

MULTILAYER PIEZO CERAMIC SPEAKER SPECIFICATIONS



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**承 认 书**

**SPECIFICATION FOR APPROVAL**

客户 CUSTOMER			
客户料号 CUST P/N			
名称 NAME		型 号 MODEL	
版本 Ver.		日期 DATE	

客户签认 CUSTOMER APPROVAL	承认 APPD.	承认章 COMPANY CHOP

出图 DRAWING	制作 DWN.	审核 CHK.	核准 APPD.

注: 承认书一式两份, 请返回一份 PLEASE SENT ONE OF THE SAME TWO BACK

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**Content:**

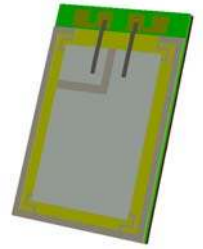
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■ 1. Characteristics and applications:

As one of our MLCT (MULTILAYER CERAMIC TRANSMITTER) series, this product is in multilayer ceramic structure. Thanks to its high power density, it can get high output with a low driving voltage.

Its main characteristics include:

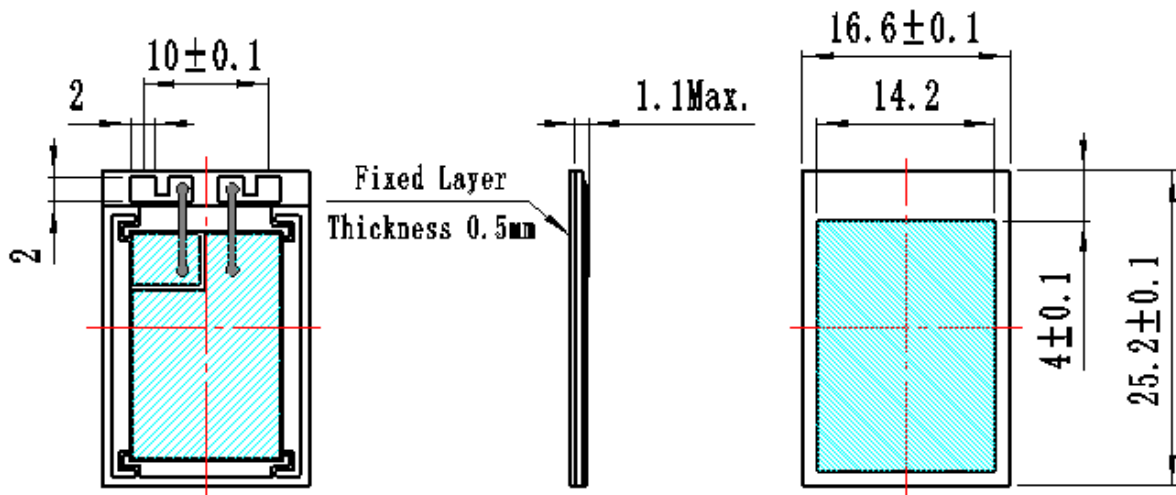
- 1) simple acoustic design- which can be installed in a narrow and flat space;
- 2) milliwatts of power consumption and high conversion efficiency, which makes it used widely;
- 3) water-proof design
- 4) it won't cause any electromagnetic interference to surrounding electronic devices and is good at anti-electromagnetic interference.



It can be widely used in digital products, general instruments and home appliances. In the humid condition, it can work as voice reminder and music player. In some special fields, it can be used for sound transfer and conversion.

