PRODUCT SPECIFICATION

R110C-IA

Bluetooth 5.0 Module Datasheet

Version:v3.0

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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R110C-IA Module Datasheet

	Part NO.	Description
Ordering Information	FGR110CIAX-00	LE5010AI,BLE5.0/BLE5.1 ,18.6*13mm,UART, with shielding

CONTENTS

Revision History

Version	Date	Contents of Revision Change	Preparde	Checked	Approved
V1.0	2022/2/14	New version	FC	Zzq	Qjp
V2.0	2022/10/1q	And Antenna clearance area requirements	FC	Zzq	Qjp
V3.0	2023/08/03	Modify the frequency band Modify the number of channels Modify the output power	Lxp	Zzq	Qjp

1. General Description

1.1 Introduction

Fn-Link Technology would like to announce a low-cost and low-power consumption BT5.0 module. It is highly integrated internally with a 32-bit MCU with 64kByte SRAM and 512kByte Flash, as well as bluetooth 5.0 BLE transceiver. The Bluetooth wireless module complies with the Bluetooth 5.0 BLE standard. Moderate module size. suitable for applications such as smart LEDs. lt can efficiently solve emergency communication problems in complex environments such as high-rise,underground ,tunnels and large complex environments.

1.2 Description

Model Name	R110C-IA
Product Description	Support Bluetooth functionalities
Dimension	L x W x H: 18.6 x 13 x2.5 mm
BT Interface	UART
OS supported	Android /Linux/ Win CE /iOS /XP/WIN7/WIN10
Operating temperature	-20°C to 85°C
Storage temperature	-40°C to 125°C

2. Features

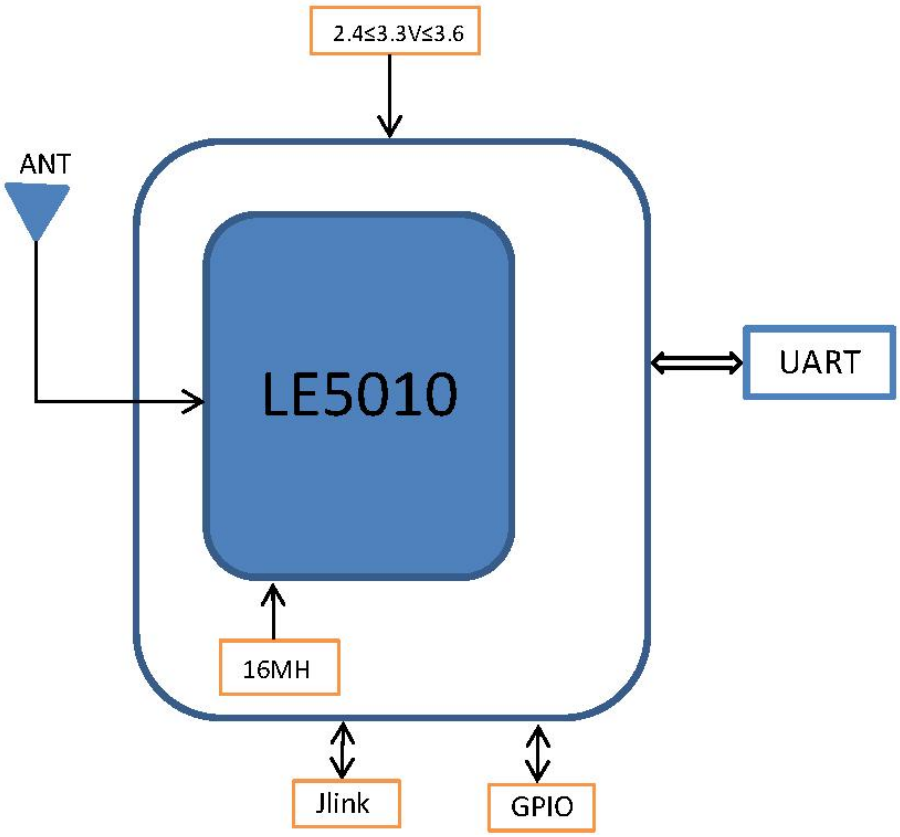
General

- LE Broadcasting Development
- Support OTA control escalation
- Support UART communication

