	3.3V
10	USB_DM	I/O	USB DM	
11	USB_DP	I/O	USB DP	
12	PWRKEY		Default Power Enable: pull high» 8ms Power Disable: pull low	
13	WL_HOST_WAKE	O	WLAN to wake up HOST	VDDIO
14	SD_D2	I/O	SDIO data line 2	
15	SD_D3	I/O	SDIO data line 3	
16	SD_CMD	I/O	SDIO command line	
17	SD_CLK	I	SDIO clock line	
18	SD_D0	I/O	SDIO data line 0	
19	SD_D1	I/O	SDIO data line 1	
20	NC		Floating(NC)	
21	NC		Floating(NC)	
22	VDDIO	P	I/O Voltage supply input	1.8/3.3V
23	HST_WAK_WF		HOST to wake up WF device	
24	NC		Floating(NC)	
25	PCM_OUT	O	PCM Output	VDDIO
26	PCM_CLK	I/O	PCM Clock	VDDIO
27	PCM_IN	I	PCM Input	VDDIO
28	PCM_SYNC	O	PCM Sync	VDDIO
29	UART0_TX	I/O	GPIOA9, UART0 TX	VDDIO
30	UART0_RX	I/O	GPIOA8, UART0 RX	VDDIO
31	NC		Floating(NC)	
32	NC		Floating(NC)	

33	NC		Floating(NC)	
34	NC		Floating(NC)	
35	NC		Floating (NC)	
36	AGND		Ground connections	
37	NC		Floating (NC)	
38	NC		Floating (NC)	
39	NC		Floating (NC)	
40	NC		Floating (NC)	
41	UART_RTS	I/O	UART RTS	
42	UART1_TX	I/O	BT_UART1_TX, GPIOA5	VDDIO
43	UART1_RX	I/O	BT_UART1_RX, GPIOA4	VDDIO
44	UART_CTS	I/O	UART CTS,	VDDIO

P:POWER I:INPUT O:OUTPUT

## 6. Electrical Specifications

### 6.1 Power Supply DC Characteristics

The digital IO supports VDD33 or VDD18 application.

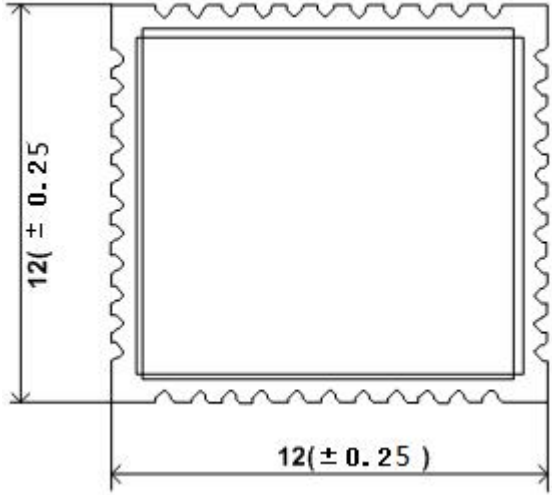
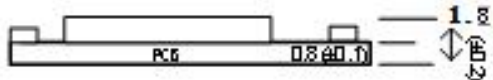
	MIN	TYP	MAX	Unit
Operating Temperature	-20	25	80	deg.C
VBAT	3	3.3	3.6	V
VDDIO	1.7	1.8/3.3	3.6	V

### 6.2 Power Consumption

2.4G	Test condition: VBAT=3.3V / VDDIO=3.3V	
	Current @ TX	Current @ RX
	Maximum(mA)	Maximum(mA)
11b@20dbm	TBD	
11g@17dbm		
HT20-mcs7@16dbm		
HT40-mcs7@16dbm		
VHT20-mcs8@16dbm		
VHT40-mcs9@16dbm		
HE20-mcs11@15dbm		
HE40-mcs11@15dbm		

## 7. Size reference

### 7.1 Module Picture

<p><b>L x W : 12 x 12 (<math>\pm 0.25</math>) mm</b></p>	
<p><b>H: 1.8 (<math>\pm 0.2</math>) mm</b></p>	
<p><b>Weight</b></p>	

