Basic Information

TPV Part No.	Supplier Part Name	Part Description	
	CDB-BM2853C-00	BT Module	
Supplier Name	TPV Vendor Code	Manufacturing Location	
CHINA DRAGON TECHNOLOGY LIMITED		Shenzhen City, Bao' an	
Safety Parts	YES ☐ NO ☐	Net Weight (g)	1.3

Environmental Guarantee

1. All raw materials of supplied parts should be met TPV latest version standard (RDEMS-01) and the requirement of regional or country laws and ordinances.

2. All raw materials of supplied parts comply below requirements or not (mark "√" in the "☐" if item complies; mark "×" in the "☐" if not).

☐ Free of halogen (Not contain any halogen in products or parts)

☐ Low halogen / (According TPV standard RDEMS-01)

☐ Not contained any red phosphorus

☐ VOCs / (According TPV standard RDEMS-01)

Important Notice /

1. Any specification change for component, especially following items: Raw Material, Process, Tooling, Factory, Label, halftone, and any engineering changed of production, should be approved by TPV.

2. Any engineering change for component should be in version record, supplier should provide management information for old version parts to TPV if required.

3. Safety parts should be ensured that all safety certificate is complete and in the period of validity. Any change of safety certificate should be noticed to TPV timely and phased-in after approved by TPV.

Supplier Information

Prepared	Liu Zhonglin	Check	Wu Zengxi	Approved	Li Wei
Tel.	(86 755) 81449957	Fax	(86 755) 81449967	Email	liwei-lever@cdtech.cn
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VERSION RECORD

CDB-BM2853C-00
DATASHEET

Software：

Customer	Approve	Date

Design	Check	Approve	Version	Date
			V1.0	2021.11.22

CHINA DRAGON TECHNOLOGY LIMITED
Address：Building B4, No. 1 Industrial Park, Linpo Keng Ho 3, Nanpu Road, Shajing Street, Bao'an District, Shenzhen
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Http://www.cdtech.cn

Reversion History:

Version	Date	Modification
1.0	2021.11.22	New Release

Software Information and Ordering Information

Software	ats2853_TAB5305_Main_v001_202110221139	ats2853_TAB5305_Sub_v001_202110221140	ats2853_TAB5105_Main_v001_202110221139
Software Ver.	V001	V001	V001
BT Name	TAB5305	TAB5305	TAB5105
Application Type	The main speaker	Woofer	Main Speaker
Module distinction and corresponding type number	CDB-BM2853C-00 / M1	CDB-BM2853C-00 / S1	CDB-BM2853C-00 / M2

1. Overview

The CDB-BM2853C-00 is a highly integrated single-chip Bluetooth audio device. It also can act as traditional card speakers and card-reader for data transmission.
The CDB-BM2853C-00 integrates the high-performance transceiver, rich features baseband processor and Bluetooth audio profile. It meets Bluetooth V5.0 and compliant with V4.2/2.1+EDR, and supports dual mode (BR/EDR + Low Energy Controllers). The links in BR/EDR and LE can be active simultaneously.
CDB-BM2853C-00 integrates high quality and low latency SBC decoder and CVSD codec. It also supports PLC technique and AEC in voice call providing a high audio quality.
The CDB-BM2853C-00 integrates a complete set of power management circuits, flexible memory configuration, Matrix LED controller for UI display and rich interfaces, such as SD/SDIO/SPI/USB2.0 FS/UART/TWI/PWM/IR /I2S TX&RX and so on. The architecture is fully programmable with any application. It also has the minimum package and the most compact BOM.

2. Features

- Bluetooth V5.0 specification compliant
- 32bit RISC processor Core, up to 240MHz.
- Internal 2MByte Nor flash
- Supports 24MHz OSC with on-chip PLL
- Support USB/SDCard/Uart firmware upgrade
- Support for echo cancellation and noise reduction
- Supports for packet loss concealment
- Compatible with AVRCP Profile V1.6, A2DP Profile V1.3,HFP Profile V1.7
- Supports GFSK,DQPSK and 8DPSK modulation
- Support for SBC & AAC Bluetooth audio transmission format