Bluetooth Features

- Support Bluetooth 5.0 LE standard
- Supports 2Mbps LE

3. Block Diagram



4. General Specification

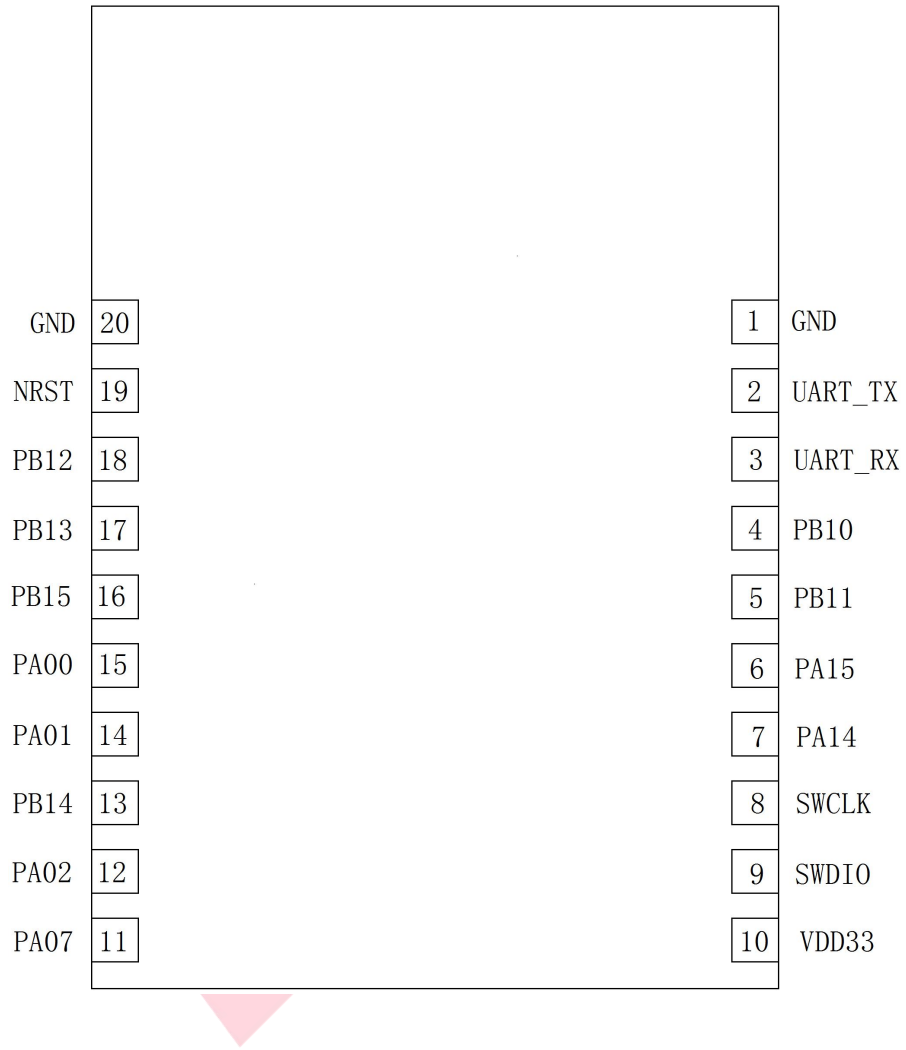
4.1 Bluetooth Specification

Feature	Description		
General Specification			
Bluetooth Standard	Bluetooth V5.0 LE		
Host Interface	UART		
Antenna Reference	On board antenna		
Frequency Band	2402 MHz ~ 2483.5 MHz		
Number of Channels	40（3 Advertising + 37 Data）		
Modulation	GFSK		
RF Specification			
	Min.	**Typical.**	**Max.**
Output Power	-3dbm	0dBm	3dbm
Center Frequency Error Fn	-75KHz		75KHz
Sensitivity @ PER<=30.8% for LE 1Mbps		-90dBm	
Maximum Input Level	LE 1Mbps: -20dBm		
	LE 2Mbps: -20dBm		

5. Pin Definition

5.1 Pin Outline

< TOP VIEW >



5.2 Pin Definition details

NO.	Name	Type	Description	Voltage
1	GND	p	Ground connections	
2	UART_TX	I/O	PB00/ GPIO Pin /UART Download serial port TX	
3	UART_RX	I/O	PB01/ GPIO Pin /UART Download serial port RX	
4	PB10	I/O	GPIO Pin	

