FN-LINK 欧智通

PRODUCT SPECIFICATION

6161C-IC

Bluetooth 5.0 Module Datasheet

Version:v7.1

6161C-IC Module Datasheet

Ordering Information	Part NO.	Description
	FG6161CICX-00	RTL8762CMF QFN40_5x5 BT5.0+UART PCB V1.0

Customer: _____

Customer P/N:_____

Signature:_____

Date:_____

CONTENTS

Revision History

Version	Date	Contents of Revision Change	Draft	Checked	Approved
V1.0	2019/12/10	New version	Lgp	Lgp	Szs
V2.0	2020/3/16	Add module pictures Correct UART pin description	Lgp	Lgp	Szs
V3.0	2020/4/23	Add packaging information	Lgp	Lgp	Szs
V4.0	2020/12/18	Renew module pictures,add label information, firmware version information, Renew The Key Material List,	Lgp	Lgp	Szs
V5.0	2021/01/19	Renew label information and The Key Material List	Lgp	Lgp	Szs
V6.0	2021/01/23	Renew label information, Correct typo	Lgp	Lgp	Szs
V7.0	2020/8/24	Add features functions	Zzq	Zzq	Qjp
V7.1	2022/01/13	Update the specification format Chinese-English translation	FC	Zzq	Qjp

1. General Description

1.1 Introduction

Fn-link has released a low-cost, low-power Bluetooth 5.0 module, Support Mesh function .It is highly integrated internally with an ARM Cortex-M4F 32-bit MCU with 160kByte RAM and 512kByte Flash, as well as a Bluetooth 5.0 LE transceiver.

The Bluetooth wireless module conforms to bluetooth 5.0 LE standard and provides UART, SPI, I2C, ADC and other interfaces for Bluetooth.   Module size is moderate, suitable for intelligent LED applications, can effectively solve the emergency communication problems in high-rise, underground, tunnel, large complex and other complex environment.

1.2 Description

Model Name	6161C-IC
Product Description	Support Bluetooth functionalities
Dimension	L x W x H: 16.5X13.3X2.3 mm (typical)
BT Interface	UART
firmware version	OZT_DO_201215_r1530，922BC1E2
Operating temperature	-20°C to 85°C
Storage temperature	-40°C to 125°C

2. Features

General

■ Supports 2Mbps LE

■ Support OTA control upgrade

■ Supports four-wire SPI

■ Supports one I2C

■ multiple configurable GPIO

■ It supports master-slave integration,both host roles and slave roles, and supports the establishment of 9 links, one host link and   eight slave links at the same time

