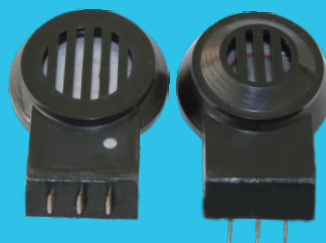


BeStar Acoustics Co., Ltd.

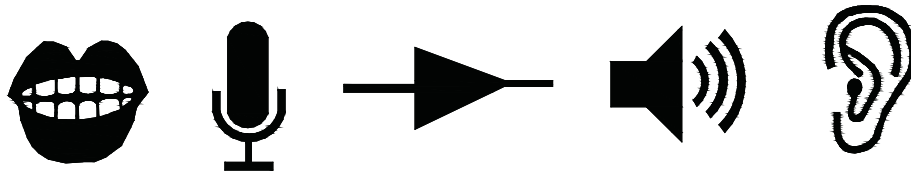
Moving Coil &
Rocking Armature Technologies
Dynamic Microphone &
Dynamic Receiver unit

BESTAR ACOUSTICS CO., LTD.
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The logo for BeStar Acoustics Co., Ltd. features the word "BeStar" in a blue, italicized sans-serif font. A stylized orange swoosh or ribbon-like element curves around the "B" and "S", adding a dynamic and modern feel to the branding.

INTRODUCTION

INTRODUCTION TO MICROPHONES AND RECEIVERS

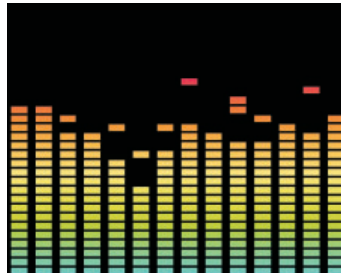


MICROPHONE CAPTURES SOUND PRESSURE

A sound pressure is captured by microphone, causing its membrane to vibrate. The vibration is translated into an electrical signal.

RECEIVE REPRODUCES SOUND PRESSURE

An electronic signal is received and causes movement of a coil (moving coil) or an armature (balanced). This in turn creates movement of the membrane, which creates sound.



WHAT IS A MICROPHONE

Microphone is the energy conversion device that transfers the sound signal to the electric signal. The working principle of microphone is opposite to Speaker's (electrical → sound). As the two terminals of the audio devices, microphone is used for input, and speaker is used for output.

The range of microphone can be divided into three parts: for performance, for recording, and for meeting.

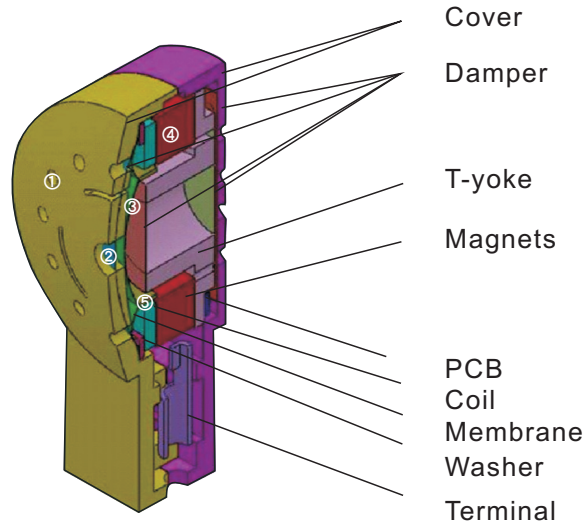
Products are mainly applied in GPS, mobile phones, notebook, recording equipment, walkie and so on.

WHAT IS A RECEIVER

A receiver-also sometimes referred to as a speaker-translates an electrical signal into sound pressure, which is subsequently captured by the human ear as sounds. Receivers are used in multiple electronic devices-including for example cell phones, laptops and televisions.

INTRODUCTION

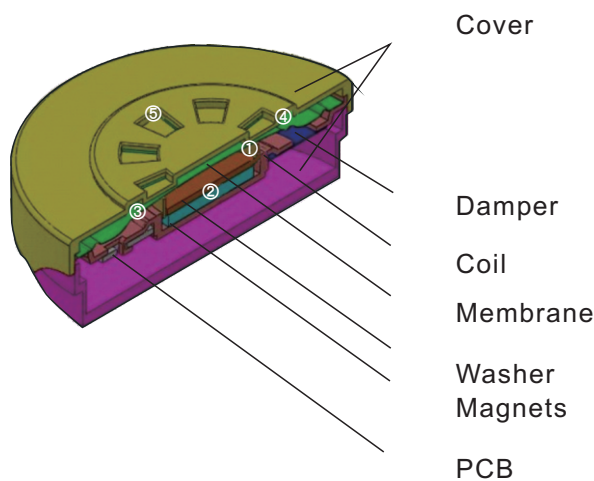
MOVING COIL MICROPHONE STRUCTURE



MOVING COIL MICROPHONE TECHNOLOGY

1. Sound pressure is entered into through the sound inlet.
2. Sound waves pressure the membrane for vibration, while coil is vibrating simultaneously, and create the electronic signals.
3. The movement of the membrane creates the vibration of coil.
4. Locating in a magnetic field, the coil starts to move (moving coil).
5. The vibration of coil creates the electronic signals, which coil is with magnetic.