5	PB11	I/O	GPIO Pin /WKUP	
6	PA15	I/O	GPIO Pin	
7	PA14	I/O	GPIO Pin	
8	SWCLK	I/O	PB06/ GPIO Pin /Debugging port： SWCLK clock line	
9	SWDIO	I/O	PB05/ GPIO Pin /Debugging port：SWDIO data cable	
10	VDD33	p	3.3V power input	
11	PA07	I/O	GPIO Pin /WKUP	
12	PA02	I/O	GPIO Pin /ADC6	
13	PB14	I/O	GPIO Pin	
14	PA01	I/O	GPIO Pin /ADC5	
15	PA00	I/O	GPIO Pin /ADC4 /WKUP	
16	PB15	I/O	GPIO Pin /WKUP	
17	PB13	I/O	GPIO Pin /ADC1	
18	PB12	I/O	GPIO Pin /ADC0	
19	NRST	I/O	Power enable of module ON: pull high ; OFF: pull low	
20	GND	p	Ground connections	

P:POWER I:INPUT O:OUTPUT

1、 NRST is the reset pin，low level reset，After reset, the chip needs to be released to work normally.

2、 After PB00 and PB01 are powered on the TX/RX interface defaults to UART1,which can change functions in the program.

3、 when using UART burning, PB14 needs to be forced to be raised.

6. Electrical Specifications

6.1 Power Supply DC Characteristics

The digital IO supports VDD33 or VDD18 application.

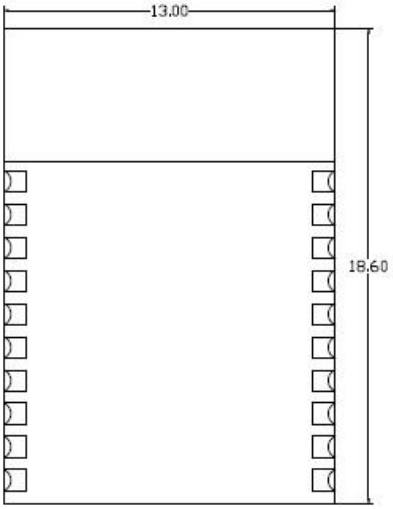
	MIN	TYP	MAX	Unit
Operating Temperature	-20	25	85	deg.C
Operating Voltage	2.4	3.3	3.6	V

6.2 Power Consumption

		Min.	Typ.	Max.	Unit
Power Consumption @VBAT=3.3V	Power Down		700		nA
	TX(0dBm)		12		mA
	RX		10		mA

