

承 认 书

SPECIFICATION FOR APPROVAL

Bluetooth module/蓝牙模块

客 户：
CUSTOMER: _____
产品描绘：
DESCRIPTION: _____
机种型号：
OUR MODEL NO: _____
样品编号：
SAMPLE NO: _____
日期：
DATE: _____

APPROVAL SIGNATURE/客户确认		
APPROVED BY/核准	CHECKED BY/审核	TESTED BY/检测

Manufacturer/制造商		
SALES/业务	APPROVED BY/核准	Quality/品质

Bluetooth Module Datasheet

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BT03A

1. Device Features

- **Bluetooth v2.0 Specification Compliant**
- **16-bit Internal Stereo CODEC for DAC**
- **Low-Power 1.8V Operation, 3.3V I/O**
- **Integrated 1.8V Regulator**
- **USB and UART with Dual Port**
- **Multi-configurable I2S, PCM, or SPDIF Interface**
- **Support for 802.11 Co-existence**
- **Rohs compliant**

2. Applications

- **High-End Stereo Wireless Headsets**
- **High-End Mono Headsets**
- **Hands-Free Car Kits**
- **Wireless Speakers**
- **Analogue and USB Multimedia Dongles**

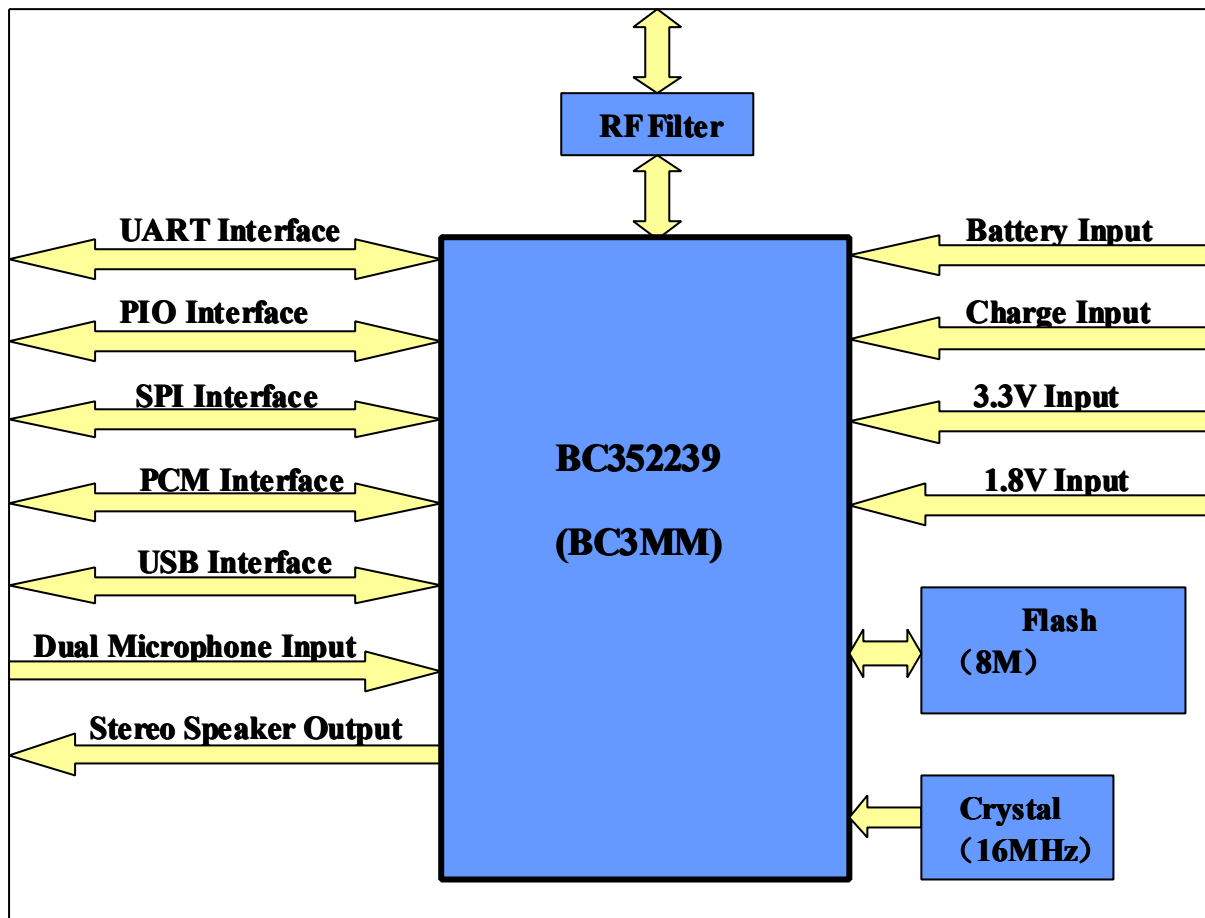
3. General Description

The BT03A Bluetooth Module is a perfect solution for enhanced audio applications, such as stereo headphones and high performance telephony headsets. It can be connected with any Bluetooth devices in an operating range of ten meters. It is slim and light so the designers can have better flexibilities for the product shapes.

4. Key Features

Operating Frequency Band	2.402GHz -2.480GHz ISM band
Bluetooth Specification	V2.0 or V2.0+EDR
Theoretical range in open field	Bluetooth Class II
Main Chip	CSR BC57E687A