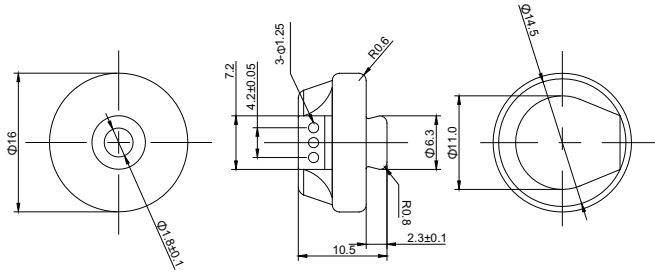
MOVING COIL RECEIVER STRUCTURE



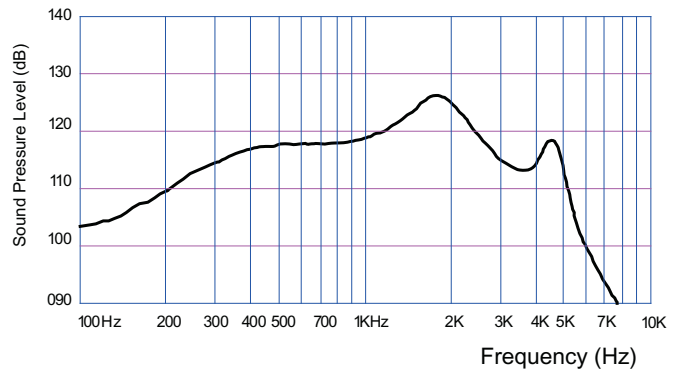
MOVING COIL RECEIVER TECHNOLOGY

1. The coil vibration receives electronic signals, and is magnetized.
2. Sitting in a magnetic field. The coil starts to move (moving coil).
3. Movement of the coil creates a vibration in the membrane.
4. Movement of the membrane pressures the air above the membrane, creating sound pressure.
5. Sound pressure is let out through the sound outlet.

1. Drawing (Unit: mm Tolerance: ±0.3)



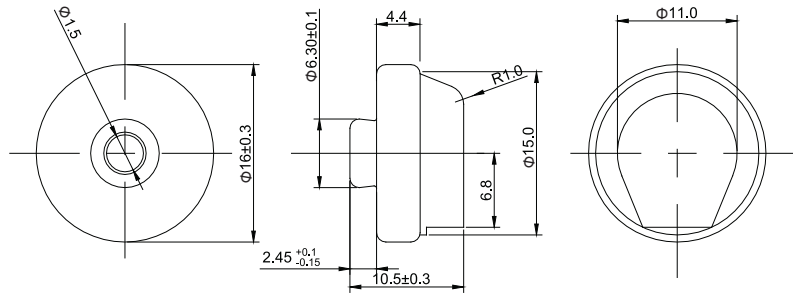
2. Frequency Response Curve



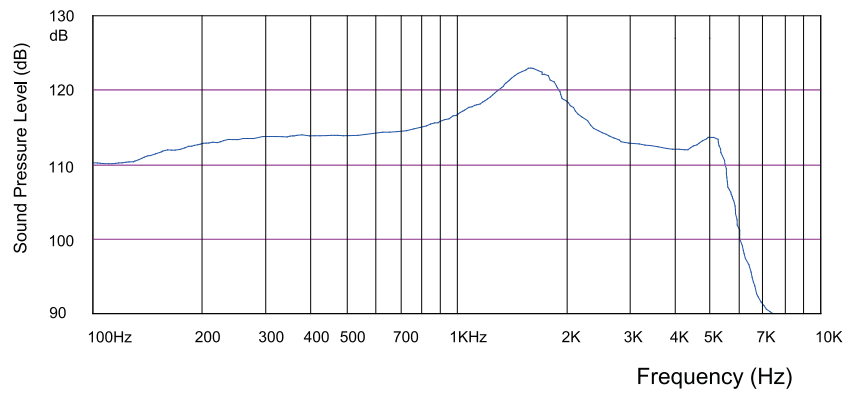
3. Technical Terms

No.	Item	Specifications
1.	Impedance (ohm)	100±20 at 1KHz
2.	DC Resistance (ohm)	40±5
3.	Sensitivity (dB)	120±3dB at 1000Hz
4.	Nominal Input	20mW
5.	Maximum Input	300mW
6.	Operating Temperature(°C)	-20~60°C

