

CDB-BM1048B20-00

DATASHEET

Software:

客 户 Customer	客户承认 Approve（请盖 印章）	日 期 Date

拟制 Design	审核 Check	批准 Approve	版本 Version	日 期 Date
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深圳市中龙通电子科技有限公司
CHINA DRAGON TECHNOLOGY LIMITED

工厂地址：深圳市宝安区沙井街道南浦路林坡坑蚝三第一工业园 B4 栋

电话：(86 755) 81449957

传真：(86 755) 81449967

E-mail: Info@cdtech.cn

Http://www.cdtech.cn

更改记录：

Reversion History:

版本 Version	日期 Date	更改内容 Modification
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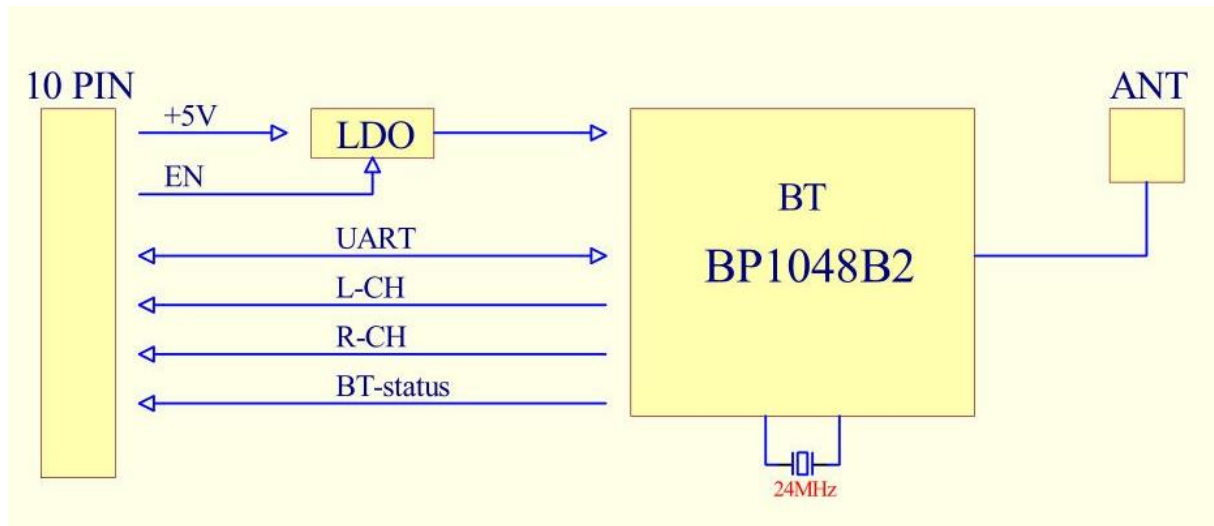
1. Overview

CDB-BM1048B20-00 is A highly integrated Bluetooth 5.0 module, built-in a BP1048B2 chip ,The Mvsilicon BP1048B2 using the Industry's advanced CMOS low-power process, integrated RISC 32-bit with DSP instruction and floating-point unit(FPU) for efficient signal processing .

2. Features

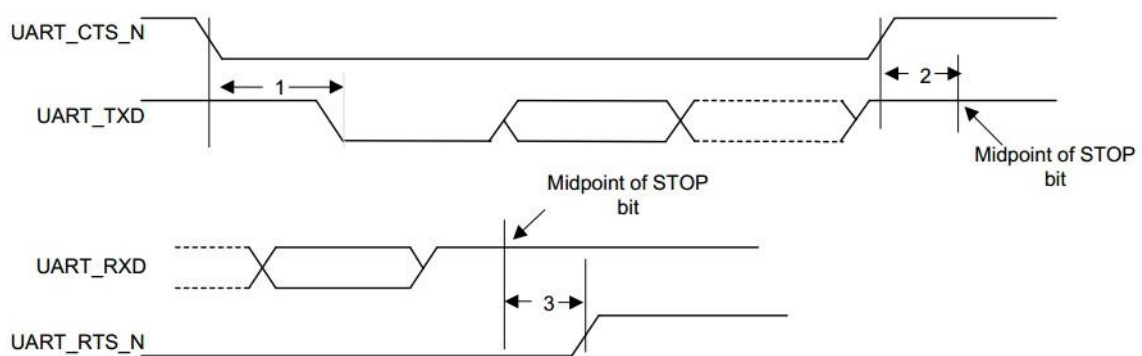
- Bluetooth V5.0 specification compliant
- +9 dBm (typ) RF transmit power with level control ,support
- Embedded Bluetooth stack, supporting A2DP, AVRCP, HFP,SPP,GATT
- Built-in ARM Cortex-M4 processor , 32-bit fixed point core
- Built-in 16Mbit FLASH , 320KB SRAM , 32KB I-Cache , 32KB D-Cache
- Built-in MP2/MP3/WMA/FLAC(8/16/24bit)/WAV(IMA-ADPCM and raw PCM) decoder and MP2 encoder
- Built-in super bass sound effect
- Built-in parametric EQ
- Embedded 24-bit Audio DAC and 16-bit Audio ADC
- Embedded LDO
- OTG 2.0 full-speed controller
- Supports UART interface for debug and programming,I2C , ADC , SPI and PWM interface

