



soberton inc.

SP DYNAMIC  
SPEAKER UNIT

Acoustic Product Specification

Product Number: SP-2003



Release | Revision: D/2021

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Dynamic Speaker Electroacoustic Characteristics

Sound Pressure Level

90±3dB SPL @0.3 Watt, 10cm  
Average at 0.8, 1.0, 1.2 & 1.5KHz

Measuring Condition: 0.3W (Sine wave) 10cm measured with baffle, as shown in Figure 1

Frequency Response Curve

As shown in Figure 2

Frequency Range

F0 ~ 20.0KHz

Response Frequency

650±20%Hz at 1.0V

Input Power (Nominal and Maximum)

Rated Noise Power: 0.3 Watt

Short Term Max Power: 0.5 Watt

Operation Test

Result must be normal when tested at 1.55 Volts in free air

Total Harmonic Distortion

10% Max @1.0KHz, 0.3 Watt

Polarity

Diaphragm shall move forward when a positive DC current is applied to the “+” or ‘marked’ Terminal.

General Specifications

Operating Temperature Range

-20°C ~ +60°C

Storage Temperature Range

-30°C ~ +70°C

Standard Test Conditions

Temperature 15°C ~ 35°C

Relative Humidity 45% ~ 85% (RH)

Voice Coil Impedance

DC: 8±15%Ω

Dimension

Ø20.0 x H3.8 mm

IP Level

No Rating



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Reliability Tests

The sound pressure as specified shall neither deviate more than  $\pm 3\text{dB}$  from the initial value, nor have any significant damage after any of following testing.

High Temperature Test

High Temperature     $+70\pm 2^{\circ}\text{C}$   
Duration                96 hours

Low Temperature Test

Low Temperature     $-30\pm 2^{\circ}\text{C}$   
Duration                96 hours

Heat Shock Test

High Temperature     $+70\pm 2^{\circ}\text{C}$   
Low Temperature     $-30\pm 2^{\circ}\text{C}$   
Changeover Time     $<30$  seconds  
Duration                1 hour  
Number of Cycles      10

Humidity Test

Temperature            $+40\pm 2^{\circ}\text{C}$   
Relative Humidity    90% ~ 95%  
Duration                48 hours

Temperature Cycle Test

Temperature            $-30^{\circ}\text{C}$              $+70^{\circ}\text{C}$   
Duration                45 minutes    45 minutes  
Temperature gradient    $1 \sim 3^{\circ}\text{C}/\text{min}$   
Number of Cycles      25

Drop Test

The speaker is mounted onto the dummy assembly, placed in a standard cardboard box and then dropped onto a concrete board.

Height                0.75 m  
Number of Cycles      6

Load Test

Speaker mode: White noise (EIA filter) for 96 hours @0.3W input power



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Measuring Method (Speaker Mode)