1. Drawing (Unit: mm Tolerance: ±0.3)



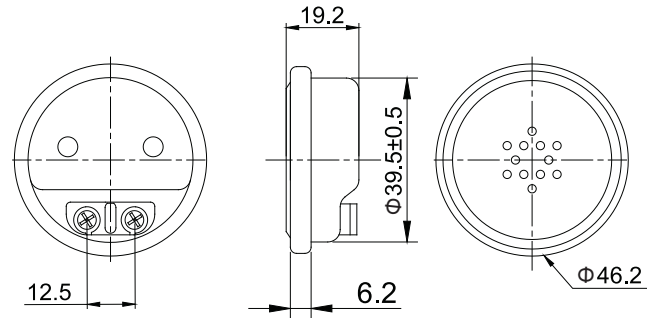
2. Frequency Response Curve



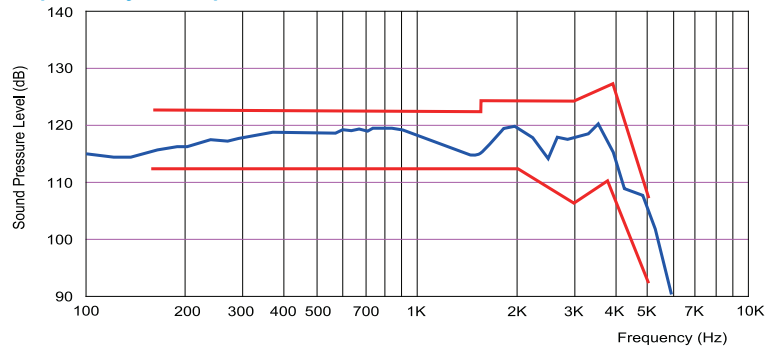
3. Technical Terms

No.	Item	Specifications
1.	Impedance (ohm)	25±20% at 1000Hz
2.	DC Resistance (ohm)	12±15%
3.	Sensitivity (dB)	116±3dB at 1000Hz
4.	Nominal Input	20mW
5.	Maximum Input	300mW
6.	Operating Temperature(°C)	-20~70°C

1. Drawing (Unit: mm Tolerance: ±0.3)



2. Frequency Response Curve



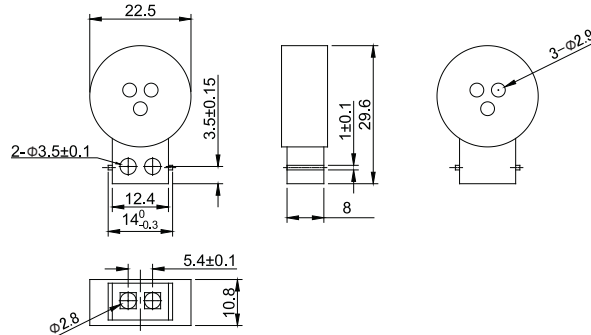
3. Tolerance Mask

Upper Limit	F/Hz	160	1600	1600	3000	4000	5000
	P/dB	10	10	12	12	16	-5
Lower Limit	F/Hz	160	2000	3000	3800	5000	/
	P/dB	0	0	-6	-2	-20	/

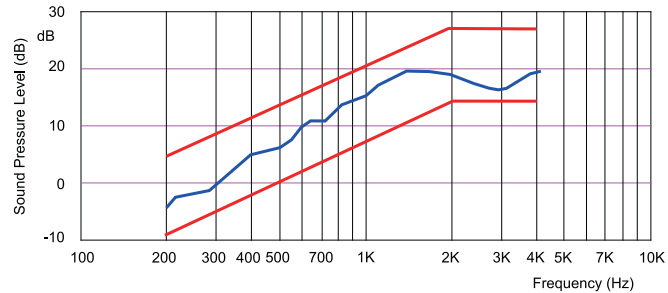
4. Technical Terms

No.	Item	Specifications
1.	Average Sensitivity at 150-4000Hz 600mV	min. dB112dB IEC 318
2.	AC Impedance at 1KHz	300Ω ± 20%
3.	AC Impedance at 2.6KHz	600Ω ± 30%
4.	T.H.D(frequency: 1kHz at 2V)	<5%
5.	Average SPL at 2.6KHz-3KHz by 5.5V distance 50mm	No less than 105dB
6.	Tolerance to influence of sinusoidal vibrations at 10-120Hz with vibroacceleration	5g
7.	Tolerance to influence of impact load	120g 4000bangs
8.	Tolerance to influence of high relative humidity 100%	50°C, 240hours
9.	Elevated Operating Temperature	60°C
10.	Low Operating Temperature	-60°C
11.	Tolerance to Stay in Water	Depth 1.0m, during 2 hours
12.	Tolerance to cycling of temperature form extreme low temperature to elevated operating temperature	-60°C +80°C 3cycles

1.Drawing(Unit: mm Tolerance:±0.3)