3. Block Diagram



4. UART Timing Specification

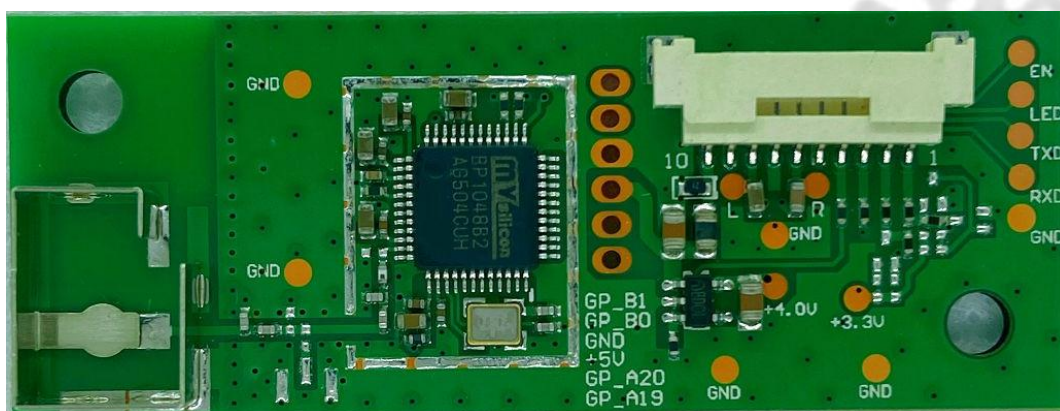
The default baud rate for UART HCI is 115.2 Kbaud



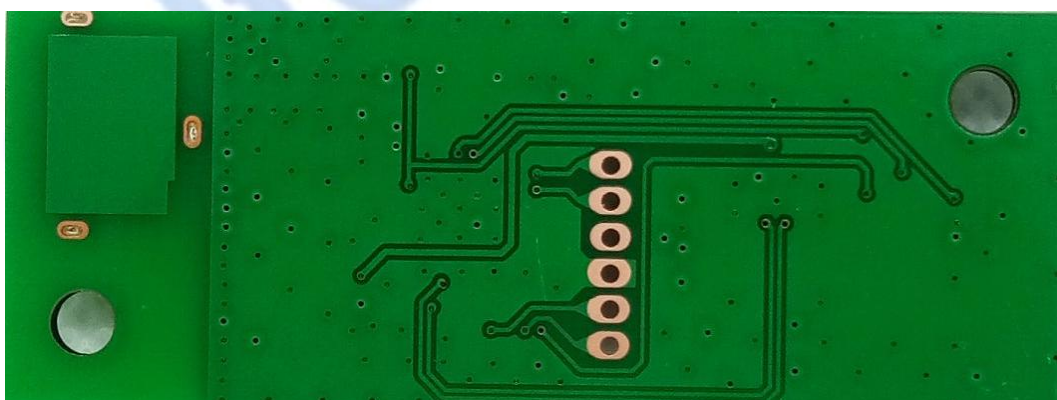
5. General Specification

Model	CDB-BM1048B20-00
Product Name	Bluetooth module
Major Chipset	BP1048B2
Wireless Standard	BT5.0
Profiles	A2DP 1.2, AVRCP 1.5, HFP 1.7 HSP 1.2, OPP 1.1, HID 1.0 SPP 1.2, PBAP 1.2, GAVDP 1.2
Decode Method	MP2,MP3,WMA,APE,FLAC,AAC,MP4,M4A,WAV,AIF,AIFC
Modulation Method	GFSK, $\pi/4$ QPSK, 8DPSK
Frequency Band	2.402~2.480 GHz
Operation Range	Up to 10 meters in open space
Supply Voltage (VCC)	DC +4.0V ~ +6.5V
Power Max current(+5V)	85 mA
Power current(working)	Up to 60 mA
AUDIO OUTPUT LEVEL (0dBFS,1KHz,Sine Waveform)	0.942 Vrms/FS
AUDIO OUTPUT SNR (0dBFS,1KHz,Sine,A-wt)	≥ 94 dB
AUDIO L/R Crosstalk (0dBFS,1KHz,Sine Waveform)	< -100 dB
Operating Temperature	-40~ +85°C ambient temperature
Maximum Junction Temperature	+125°C
Storage Temperature	-50 ~ 150°C ambient temperature
Humidity	5 to 90 % maximum (non-condensing)
ESD Protection	2KV
Dimension	60 x 23 x 5.6 mm (LxWxH) ± 0.5 mm
Single Module Mass	6.00g ± 0.02 g
Carton of Module number	3 * 120 = 360 PCS
Carton of Module Mass	2.66 KG

6. Pin Description



(TOP VIEW)



(BOTTOM VIEW)



PIN10

PIN1

NO	Name	Description
1	RXD	UART_RXD
2	TXD	UART_TXD
3	LED	Bluetooth status display
4	EN	Module enabler , High active
5	GND	Ground
6	DAC_R	Right channel Audio output
7	GND	Ground
8	DAC_L	Left channel Audio output
9	GND	Ground
10	VCC	DC 4.0V < Power Supply < DC 6.5V

Notice:

GP_A19 and GP_A20 is used for firmware upgrades.

7. Bluetooth Radio Characteristics

Table 1 Transmit Characteristics-Basic Data Rate

Radio Characteristics VCC=+5V Temperature=+27°C

PARAMETER	CONDITIONS	MIN	TYPE	MAX	UNIT
Maximum RF transmit power		0		+9	dBm
RF power control range		+2		+8	dB
20 dB band with			0.9	0.94	MHz
Adjacent channel transmit power	F=F0+1MHz		-31	-26	dBm
	F=F0-1MHz		-33	-26	dBm
	F=F0+2MHz		-30	-20	dBm
	F=F0-2MHz		-47	-20	dBm
	F=F0+3MHz		-50	-40	dBm
	F=F0-3MHz		-41	-40	dBm
	F=F0+>3MHz	-58	-52.5	-40	dBm
Δ	F=F0->3MHz	-58	-53.4	-40	dBm
Δ f1 _{avg} Maximum modulation		160		174	KHz
Δ f2 _{avg} Maximum modulation		150		174	KHz
Δ f2 _{avg} / Δ f1 _{avg}		0.8			
ICFT		-3.45		-0.02	KHz
Drift rate			0.1	0.18	KHz/50us
Drift (1 slot packet)		-5		5	KHz
Drift (3 slot packet)		0		5	KHz
Drift (5 slot packet)		-5		5	KHz

