JS-BTM657

JIASHI Bluetooth Module Data Sheet

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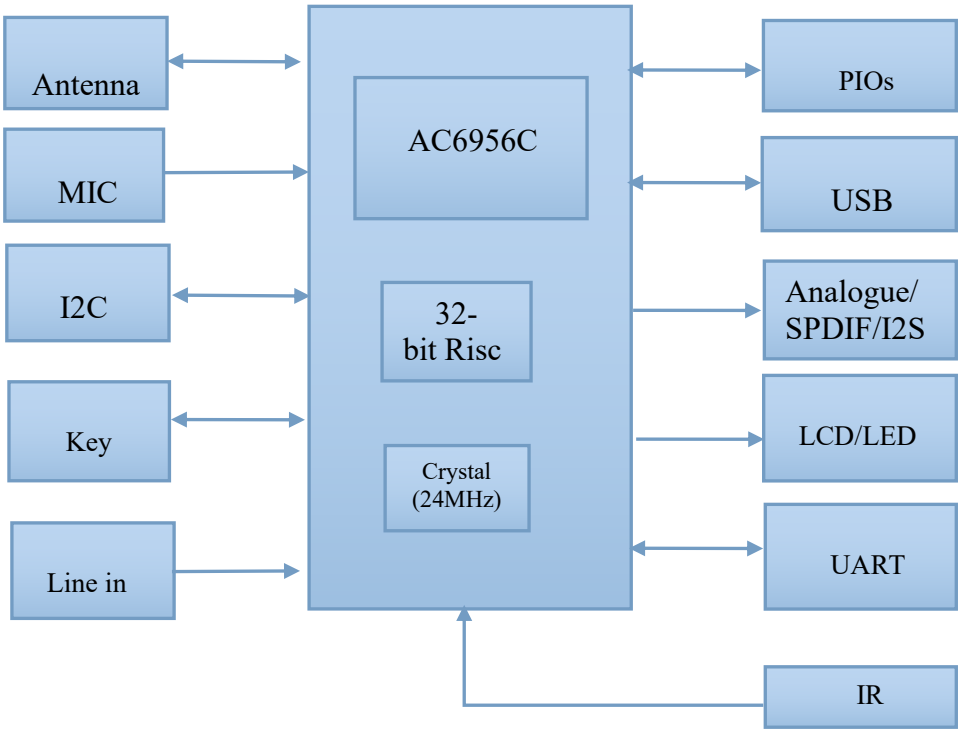
1. INTRODUCTION

1.1 Block Diagram



1.2 Features

- ✓ Small overall dimension (13.5 * 20 * 3.0 mm)
- ✓ Based on JIELI chip set AC6956C
- ✓ Compliant with Bluetooth V5.3+BR+EDR+BLE specification
- ✓ 32-bit DSP supports hardware Float Point Unit(FPU)
- ✓ Up to 240MHz programmable processor
- ✓ SBC, AAC Audio decodes supported for BT audio
- ✓ Supports MP2, MP3, WMA, APE, FLAC,AAC, MP4, M4A, WAV, AIF, AIFC audio decoding
- ✓ One analog MIC amplifier, build-in MIC bias generator
- ✓ Supports two PDM digital MIC inputs
- ✓ Meet class1 class2 and class3 transmitting power requirement
- ✓ Support GFSK and π/4 DQPSK all paket types
- ✓ Fast AGC for enhanced dynamic range
- ✓ Supports a2dp\avctp\avdtp\avrcp\hfp\spp\smp\att\gap\gatt\rfcomm\sdp\l2cap profile
- ✓ One full speed USB 2.0 OTG controller
- ✓ Three full-duplex basic UART, UART0 and UART1 supports DMA mode
- ✓ Low voltage LDO for internal digital and analog circuit supply