- Supports SCO/eSCO link
- Built-in stereo 24-bit input sigma-delta DACs
- Supports Secure Simple Pairing
- Supports Low Power Mode (Sniff / Sniff Sub-rating / Hold / Park)
- Bluetooth Dual Mode support: Simultaneous LE and BR / EDR
- Support differential audio output for speaker PA
- Linear regulators output VCC, SVCC, RTCVDD

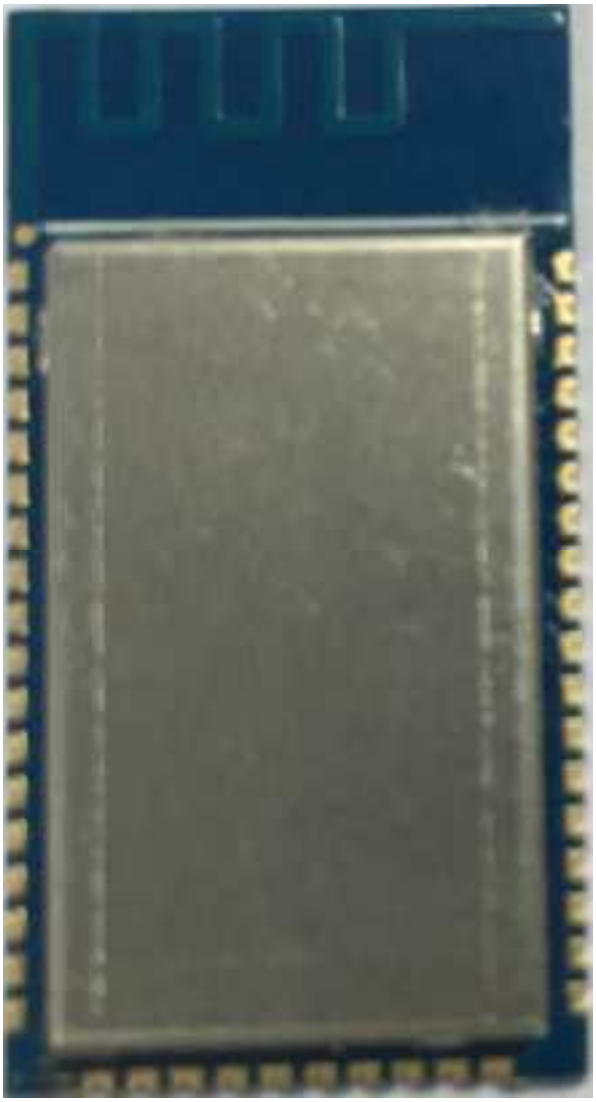
4. Application

- Portable stereo speakers and speakerphones
- Bluetooth car audio unit
- Stereo headsets and headphone
- Other Bluetooth audio applications