Table 2 Receiver Characteristics-Basic Data Rate

Radio Characteristics VCC=+5V Temperature=+27°C

PARAMETER	CONDITIONS	MIN	TYPE	MAX	UNIT
Sensitivity @0.1%BER		-88	-87	-85	dBm
Maximum received signal @0.1%BER		0			dBm
C/I c-channel			+10		dB
Adjacent channel selectivity C/I	F=F0+1MHz			-5	dB
	F=F0-1MHz			0	dB
	F=F0+2MHz			-33	dB
	F=F0-2MHz			-30	dB
	F=F0+3MHz			-45	dB
	F=F0-3MHz			-40	dB
Adjacent channel selectivity C/I	F=F _{image}			0	dB
Out-of-band blocking performance	30MHz-2GHz	-10			dBm
	2GHz-2.4GHz	-27			dBm
	2.4GHz-3GHz	-27			dBm
	3GHz-12.5GHz	-10			dBm
Intermodulation		-35			dBm
Spurious output level		-150			dBm/Hz

Table 3 Audio DAC Characteristics

DAC Characteristics VCC=+5V Temperature=+27°C

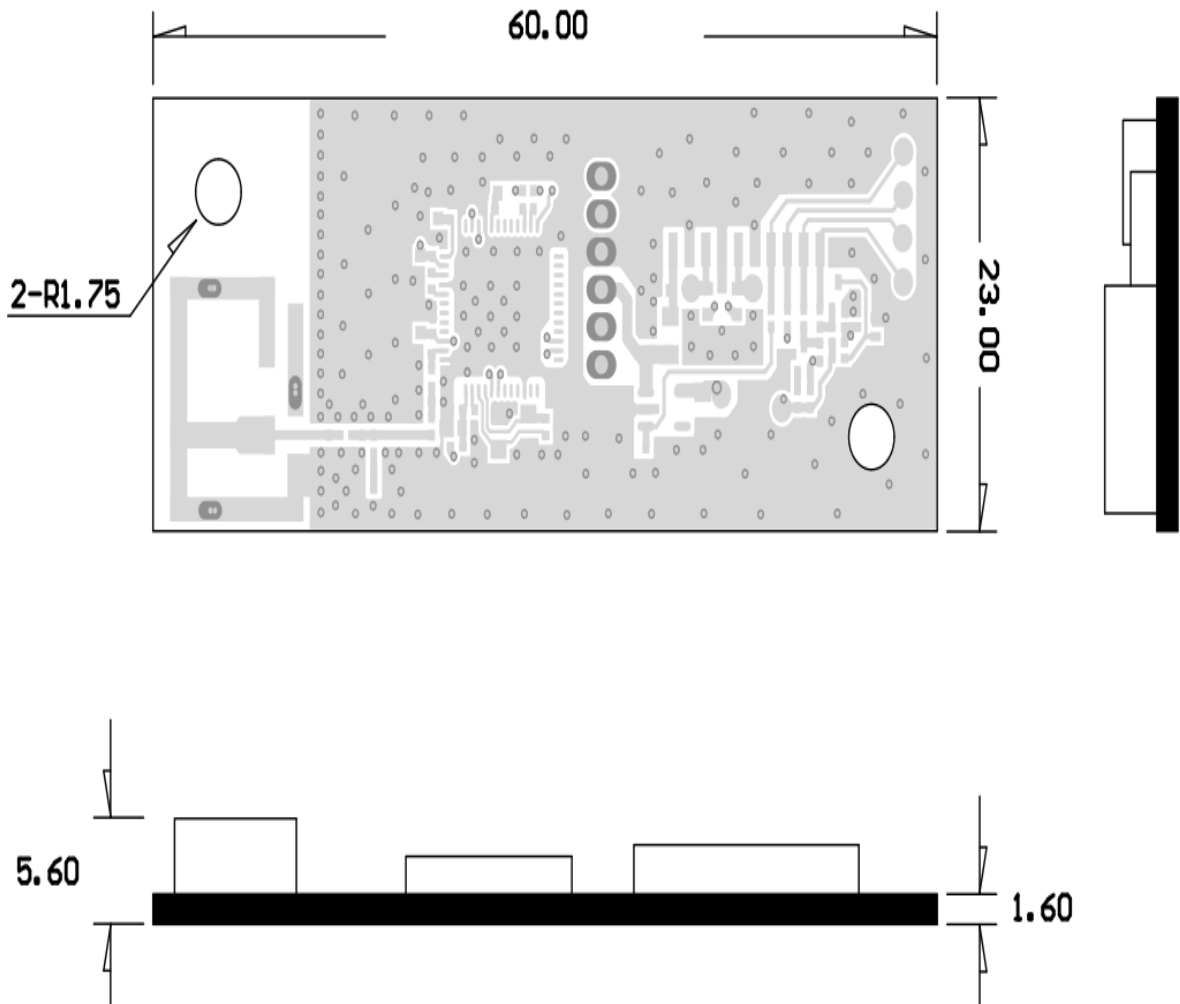
PARAMETER	CONDITIONS	MIN	TYPE	MAX	UNIT
Resolution				24	Bit
Output Sample Rate		8		48	KHz
Dynamic Range	@Fin=1KHz, -60dBFS,A-Weighted		105		dB
SNR	@Fin=1KHz, 0dBFS,A-Weighted		105		dB
THD+N	@Fin=1KHz, -60dBFS,A-Weighted		-86		dB
Output Voltage Swing				1	Vrms
Phase difference			0.18		degree
Crosstalk(L/R)			-106		dB

