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DK-BT-MUSIC-21A specification

Version V1.0

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Create/revise/cancel resume as required

editio n	date	Formulate/revised content	lay down	examine and verify
V1.0	2023.05.17		Wei Liu	

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catalogue

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I. Product Overview

The TB-MUSIC-56C8 Bluetooth module, designed based on the BP 28855-56C8 chip and compliant with BT 5.0 standards, features low-power Bluetooth (BR/EDR/BLE) capabilities. When paired with our company's voice control module, it enables voice-enabled operation. This module is specifically engineered for smart audio control systems, delivering low power consumption, minimal latency, and short-range wireless data communication performance.

characteristic

- **SMD-14*15mm packaging is adopted**
- **Built-in board antenna, no need to design antenna**
- **The voice module can be directly controlled by the MCU**
- **Bluetooth 5.0, low**

power consumption, ●
Support DSP commands

- **High performance 32-bit RISC CPU**
- **16-bit stereo DAC with headphone amplifier, signal to noise ratio>95dB**
- **The embedded PMU supports low power mode**

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main parameter

Module type	DK-TB-MUSIC-56C8
size	15*14*3.5mm（L*W*H)
package	SMD-12
Wireless standards	Bluetooth 5.0
frequency range	FM RX 76~108MHz
Maximum transmission power	Maximum value +1dBm
receiving sensitivity	-89dBm±2
joggle	GPIO/SPI/ADC/I2S
working temperature	-20℃~+70℃
Storage environment	-65℃~+125℃
Storage and power supply scope	Power supply voltage +2.2V~+5.5V, power supply current ≥50mA
power dissipation	Deep sleep mode: 0.37uA
	Standby mode: 2.51mA
	TX(PRBS9)@+2dBm:5.36mA
	TX(CarrierData)@+2dBm:16.54mA
transmission distance	Open outdoor viewing distance: 10 ~12 meters

2. Electrical parameters

operating characteristic of electrical apparatus

Absolute maximum rating

Any value exceeding the maximum rated value will cause damage to the chip

name	least value	representative value	crest value	unit
service voltage	2.2	4.7	5.5	V
I/O supply voltage	-0.3	-	5.5	V
Provide operating temperature	-20	-	+70	℃

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power dissipation

Parameter name	representative value	unit
Transmission power consumption	16.54	mA
Receiving power consumption	5.36	mA
Standby power consumption	2.51	mA
Light sleep	1.5	uA
Get deep sleep	0.37	uA

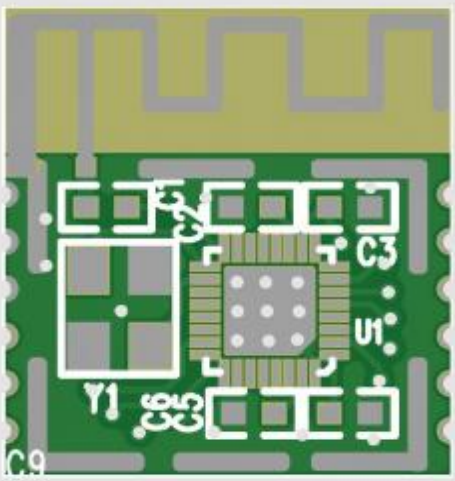
Radio frequency parameters

transmitting power

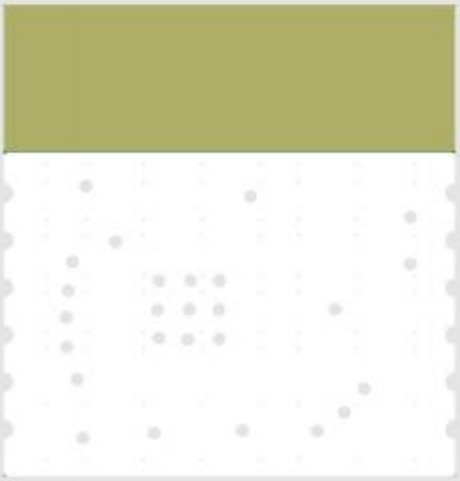
name	least value	representative value	crest value	unit
mean power	-	-	10	mW

receiving sensitivity

name	least value	representative value	crest value	unit
receiving sensitivity	-89	-85	-	dBm