Product Name: Combo Module

Brand Name: /

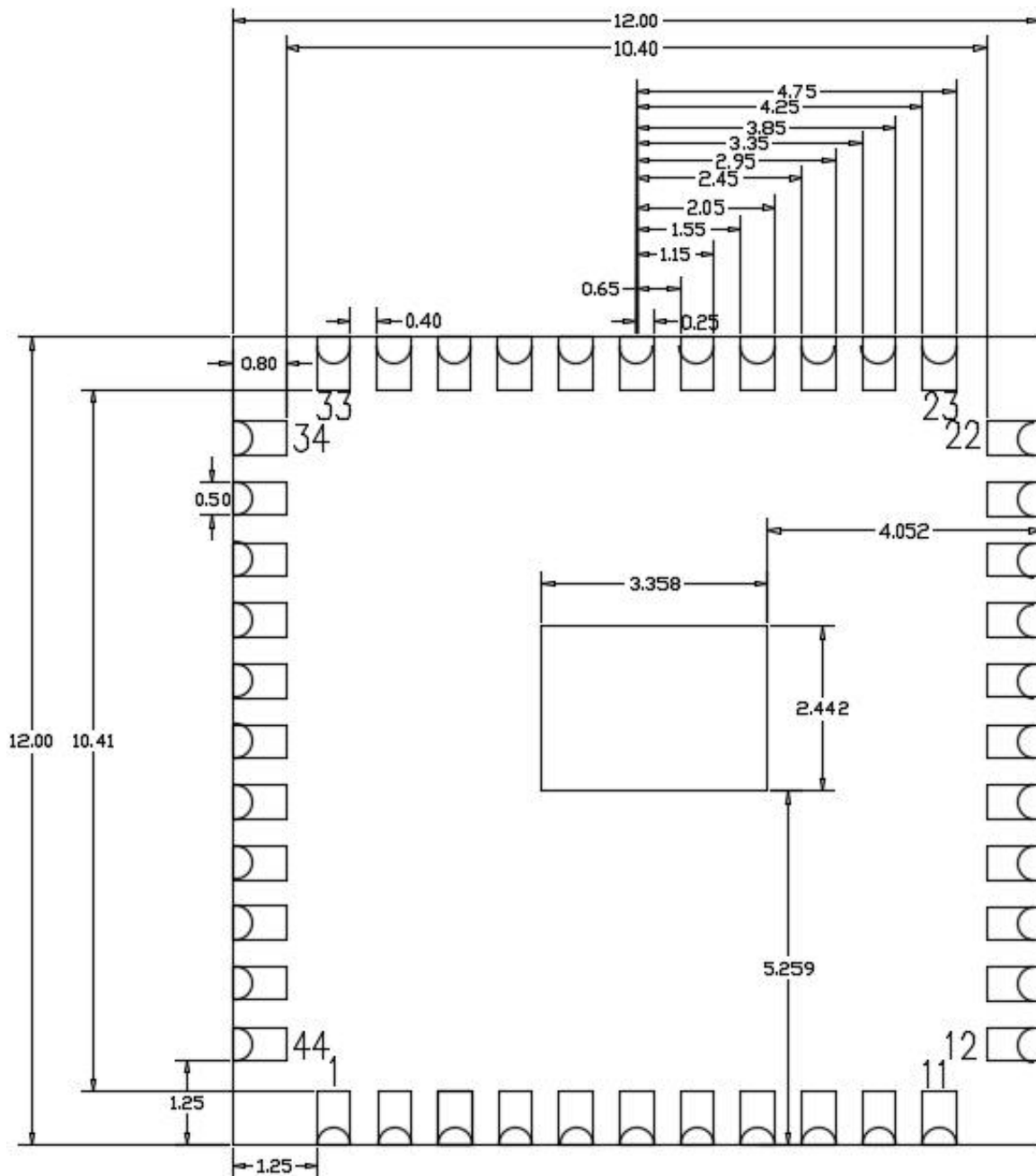
Model No.: N200ASRL

FN-LINK TECHNOLOGY LIMITED

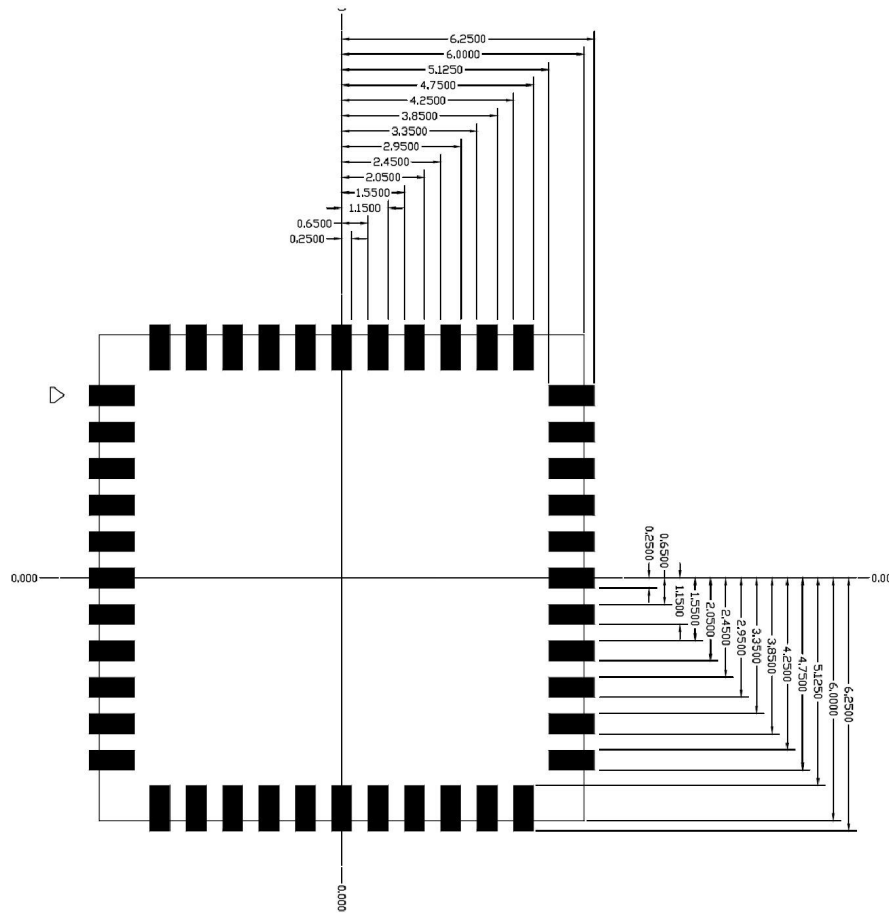
E-mail: [jim@fn-link.com](mailto:jim@fn-link.com)

FCC ID: 2AATL-N200ASRL

## 7.2 Physical Dimensions



### 7.3 Layout Recommendation



### 8. The Key Material List

Item	Part Name	Description	Manufacturer
1	Inductor	1608 10uH, $\pm 10\%$	Sunlord, Ceaiya, Cenker, Taiyo, inpaq
2	Crystal	2016 26MHz 8ppm	ECEC, TKD, Hosonic, JWT, TXC
3	Chipset	AIC8800DL-H3, 2.4G b/g/n/ac/ax+BLE5.2 1T1R, Wi-Fi6	AIC
4	PCB	FR4, 4 LAYER, GREEN	XY-PCB, GDKX, Sunlord, SLPCB, Truly