ADC Characteristics VCC=+5V Temperature=+27°C

PARAMETER	CONDITIONS	MIN	TYPE	MAX	UNIT
Resolution				16	Bit
Input Sample Rate		8		48	KHz
Dynamic Range	@Fin=1KHz,A-Weighted		95	96	dB
SNR	@Fin=1KHz, 850mVrms,A-Weighted		95	96	dB
THD+N	@Fin=1KHz, 700mVrms	-86	-82		dB
Input Voltage Level	AVDD=3.3V		0.85		Vrms
Input Resistance			36	50	KΩ
Crosstalk(L/R)			-100		dB

8. PCB SIZE

Unit : mm



Length : 60 ± 0.5 mm

Width : 23 ± 0.5 mm

Height: 5.6 ± 0.2 mm

PCB Thickness : 1.6 ± 0.1 mm

Installation instructions:

According to the shape of the module, there are two installation fixed holes on the module, and the whole machine product can be installed in the product according to the fixed hole. Note that the antenna part does not contact and get close to other metals.

9. BOM

物料名称	位号	规格型号
珍珠棉		珍珠棉 350*255*40mm 红色 防静电 60 格/板
隔板		隔板 (9N 6N) 33cm*25.5cm 用量 1PCS
纸箱		纸箱 37*26.5*14.5 (CM) 材质 K=A HFA11-00/01 不带中龙通字样
半成品		SMT 半成品 PCB (CDB.BM1048B20-00)
电源管	U2	SMT LDO ME6119C36M SOT23-5 Microne 微盟电子
ESD	D1	SMT ESD 静电管 ULC0511CDN DFN1006DN Air discharge: $\pm 30\text{kV}$ Contact discharge: $\pm 30\text{kV}$ leiditech
IC	U1	SMT IC BP1048B2 QFP48 山景
晶振	X1	SMT CRYSTAL 24MHz 3225 12PF $\pm 10\text{PPM}$
电感	L1	SMT COIL 0805 10UH $\pm 20\%$ Sunlord 黑 MCL2012H100MT
电感	L3	SMT COIL 0402 1.3nH $\pm 0.1\text{nH}$ Sunlord 白SDCL1005C1N3BTDF
磁珠	FB1	SMT BEAD 0402 600R 300mA $\pm 25\%$ (GZ1005U601CTF)
电阻	R9,R10,R12	SMT RES 0402 0 OHM 1/16W $\pm 5\%$
电阻	R5,R6,R7,R8,R15,R16	SMT RES 0402 100 OHM 1/16W $\pm 5\%$
电阻	R13	SMT RES 0402 100K OHM1/16W $\pm 5\%$
电容	C18	*SMT CAP 0402 0.2pF/50V $\pm 0.1\text{PF}$ C0G EYANG C0402C0G0R2B500NTB
电容	C5,C6	*SMT CAP 0402 0.5pF/50V $\pm 0.1\text{PF}$ C0G EYANG C0402C0G0R5B500NTB
电容	L2,C20,C21	*SMT CAP 0402 1.0pF/50V $\pm 0.1\text{PF}$ C0G EYANG C0402C0G1R0B500NTB
电容	C1,C2,C3,C4,C7,C8	SMT CAP 0402 0.1uF/16V $\pm 80-20\%$ Y5V Samsung CL05F104Z05NNNC
电容	C16	*SMT CAP 0402 1uF/6.3V $\pm 10\%$ X5R Samsung CL05A105KQ5NNNC
电容	C9,C10,C11,C13,C14,C15,C17	SMT CAP 0603 10uF/16V $\pm 20\%$ X5R Samsung CL10A106M08NQNC
电容	C12,C23	SMT CAP 0805 10uF/50V $\pm 10\%$ X5R Samsung CL21A106KBYQNE
PCB		V1.2 PCB FR-4 双面板 :145*180*1.6mm 1 拼18 绿色 无铅 ODP 2000506 孔数 137432 ORB 丝印 “131-BM1048B20-02”
屏蔽盖		屏蔽盖 15.85*12.65*2.0mm 洋白铜 t=0.15mm
连接器	CN1	SMT 10PIN 间隔D=1.25mm 高度 H=2.6mm 编带包装
天线	T3	五金贴片 5G 天线 磷青铜度镍天线 厚 0.3mm 尺寸: 12.1*9.3*4.0mm 右 天线 百傲 编带

10. Label

Label Note

1、二维码条码使用规格 ORCode，等级B；尺寸：4x4mm

2、二维码显示BT MAC内容：XXXXXXXXXXXX

3、MAC：前六位为BRAND固定码，后六码为管控序号

4、明码MAC以BT MAC

5、S/N:Mode name+年(2)+月(1)+流水号(6)

6、标签材质：50#白色特多龙

7、标贴必须统一黏贴位置(方向)

8、标贴文字必须清晰可辨识，且二维码须便于刷出所规范内

注：S/N编码规则

CDB-BM1048B20-00 YY M XXXXX

年份后两位 月份 流水号：000001-999999(十进制)