※ ***Some features are optional for customization on demand.***

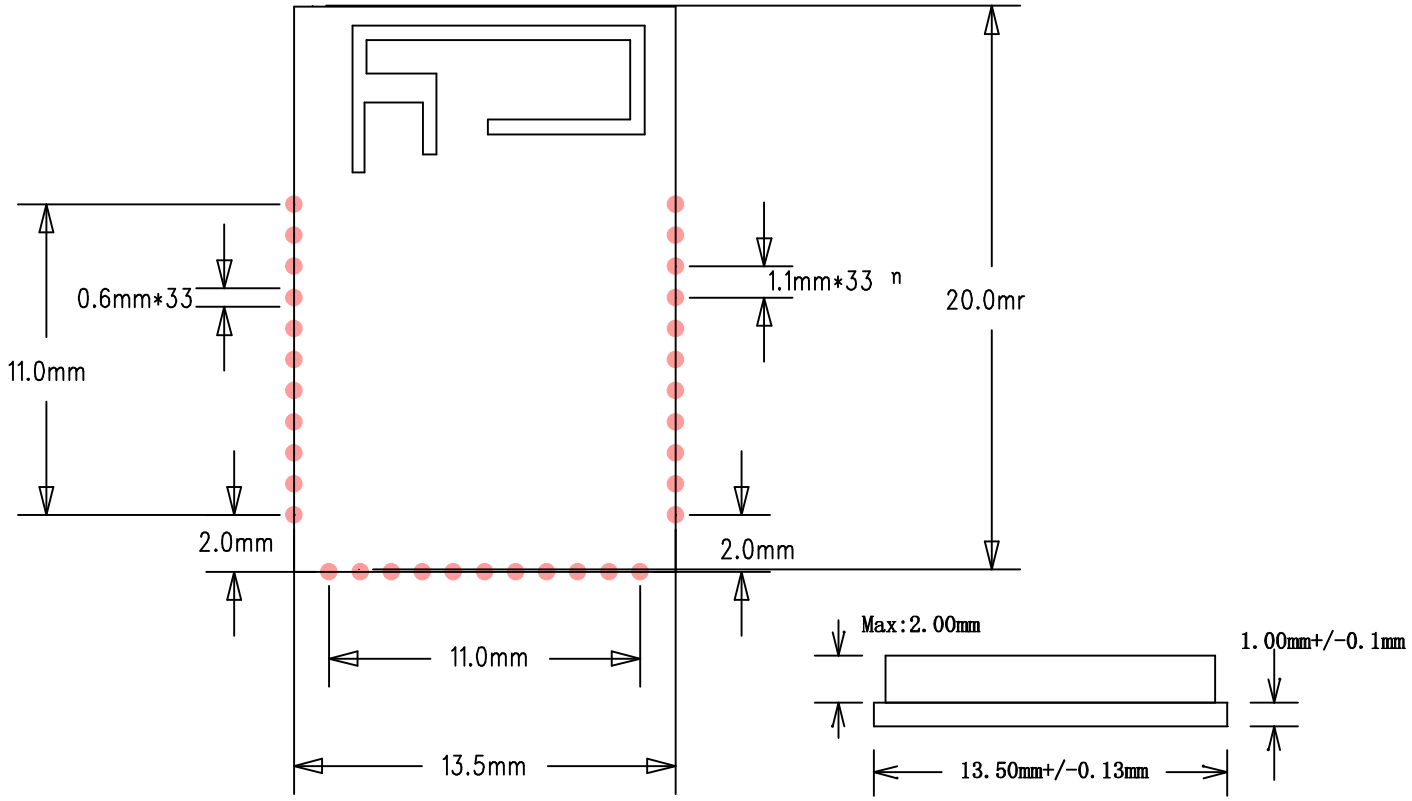
1.3 Application

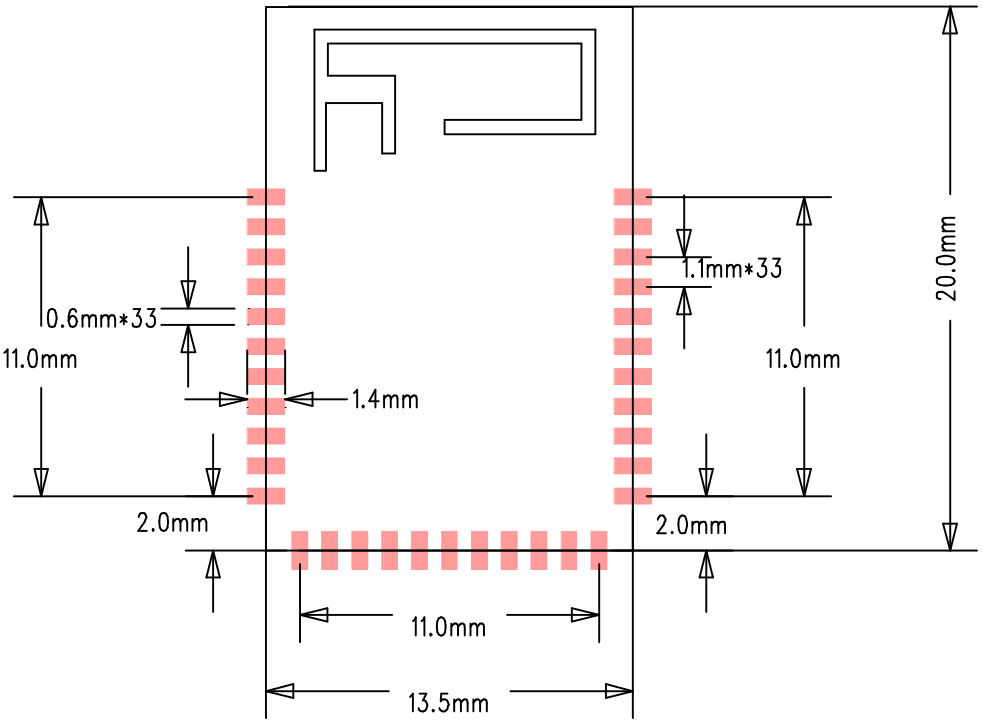
- ✓ Bluetooth Stereo Sound Box
- ✓ Bluetooth Mono Sound Box
- ✓ Bluetooth TWS Sound Box
- ✓ Massage chair
- ✓ Electric bicycle
- ✓ Golf cart
- ✓ Running Machine
- ✓ Eye massage instrument
- ✓ Helmet
- ✓ Lamp/Lighting

2. GENERAL SPECIFICATION

Bluetooth Specification	
Chip Set	AC6956C
Module ID	JS-BTM657
BT Standard	Bluetooth® V5.3 specification
RF TX Output Power	-6~6dBm (typical)
RX Sensitivity	-88dBm (typical)
Frequency Band	2.402GHz~2.480GHz ISM Band
Modulation Type	GFSK,π/4 DQPSK,8DPSK
Channel No.	79(for Classic),40(for BLE)
Baseband Crystal OSC	24MHz
Hopping	1600hops/sec, 1MHz channel space
RF Input Impedance	50 ohms
Environmental	RoHS Compliant