5. General Specification

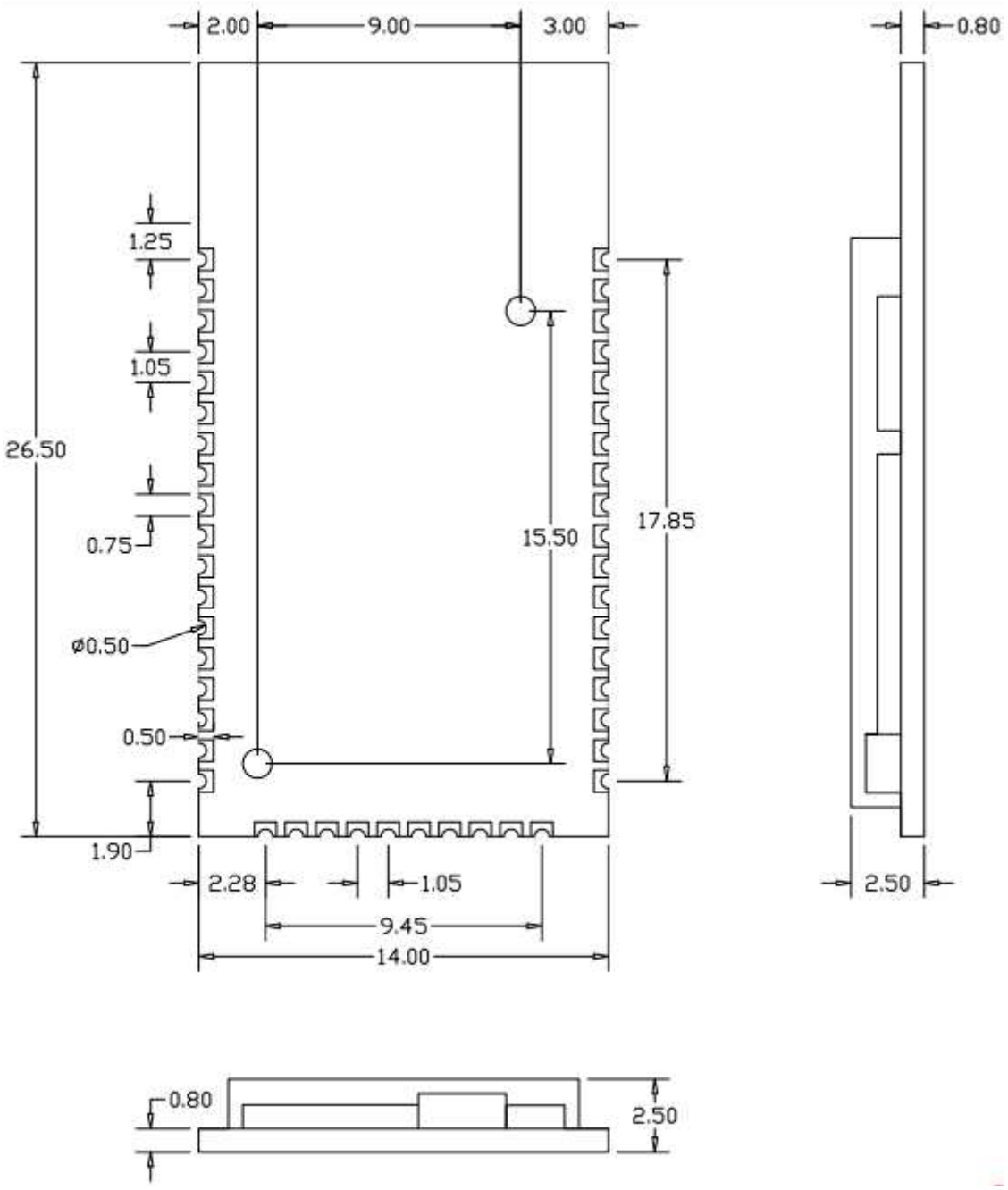
Model	CDB-BM2853C-00
Product Name	Bluetooth module
Major Chipset	ATS2853
Wireless Standard	Bluetooth® V5.0 specification
RF TX Output Power	-6~8dBm (typical)
RX Sensitivity	-92dBm (typical)
Modulation Method	GFSK,π/4 DQPSK,8DPSK
Frequency Band	2.402~2.480 GHz
Supply Voltage (BAT)	BAT +3.0V ~ +5V
Operating Temperature	-20~ +70°C
Storage Temperature	-40 ~ 85°C
Humidity	5 to 90 % maximum (non-condensing)
ESD Protection	2KV
Dimension	26.5 x 14 x 2.5 mm (LxWxH) ±0.2mm
Single Module Mass	1.3g±0.05g