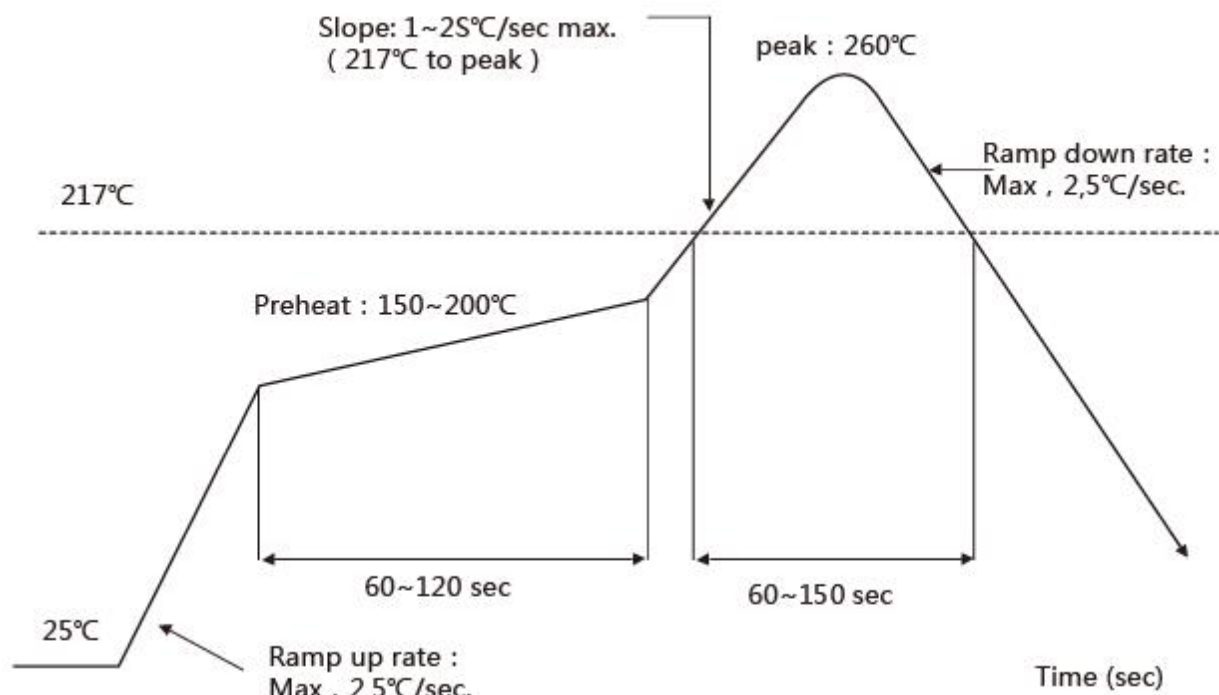
## 9. Recommended Reflow Profile

Referred to IPC/JEDEC standard.