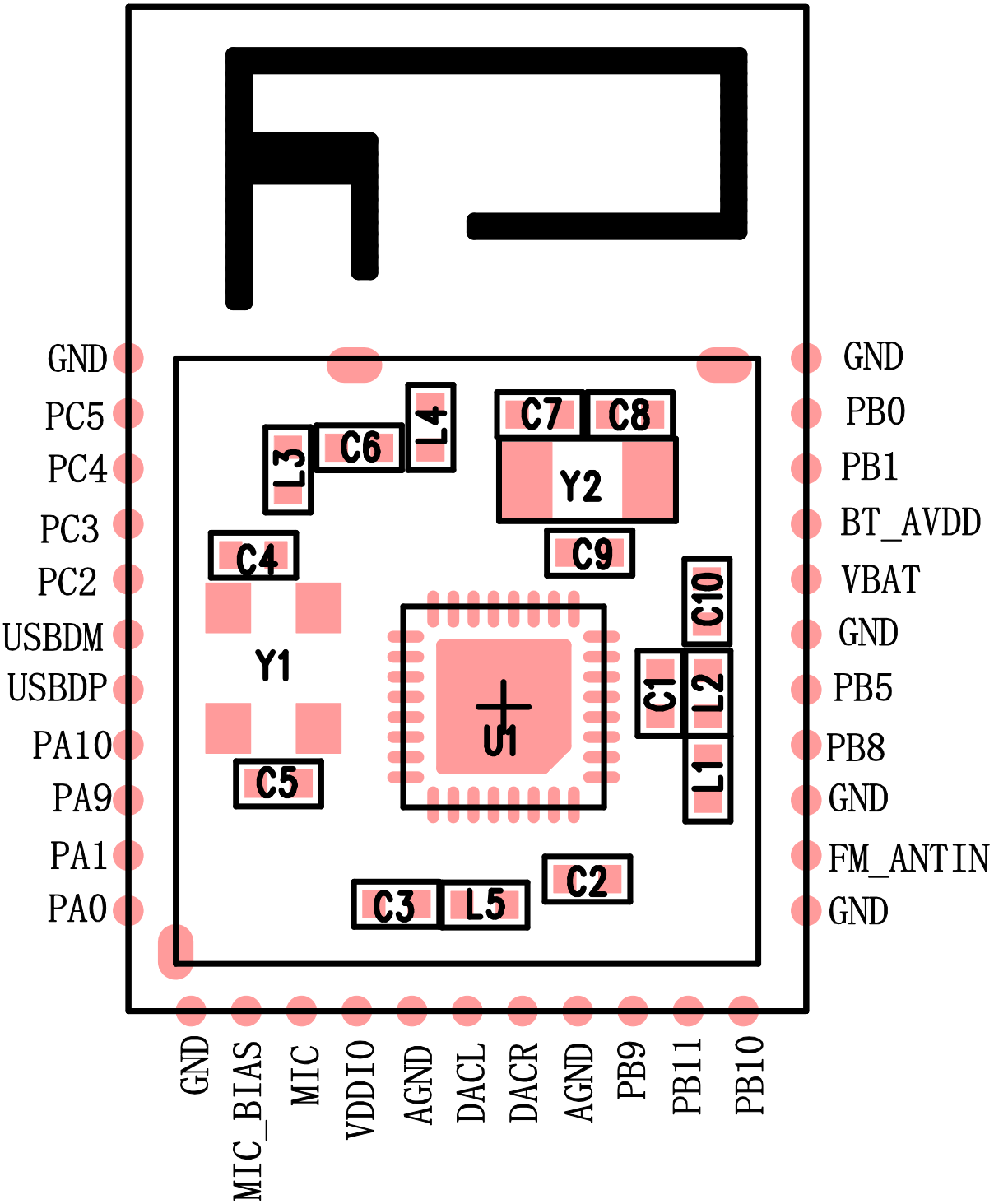
3. PHYSICAL CHARACTERISTIC





备注:

模块拼板连接处,实际分板存在毛边,生产工艺对毛边尺寸控制为:正 0.6mm


GND
PC5
PC4
PC3
PC2
USBDM
USBDP
PA10
PA9
PA1
PA0
GND
PB0
PB1
BT_AVDD
VBAT
GND
PB5
PB8
GND
FM_ANTIN
GND
GND
MIC_BIAS
MIC
VDDIO
AGND
DACL
DACR
AGND
PB9
PB11
PB10
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
L1
L2
L3
L4
L5
Y1
Y2
U1