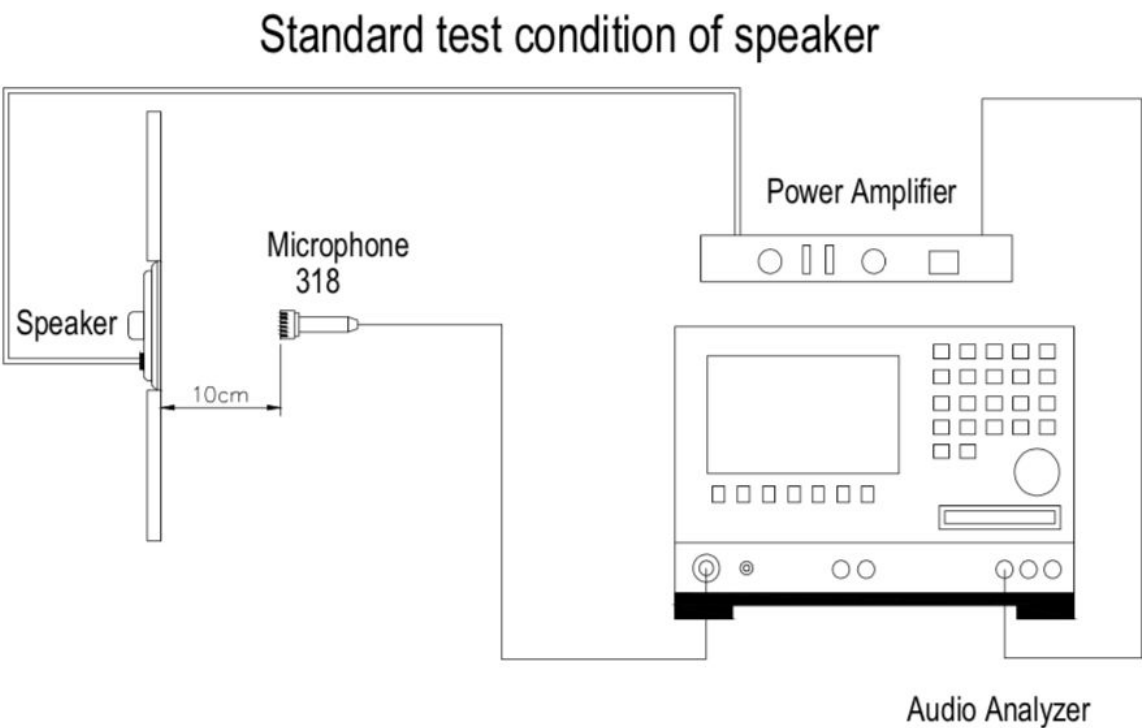
Standard Test Condition

- Temperature 15 ~ 35°C
- Relative humidity 45% ~ 85%
- Atmospheric pressure 860mbar ~ 1060mbar

Standard Test Fixture

- Input Power 0.3W / 1.55V
- Zero Level -dB
- Mode TSR
- Potentiometer Range 50dB
- Sweep Time 0.5sec

Standard Test Condition of Speaker (Fig. 1)





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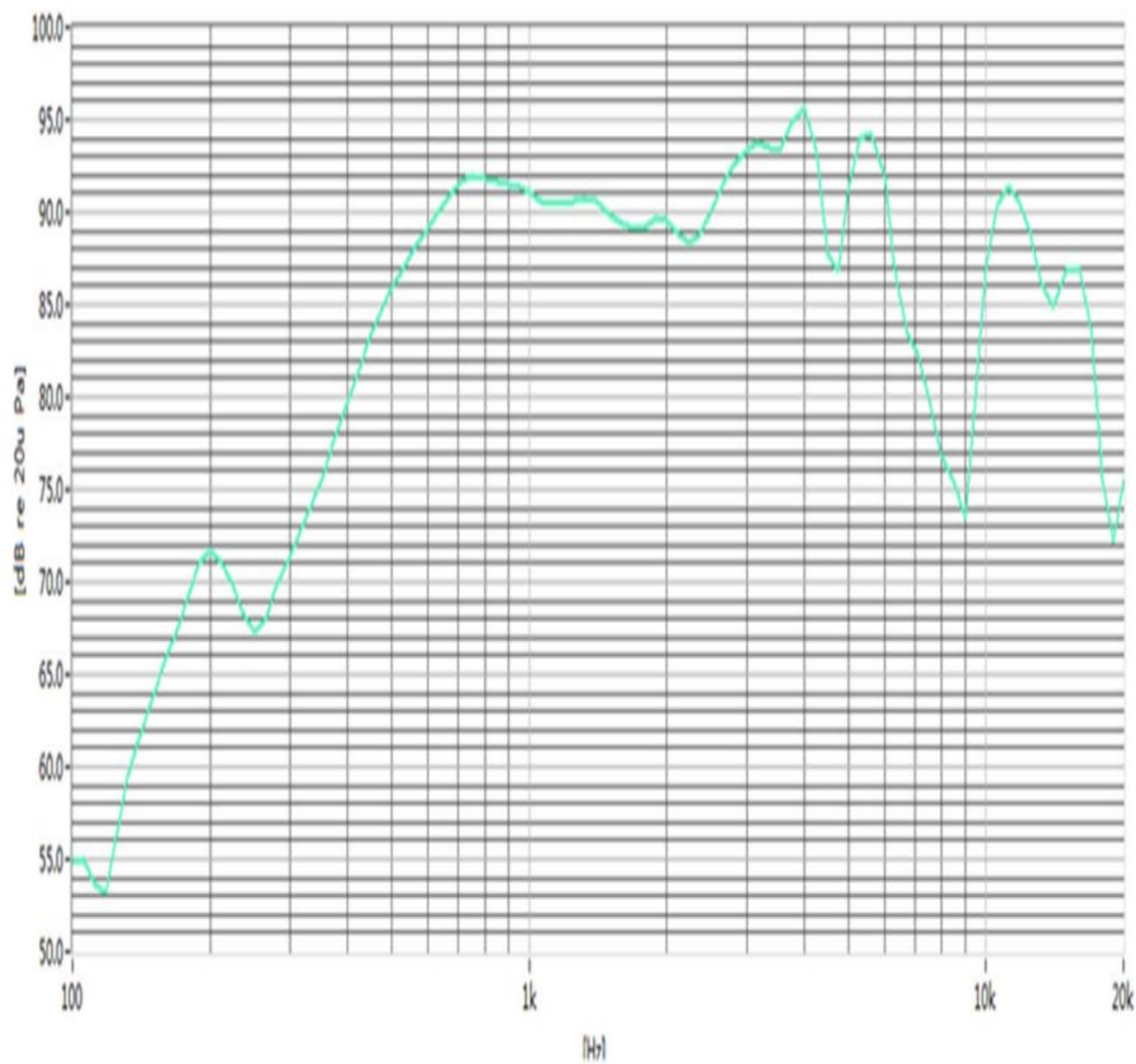
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Frequency Response Curve (Fig. 2)