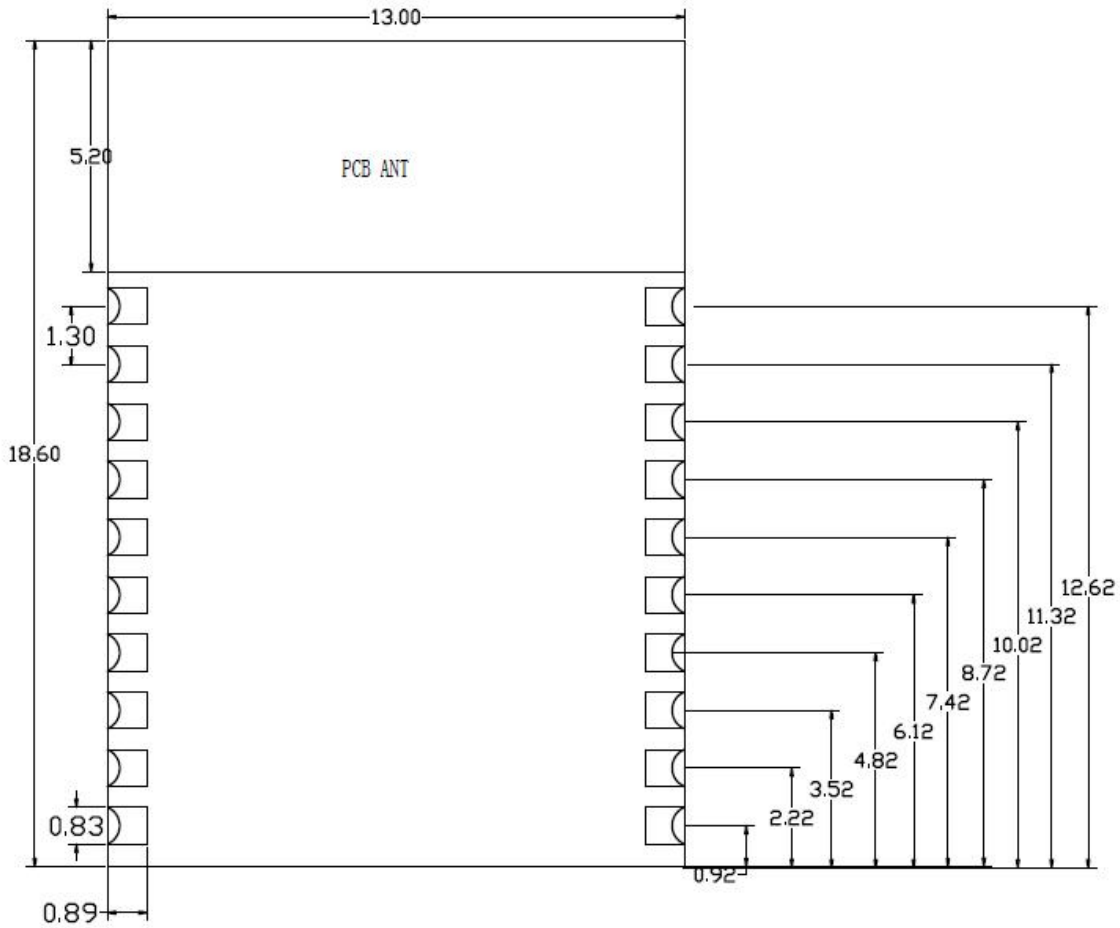
7. Size reference

7.1 Module Picture

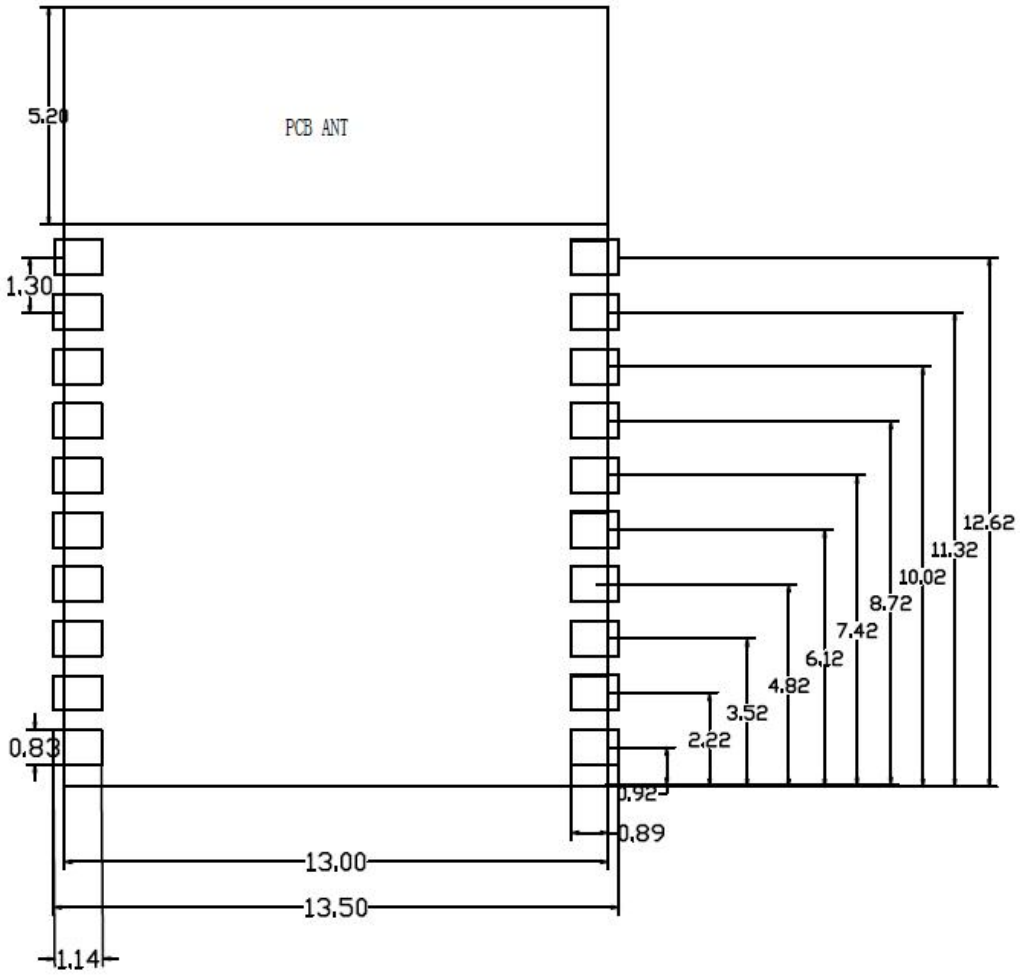
L x W : 13 x 18.6 (+0.3/-0.1) mm 	
H: 2.5 (±0.2) mm	
Weight	TBD