3.1 Pin Description

Pin#	Pin Name	Pad Type	Description
1	GND	Ground	Ground
2	PC5	GPIO	SD1CLKA：SD1 Clock(A); SPI1DOB：SPI1 Data Out(B); UART2RXD：Uart2 Data In(D); IIC_SDA_B：IIC SDA(B); ADC13：ADC Input Channel 13; PWMCH5L：Motor PWM Channel5(L)；
3	PC4	GPIO	SD1CMDA：SD1 Command(A); SPI1CLKB：SPI1 Clock(B); UART2TXD：Uart2 Data Out(D); IIC_SCL_B：IIC SCL(B); ADC10：ADC Input Channel 10; PWMCH5H：Motor PWM Channel5(H)；
4	PC3	GPIO	SD1DAT0A：SD1 Data0(A); SPI1DIB：SPI1 Data In(B);
5	PC2	GPIO	SD1DAT1A：SD1 Data1(A); ALNK1_DAT0：Audio Link Data0; Touch12：Touch Input Channel 12; FPIN5：Motor Auto-Stop Protective Pin5；
6	USB_DM	USB Negative Data (pull down)	UART1RXD：Uart1 Data In(D); IIC_SDA_A：IIC SDA(A);
7	USB_DP	USB Negative Data (pull down)	UART1TXD：Uart1 Data Out(D); IIC_SCL_A：IIC SCL(A); ADC12：ADC Input Channel 12;
8	PA10	GPIO	SD0CLKA：SD0 Clock(A); ALNK0_LRCKB：Audio Link Word Select(B); ADC3：ADC Input Channel 3; SPDIF_IN_B：Sony/Philips Digital Interface Input(B) TMR1：Timer1 Clock Input; Touch9：Touch Input Channel 9; UART2RXB：Uart2 Data In(B); PWMCH4L：Motor PWM Channel4(L)；
9	PA9	GPIO	SD0CMA：SD0 Command(A); ALNK0_SCLKB：Audio Link Serial Clock(B); SPDIF_IN_A：Sony/Philips Digital Interface Input(A) Touch8：Touch Input Channel 8; UART2TXB：Uart2 Data Out(B); PWMCH4H：Motor PWM Channel4(H)；
10	PA1	GPIO	AMUX0R：Analog Channel0 Right; Touch1：Touch Input Channel 1; ADC0：ADC Input Channel 0; UART1RXC：Uart1 Data In(C); PWMCH0L：Motor PWM Channel0(L)；
11	PA0	GPIO	AMUX0L：Analog Channel0 Left;

			Touch0：Touch Input Channel 0; CLKOUT0： UART1TXC：Uart1 Data Out(C); PWMCH0H：Motor PWM Channel0(H)；
12	GND	Ground	Ground
13	MIC_BIAS	GPIO	MIC_BIAS：Microphone Bias Output
14	MIC	Analog	MIC：MIC Input Channel;
15	VDDIO	Supply	IO Power 3.3v
16	AGND	Ground	Analog Ground
17	DACL	/	DAC Left Channel
18	DACR	/	DAC Right Channel
19	AGND	Ground	Analog Ground
20	PB9	GPIO	AMUX2L：Analog Channel2 Left; SPI2CLKA：SPI2 Clk(A); CAP0：Timer0 Capture; UART2TXC：Uart2 Data Out(C); PWMCH3H：Motor PWM Channel3(H)；
21	PB11	GPIO	SDPG:SDC Power Gate; SPDIF_OUT：Sony/Philips Digital Interface Out
22	PB10	GPIO	AMUX2R：Analog Channel2 Right; SPI2DOA：SPI2 Data Out(A); ADC9：ADC Input Channel 9; UART2RXC：Uart2 Data In(C); PWMCH3L：Motor PWM Channel3(L)；
23	GND	Ground	Ground
24	FM_ANTIN	/	FM Single Input
25	GND	Ground	Ground
26	PB8	GPIO	AMUX1R：Analog Channel1 Right; SPI2_DIA：SPI2 Data In(A); ADC8：ADC Input Channel 8; CLKOUT1：Clk Out1;
27	PB5	GPIO (High Voltage Resistance)	PWM3：Timer3 PWM Output; CAP1：Timer1 Capture; UART0TXC：Uart0 Data Out(C); UART0RXC：Uart0 Data In(C);
28	GND	Ground	Ground
29	VBAT	Supply	Power Supply
30	BT_AVDD	Supply	BT Power