Peak Temperature:  $\leq 260^{\circ}\text{C}$

Time within  $5^{\circ}\text{C}$  of peak temperature:  $\geq 10\text{s}$

Number of Times:  $\leq 2$  times



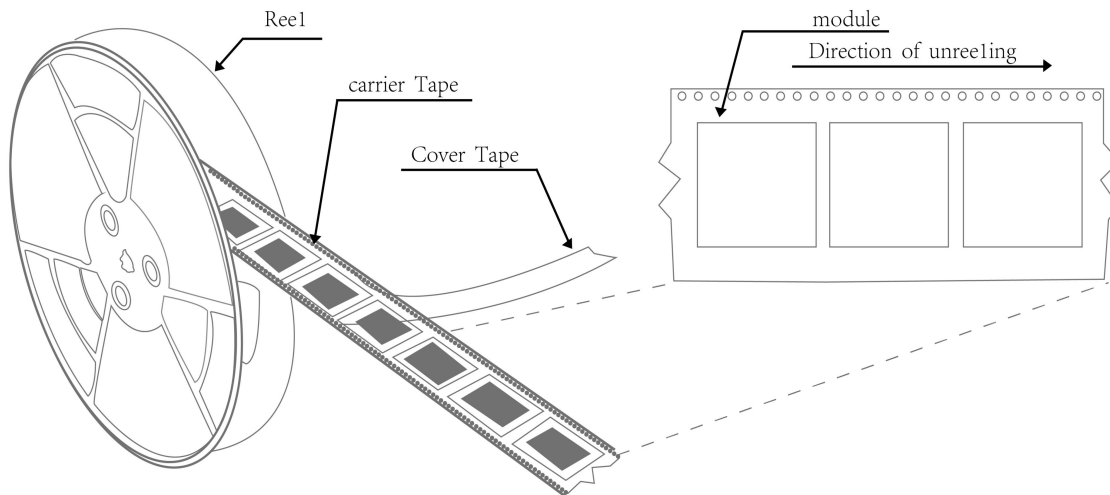
## 10. RoHS compliance

All hardware components are fully compliant with EU RoHS directive

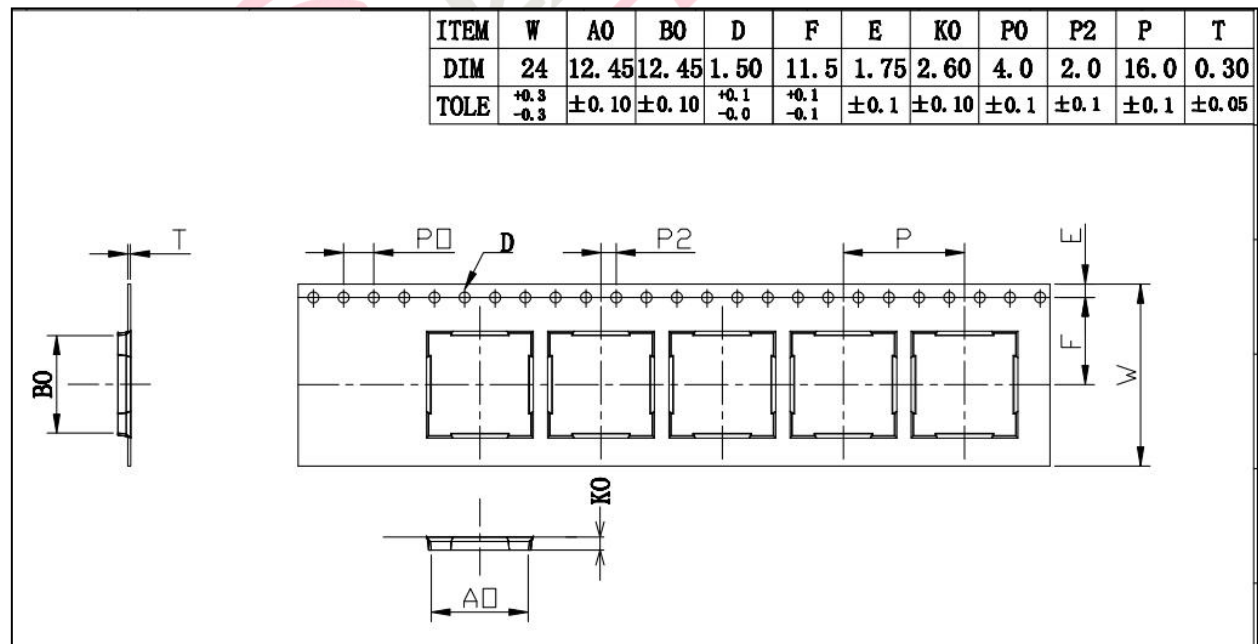
## 11. Package

### 11.1 Reel

A roll of 1500pcs



### 11.2 Carrier Tape Detail



### 11.3 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:450mm\*415mm



size : 350\*350\*35mm

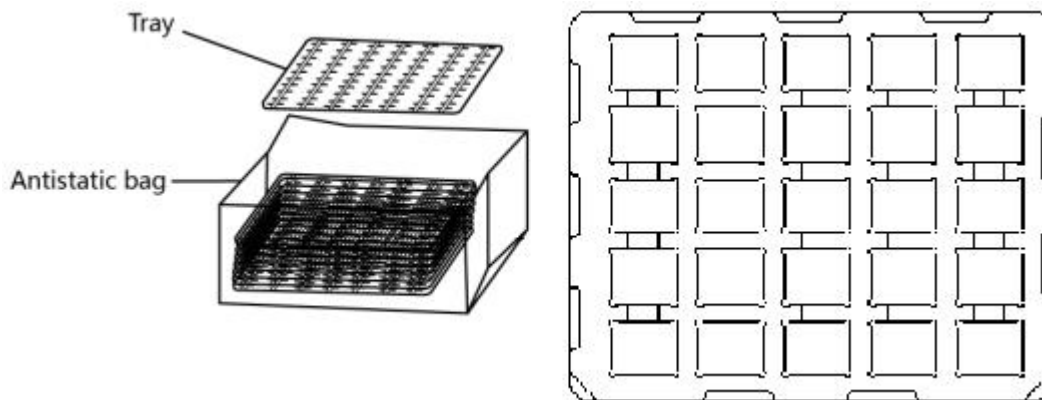


The packing case size:360\*210\*370mm



## 11.4 Tray

Use pallet packaging for less than 300 pieces



## 12. 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  $<40^{\circ}\text{C}$  and  $<90\%$  relative humidity (RH)
- b) Environmental condition during the production:  $30^{\circ}\text{C}$  / 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
- d) Baking is required if conditions b) or c) are not respected
- e) Baking is required if the humidity indicator inside the bag indicates 10% RH or more

**RF exposure considerations**

This equipment complies with the FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator and any part of your body.

**Antennas**

This product has two external antennas. The antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

No.	Antenna Type	Frequency Range	Gain	Impedance
1	External Antenna	2402-2480MHz 2412-2462MHz	4.7dBi	50ohm

**Label and compliance information**

FCC ID label on the final system must be labeled with "Contains FCC ID: 2AATL-N200ASRL" or "Contains transmitter module FCC ID: 2AATL-N200ASRL".

**Information on test modes and additional testing requirements**

Contact FN-LINK TECHNOLOGY LIMITED will provide stand-alone modular transmitter test mode. Additional testing and certification may be necessary when multiple modules are used in a host.

**Additional testing, Part 15 Subpart B disclaimer**

To ensure compliance with all non-transmitter functions the host manufacturer is responsible for ensuring compliance with the module(s) installed and fully operational. For example, if a host was previously authorized as an unintentional radiator under the Supplier's Declaration of Conformity procedure without a transmitter certified