

SPECIFICATION

Product : BLUETOOTH MODULE

SPEC. : BRM3084

Model Number : ALANBT01

List of Contents

1 Introduction	3
2 Key Features	3
3 Applications	4
4 Block Diagram	4
5 General specifications	4
6 Module Package Information	5
6.1 Pinout Diagram and package dimensions	5
6.2 Module Pin descriptions	6
7 Electrical Characteristics	10
7.1 Absolute Maximum Ratings	10
7.2 Recommended Operating Conditions	10
8 Recommended reflow temperature profile	12

1 Introduction

Alan Safety introduces the pioneer of the Bluetooth 5.3 modules

ALANBT01 which is a high performance, cost effective, low power and compact solution. The Bluetooth module provides a complete 2.4GHz Bluetooth system based on the QCC3084 WLCSP chipset which is a single chip radio and baseband IC for Bluetooth 2.4GHz systems. This module is fully qualified single-chip dual mode Bluetooth@v5.3 system.

2 Key Features

MD-BLT-QR3084I (QCC3084) Features

- Qualified to Bluetooth v5.3 specification
- 240 MHz Qualcomm® Kalimba™ audio DSP
- 32/80 MHz Developer Processor for applications
- Firmware Processor for system
- Flexible QSPI flash programmable platform
- High-performance 24-bit stereo audio interface
- Digital and analog microphone interfaces
- Flexible PIO controller and LED pins with PWM support
- Serial interfaces: UART, Bit Serializer (I² C/SPI), USB 2.0
- Advanced audio algorithms
- Active Noise Cancellation:Hybrid, Feedforward, and Feedback modes, using Digital or Analog Mics, enabled using license keys available from Qualcomm®
- Qualcomm® aptX™ and aptX HD Audio
- aptX Adaptive, enabled using license key
- 1 or 2 mic Qualcomm® cVc™ headset speech processing
- Qualcomm® cVc™ Noise Cancellation Technology,enabled using license key
- Integrated PMU: Dual SMPS for system/digital circuits, Integrated Li-ion battery charger
- 134-ball 6.7 mm x 7.4 mm x 1.0 mm, 0.5 mm pitch VFBGA

Application subsystem

- Dual-core application subsystem 32/80MHz operation
- 32-bit Firmware Processor (reserved for system use) executes:
 - Bluetooth upper stack
 - Profiles
 - House-keeping code
- 32-bit Developer Processor executes:
 - Developer applications
- Both cores execute code from external flash memory using QSPI clocked at 32 MHz or 80 MHz
- On-chip caches per core enable optimized performance and power consumption

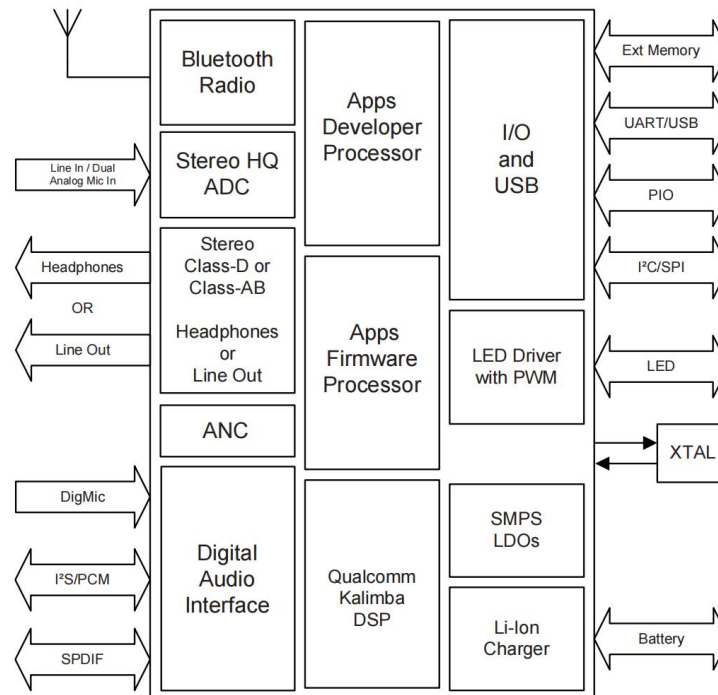
Bluetooth subsystem

- Qualified to Bluetooth v5.3 specification including 2 Mbps Bluetooth Low Energy and Bluetooth Low Energy Isochronous Channels
- Qualcomm® Bluetooth High Speed Link
- Single ended antenna connection with on-chip balun and Tx/Rx switch
- Bluetooth, Bluetooth Low Energy, and mixed topologies supported
- Class 1 support