■ Package size:16.5X13.3X2.3 mm

Bluetooth Features

■ Support Bluetooth 5.0 LE standard

■ Supports UART communication

3. Block Diagram
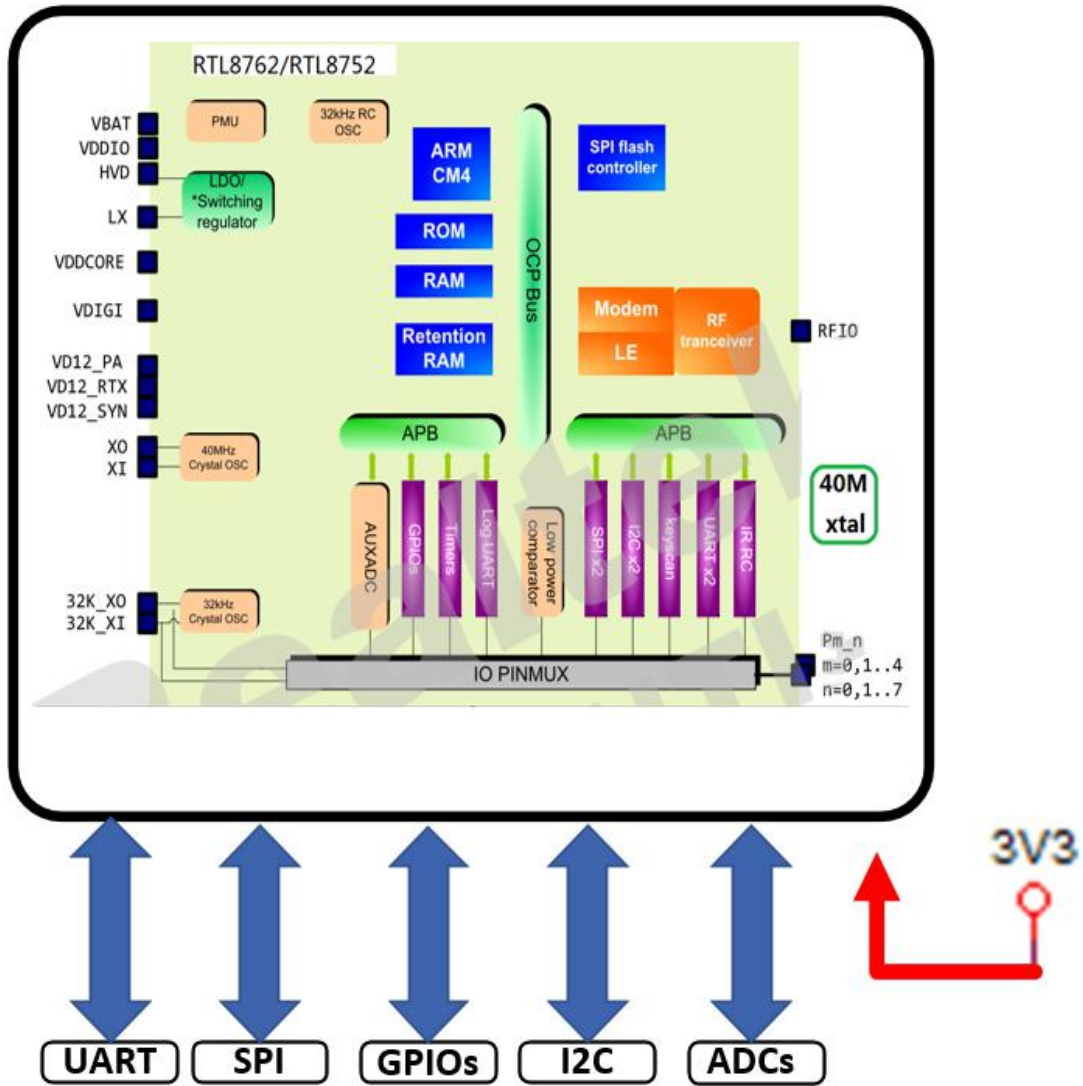
4. General Specification

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 ~ 2480 MHz
Number of Channels	40（3 Advertising + 37 Data
Modulation	GFSK
RF Specification	

	Min	**Typical**	**Max**
Output Power		7dBm	
Center Frequency Error Fn	-150KHz		150KHz
Sensitivity @ PER<=30.8% for LE 1Mbps		-95dBm	
Maximum Input Level	LE 1Mbps: -20dBm		
	LE 2Mbps: -20dBm		