1月：1
2月：2
3月：3
4月：4
5月：5
6月：6
7月：7
8月：8
9月：9
10月：A
11月：B
12月：C

客户：TPV
空白料号：
尺寸：12*10.mm
公差：±0.3mm

! 不得叠放
WACDB1000
要求按照之有章，有章勿误

12.88

Model: CDB-BM1048B20-00
MAC: 12000015E254
TPV P/N: 368GABTM607DRA
IC: 23734-CDB1048B20
FCC ID: ROW-CDB1048B20

15.00

FCC

CHINA DRAGON TECHNOLOGY LIMITED





model: CDB-BM1048B20-00
TPV P/N: 368GABTM607DRA

深圳市中龙通电子科技有限公司

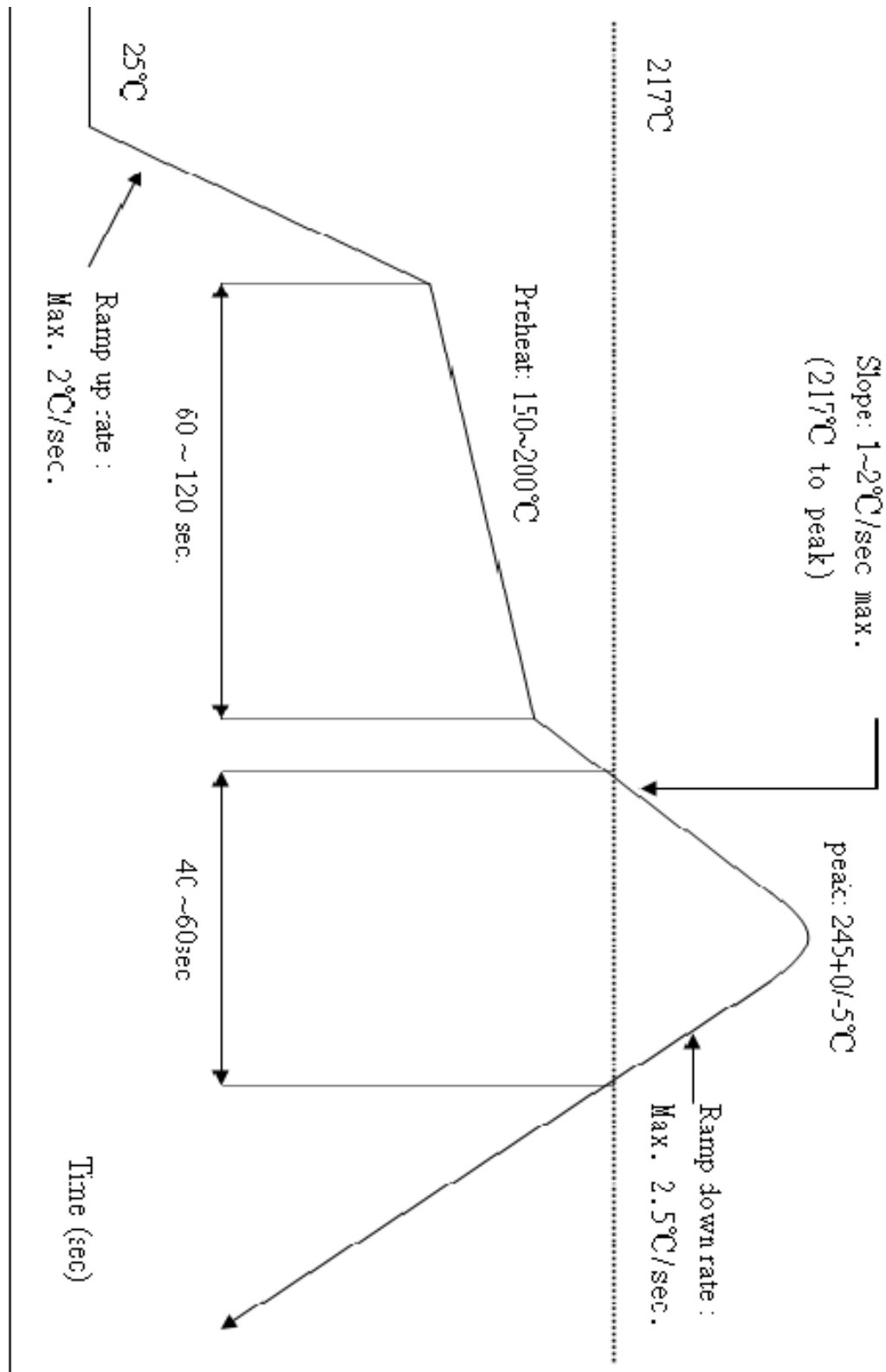
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11. Recommended Reflow Profile