正面



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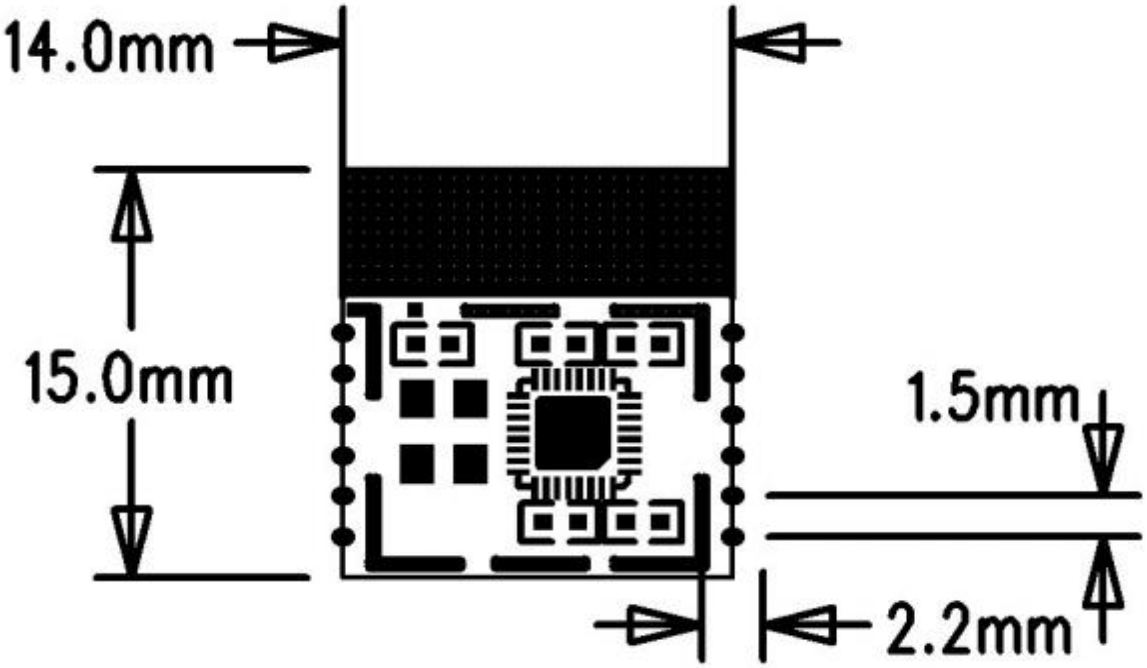