31	PB1	GPIO (pull up)	Long Press Reset； SPI1DOA：SPI1 Data Out(A); ADC5：ADC Input Channel 5; TMR2：Timer2 Clock Input; UART1RXA：Uart1 Data In(A);
32	PB0	GPIO (High Voltage Resistance)	SPI1CLKA：SPI1 Clock(A); UART1TXA：Uart1 Data Out(A); PWMCH1H：Motor PWM Channel1(H)；
33	GND	Ground	Ground

4.ELECTRICAL CHARACTERISTIC

4.1 Absolute maximum ratings

Symbol	Description	Min	Max	Unit
Tamb	Ambient Temperature	-20	+70	℃
Tstg	Storage temperature	-65	+150	℃
VBAT	Supply Voltage	2.2	5.5	V
LDO_IN	Charger Voltage	4.5	5.5	V
$V_{3.3IO}$	3.3V IO Input Voltage	-0.3	VDDIO+0.3	V

4.2 Battery Charge

Symbol	Description	Min	Typ	Max	Unit	Test Conditions
LDO_IN	Charge Input Voltage	4.5	5	5.5	V	
V_{Charge}	Charge Voltage	4.15	4.2	4.25		
I_{Charge}	Charge Current	20		320	mA	Charge current at fast charge mode
I_{Trikl}	Trickle Charge Current	20	45	70	mA	$V_{BAT}<V_{Trikl}$

4.3 DAC Characteristics

Parameter	Min	Typ	Max	Unit	Test Conditions
Frequency Response	20	_	20K	V	1KHz/0dB 10Kohm loading With A-Weighted Filter
THD+N	_	-75	_	dB	
S/N	_	95	_	dB	
Crosstalk	_	-90	_	dB	
Output Swing		1		Vms	
Dynamic Range		90		dB	1KHz/-60dB 10Kohm loading With A-Weighted Filter
DAC Output Power	11		_	mW	32ohm loading

4.4 ADC Characteristics

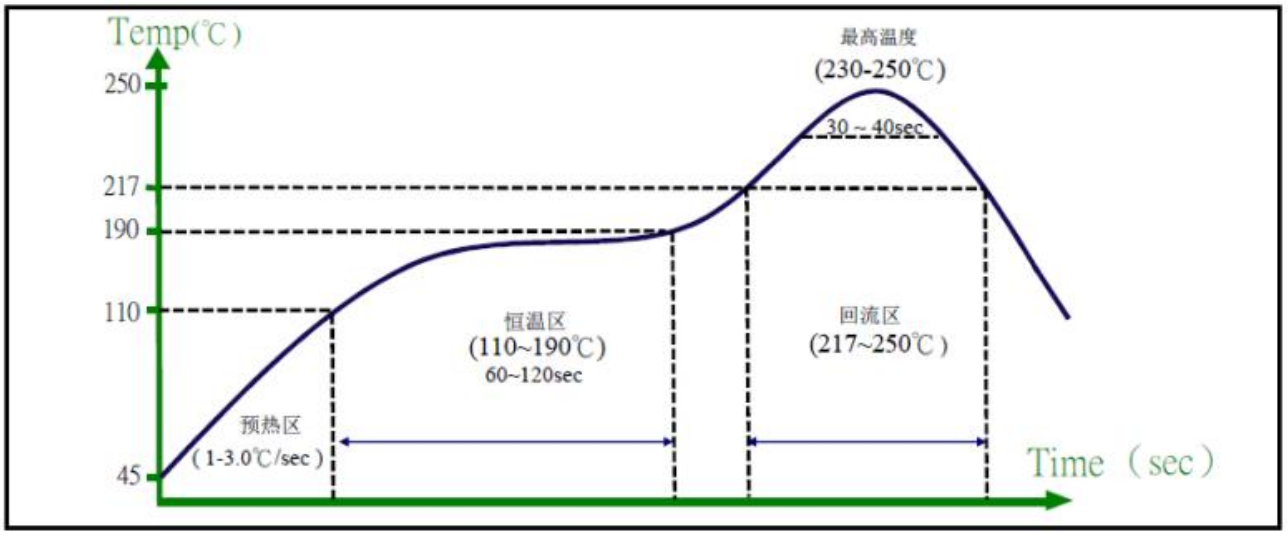
Parameter	Min	Typ	Max	Unit	Test Conditions
Dynamic Range		80		dB	1KHz/-60dB
S/N	_	90	91	dB	1KHz/-60dB
THD+N	_	-70	_	dB	1KHz/-60dB
Crosstalk	_	-80	_	dB	1KHz/-60dB