5. Pin Definition

5.1 Pin Outline

< TOP VIEW >

Pin	Name
1	GND
2	3V3
3	BOOT/LOG_TX
4	SWDIO
5	SWCLK
6	GPIO0_0
7	SPI_CSB
8	SPI_CLK
9	SPI_MISO
10	SPI_MOSI
11	I2C_SCL
12	I2C_SDA
13	UART_CTS
14	GPIO0_1
15	UART_RTS
16	GPIO2_3
17	GPIO2_4
18	GPIO2_5
19	RESET
20	UART_RX
21	UART_TX
22	ADC_IN1
23	ADC_IN2
24	GPIO2_6
25	GPIO5_0
26	GPIO0_4
27	GPIO0_2
28	GPIO_XO
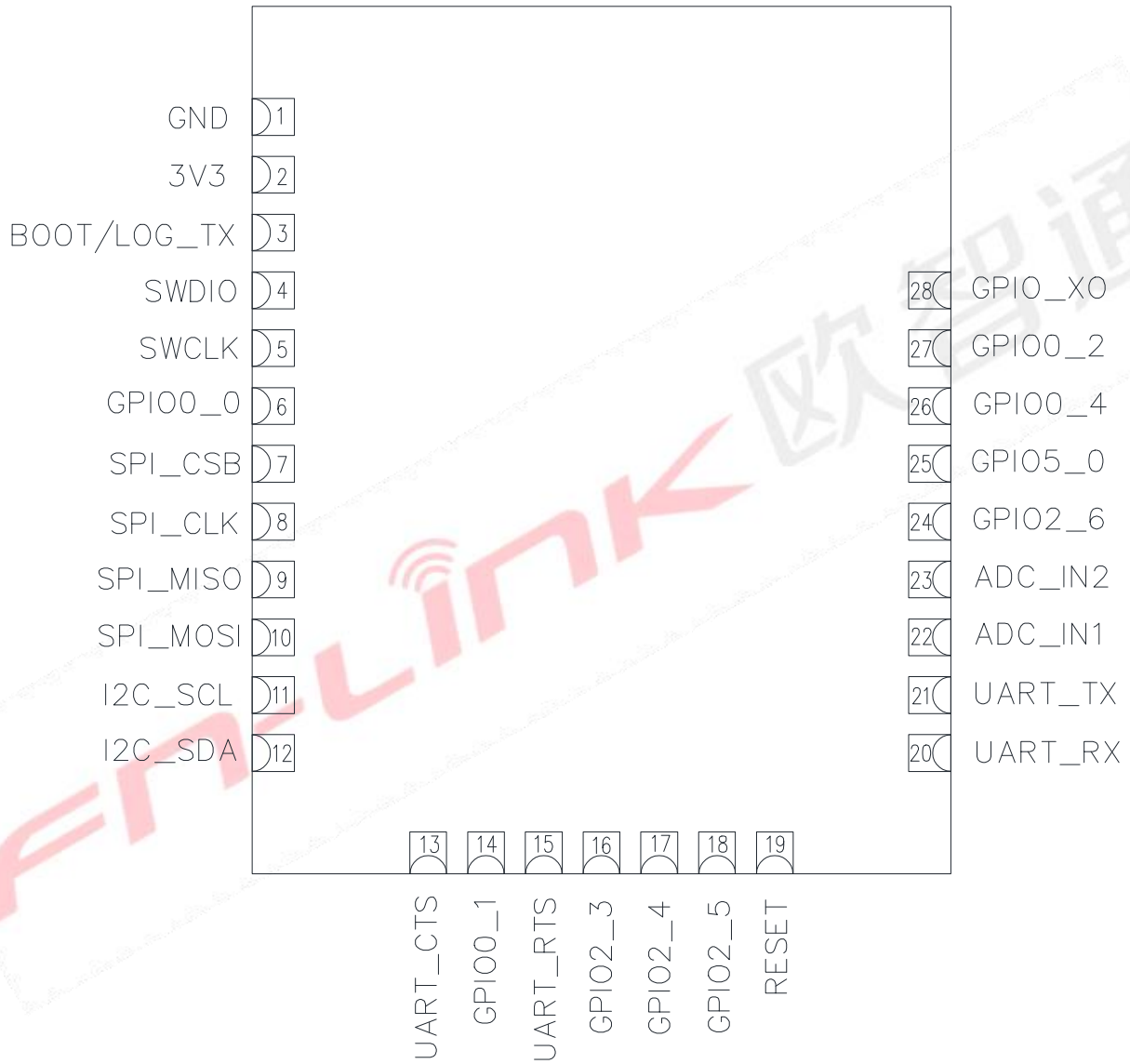
5.2 Pin Definition details

NO.	Name	Type	Description	Voltage
1	GND		Ground connections	
2	3V3	P	+3.3V power supply	DC 3.3V
3	LOG_TX		Pull down,Enter burning mode, suspended as the log output port	
4	SWDIO		Debugging port：SWDIO data cable	
5	SWCLK		Debugging port：SWCLK clock line	
6	GPIO0_0	I/O	Universal GPIO port，configurable	
7	SPI_CSB		SPI communication port	
8	SPI_CLK		SPI communication port	
9	SPI_MISO		SPI communication port	
10	SPI_MOSI		SPI communication port	
11	I2C_SCL		I2C communication port	
12	I2C_SDA		I2C communication port	
13	UART_CTS		clear-to-send （Low level enables to send）	
14	GPIO0_1	I/O	Universal GPIO port，configurable	
15	UART_RTS		request to sand （Low level Enables receiving）	
16	GPIO2_3	I/O	Universal GPIO port，configurable	
17	GPIO2_4	I/O	Universal GPIO port，configurable	
18	GPIO2_5	I/O	Universal GPIO port，configurable	
19	RESET		module reset pin (Vil reset module，internal pull-up)	
20	UART_RX		UART RXD	
21	UART_TX		UART TXD	
22	ADC_IN1		Module conversion acquisition pin	
23	ADC_IN2		Module conversion acquisition pin	
24	GPIO2_6	I/O	Universal GPIO port，configurable	
25	GPIO5_0	O	journal output （Customize support according to firmware）	
26	GPIO0_4	I/O	Universal GPIO port，configurable	
27	GPIO0_2	I/O	Universal GPIO port，configurable	
28	GPIO_XO	I/O	Universal GPIO port，configurable	