■ 2. Model: MT0002-000

■ 3. Appearance and Dimensions



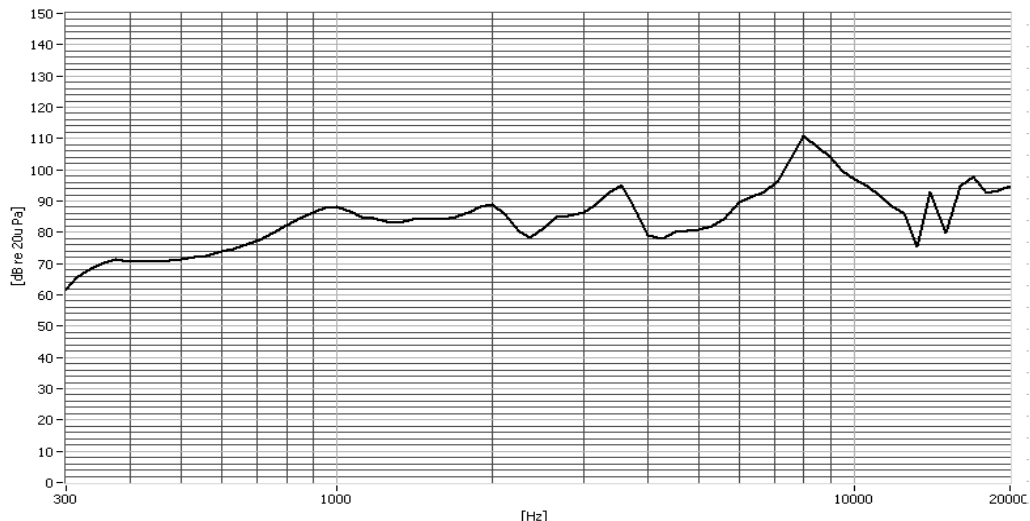
Unit: mm

# MULTILAYER PIEZO CERAMIC SPEAKER SPECIFICATIONS

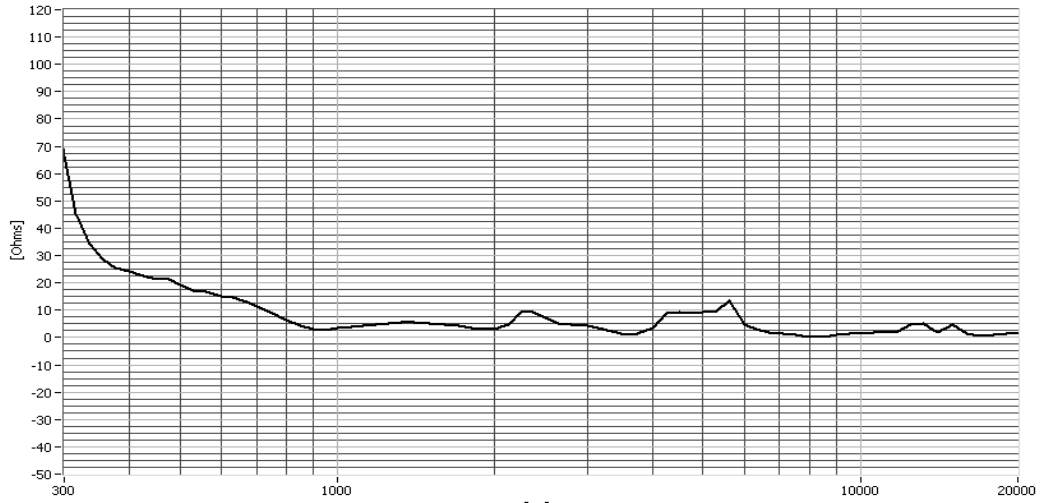
## ■ 4. Electrical Specifications:

No.	Item	Unit	Specifications	Test conditions
1	Sound Pressure Level (S.P.L)	dB	80 Min.	B&K(5cm/5Vrms/at muffle room) (Average at 4-point: 1.0K、1.5K、2.0K、3.0K)
2	Electrostatic Capacity (C)	nF	400±20%	Digital electric bridge (120Hz/1V/25℃)
3	Resonant Frequency (F0)	Hz	900 TYP.	B&K (5Vrms)
4	Resonant Impedance (R)	Ω	3.0 TYP.	B&K (5Vrms)
5	Distortion (%THD)	%	<3.5	B&K (80dB/5Vrms/5cm) (Average at 4-point: 1.0K、1.5K、2.0K、3.0K)
6	Frequency Range	Hz	300~20000	-----
7	Max Input Voltage	Vp-p	28	-----
8	Operating Temp.	℃	-20 ~ +70	-----
9	Storage Temp.	℃	-30 ~ +85	-----