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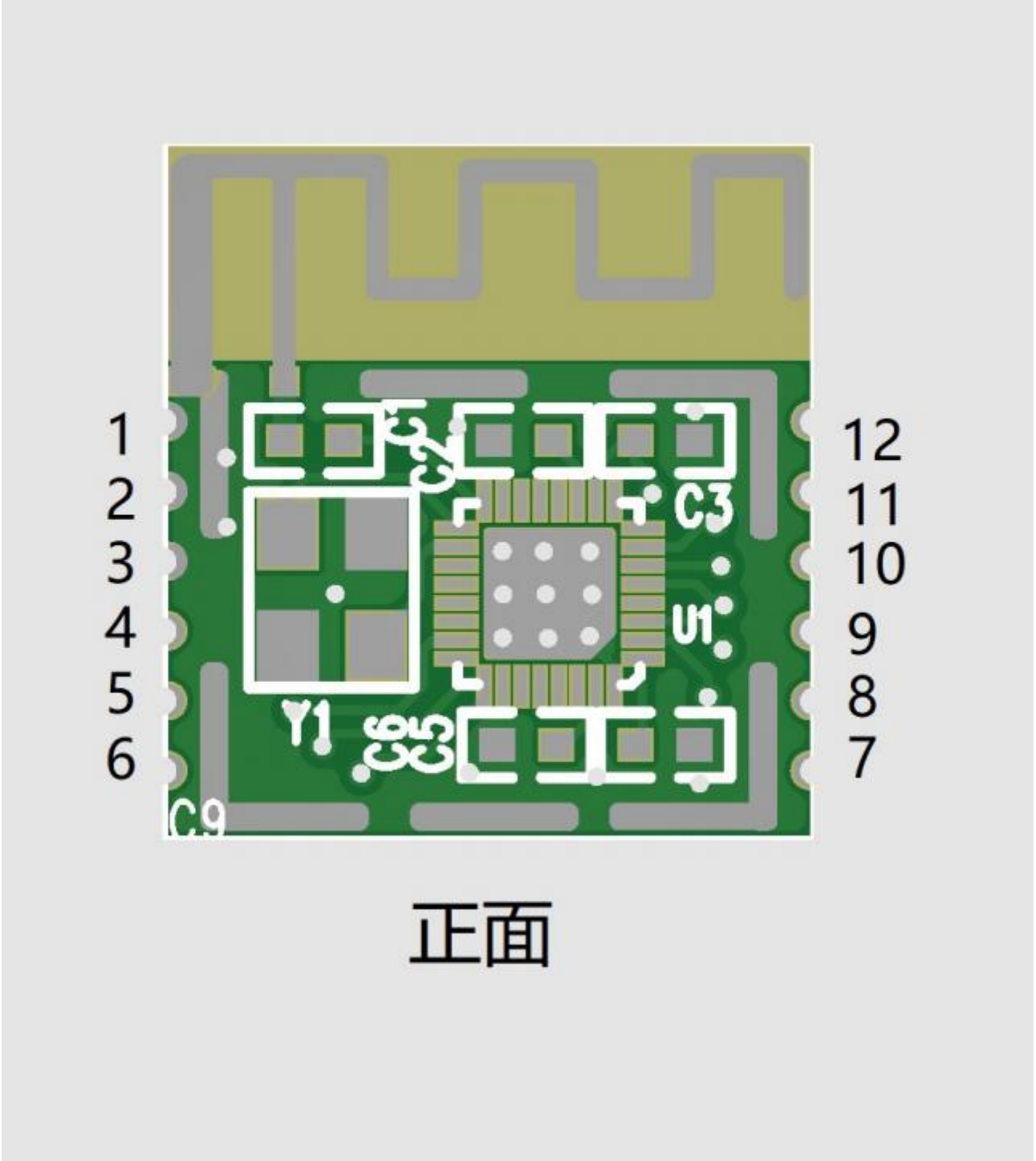
4. Pin definition

TB-MUSIC-56C8 module has a total of 12 interfaces, as shown in the pin diagram. The pin function definition table is the interface definition.



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Foreword	name	function declaration
1	GND	landing
2	GND	landing
3	GND	landing
4	USBDM	USB negative data (down)
5	USBDP	USB active (pull-up)
6	GPIO	ADC import
7	DACR	Right channel audio signal
8	DACL	Left channel audio signal
9	GPIO	PWM output
10	RXD	Serial communication RXD
11	TXD	Serial communication TXD
12	VBAT	supply electricity