P:POWER   I:INPUT   O:OUTPUT

6. Electrical Specifications

6.1 Power Supply DC Characteristics
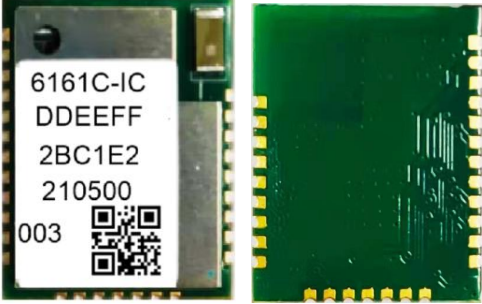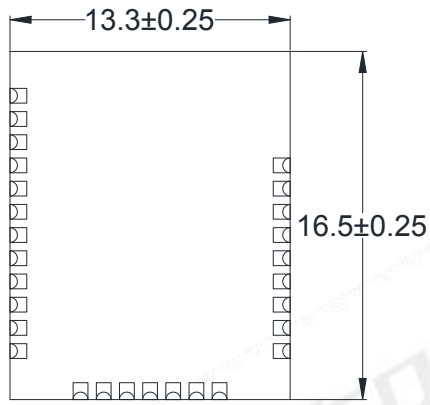
The digital IO supports VDD33 or VDD18 application.

	MIN	TYP	MAX	Unit
Operating Temperature	-40	25	85	deg.C
Operating VDC	2.7	3.0	3.3	V

6.2 Power Consumption

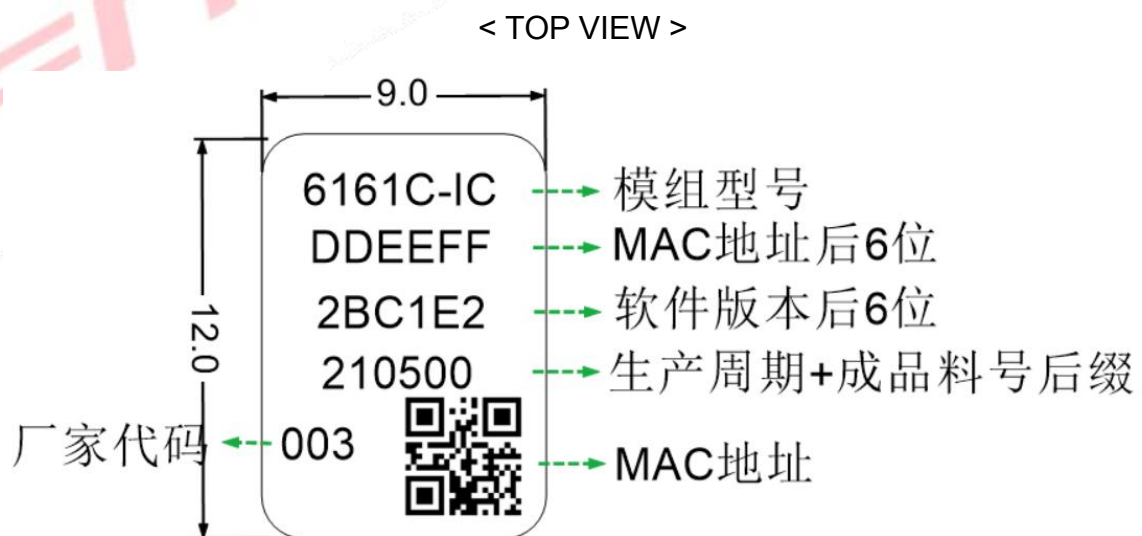|				
功耗@VBAT=3V	Power Down		450	nA
	深度睡眠		2.5	uA
	TX(7.5dBm)		11.3	mA
	TX(4dBm)		9.6	mA
	TX(0dBm)		7.9	mA
	RX		7.3	mA