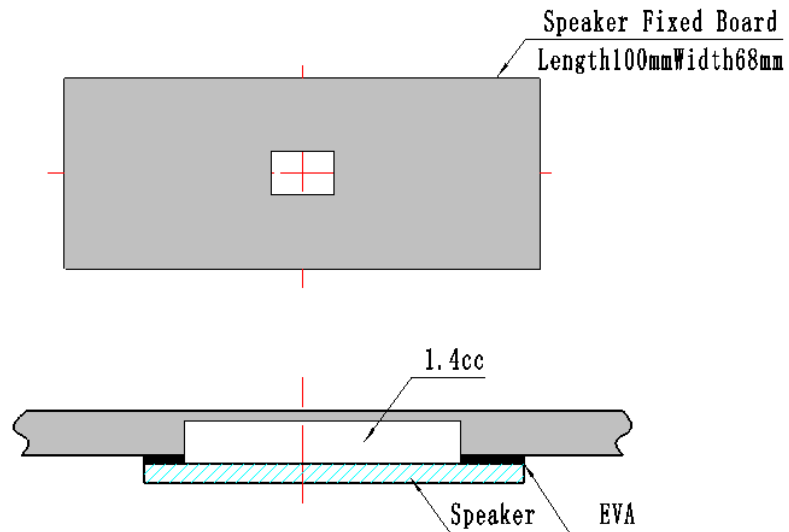
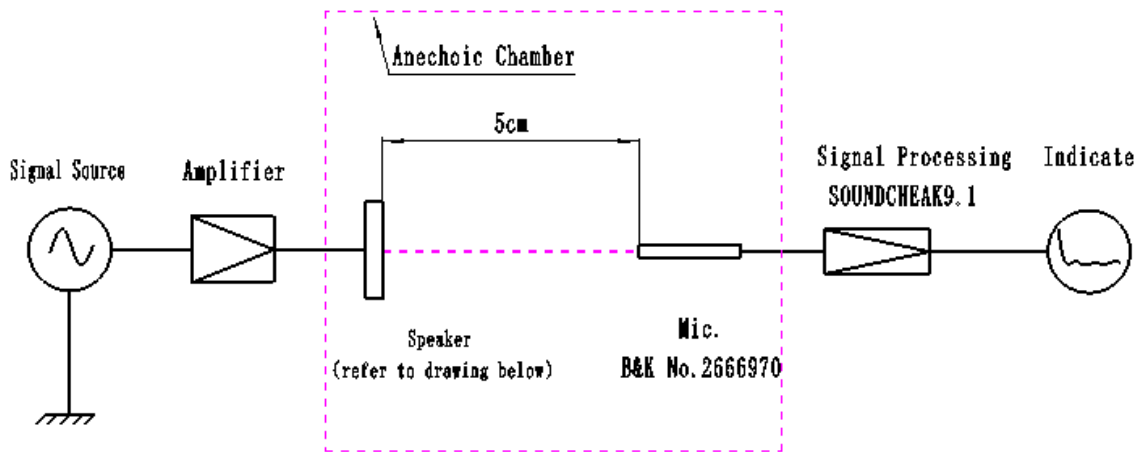
## ■ 5.1 Typical Frequency Curve



■ 5.2 Typical Impedance Curve