4.5 RF characteristics

Receiver		Average	Bluetooth Spec	Transmitter		Average	Bluetooth Spec	Unit
Sensitivity at0.1 BER	2402MHz	-88	<=-70	Output Power	2402MHz	2.5	-6~+4	dBm
	2441MHz	-88			2441MHz	2.5		dBm
	2480MHz	-88			2480MHz	2.5		dBm

5. REFLOW PROFILE

Reflow number of times: ≤ 2times



温度范围与要求

1. 预热区:60-90℃以下,升温率1 - 3.0℃/sec
2. 恒温区: 110-190℃时间为 60 - 120sec
3. 217℃以上: 30 - 90sec
4. 230℃ - 250℃ 时间为 30 -40sec
5. 最高温度: 230℃ - 250℃.

6. PACKAGING INFORMATION

1. BLUETOOTH® Module: JS-BTM657

7.FCC regulatory compliance statement

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

List of applicable FCC rules:
47 CFR Part 15, Subpart C 15.203
47 CFR Part 15, Subpart C 15.205
47 CFR Part 15, Subpart C 15.207
47 CFR Part 15, Subpart C 15.209
47 CFR Part 15, Subpart C 15.247
47 CFR Part 2.1091
This module can be used in IOT devices, the input voltage to the module is nominally 3.3V.
Limited module procedures:This module is not a limited module.
Trace antenna designs:The antenna is not a trace antenna.
RF exposure considerations
This Module complies with FCC 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 your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
Antennas
If you desire to increase antenna gain and either change antenna type or use same antenna type certified, a Class II permissive change application is required to be filed by us, or you (host manufacturer) can take responsibility through the change in FCC ID (new application) procedure followed by a Class II permissive change application.
Label and compliance information
Please notice that if the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains FCC ID: PXU-BT-A1" any similar wording that expresses the same meaning may be used.
§ 15.19 Labelling requirements shall be complied on end user device.
Labelling rules for special device, please refer to §2.925, § 15.19 (a)(5) and relevant KDB publications. For E-label, please refer to §2.935.
Information on test modes and additional testing requirements
The OEM integrator is responsible for ensuring that the end-user has no manual instruction to remove or install module.
The module is limited to installation in mobile application, a separate approval is required for all other operating configurations, including portable configurations with respect to §2.1093 and

difference antenna configurations
Test software access to different test modes: fcc_assist_1.0.2.2
Testing item, Frequencies, Transmit Power, Modulation Type can be selected on the test script instructions.

FCC other Parts, Part 15B Compliance Requirements for Host product manufacturer
This modular transmitter is only FCC authorized for the specific rule parts listed on our grant, host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification.
Host manufacturer in any case shall ensure host product which is installed and operating with the module is in compliant with Part 15B requirements.
For Class B
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.