6. Pin Description



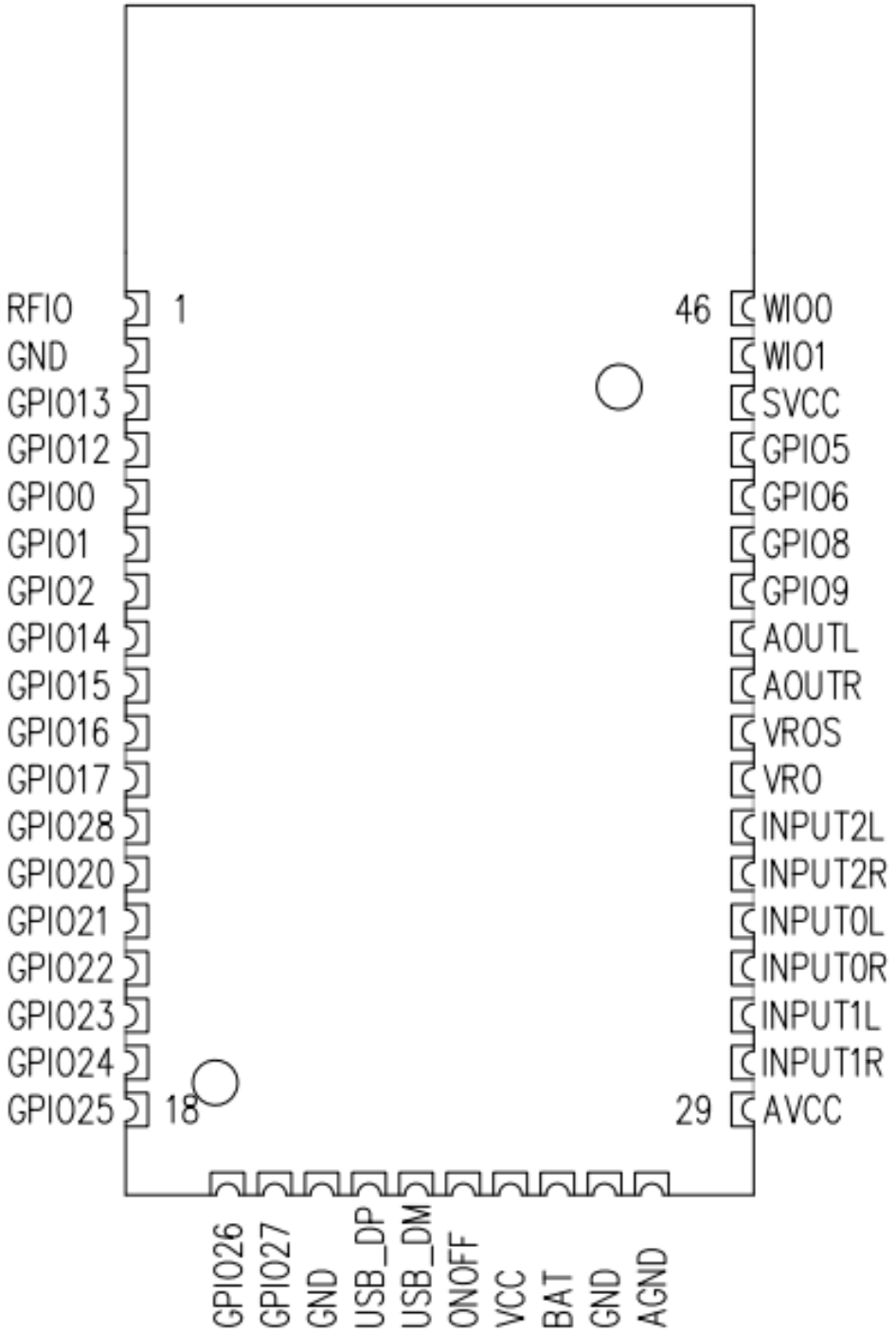
(TOP VIEW)

(BOTTOM VIEW)



unit: mm ± 0.2 mm

(TOP VIEW)


RFIO
1
GND
GPIO13
GPIO12
GPIO0
GPIO1
GPIO2
GPIO14
GPIO15
GPIO16
GPIO17
GPIO28
GPIO20
GPIO21
GPIO22
GPIO23
GPIO24
GPIO25
18
46
WIO0
WIO1
SVCC
GPIO5
GPIO6
GPIO8
GPIO9
AOUTL
AOUTR
VROS
VRO
INPUT2L
INPUT2R
INPUT0L
INPUT0R
INPUT1L
INPUT1R
29
AVCC
GPIO26
GPIO27
GND
USB_DP
USB_DM
ONOFF
VCC
BAT
GND
AGND

(PIN VIEW)

NO	Name	Description
1	RFIO	Bluetooth transmitter output/receiver input
2	GND	Ground
3	GPIO13	Bit13 of GPIO
4	GPIO12	Bit12 of GPIO
5	GPIO0	Bit0 of GPIO
6	GPIO1	Bit1 of GPIO
7	GPIO2	Bit2 of GPIO
8	GPIO14	Bit14 of GPIO
9	GPIO15	Bit15 of GPIO
10	GPIO16	Bit16 of GPIO
11	GPIO17	Bit17 of GPIO
12	GPIO28	Bit28 of GPIO
13	GPIO20	Bit20 of GPIO
14	GPIO21	Bit21 of GPIO
15	GPIO22	Bit22 of GPIO
16	GPIO23	Bit23 of GPIO
17	GPIO24	Bit24 of GPIO
18	GPIO25	Bit25 of GPIO
19	GPIO26	Bit26 of GPIO
20	GPIO27	Bit27 of GPIO
21	GND	Ground
22	USB_DP	USB signal DP
23	USB_DM	USB signal DM
24	ONOFF	ON/OFF，All-purpose hardware switch
25	VCC	IO power pin
26	BAT	Battery Voltage input
27	GND	Ground
28	AGND	Ground of Analog
29	AVCC	Power supply of Analog
30	INPUT1R	INPUT1R