Test Condition: 0.3W /0.1M





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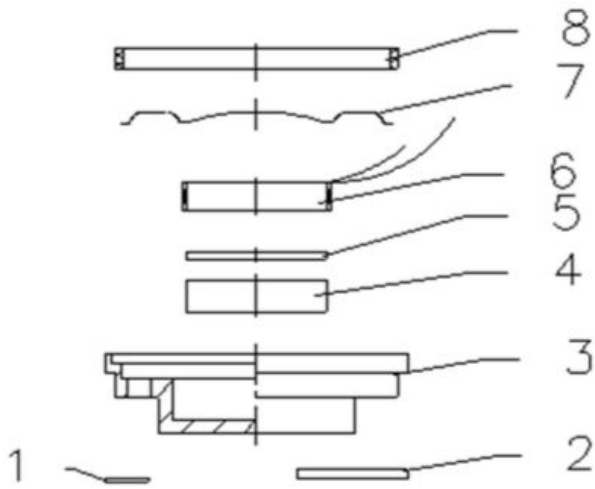
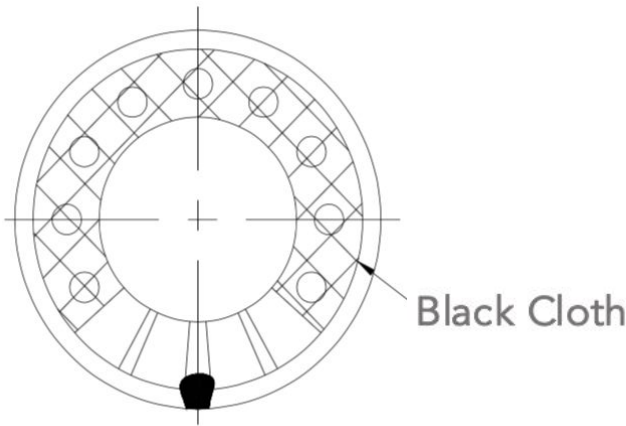
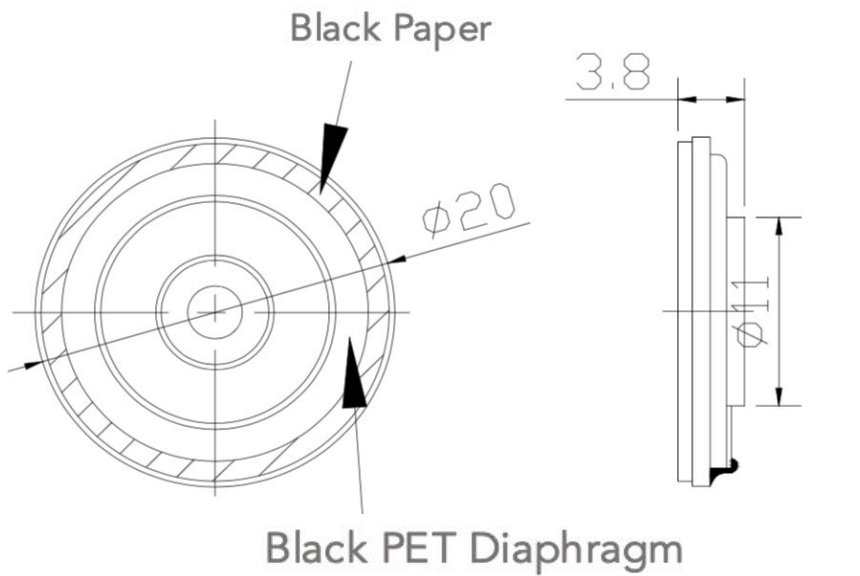
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Dimensions