2.Frequency Response Curve



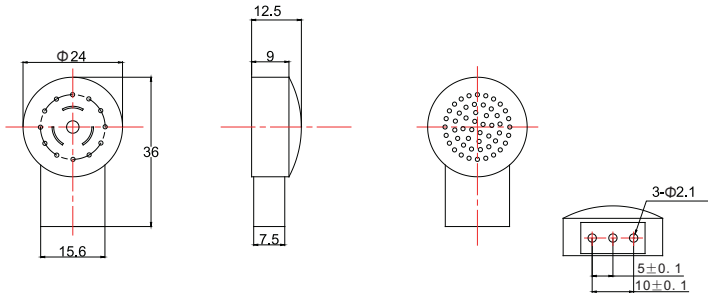
3.Tolerance Mask

Upper Limit	F/Hz	200	2000	4000	/	/
	P/dB	10	26	26	/	/
Lower Limit	F/Hz	200	2000	4000	/	/
	P/dB	-8	14	14	/	/

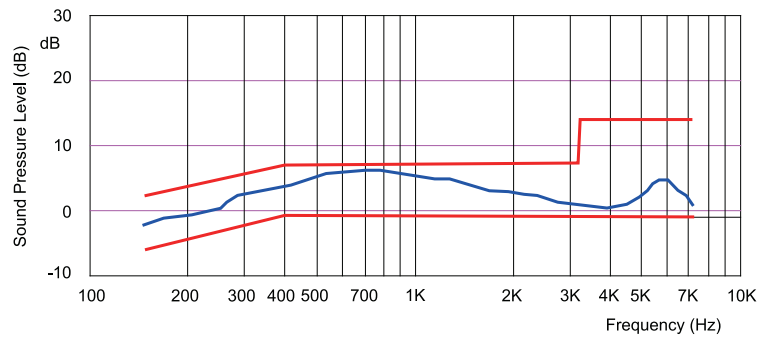
4.Technical Terms

No.	Item	Specifications
1.	* Close-talking Sensitivity	0.4~1.25mV/Pa(at 1000Hz with load 600Ω)
2.	AC Impedance	400-1000Ω(at 1KHz/0.3V)
3.	Resistance	180±50Ω
4.	Acoustic Skewness	≤20%
5.	Operating Temperature	-60~+80°C
6.	* ≥0.25mV/Pa at influence of high relative humidity,high and low temperature,frost and dew.	

1. Drawing (Unit: mm Tolerance: ±0.3)



2. Frequency Response Curve



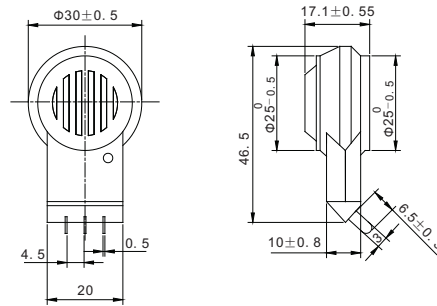
3. Tolerance Mask

Upper Limit	F/Hz	60	400	3200	7200	/
	P/dB	7	12	14	14	/
Lower Limit	F/Hz	200	400	7200	/	/
	P/dB	-6	-1	-1	/	/

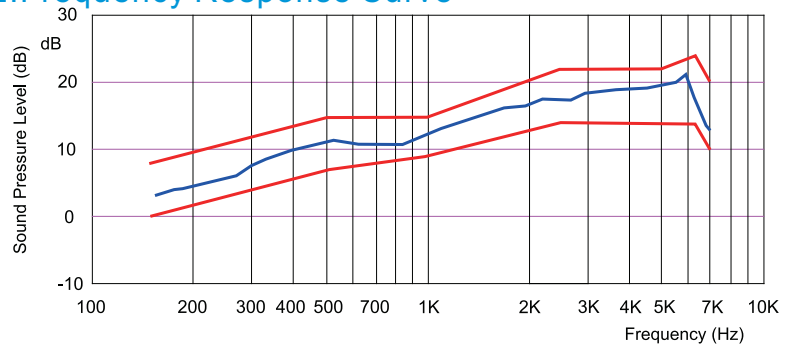
4. Technical Terms

No.	Item	Specifications
1.	Close-talking Sensitivity	0.35~0.9mV/Pa (at 1000Hz)
2.	AC Impedance	250-350MΩ(at 1KHz)
3.	Resistance	180±50Ω
4.	Isolation Electrical Resistance	≥ 50MΩ(at normal climatic conditions)
		≥ 5MΩ(at high temperature)
		≥ 5MΩ(at high relative humidity)
5.	Operate Temperature	-20°C~+60 °C
6.	Weight	≤ 20g