7. Size reference

7.1 Module Picture
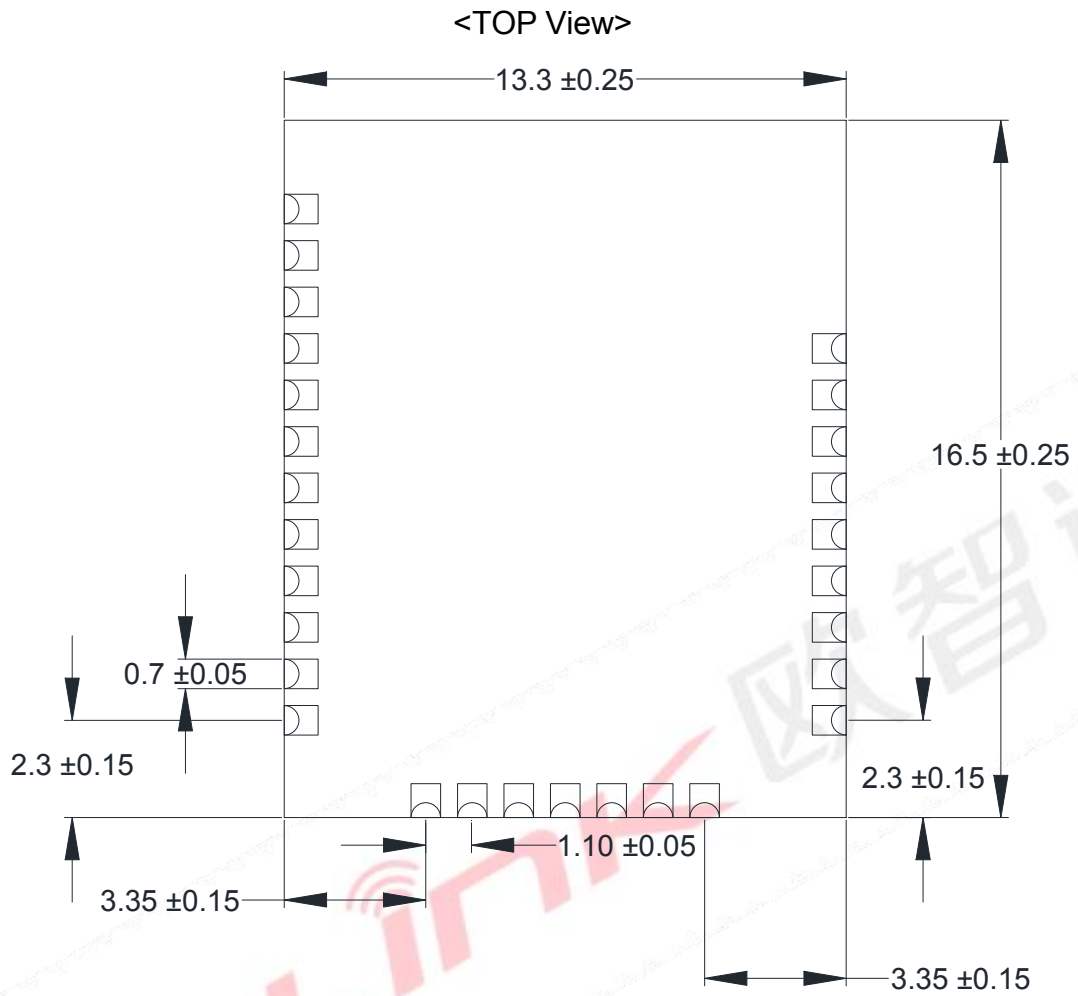
L x W : 16.5 x 13.3 (+0.3/-0.1) mm 	
H: 2.3 (±0.2) mm	
Weight	0.8g(±0.1)g

7.2 Marking Description

< TOP VIEW >

6161C-IC → 模组型号
DDEEFF → MAC地址后6位
2BC1E2 → 软件版本后6位
210500 → 生产周期+成品料号后缀
厂家代码 ← 003 → MAC地址