3 Applications

- Wired/wireless stereo headsets/headphones

4 Block Diagram

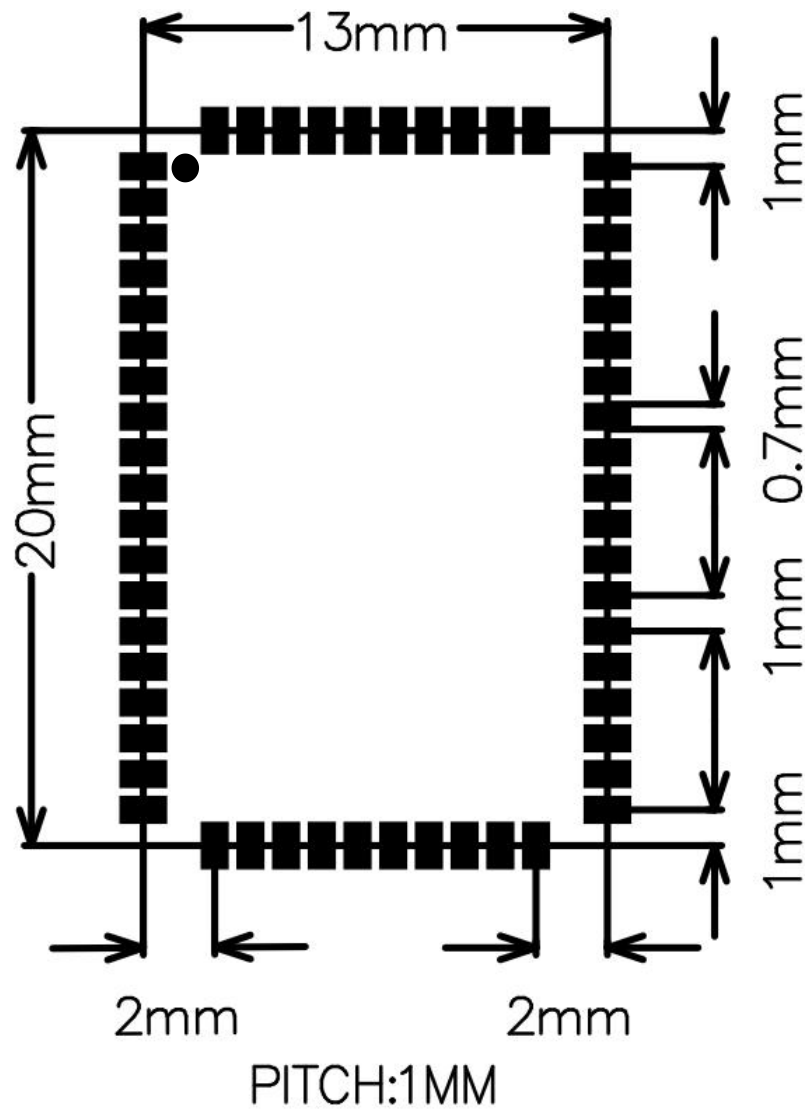


5 General specifications

Model Name	ALANBT01
Product Description	Bluetooth 5.3 Class1.5 Module
Bluetooth Standard	Bluetooth 5.3
Chipset	QCC3084 WLCSP
Dimension	13mm x 20mm x 2.8mm
Operating Conditions	
Voltage	2.8~4.3V
Temperature	-40~+85℃
Storage Temperature	-40~+85℃
Electrical Specifications	
Frequency Range	2402~2480MHz
Maximum RF Transmit Power	13dBm
$\pi/4$ DQPSK Receive Sensitivity	-94dBm
8DPSK Receive Sensitivity	-88dBm