1. Drawing (Unit: mm Tolerance: ±0.3)



2. Frequency Response Curve



3. Tolerance Mask

Upper Limit	F/Hz	150	500	1000	2500	5000	6300	7000
	P/dB	8	15	15	22	22	24	20

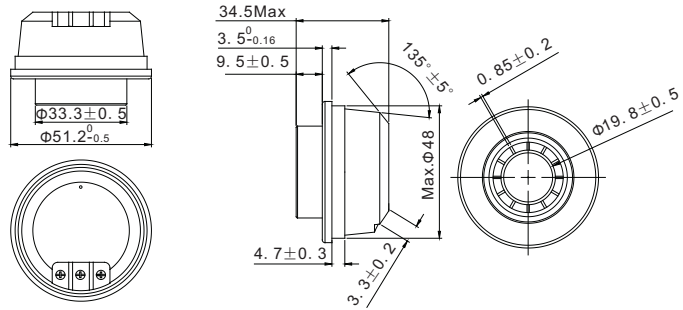
Lower Limit	F/Hz	150	500	1000	2500	5000	6300	7000
	P/dB	0	7	9	14	14	14	10

4. Technical Terms

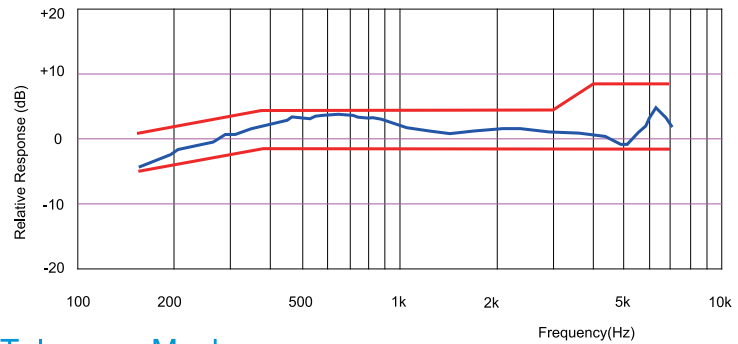
No.	Item	Specifications
1.	Close-talking Sensitivity	0.3~0.9mV/Pa (at 1000Hz)
2.	AC Impedance	< 360ohm (at 1KHz)
3.	Resistance	180± 50Ω
4.	Test Conditions	High humidity, water ≥ 1.5 MΩ
		High temperature ≥ 7.5 MΩ
5.	Weight	≤ 30g
6.	Suit in high humidity of the environment	100% at 50°C temperature conditions
7.	Operate Temperature	-60°C ~ +60 °C
8.	Extreme Temperature	-60°C ~ +80 °C
9.	After low atmosphere pressure must be suit performance	12K pascal (90 mm mercury) at -50°C -50°C temperature
11.	Water Impermeability	2 hours in the water at depth 0.5 m



1. Drawing (Unit: mm Tolerance: ±0.3)



2. Frequency Response Curve



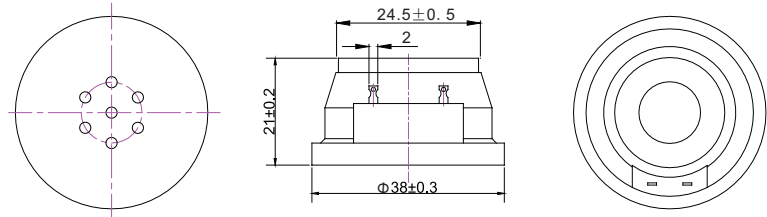
3. Tolerance Mask

Upper Limit	F/Hz	60	380	3000	4000	5000
	P/dB	1	4.5	4.5	8.5	8.5
Lower Limit	F/Hz	60	380	5000	/	/
	P/dB	-5	-1.5	-1.5	/	/

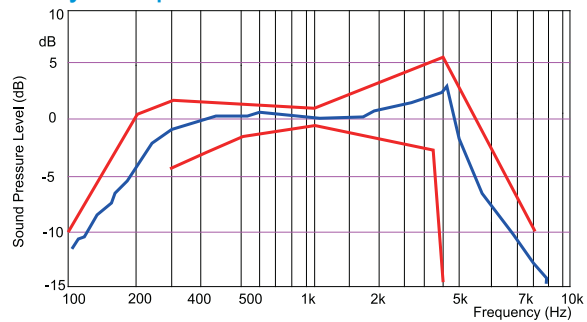
4. Technical Terms

No.	Item	Specifications
1.	Close-talking Sensitivity	$\geq 1.2\text{mV/Pa}$ (at 1000Hz)
2.	AC Impedance at 1KHz	80-120 Ω
3.	Sensitivity at 1kHz	-56 \pm 3dB
4.	Frequency Range(Hz)	150-7000Hz
5.	Insulation Resistance	10M Ω
6.	Weight	125g