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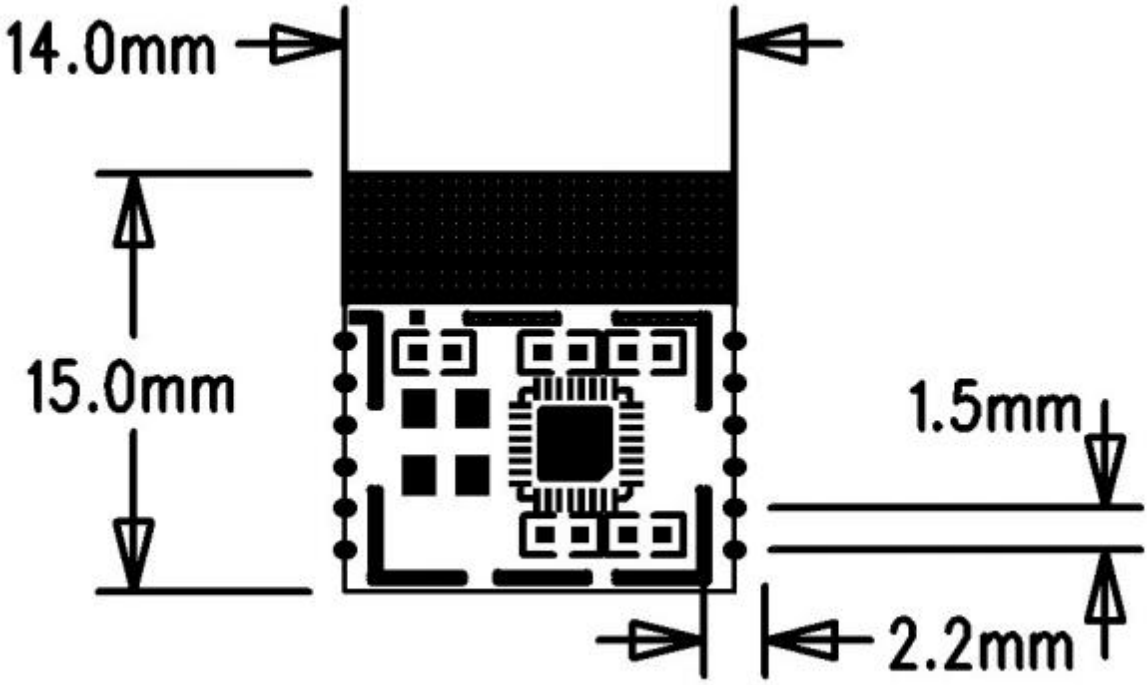
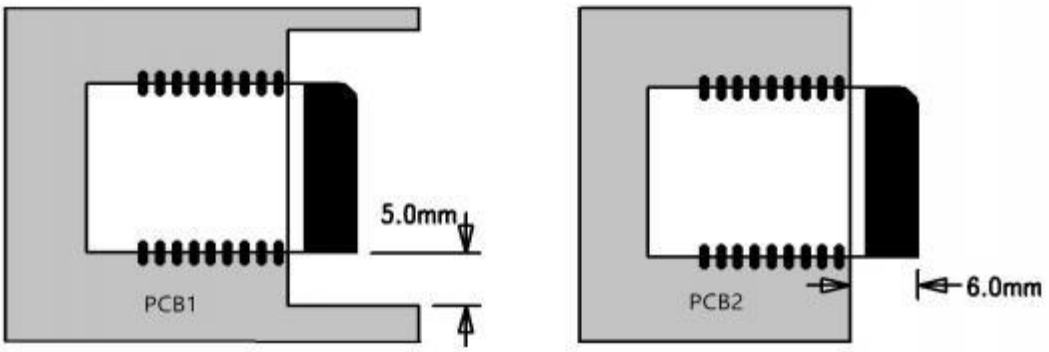
2. Recommended module packaging design size



Note: This is the TB-MUSIC-56C8 module packaging diagram. It is recommended to design the PCB board according to this diagram to ensure the module can work properly on the PCB.
When designing the pads, it is important to note that the PCB pads should not be designed with a recessed offset compared to the corresponding pads on the module.
The PCB solder pad is relatively expanded from the module solder pad, which does not affect the use of the module.
3. Antenna layout requirements
(1) There are two recommended ways to install on the main board:
Scheme 1: Place the module on the edge of the motherboard, and extend the antenna area beyond the edge of the motherboard.
Scheme 2: Place the module on the edge of the motherboard, and hollow out a region at the antenna position.
(2) In order to meet the performance of the onboard antenna, metal parts are prohibited around the antenna and high frequency devices are kept away.