Transmitter Power	+4dBm (Typical)
Receive Sensitivity	-85dB at 0.1% BER (Typical)
Antenna	External
Antenna Impedance	50Ω
Power Supply	Li-ion battery voltage
Dimension	21mm(L) * 13.5mm(W) * 2.2 mm(H)

5. Block Diagram



6. Electrical Characteristic

6.1 Absolute Maximum Ratings

Parameter	Symbol	Condition	Rating
Power Supply Voltage	VDD	-	3.2V — +3.4V
Power Supply Voltage	1V8		1.75V — +1.85V
Storage Temperature	T _{stg}	-	-40°C — +105°C

6.2 Recommend operation conditions

Parameter	Symbol	Min	Type	Max
Power Supply Voltage	VDD	3.2V	3.3V	3.5V
Power Supply Voltage	1V8	1.75V	1.8V	1.85V

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Operator Temperature	T _{stg}	-40℃		85℃
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6.3 Stereo Audio Characteristics

6.3.1 Microphone input

Microphone Input	Min	Type	Max	Unit
Input full scale at maximum	-	4	-	mV rms
Input full scale at minimum gain(differential)	-	560	-	mV rms
Gain resolution	-	3	-	dB
Distortion at 1kHz	-	-	-74	dB
Input referenced rms noise in 15kHz bandwidth	-	8	-	uV rms
3dB Bandwidth	-	17	-	kHz
Input impedance	-	5.6	-	K ohm
THD+N(microphone input)@30mV rms input	-	-66	-	dB

6.3.2 Speaker output

Loudspeaker Driver		Min	Type	Max	Unit
Output voltage full scale swing(differential)		-	2.0	-	V Pk-Pk
Output current drive at full scale swing		-	62	-	mA
Allow Load	Resistive	16(8)	-	-	ohm
	Capacitive	-	-	500	pF
THD 100Kohm load		-	-	0.01	%
THD 16ohm load		-	-	0.1	%
SNR (-1dB FS relative to digital silence)		-	92	-	dB