1. Drawing (Unit: mm Tolerance: ±0.3)



2. Frequency Response Curve



3. Tolerance Mask

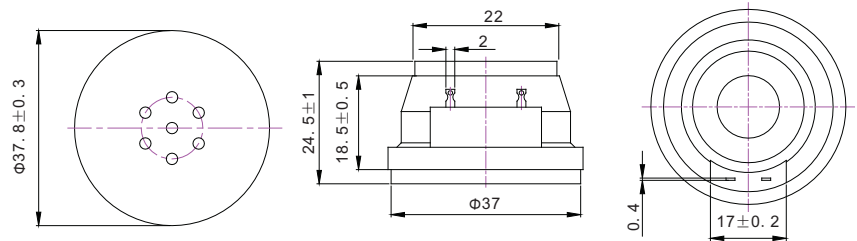
Upper Limit	F/Hz	100	200	300	1000	4000	8000	10000
	P/dB	-10	+1	+3	+1.5	+6	-10	-10

Lower Limit	F/Hz	300	500	800	1000	2000	3226	3440
	P/dB	-4	-2	-1.5	-1	-1.5	-2	-20

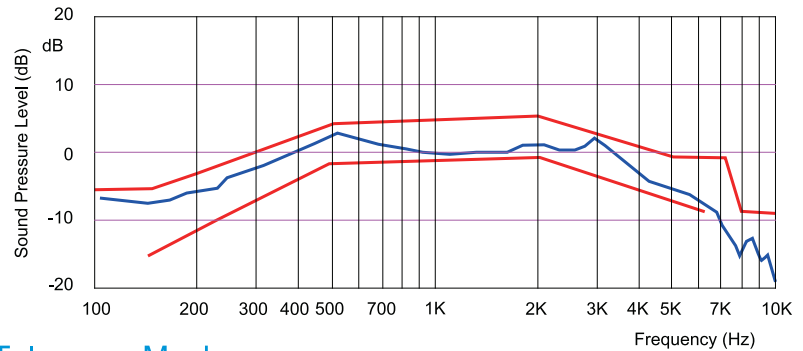
4. Technical Terms

No.	Item	Specifications
1.	DC Impedance	105±10.5Ω at 20°C
2.	AC Resistance	125±25Ω at 20°C
3.	Sensitivity (60mV 1KHz)	97±3dB
4.	Rated Input	20mW
5.	Maximum Input	40mW
6.	Operating Temperature	-40...+ 60°C
7.	Storage Temperature	-40...+ 70°C
8.	Weight	38g

1. Drawing (Unit: mm Tolerance: ±0.3)



2. Frequency Response Curve



3. Tolerance Mask

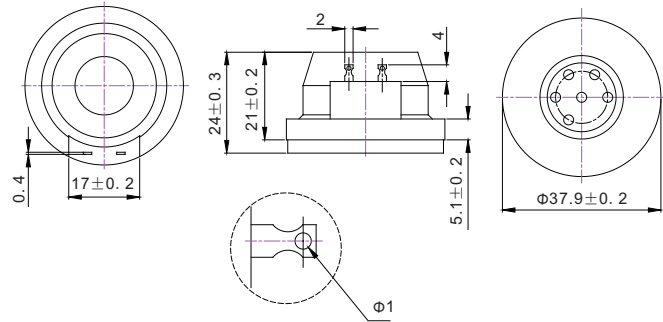
Upper Limit	F/Hz	100	150	160	500	2000	5000	7100	8000	10K
P/dB		-7	-7	-7	4	5	-1	-1	-9	-9

Lower Limit	F/Hz	100	150	200	500	2000	6300	7100	8000	10K
P/dB		/	-16	-11	-2	-1	-9	/	/	/

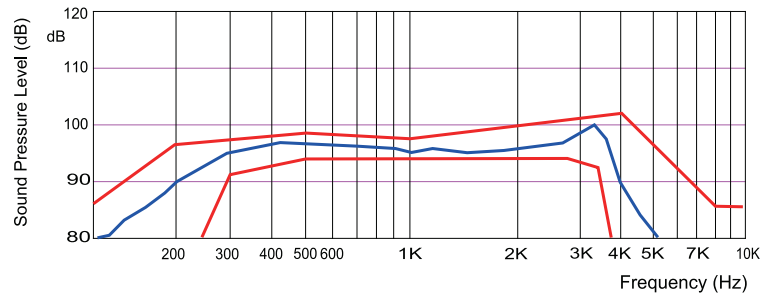
4. Technical Terms

No.	Item	Specifications
1.	AC Impedance (coil and hearing aid coil)	$150 \pm 30 \Omega$ at 1KHz
2.	DC Resistance (coil and hearing aid coil)	$150 \pm 20 \Omega$ at 20°C
3.	Sensitivity	$89 \pm 2 \text{dB}$ at 1KHz / 60mV
4.	THD	< 4% (at 104dB, 150-7KHz)
		< 1.7% (at 90dB, 150-7KHz)
5.	Loudless Rating (RLR)	$-3 \pm 2 \text{dB}$
6.	Rated Input	20mW
7.	Maximum Input	40mW
8.	Buzzer & Rattle	Must be normal at 1Vrms sine wave
9.	Operating Temperature	-10... + 60°C
10.	Storage Temperature	-20... + 70°C
11.	Weight	38g