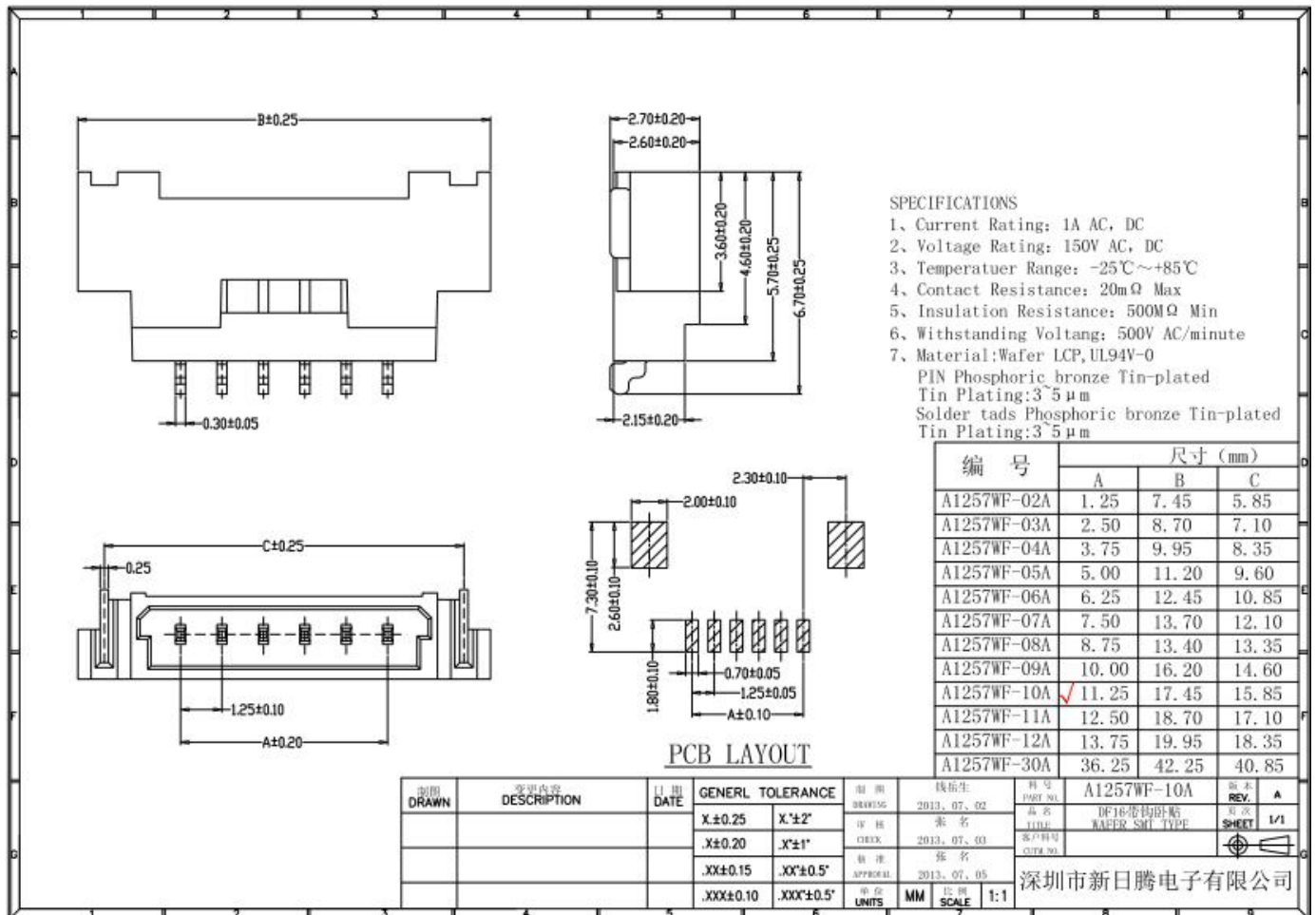
Referred IPC/JEDEC standard.