Tolerance: ±0.5 (unit: mm)



No.	Part Name	Material	Quantity
1	Silk Screen	100 net	1
2	PCB	FR-4	1
3	Frame	SPCC	1
4	Magnet	ND Fe B	1
5	Plate	SPCC	1
6	Voice Coil	Polyurethane Enamelled Wire	1
7	Diaphragm	PET	1
8	Gasket	Black Paper	1



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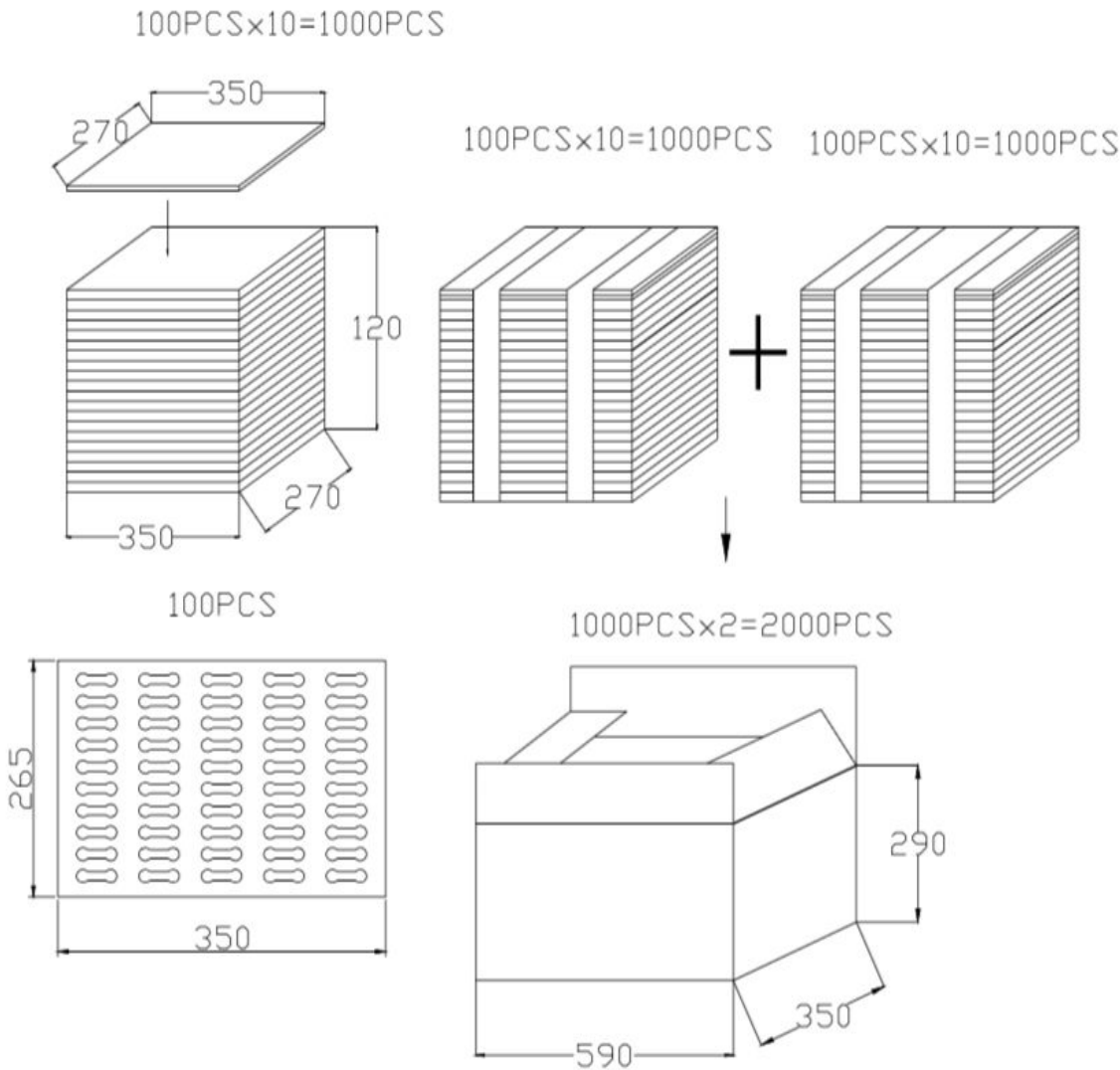
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Remarks

Per Tray: 100 pcs  
Per Box : 1,000 pcs  
Per Carton: 2,000 pcs  
Carton Size: 590 x 350 x 290mm