1. Drawing (Unit: mm Tolerance: ±0.3)



2. Frequency Response Curve



3. Tolerance Mask

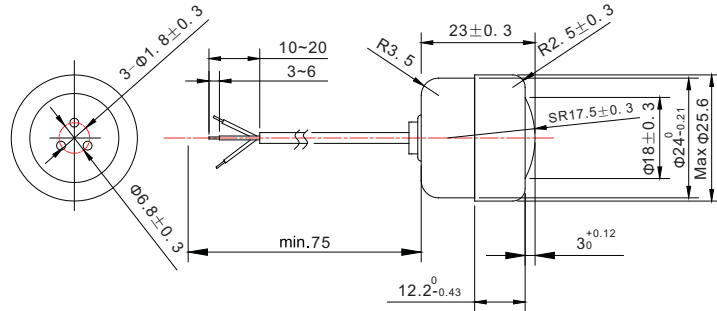
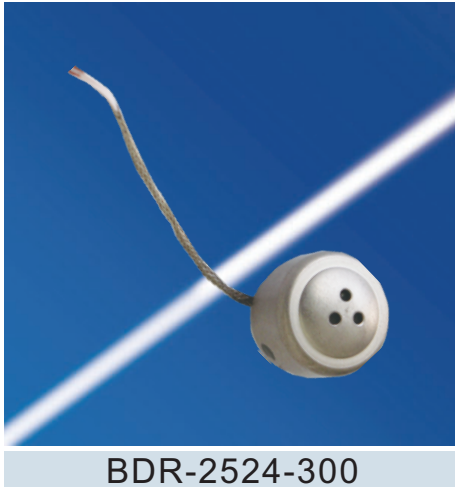
Upper Limit	F/Hz	100	200	300	500	900	1000	1100	2970	4000	8000	10K
P/dB		-10	1	2	3	2	1.5	2	5	6	-10	-10

Lower Limit	F/Hz	250	300	500	2800	3400	3550	4000
P/dB		-150	-4	-1	-1	-1	-3	-150

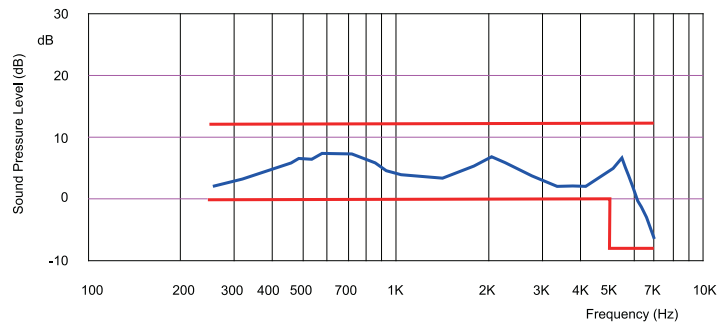
4. Technical Terms

No.	Item	Specifications
1.	AC Impedance	$160\Omega \pm 10\%$ at 1KHz
2.	DC Resistance	$145\Omega \pm 10\%$ at 20°C
3.	Sensitivity	$95 \pm 2\text{dB}$ at 1KHz / 60mV
4.	THD	$< 4\%$ (at 104dB, 300-3400Hz) $< 2\%$ (at 90dB, 300-3400Hz)
5.	Loudless Rating (RLR)	$-8.8 \pm 2\text{dB}$
6.	Rated Input	1mW
7.	Maximum Input	10mW
8.	Buzzer & Rattle	Must be normal at 1Vrms sine wave
9.	Operating Temperature	$-10 \dots + 60^\circ\text{C}$
10.	Storage Temperature	$-40 \dots + 70^\circ\text{C}$
11.	Weight	38g

1. Drawing (Unit: mm Tolerance: ±0.3)



2. Frequency Response Curve



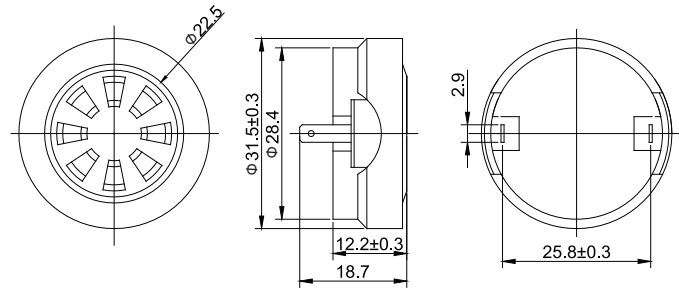
3. Tolerance Mask

Upper Limit	F/Hz	150	7000	/	/	/
	P/dB	12	12	/	/	/
Lower Limit	F/Hz	150	5000	7000	/	/
	P/dB	0	0	-8	/	/