6 Module Package Information

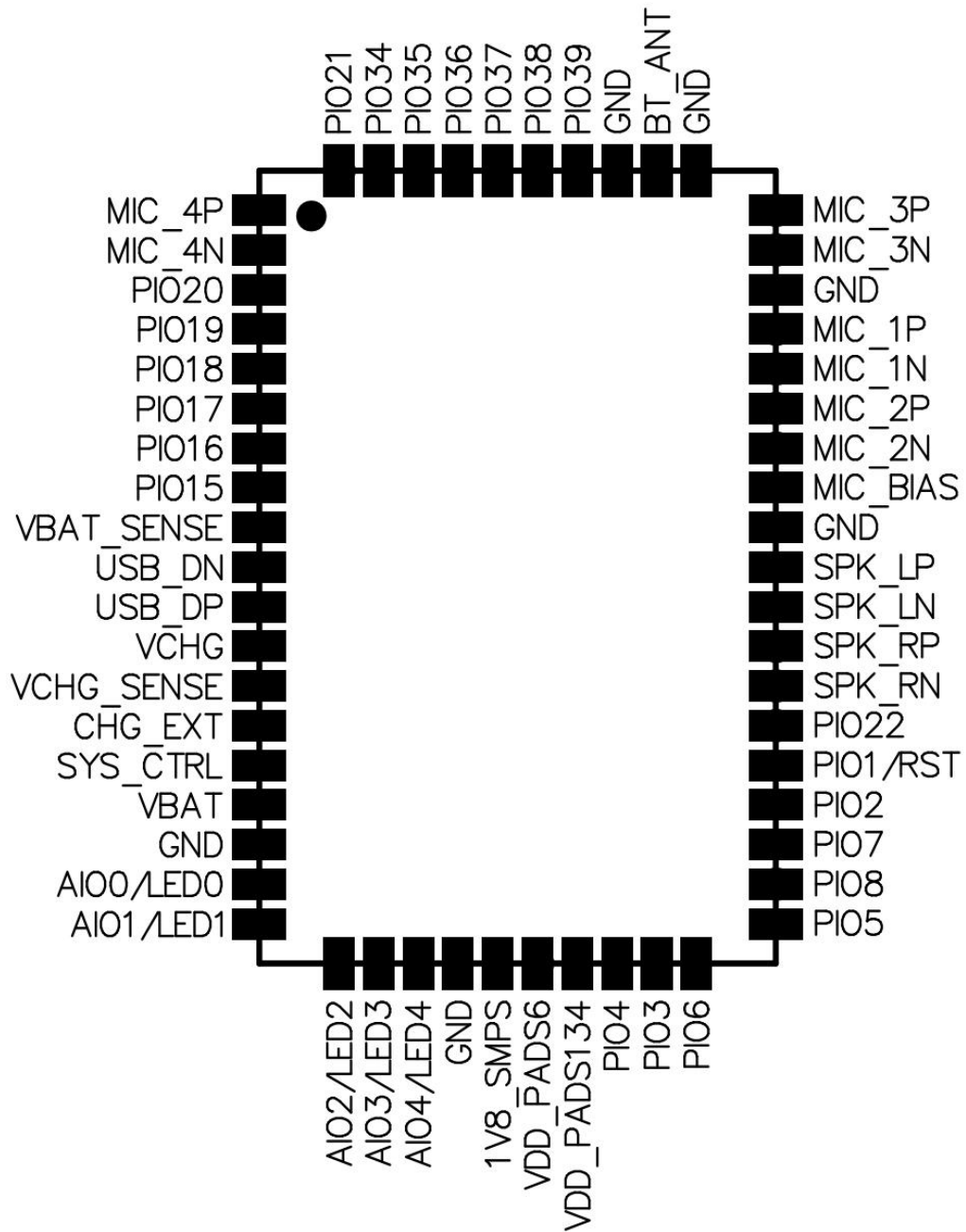
6.1 Pinout Diagram and package dimensions