31	INPUT1L	INPUT1L
32	INPUT0R	INPUT0R
33	INPUT0L	INPUT0L
34	INPUT2R	INPUT2R
35	INPUT2L	INPUT2L
36	VRO	Direct drive mode bias
37	VROS	Direct drive mode bias
38	AOUTR	AOUTR/AOUTLN
39	AOUTL	AOUTL/AOUTLP
40	GPIO9	Bit9 of GPIO
41	GPIO8	Bit8 of GPIO
42	GPIO6	Bit6 of GPIO
43	GPIO5	Bit5 of GPIO
44	SVCC	Power Supply for SIO and Hosc
45	WIO1	Wake up IO1. It's also can used as SIO and LRADC2. When it used as SIO, the Maximum frequency can no more than10KHz.
46	WIO0	Wake up IO0. It's also can used as SIO and LRADC1. When it used as SIO, the Maximum frequency can no more than 10KHz.

7. BOM

Materal Name	Position	Specification
SMT semi-finished		SMT semi-finished PCB (CDB.BM2853C-00)
ESD	MB1	SMT ESD ULC0511CDN DFN1006DN Air discharge: ±30kV Contact discharge: ±30kV leiditech
IC	U1	SMT IC ATS2853 QFN-48 6*6*0.75m
patch crystals	YZ1	SMT CRYSTAL 24MHz +/-10PPM CL=8PF 3225 -20℃~+70℃
Inductance	R4	SMT COIL 0201 1.9nH +/-0.1nH 500mA 250mohm Murata LQP03TG1N9B02D
Winding Inductance	LZ1	SMT COIL 0805 4.7uH HCD0805-R-4R7JL HEK
Resistance	R1	SMT RES 0201 0 OHM 1/20W +/-5%
Resistance	R2	SMT RES 0402 0 OHM 1/16W +/-5%
Capacity	C26 C29	*SMT CAP 0201 2.0pF/50V +/-0.1PF C0G EYANG C0201C0G2R0B500NTA
Capacity	C8	SMT CAP 0201 0.1uF/10V +/-10% X5R Samsung CL03A104KP3NNNC
Capacity	C1 C2 C5 C6 C7	*SMT CAP 0201 1uF/6.3V +/-20% X5R Samsung CL03A105MQ3CSNC
Capacity	C3	SMT CAP 0402 10uF/10V +/-20% X5R Samsung CL05A106MP5NUNC
PCB		PCB FR-4 size:126.00*124.00*0.8mm 1&32 thickness0.8MM Chemical zedoary Blueoil white letter without 20211102
Shield Cover		Size:19.2*11.6*1.6mm Thickness: 0.2mm Copper
Label		Length: 5MM ; Width : 5MM : 0.0065MM Material: high-temperature material

8. ELECTRICAL CHARACTERISTIC

8.1 Absolute maximum ratings

Rating	Symbol	Min	Max	Unit
Ambient Temperature	Tamb	TBD	TBD	°C
Storage temperature	Tstg	-55	+150	°C
ESD Stress voltage	Vesd (Human body model)	4000	-	V
Supply Voltage	BAT	3.0	5	V
	VCC/AVCC/SVCC	2.7	3.6	V
	VD15	1.0	1.7	V
Input Voltage	ONOFF	-	5	V
	3.3V IO	2.7	VCC+0.2	V

8.2 Recommended power supply

Rating	Min	Typ	Max	Unit
BAT(LI)	3.3	3.8	4.5	V
VCC/SVCC	3.0	3.1	3.6	V
AVCC	2.9	2.95	3.25	V
VD15	1.2	1.5	1.7	V