7.3 Physical Dimensions

<TOP View>

13.3 ±0.25

16.5 ±0.25

0.7 ±0.05

2.3 ±0.15

1.10 ±0.05

3.35 ±0.15

2.3 ±0.15

3.35 ±0.15

7.4 Layout Recommendation
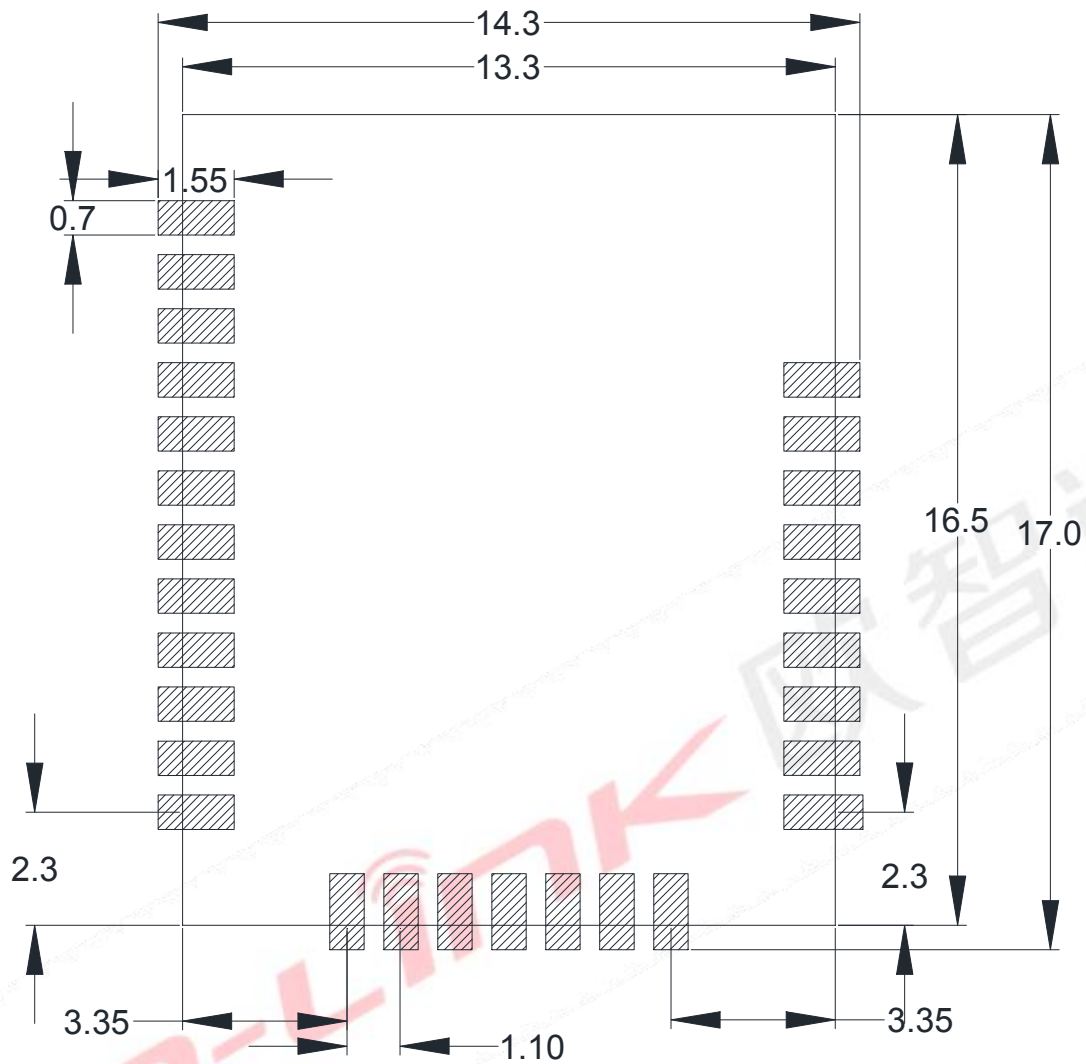
8. The Key Material List

| Item	Part Name	Description	Manufacturer
1	Crystal	3225 40MHz 9pF +/-10ppm	ECEC, TKD, Hosonic, JWT, TXC
2	Chipset	RTL8762CMF	Realtek
3	PCB	FR4, 2 LAYER, GREEN	XY-PCB, GDKX, Sunlord, SLPCB
4	Inductor	Power Inductor, 2.2uH, 0603	Sunlord, Ceaiya, Cenker, Fangci
5	Inductor	RF Inductor	Sunlord, Murata, Chilisin