Unit: MM

Recommended PCB layout footprint

6.2 Module Pin descriptions



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Pin#	Pin Name	Pin type	Description
1	MIC_4P	Analog	Microphone differential 4 input, positive. Alternative function: ■ Differential audio line input 4,positive
2	MIC_4N	Analog	Microphone differential 4 input,negative. Alternative function: ■ Differential audio line input 4,negative
3	PIO[20]	Digital: Bidirectional with programmable strength internal pull-up/pull-down	Programmable I/O line 20. Alternative function: ■ PCM_DOUT[1]
4	PIO[19]	Digital: Bidirectional with programmable strength internal pull-up/pull-down	Programmable I/O line 19. Alternative function: ■ PCM_DIN[0]
5	PIO[18]	Digital: Bidirectional with programmable strength internal pull-up/pull-down	Programmable I/O line 18. Alternative function: ■ PCM_DOUT[0]
6	PIO[17]	Digital: Bidirectional with programmable strength internal pull-up/pull-down	Programmable I/O line 17. Alternative function: ■ PCM_SYNC
7	PIO[16]	Digital: Bidirectional with programmable strength internal pull-up/pull-down	Programmable I/O line 16. Alternative function: ■ PCM_CLK
8	PIO[15]	Digital: Bidirectional with programmable strength internal pull-up/pull-down	Programmable I/O line 15. Alternative function: ■ MCLK_OUT
9	VBAT_SENSE	Analog	Battery voltage sense input.
10	USB_DN	Digital	USB Full Speed device D- I/O.
11	USB_DP	Digital	USB Full Speed device D+ I/O.
12	VCHG	Supply	Supply to SMPS power switch from battery.
13	VCHG_SENSE	Analog	Charger input sense pin. High impedance. Connect VCHG_SENSE direct to SMPS_VCHG.
14	CHG_EXT	Analog	External charger transistor current control. Connect to base of external charger transistor as per application schematic.
15	SYS_CTRL	Digital input	Typically connected to an ON/OFF push button. If power is present from the battery and/or charger, and software has placed the device in the OFF or DORMANT state, a button press boots the device. Also usable as a digital input in normal operation. No pull. Additional function: ■ PIO[0] input only

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16	VBAT	Supply	Battery voltage input.
17	GND	Ground	Ground
18	AIO0/LED0	Analog or digital input/ open drain output.	General-purpose analog/digital input or open drain LED output.
19	AIO1/LED1	Analog or digital input/ open drain output.	General-purpose analog/digital input or open drain LED output.
20	AIO2/LED2	Analog or digital input/ open drain output.	General-purpose analog/digital input or open drain LED output.
21	AIO3/LED3	Analog or digital input/ open drain output.	General-purpose analog/digital input or open drain LED output.
22	AIO4/LED4	Analog or digital input/ open drain output.	General-purpose analog/digital input or open drain LED output.
23	GND	Ground	Ground
24	1V8_SMPS	Supply	1.8V voltage output.
25	VDD_PADS6	Supply	1.8 V/3.3 V PIO supply.
26	VDD_PADS134	Supply	1.8 V/3.3 V PIO supply.
27	PIO[4]	Digital: Bidirectional with programmable strength internal pull-up/pull-down	Programmable I/O line 4. Alternative function: ■ TBR_MOSI[1]
28	PIO[3]	Digital: Bidirectional with programmable strength internal pull-up/pull-down	Programmable I/O line 3. Alternative function: ■ TBR_MISO[2]
29	PIO[6]	Digital: Bidirectional with programmable strength internal pull-up/pull-down	Programmable I/O line 6. Alternative function: ■ TBR_MOSI[0]
30	PIO[5]	Digital: Bidirectional with programmable strength internal pull-up/pull-down	Programmable I/O line 5. Alternative function: ■ TBR_MISO[1]
31	PIO[8]	Digital: Bidirectional with programmable strength internal pull-up/pull-down	Programmable I/O line 8. Alternative function: ■ TBR_CLK
32	PIO[7]	Digital: Bidirectional with programmable strength internal pull-up/pull-down	Programmable I/O line 7. Alternative function: ■ TBR_MISO[0]
33	PIO[2]	Digital: Bidirectional with programmable strength internal pull-up/pull-down	Programmable I/O line 2. Alternative function: ■ TBR_MISO[3]
34	PIO[1]/RST	Digital: Bidirectional with programmable strength internal pull-up/pull-down	Automatically defaults to RESET# mode when the device is unpowered, or in off modes. Reconfigurable as a PIO after boot. Alternative function: ■ Programmable I/O line 1
35	PIO[22]	Digital: Bidirectional with programmable strength	Programmable I/O line 22.