■ 6. Test method



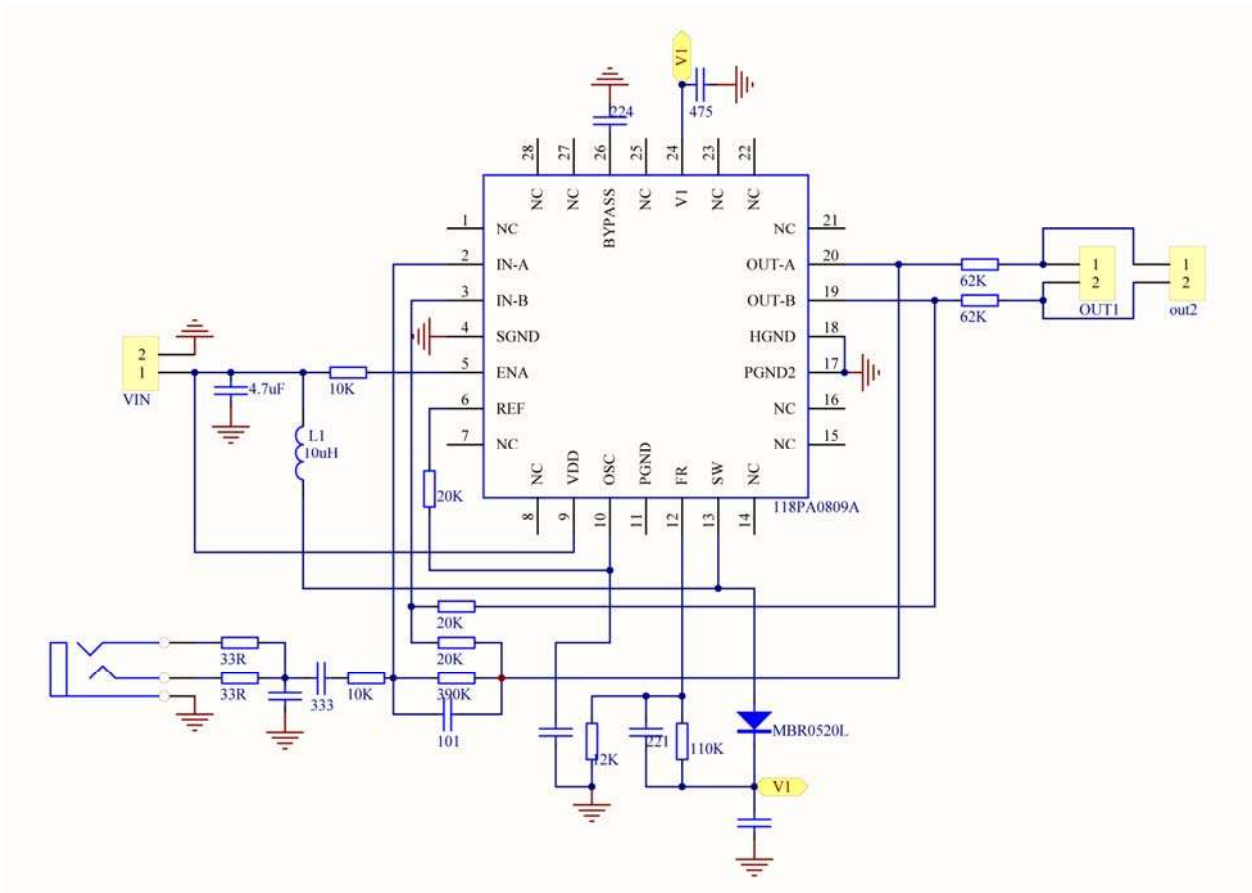
## MULTILAYER PIEZO CERAMIC SPEAKER SPECIFICATIONS