Peak Temperature : $<250^{\circ}\text{C}$

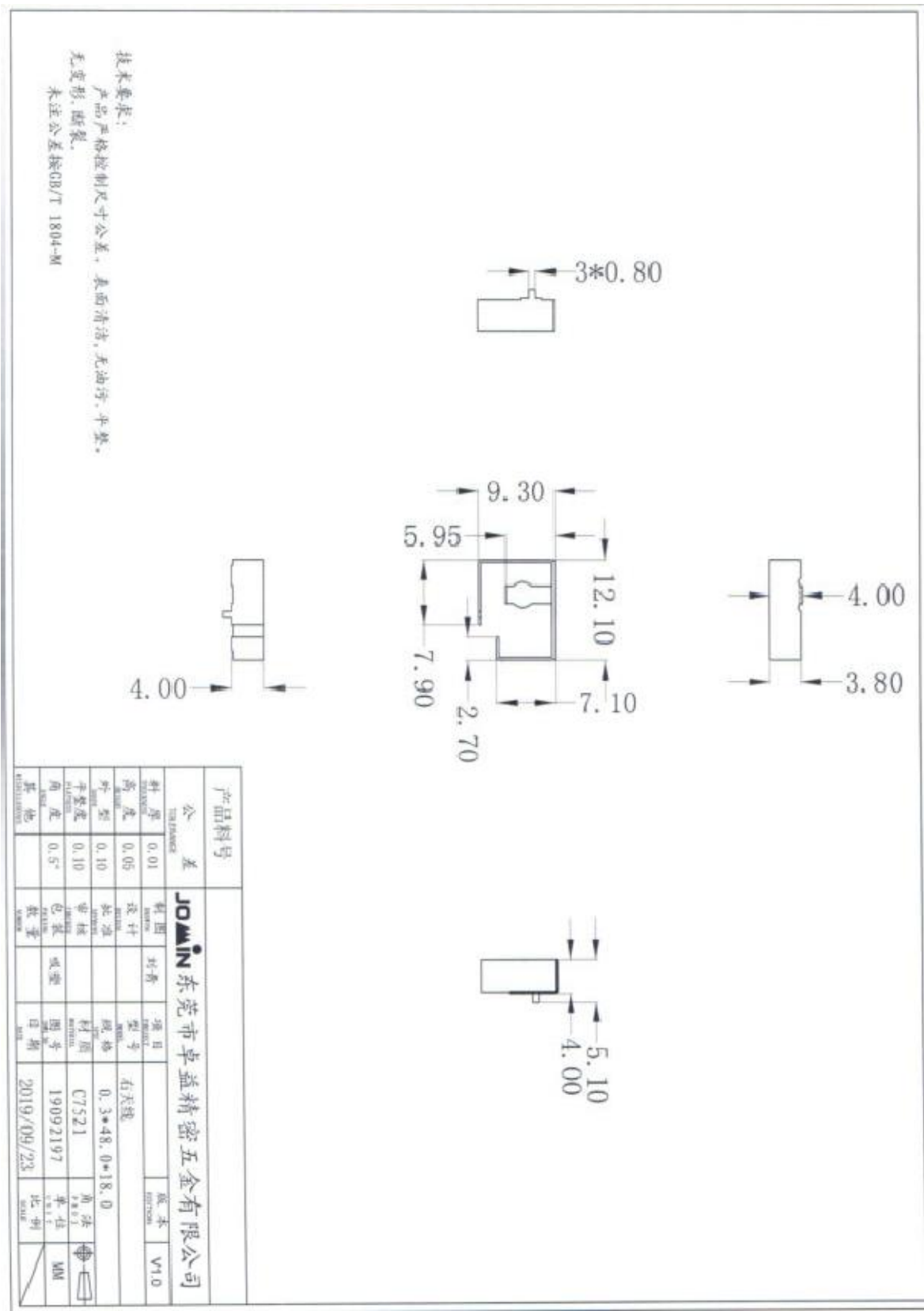
Number of Times : 2 times



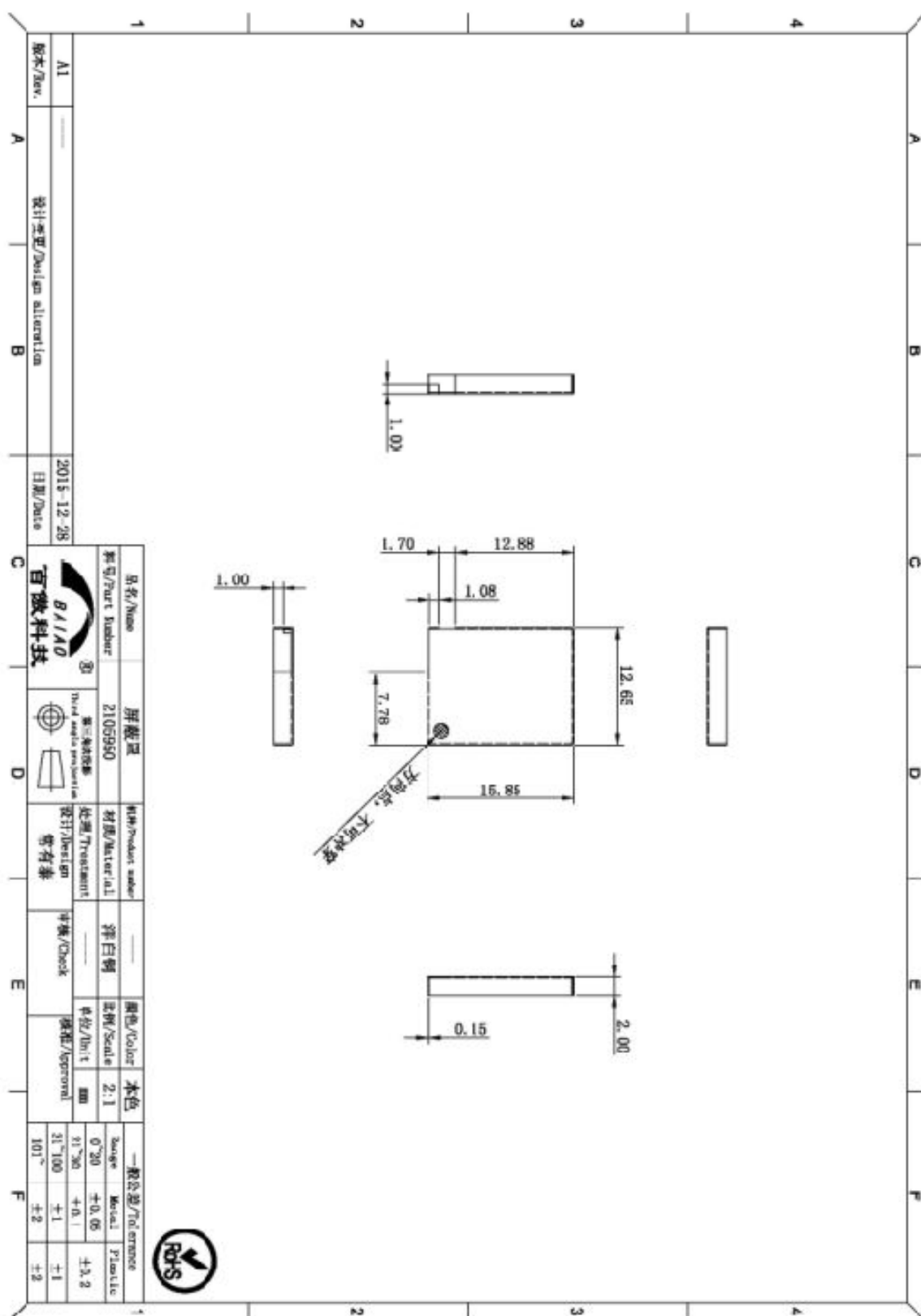
12. Connector spec



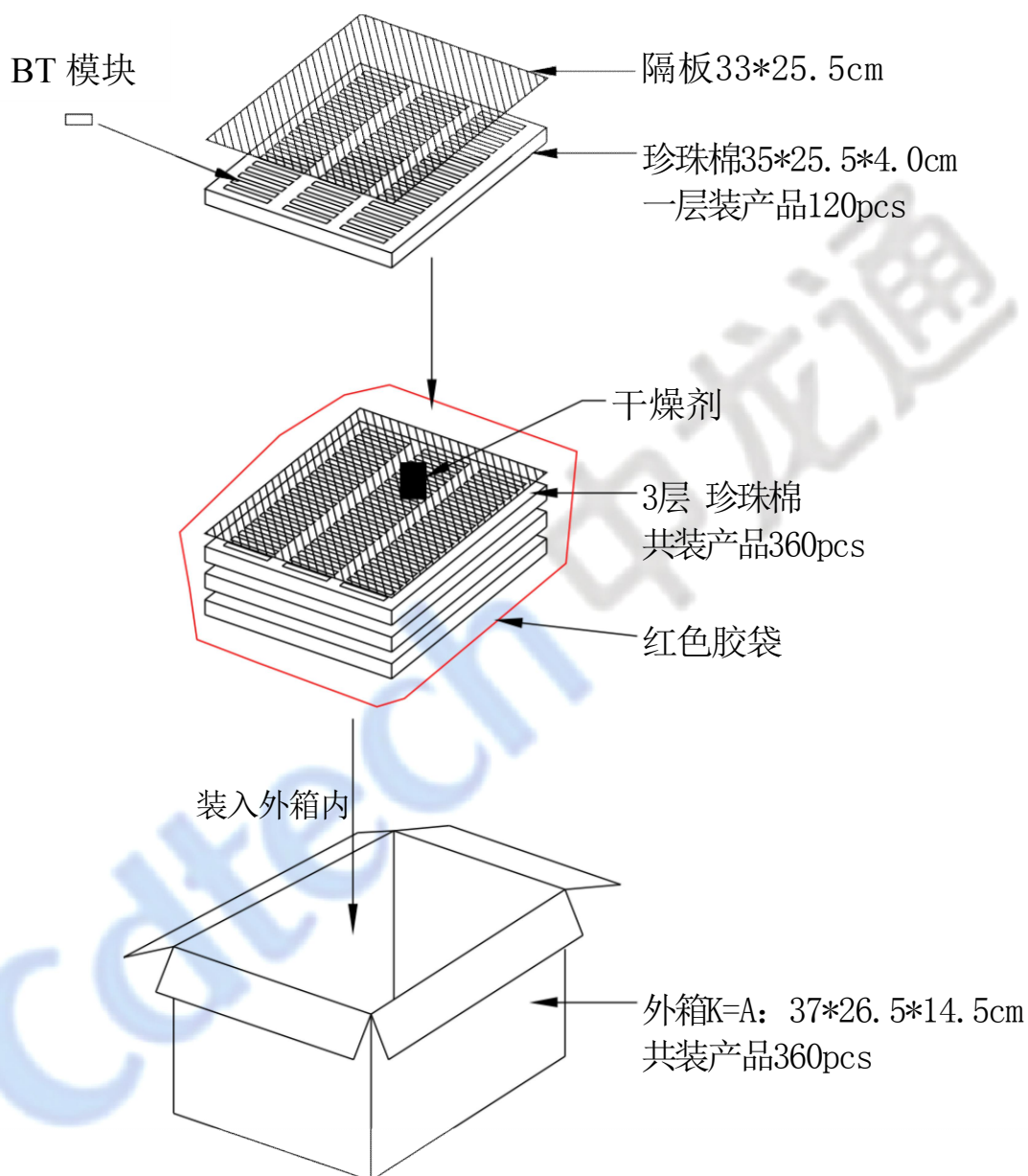
13. Antenna spec



14. Shielding cover spec



15. Package

Single Module Mass : 6.00 ± 0.02 gCarton of Module Mass : 2.66 ± 0.02 KG

**ESD CAUTION**

The CDB-BM1048B20-00 is ESD (electrostatic discharge) sensitive device and may be damaged with ESD or spike voltage. Although CDB-BM1048B20-00 is with built-in ESD protection circuitry, please handle with care to avoid the permanent malfunction or the performance degradation.

Cdtech 中龙通

FCC Statements

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.

NOTE:

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

NOTE: THE MANUFACTURER IS NOT RESPONSIBLE FOR ANY RADIO OR TV INTERFERENCE CAUSED BY UNAUTHORIZED MODIFICATIONS TO THIS EQUIPMENT. SUCH MODIFICATIONS COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.

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:ROW-CDB1048B20”

When the module is installed inside another device, the user manual of this device must contain below warning statements:

1. 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.

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

The devices must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product.

The 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. The final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.

The end user manual shall include all required regulatory information/warning as shown in this manual, include:

This product must be installed and operated with a minimum distance of 20 cm between the radiator and user body.

FCC Radiation Exposure Statement:

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This device and its antenna must not be co-located or operating in conjunction with any other antenna or transmitter. To comply with FCC RF exposure compliance requirements, this grant is applicable to only Mobile Configurations. The antennas used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