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		internal pull-up/pull-down	
36	SPK_RN	Analog	Headphone/speaker differential 2 output, negative. Alternative function: ■ Differential line output 2, negative
37	SPK_RP	Analog	Headphone/speaker differential 2 output, positive. Alternative function: ■ Differential line output 2, positive
38	SPK_LN	Analog	Headphone/speaker differential 1 output, negative. Alternative function: ■ Differential line output 1, negative
39	SPK_LP	Analog	Headphone/speaker differential 1 output, positive. Alternative function: ■ Differential line output 1, positive
40	GND	Ground	Ground
41	MIC_BIAS	Analog	Mic bias output.
42	MIC_2N	Analog	Microphone differential 2 input, negative. Alternative function: ■ Differential audio line input 2, negative
43	MIC_2P	Analog	Microphone differential 2 input, positive. Alternative function: ■ Differential audio line input 2, positive
44	MIC_1N	Analog	Microphone differential 1 input, negative. Alternative function: ■ Differential audio line input 1, negative
45	MIC_1P	Analog	Microphone differential 1 input, positive. Alternative function: ■ Differential audio line input 1, positive
46	GND	Ground	Ground
47	MIC_3N	Analog	Microphone differential 3 input, negative. Alternative function: ■ Differential audio line input 3, negative
48	MIC_3P	Analog	Microphone differential 3 input, positive. Alternative function:

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49	GND	Ground	Ground
50	BT_ANT	RF	Bluetooth transmit/receive.
51	GND	Ground	Ground
52	PIO[39]	Digital: Bidirectional with programmable strength internal pull-up/pull-down	Programmable I/O line 39. Alternative function: ■ QSPI2_IO[3]
53	PIO[38]	Digital: Bidirectional with programmable strength internal pull-up/pull-down	Programmable I/O line 38. Alternative function: ■ QSPI2_CS0#
54	PIO[37]	Digital: Bidirectional with programmable strength internal pull-up/pull-down	Programmable I/O line 37. Alternative function: ■ QSPI2_IO[1]
55	PIO[36]	Digital: Bidirectional with programmable strength internal pull-up/pull-down	Programmable I/O line 36. Alternative function: ■ QSPI2_IO[2]
56	PIO[35]	Digital: Bidirectional with programmable strength internal pull-up/pull-down	Programmable I/O line 35. Alternative function: ■ QSPI2_CLK
57	PIO[34]	Digital: Bidirectional with programmable strength internal pull-up/pull-down	Programmable I/O line 34. Alternative function: ■ QSPI2_IO[0]
58	PIO[21]	Digital: Bidirectional with programmable strength internal pull-up/pull-down	Programmable I/O line 21. Alternative function: ■ PCM_DOUT[2]