8.3 Regulators maximum output current

LDO	Output Voltage	capacitance	Load Capacity
SVCC	3.1V	1UF	10mA
VCC	3.1V	1~10UF	300mA
AVCC	2.95V	1~10UF	40mA
VDD	1.2V	CAPLESS	60mA

8.4 Audio ADC Parameters

Core Supply Voltage = 1.2V @ 25

Pre-Amplifier					
Parameter	Conditions	Min	Typ	Max	Unit
Full Scale Input Voltage	THD+N<1%	-	-	2.6	Vpp
Analogue gain	Differential input	-12	-	33	dB
	Single Ended input	-18	-	27	dB
Analogue to Digital Converter					
Resolution	-	-	-	24	Bits
Input Sample Rate	-	8	-	96	kHz
SNR	fin = 1kHz@Full Scale Input Voltage, B/W = 22Hz~22kHz, Fs=48kHz & PA 1.6VPP output	-	96	-	dB
		A-Weighting	98	-	dB
Dynamic Range	fin = 1kHz@-40dBFS Input Voltage, B/W = 22Hz~22kHz, Fs=48kHz & PA 1.6VPP output	-	96	-	dB
		A-Weighting	98	-	dB
THD+N	fin = 1kHz(input=1.6Vpp), B/W = 22Hz~22kHz, Fs=48kHz & PA 1.6VPP output	-	-	-89	dB
Digital gain	-	0	-	52.5	dB