IC Statements

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

- (1) This device may not cause interference; and
- (2) This device must accept any interference, including interference that may cause undesired operation of the device.

Cet appareil est conforme aux CNR exemptes de licence d'Industrie Canada . Son fonctionnement est soumis aux deux conditions suivantes :

- (1) Ce dispositif ne peut causer d'interférences ; et
- (2) Ce dispositif doit accepter toute interférence , y compris les interférences qui peuvent causer un mauvais fonctionnement de l'appareil.

IC Radiation Exposure Statement

The modular can be installed or integrated in mobile or fix devices only. This modular cannot be installed in any portable device, for example, USB dongle like transmitters is forbidden.

This modular complies with IC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This modular must be installed and operated with a minimum distance of 20 cm between the radiator and user body. Cette modulaire doit être installé et utilisé à une distance minimum de 20 cm entre le radiateur et le corps de l'utilisateur.

If the IC 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 IC: 23734-CDB1048B20"

when the module is installed inside another device, the user manual of this device must contain below warning statements;

1. This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions::

(1) This device may not cause interference; and

(2) This device must accept any interference, including interference that may cause undesired operation of the device.

2. Cet appareil est conforme aux CNR exemptes de licence d'Industrie Canada . Son fonctionnement est soumis aux deux conditions suivantes :

(1) Ce dispositif ne peut causer d'interférences ; et

(2) Ce dispositif doit accepter toute interférence , y compris les interférences qui peuvent causer un mauvais fonctionnement de l'appareil.

The devices must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product.