9. Reference Design
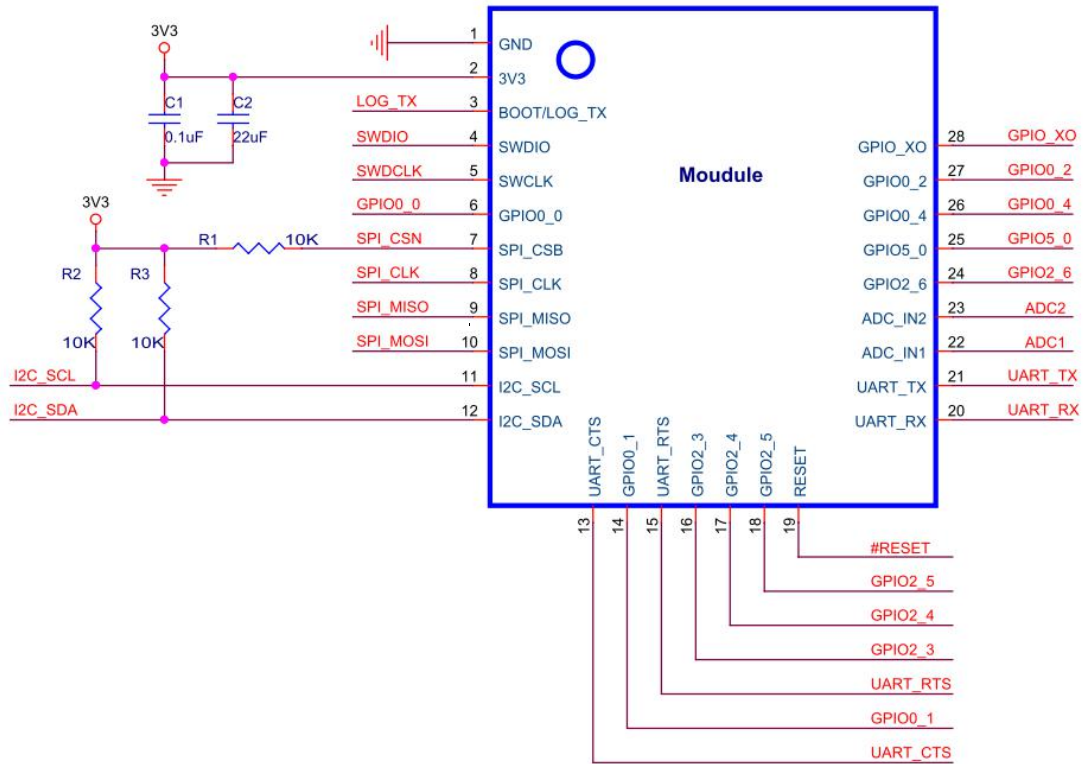
Note:

1, C1, C2 is as close to module 2 pin as possible；

2, The UART interface level of the module is 3.3V. If 5V equipment needs to be connected externally, the peripheral level conversion circuit should be added