6.4 Radio characteristics – Basic data rate

6.4.1. Transmitter

Radio characteristics Temperature=+20℃

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Parameter	Min	Type	Max	Bluetooth specification	Unit
Maximum RF transmit power	-	4	-	-6 to +4	dBm
Variation in RF power over temperature range with compensation disabled	-	2.5	-	-	dB
Variation in RF power over temperature range with compensation enable	-	1.5	-	-	dB
RF power control range	-	35	-	≥ 16	dB
RF power range control resolution	-	0.5	-		dB
20dB bandwidth for modulated carrier	-	780	-	≤ 1000	kHz
Adjacent channel transmit power $F=F_0 \pm 2\text{MHz}$	-	-35	-	≤ -20	dBm
Adjacent channel transmit power $F=F_0 \pm 3\text{MHz}$	-	-45	-	≤ -40	dBm
$\Delta f_{1\text{avg}}$ maximum modulation	-	165	-	$140 < \Delta f_{1\text{avg}} < 175$	kHz
$\Delta f_{2\text{max}}$ minimum modulation	-	155	-	≥ 115	kHz
$\Delta f_{2\text{avg}}/\Delta f_{1\text{avg}}$	-	0.99	-	≥ 0.80	-
Initial carrier frequency tolerance	-	8	-	± 75	kHz
Drift rate	-	7	-	≤ 20	kHz/50us
Drift(single slot packet)	-	8	-	≤ 25	kHz
Drift(five slot packet)	-	9	-	≤ 40	kHz
2 nd Harmonic content	-	-45	-	≤ -30	dBm
3 rd Harmonic content	-	-50	-	≤ -30	dBm

6.42 Receive

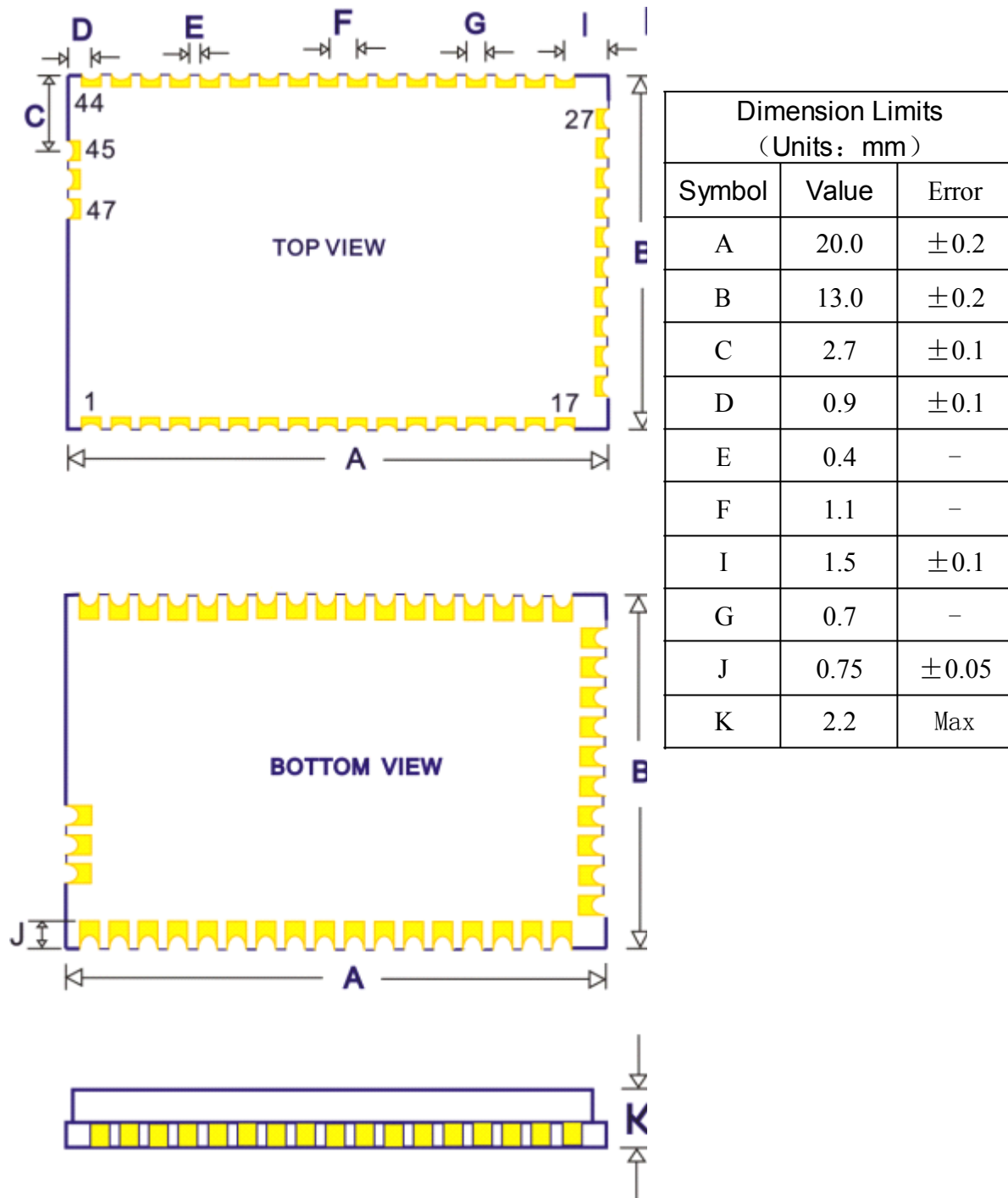
Radio characteristics Temperature= $\pm 20^\circ\text{C}$