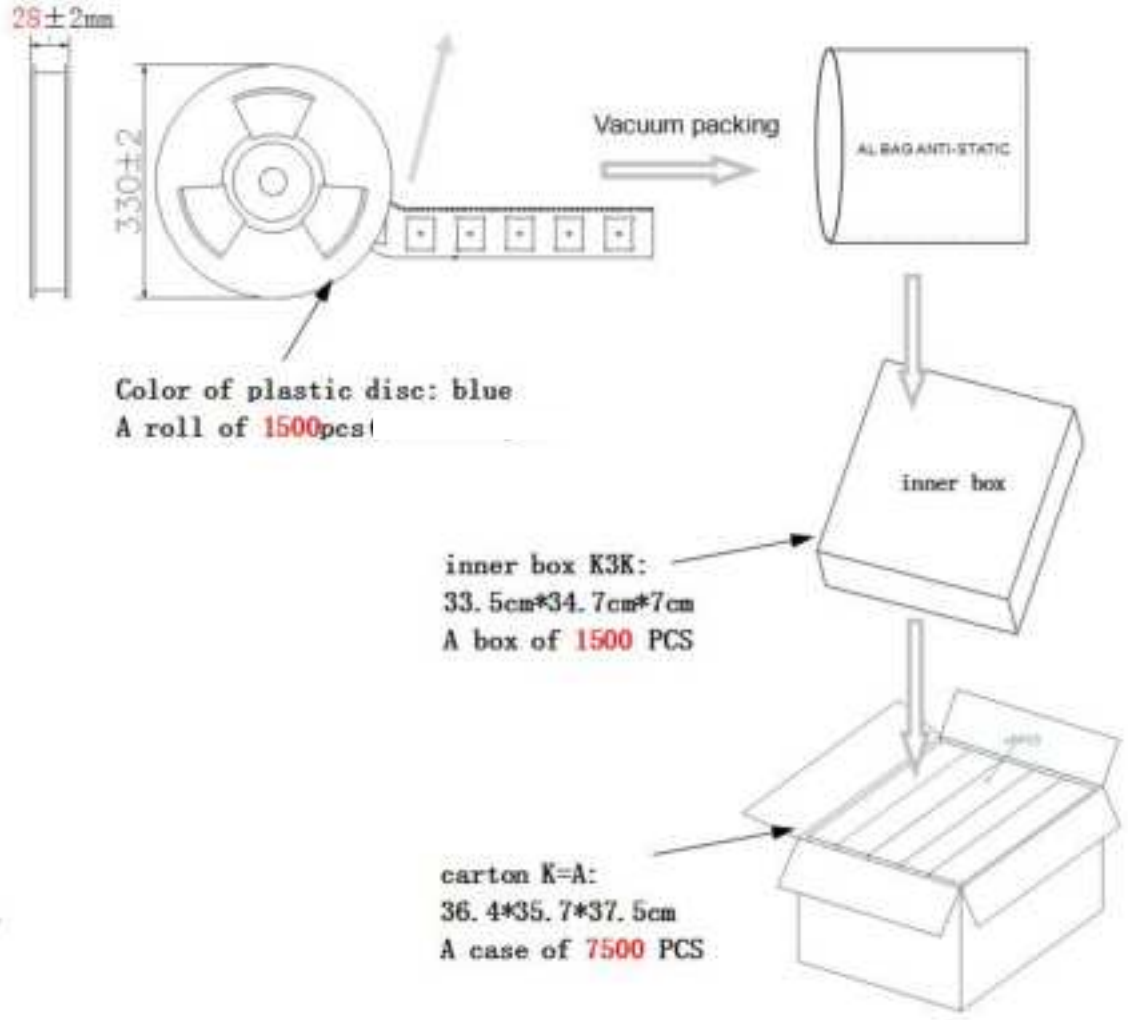
8.5 Stereo DAC Parameters

Digital to Analogue Converter							
Parameter	Conditions			Min	Typ	Max	Unit
Resolution	-			-	-	24	Bits
Output Sample Rate	-			8	-	96	kHz
SNR	fin = 1kHz@0dBFS input B/W = 22Hz~22kHz Fs=48k	2.6VPP output@Load=10kΩ	-	-	98	-	dB
			A-Weighting		100		
		1.6VPP output@Load=16.5Ω	-	-	97	-	dB
			A-Weighting		100		
Dynamic Range	fin = 1kHz@-48dBFS input B/W = 22Hz~22kHz Fs=48kHz	2.6VPP output@Load=10kΩ	-	-	97	-	dB
			A-Weighting		100		
		1.6VPP output@Load=16.5Ω	-	-	96	-	dB
			A-Weighting		100		
THD+N	fin = 1kHz@0dBFS input B/W = 22Hz~22kHz Fs=48kHz	2.6VPP output@Load=10kΩ	-	-	-85	-	dB
		1.6VPP output@Load=16.5Ω	-		-85		
Digital gain	-				-	-	-
Stereo crosstalk	fin = 1kHz@0dBFS input		-	-	-113	-	dB
PWR Amplifier							
Max Amplitude/PWR	fin = 1kHz@0dBFS input Fs=48kHz	2.6VPP output@Load=10	Single Ended	-	952	-	mVrms
			Output	-	-	-	mW
	fin = 1kHz@0dBFS input Fs=48kHz	1.6VPP output@Load=16.5Ω	Single Ended	-	568	-	Vrms
			Output	-	19.5	-	mW

8.6 RF characteristics

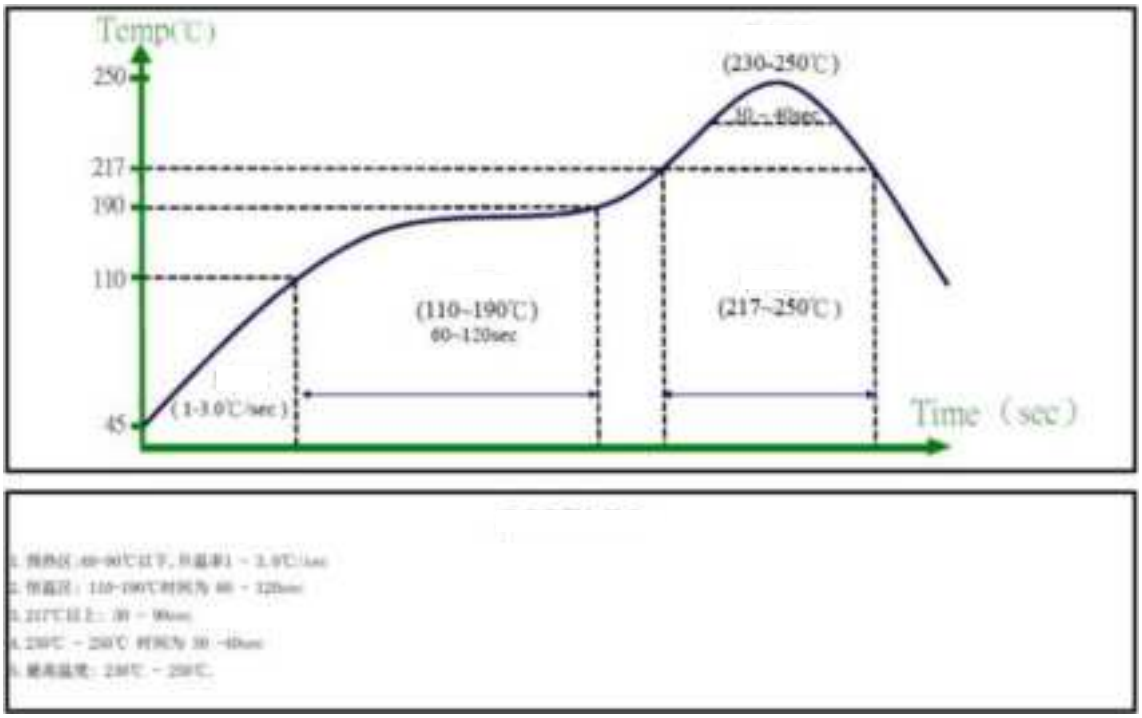
Receiver		Average	Bluetooth Spec	Transmitter		Average	Bluetooth Spec	Unit
Sensitivity at0.1 BER	2402MHz	-88	<=-70	Output Power	2402MHz	2.5	-6~+4	dBm
	2441MHz	-88			2441MHz	2.5		dBm
	2480MHz	-88			2480MHz	2.5		dBm