7.2 Physical Dimensions

<TOP View>


13.00
5.20
PCB ANT
1.30
18.60
0.83
0.89
0.92
2.22
3.52
4.82
6.12
7.42
8.72
10.02
11.32
12.62

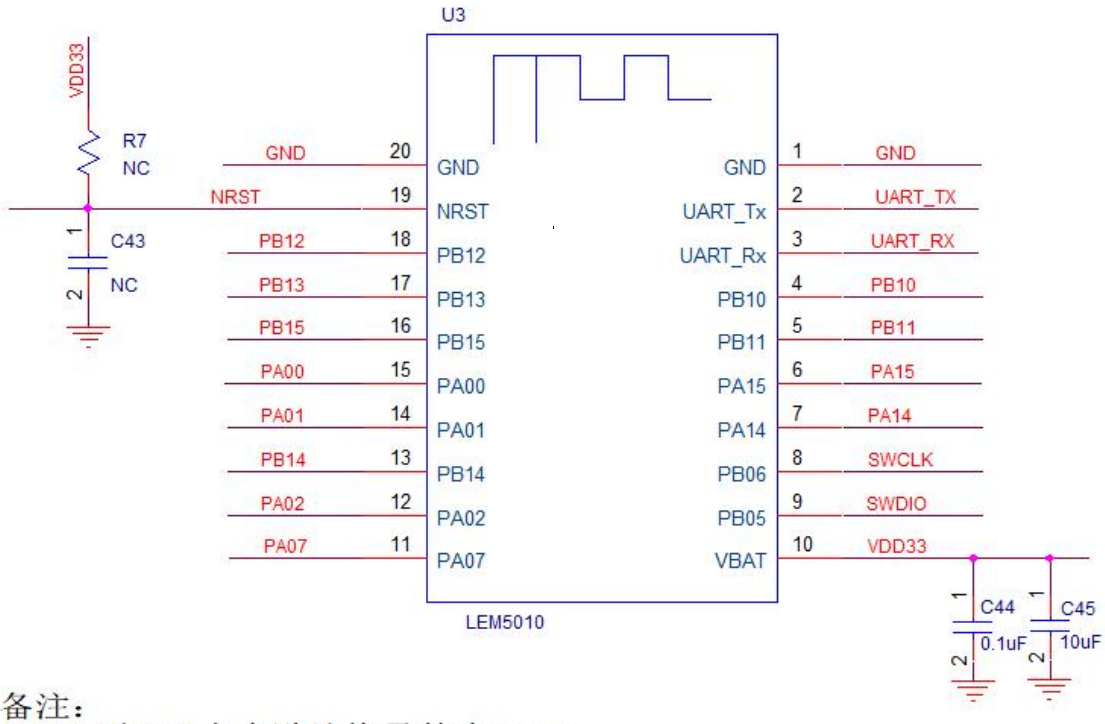
7.3 Layout Recommendation



8. The Key Material List

Chipset	LE5010AI,Bluetooth ,4*4mm,QFN32	Linkedsemi
PCB	R110C-IA 18.6*13mm*1.0mm 2L	XY-PCB,KX-PCB,SL-PCB,Sunlord
Crystal	3225 16MHz 9PF 8ppm	TST,HOSONIC,TKD,ECEC,JWT
Inductor	0201 3.3nH,±0.1NH	Microgate,sunlord,cenke,ceaiya
Shielding	R110C-IAshielding	信太,精力通