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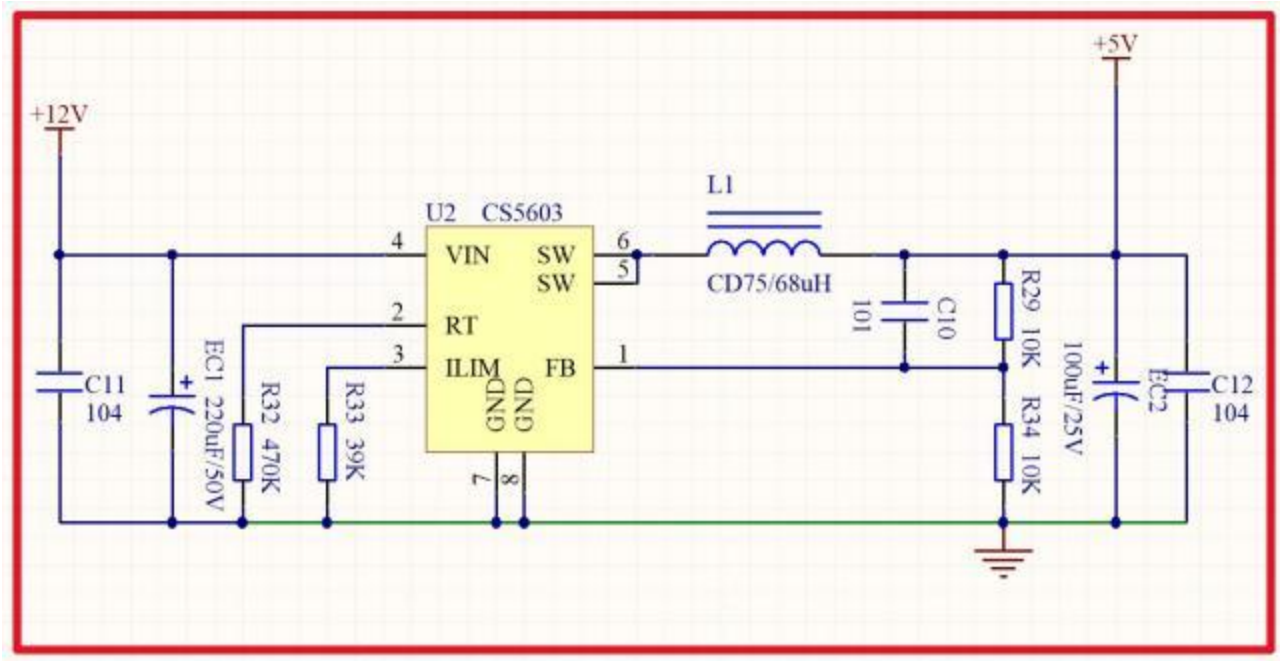
4. Power supply

(1) It is recommended to use 5V voltage with a peak current of 50mA or more

(2) It is recommended to use LDO for power supply; if DC-DC is used, the ripple control should be within 30mV.

(3) The DC-DC power supply circuit is recommended to reserve the position of dynamic response capacitor, which can optimize the output ripple when the load changes greatly.

(4) It is recommended to add ESD device to the 5V power interface.



5. Secondary development

The TB-MUSIC-56C8 module allows users to write their own firmware programs for customized features. If you are developing on Windows, refer to the original code provided by the chip manufacturer.

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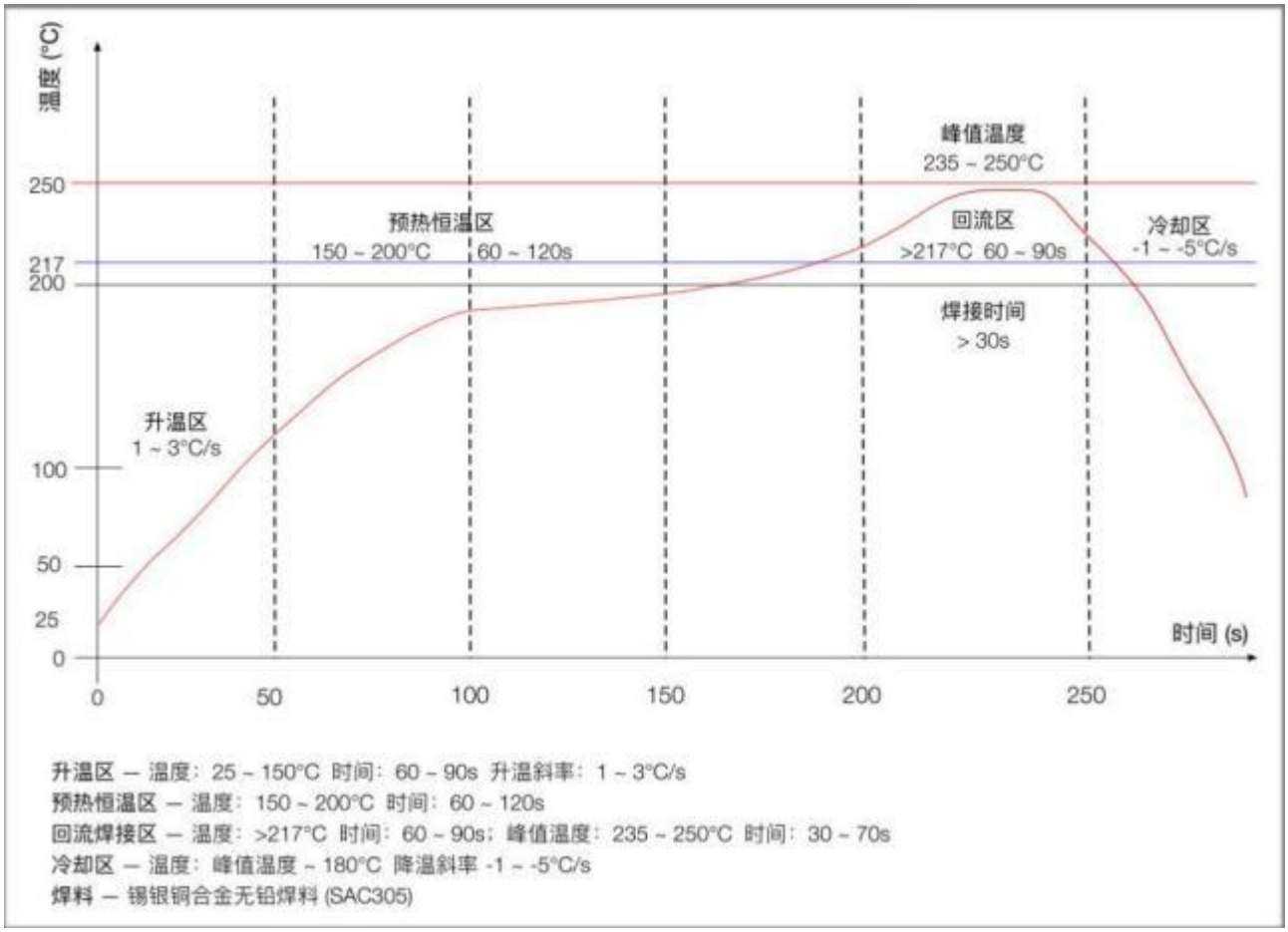
VII. Reflow soldering curve diagram