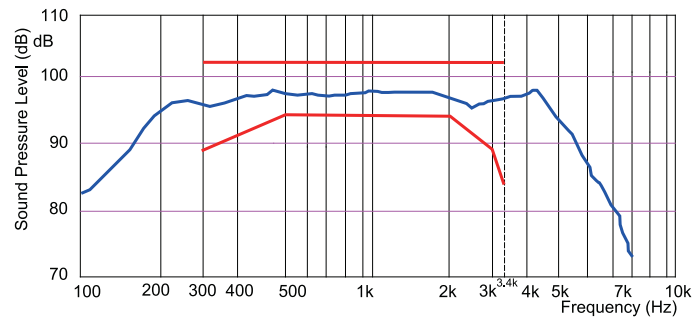
4. Technical Terms

No.	Item	Specifications
1.	Frequency Range(Hz)	150-5000
2.	Close-talking Sensitivity	7.5~12mV/Pa(at 1000Hz)
3.	AC Impedance at 1KHz	300Ω±20%
4.	T.H.D(frequency: 1kHz at 20mV)	<5%
5.	Isolation Electrical Resistance	≤ 50MΩ(at normal climatic conditions) ≤ 5MΩ(at high temperature) ≤ 0.5MΩ(at high humidity)
6.	Tolerance to influence of sinusoidal vibrations at 10-200Hz with vibroacceleration	2g
7.	Tolerance to influence of impact load	15g 4000bangs
8.	Tolerance to influence of high relative humidity 98%	40°C, 240hours
9.	Elevated Operating Temperature	50°C
10.	Low Operating Temperature	-50°C
11.	Tolerance to cycling of temperature from extreme low temperature to elevated operating temperature	-60°C +65°C 3cycles
12.	Weight	≤45g

1. Drawing (Unit: mm Tolerance: ±0.3)



2. Frequency Response Curve



3. Tolerance Mask

Upper Limit	F/Hz	300	500	2000	3000	3400
	P/dB	13	13	13	13	13
Lower Limit	F/Hz	300	500	2000	3000	3400
	P/dB	0	5	5	0	-5

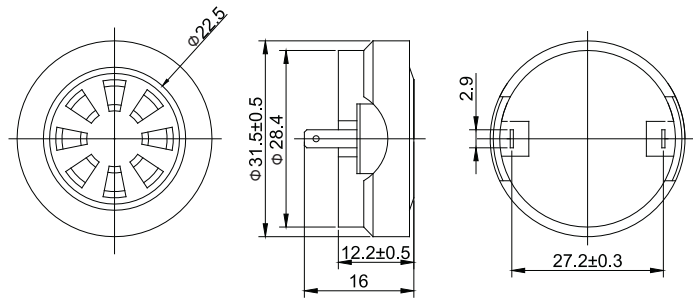
4. Technical Terms

No.	Item	Specifications
1.	Sensitivity	98±3dB at 1KHz / 60mV (IEC318)
2.	DC Resistance	135±15Ω
3.	AC Impedance at 1kHz	150±30Ω
4.	Rated Input	1mW
5.	Maximum Input	10mW
6.	Buzzer & Rattle	Must be normal at 1Vrms sine wave
7.	Operating Temperature	-40...+ 60°C
8.	Storage Temperature	-50...+ 70°C
9.	Weight	15g

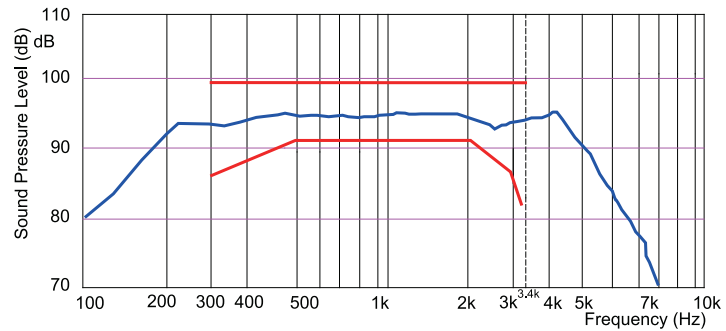
1. Drawing (Unit: mm Tolerance: ±0.3)



BDR-3112-150 B



2. Frequency Response Curve



3. Tolerance Mask

Upper Limit	F/Hz	300	500	2000	3000	3400
	P/dB	13	13	13	13	13
Lower Limit	F/Hz	300	500	2000	3000	3400
	P/dB	0	5	5	0	-5

4. Technical Terms

No.	Item	Specifications
1.	Sensitivity	98±3dB at 1kHz / 60mV (IEC318)
2.	DC Resistance	135±15Ω
3.	AC Impedance at 1kHz	150±30Ω
4.	Rated Input	1mW
5.	Maximum Input	10mW
6.	Buzzer & Rattle	Must be normal at 1Vrms sine wave
7.	Operating Temperature	-40... + 60°C
8.	Storage Temperature	-50... + 70°C
9.	Weight	20g



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