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	Frequency(GHz)	Min	Type	Max	Bluetooth specification	Unit
Sensitivity at 0.1 % BER for all packet types	2.402	-	-85	-	≤ -70	dBm
	2.441	-	-85	-		
	2.480	-	-85	-		
Maximum received signal at 0.1% BER		-	>10	-	-20	dBm
Continuous power required to block Bluetooth receipt(for sensitivity of -67dBm with 0.1%BER) measured at the antenna port	0.03-2.00	-	>0	-	-10	dBm
	2.0-2.40	-	>-10	-	-27	
	2.50-3.00	-	>0	-	-27	
	3.00-3.30	-	>3	-	-10	
C/I co-channel		-	8	-	≤ 11	dB
Adjacent channel selectivity C/I $F=F_0+1\text{MHz}$		-	-5	-	≤ 0	dB
Adjacent channel selectivity C/I $F=F_0-1\text{MHz}$		-	-4	-	≤ 0	dB
Adjacent channel selectivity C/I $F=F_0+2\text{MHz}$		-	-38	-	≤ -30	dB
Adjacent channel selectivity C/I $F=F_0-2\text{MHz}$		-	-22	-	≤ -20	dB
Adjacent channel selectivity C/I $F=F_0+3\text{MHz}$		-	-48	-	≤ -40	dB
Adjacent channel selectivity C/I $F=F_0-5\text{MHz}$		-	-45	-	≤ -40	dB
Adjacent channel selectivity C/I $F=F_{\text{image}}$		-	-23	-	≤ -9	dB
Maximum level of intermodulation interface		-	-30	-	≥ -39	dBm
Spurious output level		-	<-160	-	-	dBm/Hz

7.Mechanical Dimensions

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8. Pin Definition Descriptions

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Pin NO.	Pin Name	Pin Descriptions
1	SPK_L_N	Speaker output left negative
2	SPK_L_P	Speaker output left positive
3	SPK_R_N	Speaker output right negative
4	SPK_R_P	Speaker output right positive
5	GND	Power Ground
6	MIC_L_P	Microphone (L) positive pole input
7	MIC_L_N	Microphone (L) negative pole input
8	MIC_R_P	Microphone (R) positive pole input
9	MIC_R_N	Microphone (R) negative pole input
10	1.8V	1.8V output
11	PCM_IN	Synchronous data input, with weak internal pull-down
12	PCM_SYNC	Synchronous data sync, with weak internal pull-down
13	PCM_CLK	Synchronous data clock, with weak internal pull-down
14	PCM_OUT	Synchronous data output, with weak internal pull-down
15	AIO0	LED0 driver
16	AIO1	LED1 driver
17	AIO3	Lithium ion/polymer battery positive terminal. Battery charger output and input to switch-mode regulator
18	GND	Power Ground
19	3.3V	Power supply voltage 3.3V
20	USB_P	Blue USB data plus with selectable internal 1.5K Ω pull-up resistor
21	USB_N	Blue USB data minus
22	UART_RTS	UART request to send active low
23	UART_CTS	UART clear to send active low
24	UART_TX	UART data output active High
25	UART_RX	UART data input active High
26	RESET	Reset if low. Input debounced so must be low for >5ms to cause a reset.