10. Recommended Reflow Profile
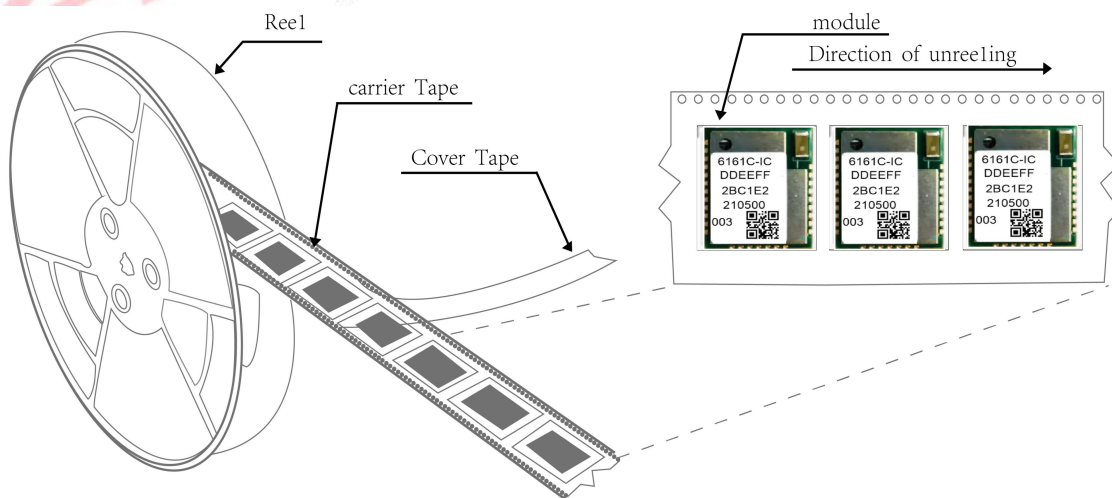
Referred to IPC/JEDEC standard.

Peak Temperature : <250°C

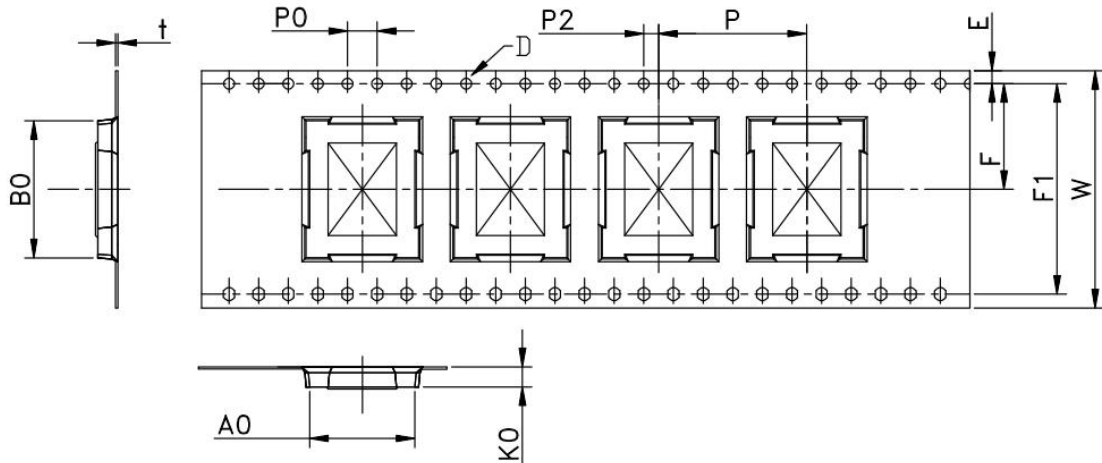Number of Times : ≤2 times
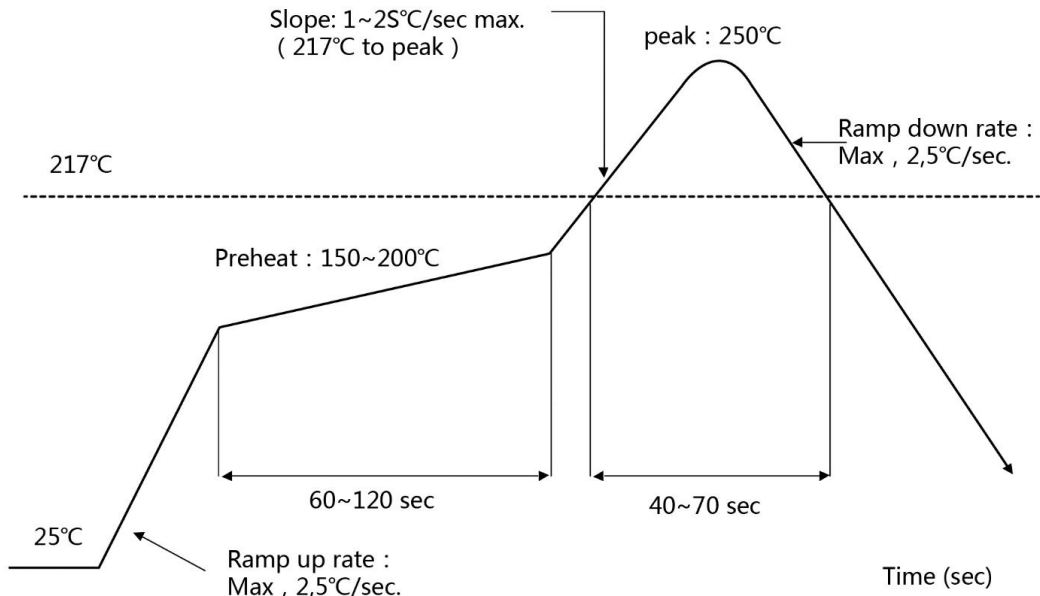
11. Package

11.1 Reel

A roll of 1000pcs

11.2 Carrier Tape Detail

ITEM	W	A0	B0	D	E	F	F1	K0	P0	P2	P	T
DIM	32	13.75	17.05	1.5	1.75	14.20	28.4	2.80	4.0	2.0	20.0	0.30
TOLE	+0.3 -0.3	±0.15	±0.15	+0.1 -0.0	±0.1	±0.15	±0.10	±0.10	±0.1	±0.15	±0.1	±0.05

11.3 Packaging Detail

the take-up package

Using self-adhesive tape
Color of plastic disc: blue

NY bag size:450X415mm

size ： 350*350*35mm

The packing case size:360X210X370mm

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°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