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VIII. Packaging information

As shown below, TB-MUSIC-56C8 is packaged in pallet packaging.

IX. Contact Us

technical support：

contact number：

Company address: No.2, Xiaobu Building, East Sandong Avenue, Huadu District, Guangzhou City, Guangdong Province

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 inte rference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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 interferenceto 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.

Radiation Exposure Statement

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

Integration instructions for host product manufacturers according to KDB 996369 D03 OEM Manual v01r01

2.2 List of applicable FCC rules

CFR 47 FCC PART 15 SUBPART C has been investigated. It is applicable to the modular transmitter

2.3 Specific operational use conditions

This module is stand-alone modular. If the end product will involve the Multiple simultaneously transmitting condition or different operational conditions for a stand-alone modular transmitter in a host, host manufacturer have to consult with module manufacturer for the installation method in end system.

2.4 Limited module procedures

Not applicable

2.5 Trace antenna designs

Not applicable

2.6 RF exposure considerations

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

2.7 Antennas

This radio transmitter FCCID:2A2PI-M2POWERBOARD has been approved by Federal Communications Commission to operate with 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.

Antenna No.	Model No. of antenna:	Type of antenna:	Gain of the antenna (Max.)		Frequency range:
			Antenna 1	Antenna 2	
BT	/	Integrated PCB Antenna	-0.58	N/A	2402-2480MHz

2.8 Label and compliance information

The final end product must be labeled in a visible area with the following" Contains **FCC ID:2A2PI-M2POWERBOARD".**

2.9 Information on test modes and additional testing requirements

Host manufacturer is strongly recommended to confirm compliance with FCC requirements for the transmitter when the module is installed in the host.

2.10 Additional testing, Part 15 Subpart B disclaimer

Host manufacturer is responsible for compliance of the host system with module installed with all other applicable requirements for the system such as Part 15 B.

2.11 Note EMI Considerations

Host manufacture is recommended to use D04 Module Integration Guide recommending as "best practice" RF design engineering testing and evaluation in case non-linear interactions generate additional non-compliant limits due to module placement to host components or properties.

2.12 How to make changes

This module is stand-alone modular. If the end product will involve the Multiple simultaneously transmitting condition or different operational conditions for a stand-alone modular transmitter in a host, host manufacturer have to consult with module manufacturer for the installation method in end system. According to the KDB 996369 D02 Q&A Q12, that a host manufacture only needs to do an evaluation (i.e., no C2PC required when no emission exceeds the limit of any individual device (including unintentional radiators) as a composite. The host manufacturer must fix any failure.