### ■ 7. Mechanical, Environment and Life Characteristics

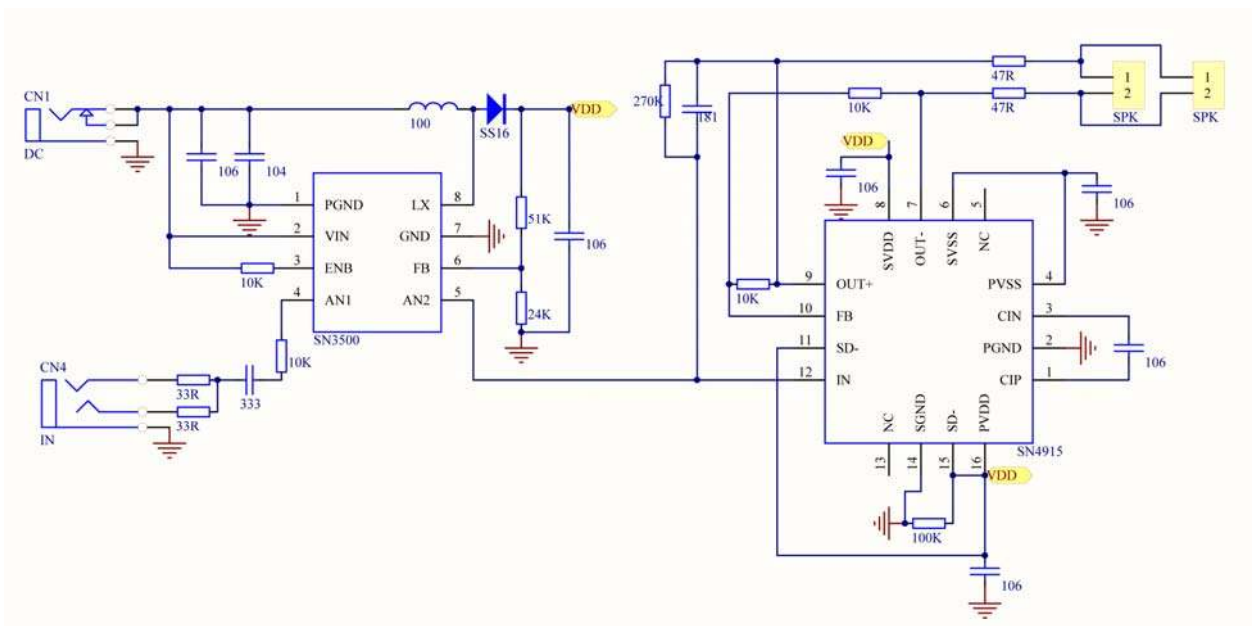
No	Experiment Item	Conditions	Test Standard
1	Shocking Test	Room temp. Sweep Fre.. 10—55Hz Amplitude 1.5mm/XYZ axis/2 Hrs	SPL should be met Initial average±3dB (1KHz/1.5KHz/2KHz/3KHz)
2	Drop Test	Fixed in a 150g Jig dropping in 6 directions of surfaces with 3 times per surface under the height of 150cm	
3	Solderability	Put it in salt mist for 24 Hrs (+35℃, mass percent of NaCl :5%)	Immerse PCB into the liquid tin (245±5℃/3.0±0.5s) Tin cover : ≥95%
4	Storage under High temp.	85±2℃/240 hous, then 4 Hrs in room temp.	SPL : average±3dB (1KHz/1.5KHz/2KHz/3KHz)
5	Storage under Low temp.	-30±2℃/240 hours, then 4 Hrs in room temp.	
6	Storage under High temp.& humid	+60±2℃/RH90—95%/240Hrs, then 4 Hrs in room temp.	
7	Power on UnderHigh temp.,humid	+60±2 ℃ /RH90—95%/240Hrs/5Vrms (300~20000Hz/ Step10Hz/ LT10s), then 4 Hrs in room temp.	
8	thermal shock	-30℃/30min., then +85℃/30min. within 2-3min., repeat 100 times, then 4 hours in room temp.	
9	Antistatic discharge	Capacitor charged and then Resistance connected in series to the Circuit : 1) Capacitor:200pF Voltage: ±200V Resistance: 0Ω; 2) Capacitor:100pF Voltage: ±1KV Resistance: 1.5Ω; 100pF、±1KV、1.5Ω	
10	Max Voltage	Max Voltage 35Vpp/0.5 hour under (Fre.300~20000Hz,Step:10Hz,LT: 10s), then 4 Hrs in room temp.	
11	Life	Under room, operate 240 hours at 5Vrms/1KHz , then 4 hours in room temp.	