7 Electrical Characteristics

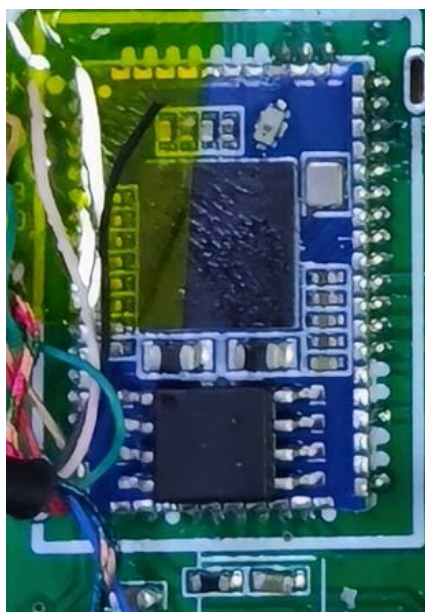
7.1 Absolute Maximum Ratings

Rating	Minimum	Maximum
Storage temperature	-40°C	+85°C

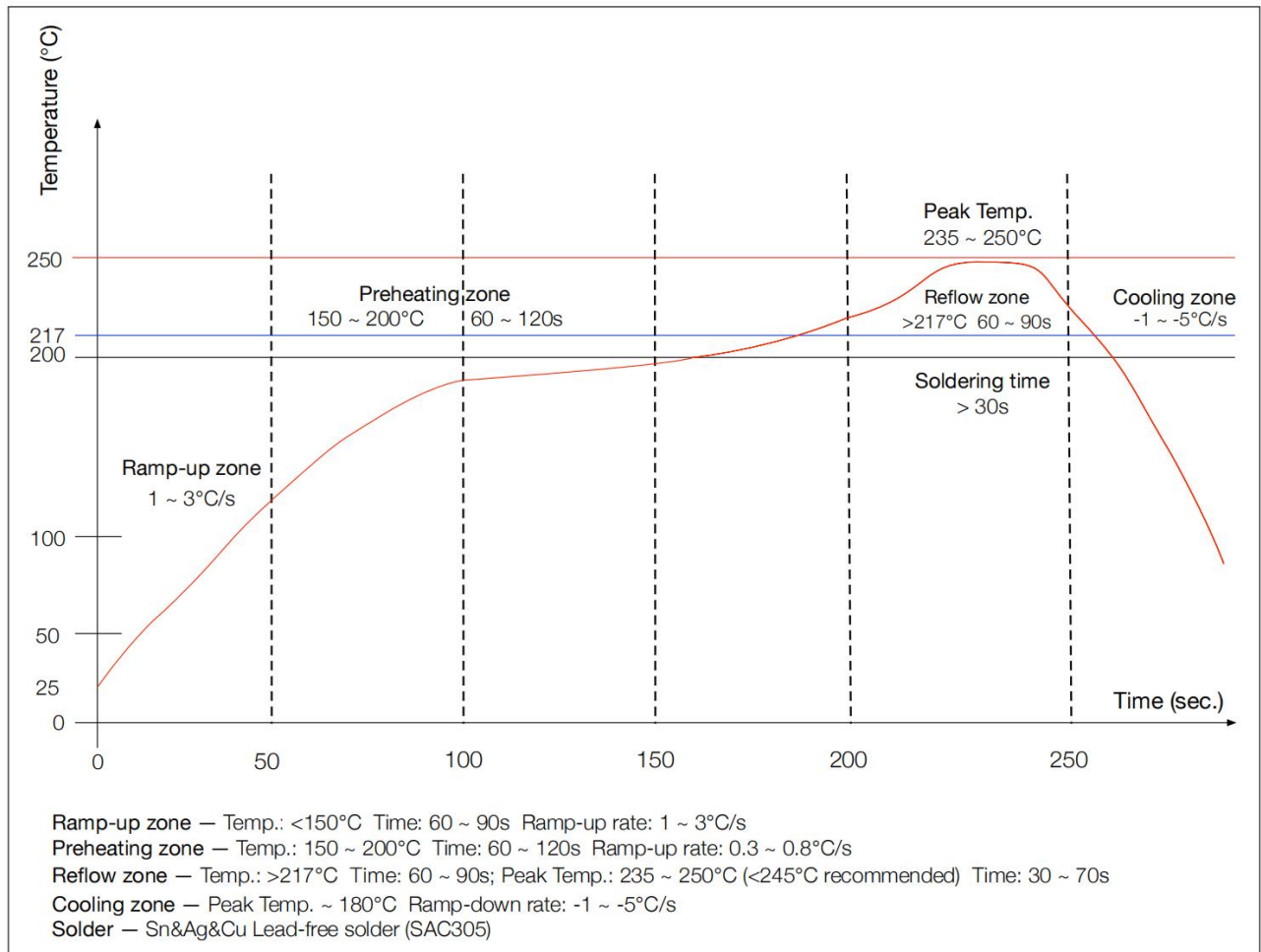
7.2 Recommended Operating Conditions

Operating Condition	Minimum	Maximum
Operating temperature range	-40°C	+85°C
Supply voltage: VBAT	+2.8V	+4.3V

7.3 PICTURE



8 Recommended reflow temperature profile



The module Must go through 125°C baking for at least 9 hours before SMT AND IR reflow process!

若拆封后未立即上线，建议让下次上线前务必以 **125°C** 烘烤 **9** 小时以上！

9. Federal Communications Commission (FCC) Statement

You are cautioned that changes or modifications not expressly approved by the part responsible for compliance could void the user's authority to operate the equipment.

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.

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 of the device.

FCC RF 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. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Federal Communications Commission (FCC) Statement

15.21

You are cautioned that changes or modifications not expressly approved by the part responsible for compliance could void the user's authority to operate the equipment.

15.105(b)

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Note: The end product shall have the words "Contains Transmitter Module FCC ID: 2BK98ALANBT01"

OEM statement

The Original Equipment Manufacturer (OEM) must ensure that the OEM modular transmitter must be labeled with its own FCC ID number. This includes a clearly visible label on the outside of the final product enclosure that displays the contents shown below. If the FCC ID is not visible when the equipment is installed inside another device, then the outside of the device into which the equipment is installed must also display a label referring to the enclosed equipment.

The end product with this module may subject to perform FCC part 15 unintentional emission test requirement and be properly authorized.

This device is intended for OEM integrator only

Chip antennas: 3.0 dBi