9. Reference Design



备注：
1）PB0和PB1上电默认烧录的为TX,RX。
2）通过UART口烧录的时候，需将PB14拉高。
3,）NRST为复位引脚，低电平复位，复位后需要将其释放，芯片才能正常工作

10 Antenna clearance area requirements

When using PCB antenna on Wi-Fi module, make sure the distance between PCB on motherboard and other metal devices is at least 16mm.The shaded areas in the figure below need to be marked away from metal devices, sensors, interference sources, and other materials that may interfere with the signal.

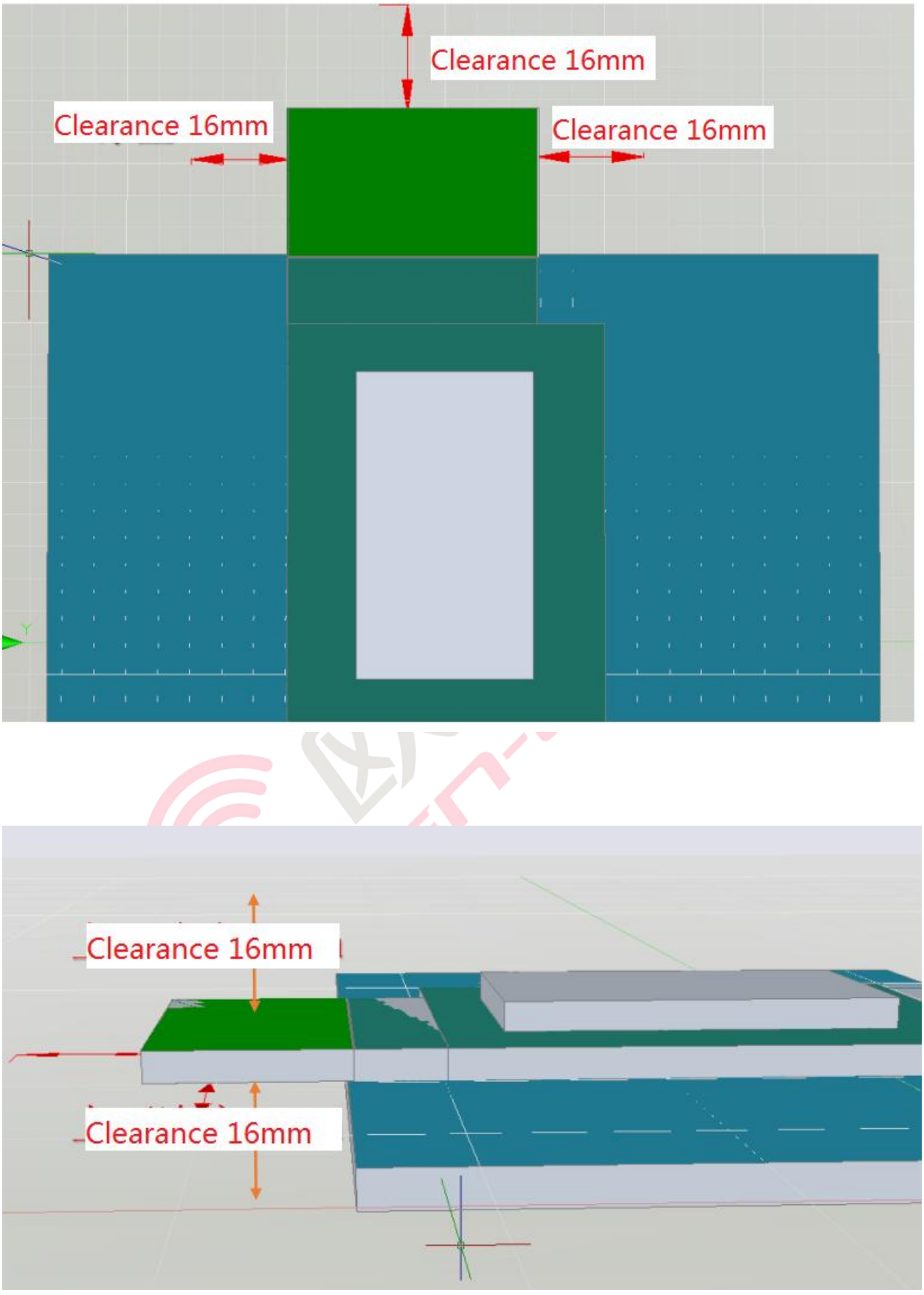


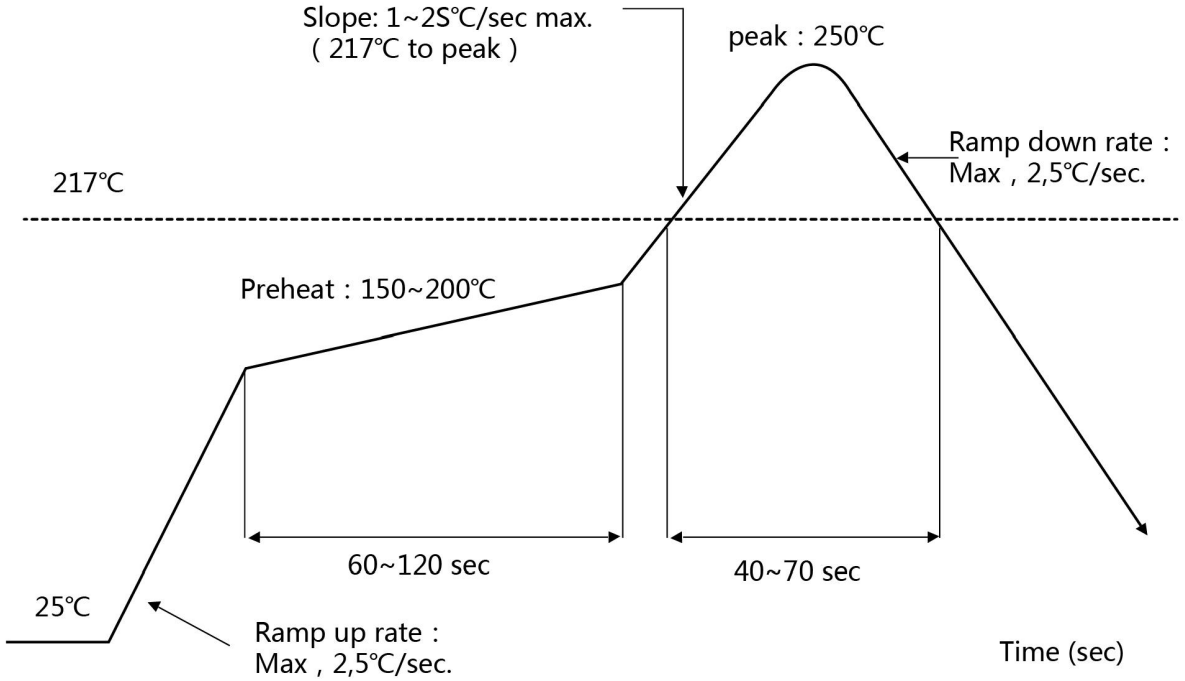
Figure 6-2 Antenna clearance reference

11. Recommended Reflow Profile

Referred to IPC/JEDEC standard.