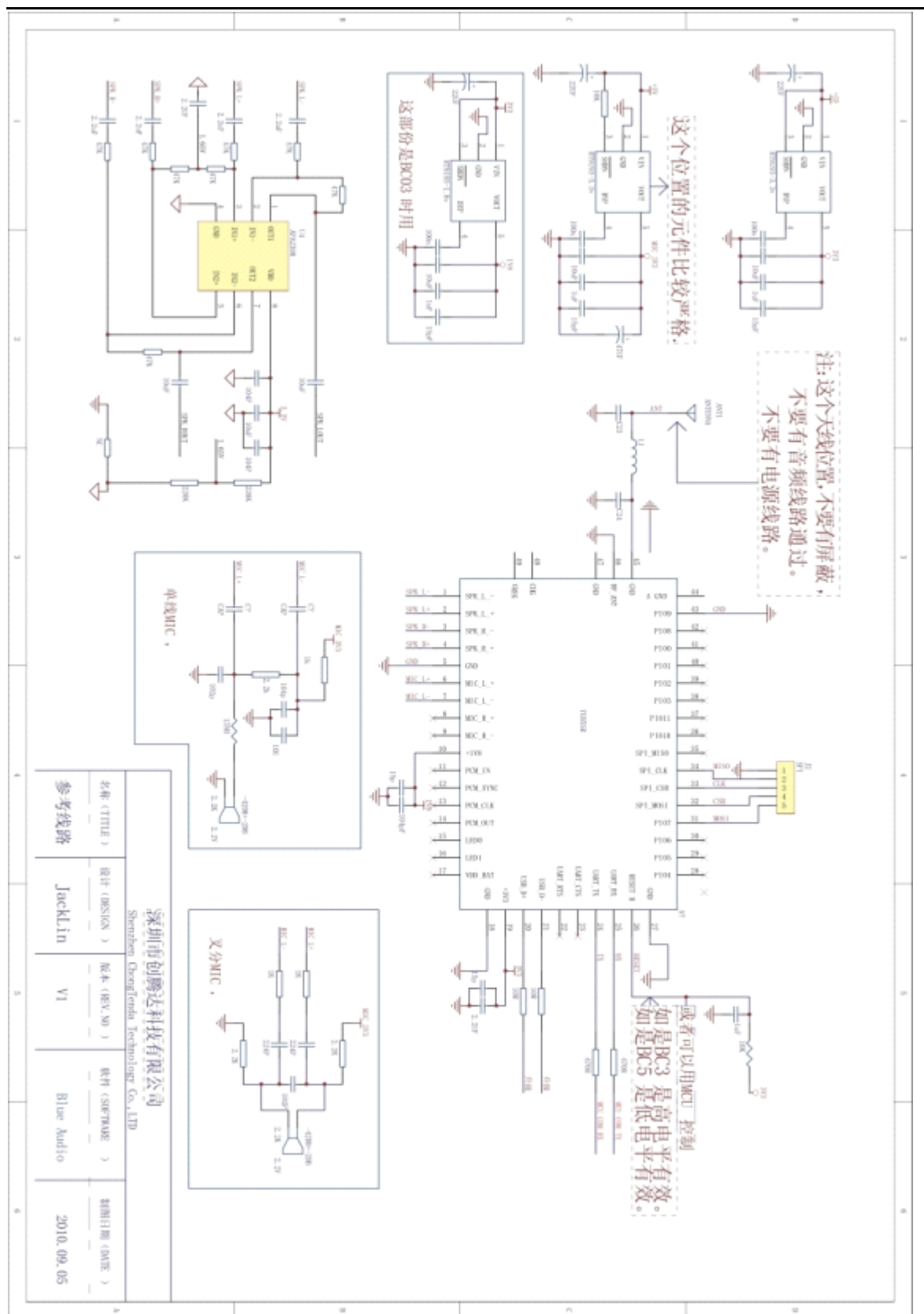
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27	GND	Power Ground
28	PIO4	Programmable input/output line
29	PIO5	Programmable input/output line
30	PIO6	Programmable input/output line
31	PIO7	Programmable input/output line
32	SPI_MOSI	Serial peripheral interface data input
33	SPI_CSB	Chip select for serial peripheral interface, active low
34	SPI_CLK	Serial peripheral interface clock
35	SPI_MISO	Serial peripheral interface data output
36	PIO10	Programmable input/output line
37	PIO11	Programmable input/output line
38	PIO3	Programmable input/output line
39	PIO2	Programmable input/output line
40	PIO1	Programmable input/output line
41	PIO0	Programmable input/output line
42	PIO8	Programmable input/output line
43	PIO9	Programmable input/output line
44	GND	Power Ground
45	GND	Power Ground
46	ANT	Blue antenna
47	GND	Power Ground