# MULTILAYER PIEZO CERAMIC SPEAKER SPECIFICATIONS

## ■8.1 Circuit: 118PA0809A (Vout: 20V)

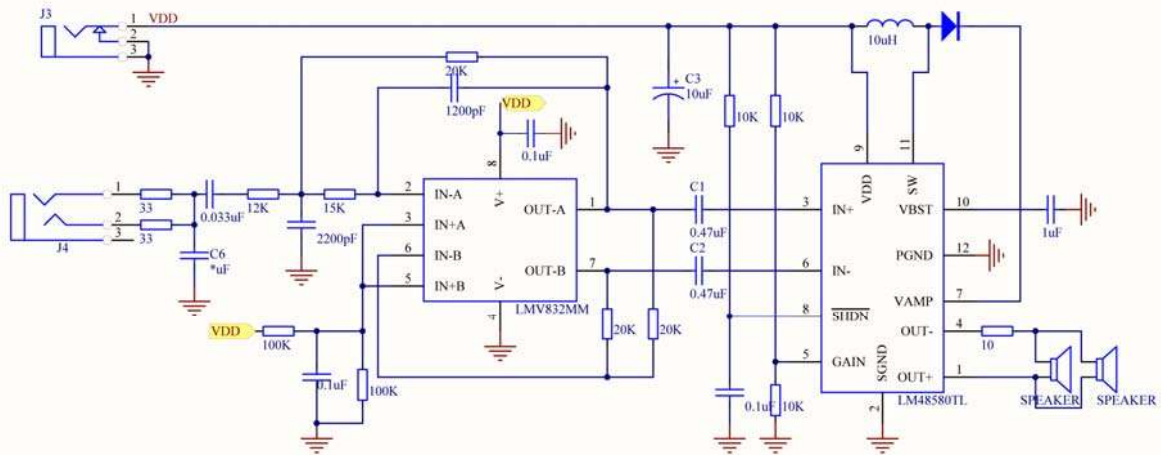


## ■8.2: Circuit: SN3500+SN4915(Vout: 20V)

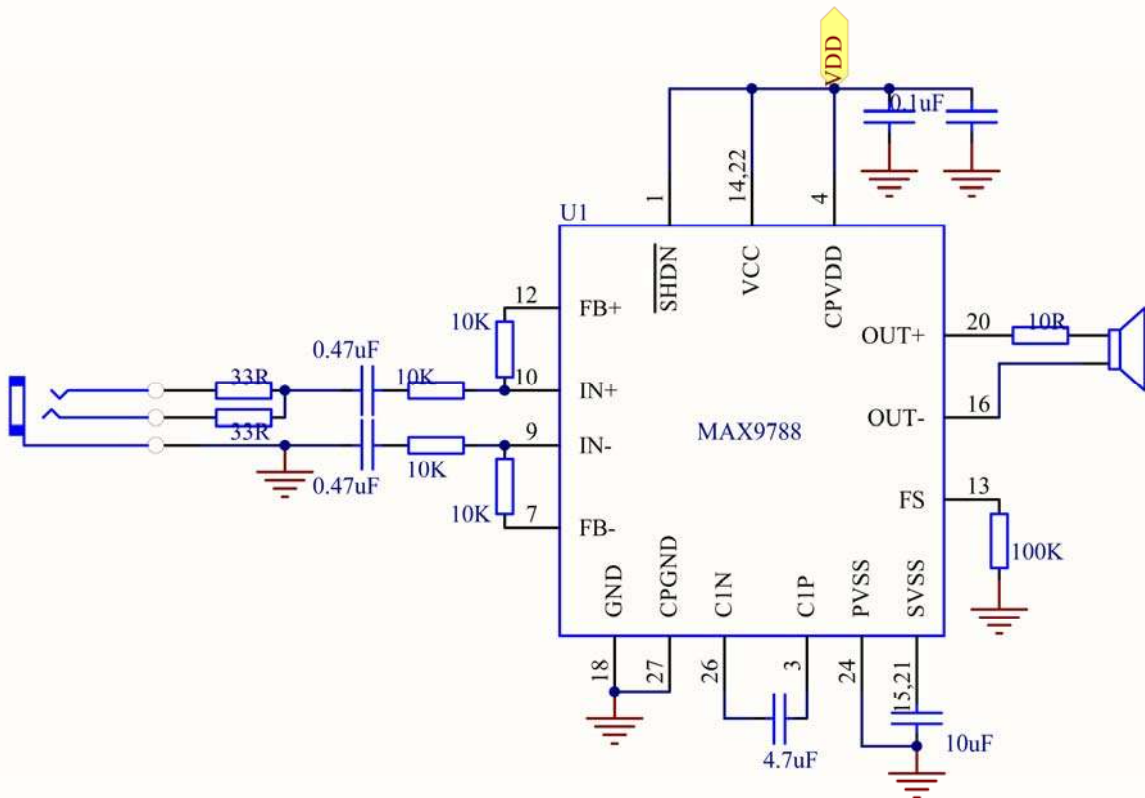


# MULTILAYER PIEZO CERAMIC SPEAKER SPECIFICATIONS

## ■8.3 circuit: LMV832MM+LM4850TL(Vout: 