9. Packaging instructions



10. REFLOW PROFILE

Reflow number of times: ≤ 2times



FCC Statement

Warning: Changes or modifications to this unit 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 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

The device must not be co-located or operating in conjunction with any other antenna or transmitter.

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.

1.The module is limited to OEM installation ONLY.
2.The OEM integrator is responsible for ensuring that the end-user has no manual instructions to remove or install module.
3.That module is limited to installation in mobile or fixed applications, according to Part 2.1091(b)
4. FCC RF Radiation Exposure Statement Caution:
To maintain compliance with the FCC's RF exposure guidelines, place the product at least 20cm from nearby persons.

IC warning user manual statement

English version:

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

Radiation Exposure Statement: The product comply with the Canada portable RF exposure limit set forth for an uncontrolled environment and are safe for intended operation as described in this manual.

French version:

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:
(1) l'appareil ne doit pas produire de brouillage, et
(2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This Class B digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.
CAN ICES-003 (B)/NMB-003(B)

Déclaration d'exposition aux radiations: Le produit est conforme aux limites d'exposition pour les appareils portables RF pour les Etats-Unis et le Canada établies pour un environnement non controlé.

This equipment complies with IC RSS-102 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.
Cet équipement est conforme aux limites d'IC RSS-102 sur l'exposition aux radiations qui sont déterminées pour un environnement non contrôlé. Cet équipement doit être installé et utilisé en observant une distance minimum de 20 cm entre la source du rayonnement et votre corps.

For Module:

This device complies with Part 15, Part 15C of the FCC Rules. The FCC ID for this device is 2AR2S-CDBBM2853C

End Product labeling:

If the FCC ID is not visible with the module is installed inside another device, then it must be still responsible for the FCC compliance requirement of the end product which referring to the enclosed module and it also must display a label, such as the following: Contains Transmitter module FCC ID: 2AR2S-CDBBM2853C or contains FCC ID: 2AR2S-CDBBM2853C

If the IC ID is not visible with the module is installed inside another device, then it must be still responsible for the IC compliance requirement of the end product which referring to the enclosed module and it also must display a label, such as the following: Contains Transmitter module IC ID: 24589-CDBBM2853C or contains IC ID: 24589-CDBBM2853C

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.

RF exposure considerations:
It is essential for module grantees to clearly and explicitly state the RF exposure conditions that permit a host product manufacturer to use the module. Two types of instructions are required for RF exposure information: (1) to the host product manufacturer, to define the application conditions (mobile, portable – xx cm from a person's body);
and (2) additional text needed for the host product manufacturer to provide to end users in their end product manuals. If RF exposure statements and use conditions are not provided, then the host product manufacturer is required to take responsibility of the module through a change in FCC ID (new application).