module and a module is added, the host manufacturer is responsible for ensuring that the after the module is installed and operational the host continues to be compliant with the Part 15B unintentional radiator requirements. Since this may depend on the details of how the module is integrated with the host, UConnect International Co.,Ltd. shall provide guidance to the host manufacturer for compliance with the Part 15B requirements.

**FCC Warning**

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

**NOTE 1:** Any changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

**FCC Radiation Exposure Statement:**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance.

**Note 1:** This module certified that complies with RF exposure requirement under mobile or fixed condition, this module is to be installed only in mobile or fixed applications.

A mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. Transmitting devices designed to be used by consumers or workers that can be easily re-located, such as wireless devices associated with a personal computer, are considered to be mobile devices if they meet the 20 centimeter separation requirement.

A fixed device is defined as a device is physically secured at one location and is not able to be easily moved to another location.

**Note 2:** Any modifications made to the module will void the Grant of Certification, this module is limited to OEM installation only and must not be sold to end-users, end-user has no manual instructions to remove or install the device, only software or operating procedure shall be placed in the end-user operating manual of final products.

**Note 3:** Additional testing and certification may be necessary when multiple modules are used.

**Note 4:** The module may be operated only with the antenna with which it is authorized. Any antenna that is of the same type and of equal or less directional gain as an antenna that is authorized with the intentional radiator may be marketed with, and used with, that intentional radiator.

**Note 5:** For all products market in US, OEM has to limit the operation channels in CH1 to CH11 for 2.4G band by supplied firmware programming tool. OEM shall not supply any tool or info to the end-user regarding to Regulatory Domain change.