24V)



## ■8.4 circuit: MAX9788(Vout: 14V)



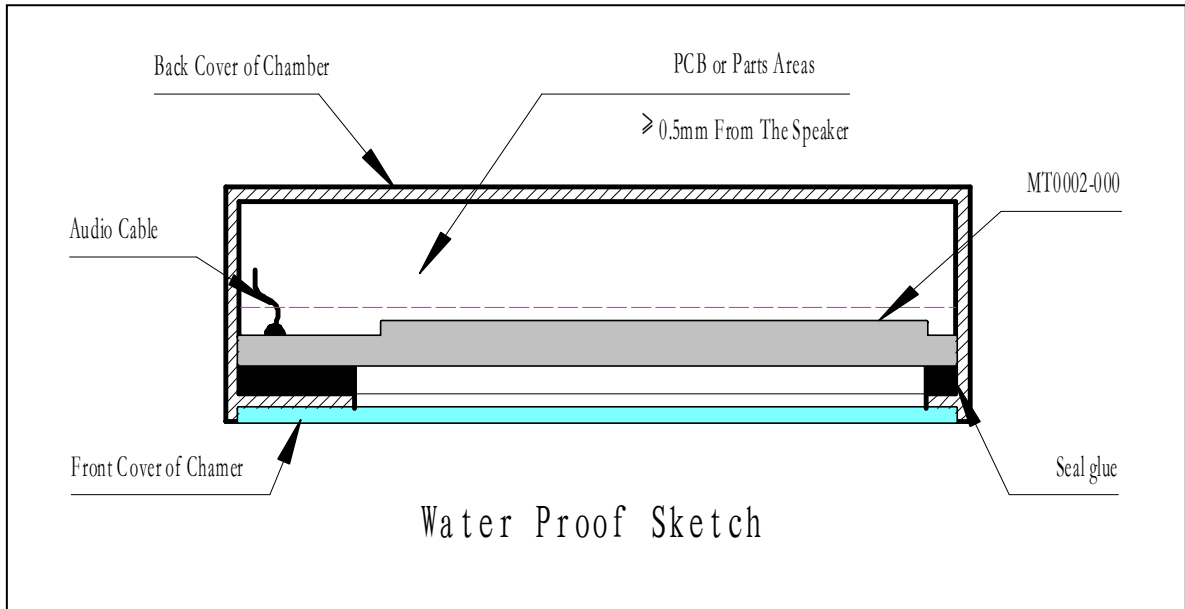


# MULTILAYER PIEZO CERAMIC SPEAKER SPECIFICATIONS

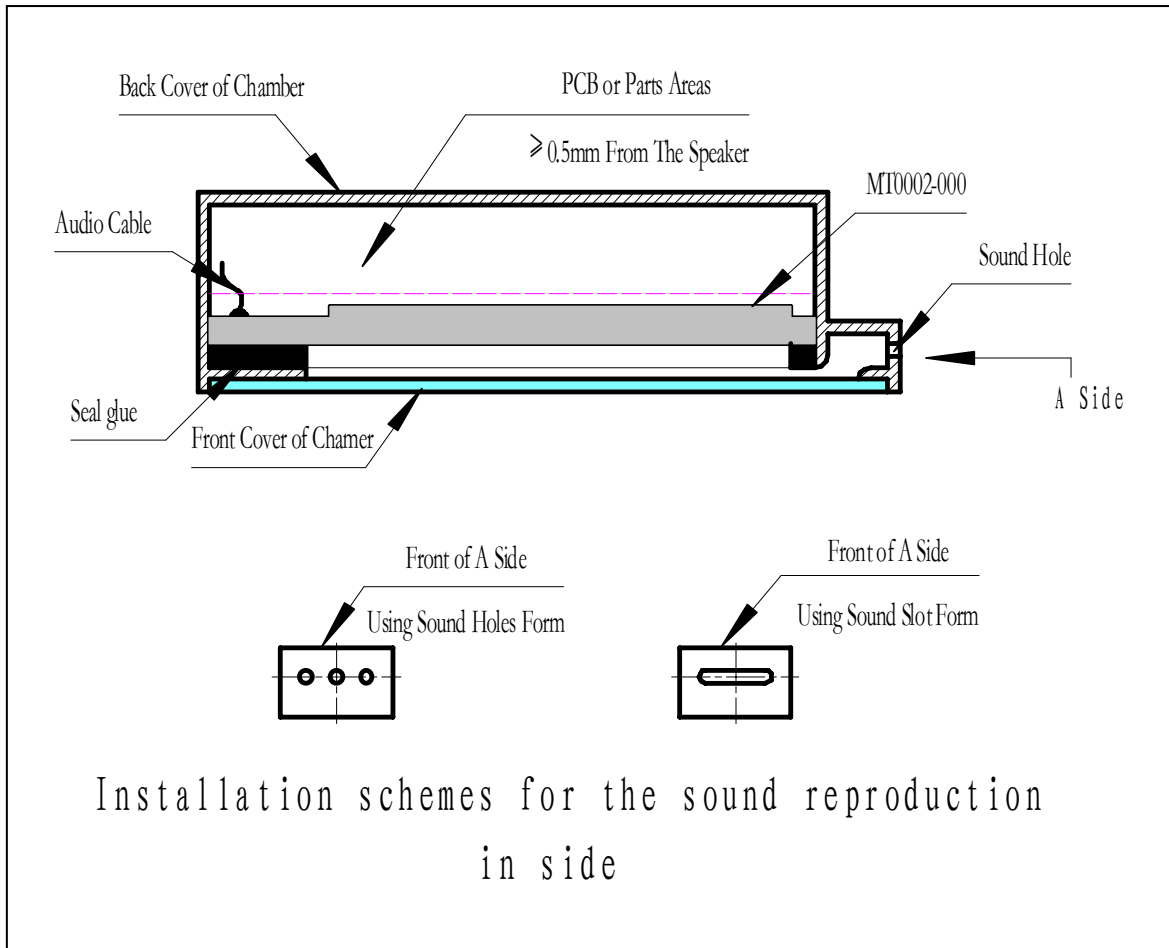
8.5 Above recommended circuits are under low voltage 2.7-5.5V. If working under voltage, please refer to other designs.