9. Reference Application Schematic

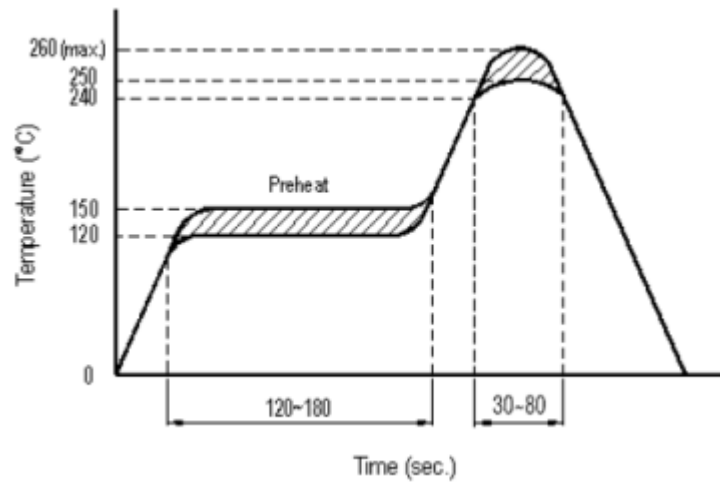
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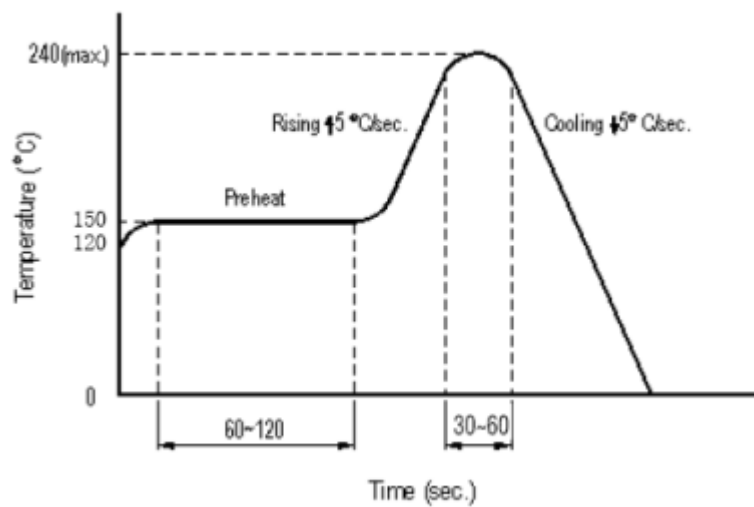


10. SMT Reflow Profile

10.1 Reliability solder temperature chart:



10.2 Reflow temperature chart



11. AT8852B TEST