Peak Temperature : <250°C

Number of Times : ≤2 times



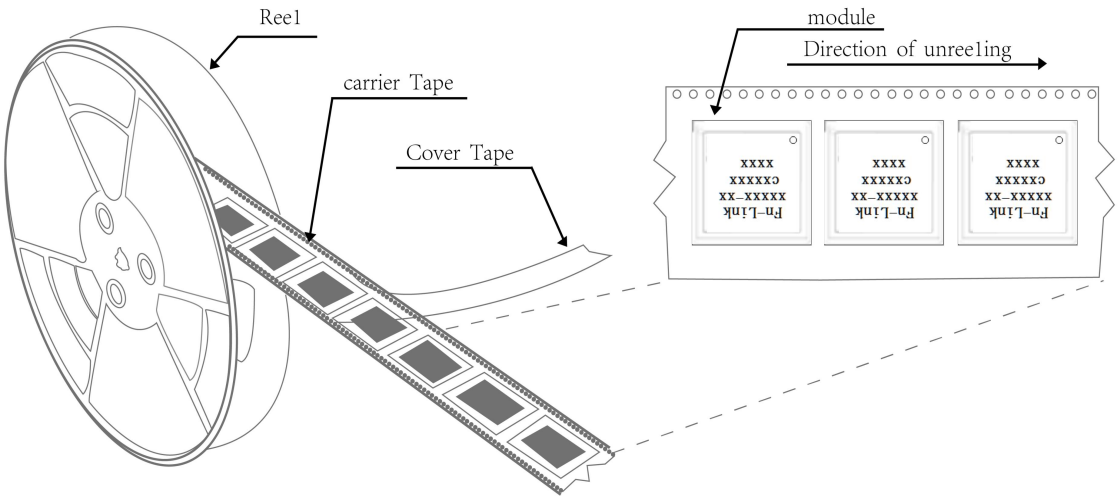
12. RoHS compliance

All hardware components are fully compliant with EU RoHS directive

13. Package

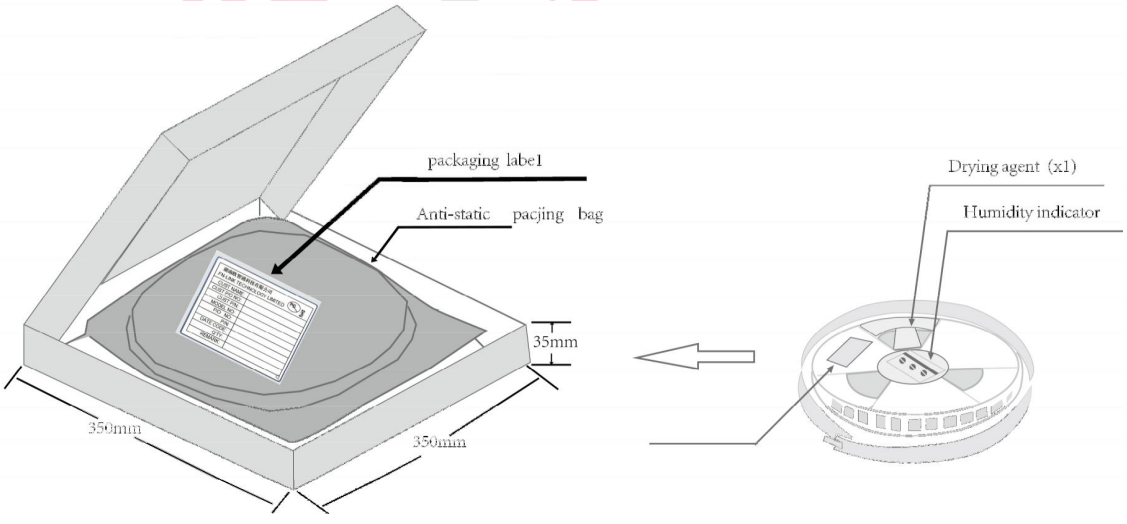
13.1 Reel

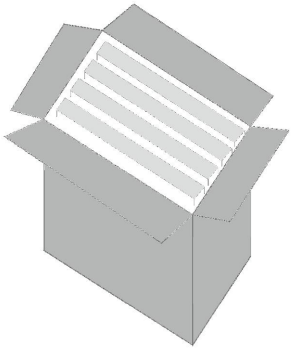
A roll of 1500pcs

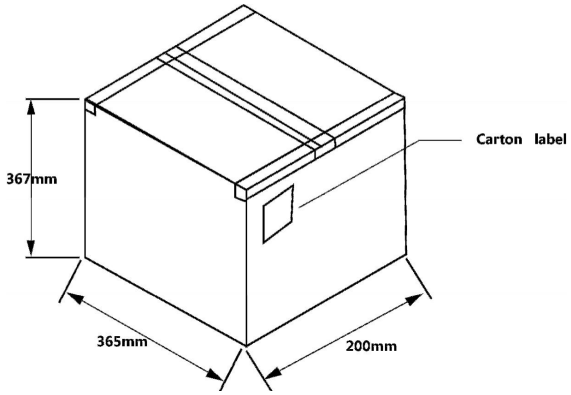


13.2 Packaging Detail

the take-up package







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

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