## 9. Design and installation:

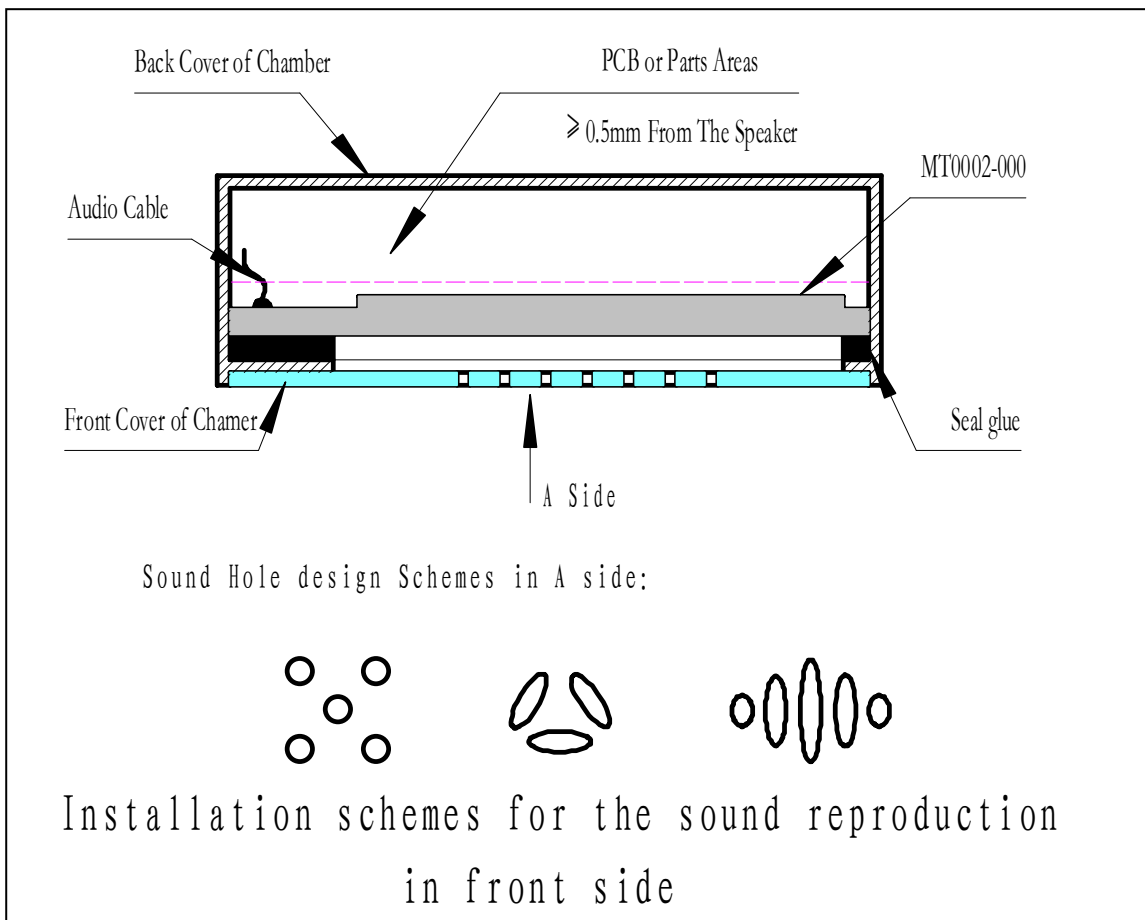
### 9.1



### 9.2



9.3



■ 10. Suggestions and notices:

10.1 The front and back chamber cover can use the covers of the machine. For example, if it is installed in a cell phone, there is no need for extra design of chamber.

10.2 The following three situations which cause murmurs, vibrato and resonance should be avoided: the structure of facility is not firmly fixed; Audio cable of Speaker contacts the vibrating area of it; speaker itself is not fixed well.

10.3 The chamber which is shaped by the sealed adhesives and the Surrounding structure should be kept sealed. If you want a sound hole, please refer to the design 9.2 and 9.3. The distance between front cover and speaker is more than 0.5mm.

10.4 The sound hole on the front cover of chamber should be evenly distributed, aperture ratio  $\geq 80\%$ . The size, arrangement and shape of Hole can depend on the whole design of part unit and test performance.

10.5 The distance from the back cover to the structural parts and other electrical components should be more than 0.5mm, so as to avoid any contact or friction with the speaker.

10.6 Suggestion: Back chamber should be separated and sealed ( $\geq 0.7\text{cc}$ ). The bigger chamber is, the better for sound quality. The back chamber should be sealed during assembly avoid the sound leaked, which effects the sound quality and volume .

10.7 During installation, Please don't pressure too much on the speaker in vertical direction

# MULTILAYER PIEZO CERAMIC SPEAKER SPECIFICATIONS

## ■ 11.package

