

1. Prologue

Introduction

The Ultrasonic sensor send ultrasonic wave to the air, and detect the ultrasonic echo from the impediment. The Ultrasonic sensors are multipurpose, for example, it used as Burglar alarms, Range finders, Automatic doors, Back sonar of automobiles, Parking meters, Water level meters and so on.

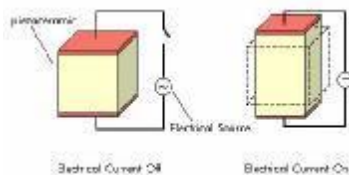
With the information technology developing rapidly, the areas of new Ultrasonic sensors applying for automatic equipments in factories and electrical devices in cars, are increasing day by day, and will go on.

Resorting to the advanced technology and perennial experience, our company have researched and developed manifold types Ultrasonic sensor which has ascendant performance just as such the compact and light weight, the high sensitivity and sound pressure, the less power consumption and high reliability.

The information in this presentation is very helpful for you to effectively use our Ultrasonic sensor

2. Application theory

The piezoelectric effect



The piezoelectric effect describes the relation between a mechanical stress and an electrical voltage in solids. It is reversible: an applied mechanical stress will generate a voltage and an applied voltage will change the shape of the solid by a small amount (up to a 4% change in volume). In physics, the piezoelectric effect can be described as the link between electrostatics and mechanics.

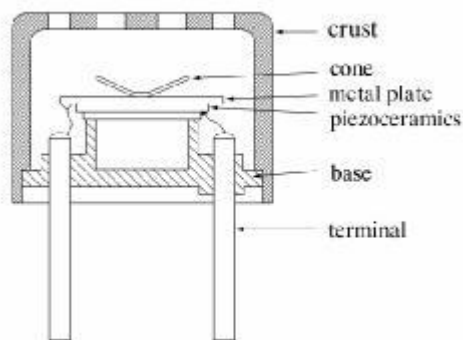
The Ultrasonic sensor application theory

When an AC voltage drives the piezoelectric ceramic, it mechanically vibrates with a certain frequency. The opposition is true, when the ceramic vibrates, it will produce an AC voltage. This is the piezoelectric effect. Using this theory, when sending an electric signal, the oscillator that consists on the two sides of the piezoceramics can bends and sends ultrasonic waves. Basing on the effect, we will use the piezoceramics in the ultrasonic sensor.

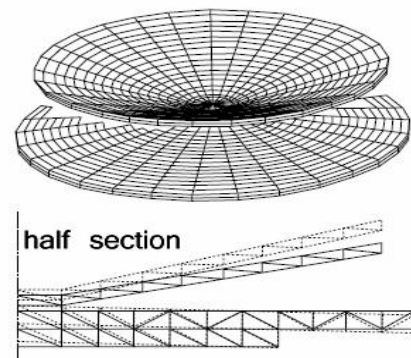
3. Open Structure Ultrasonic Sensor

3.1 Structure of Ultrasonic Sensor

As the figure of ultrasonic sensor, a compound oscillator is fixed on the base flexibly. The compound oscillator is a conjunct object that is made from cone, piezoceramics and a metal plate. The oscillate looks as a loudspeaker, it can radiate ultrasonic wave that the compound oscillator vibrates to produce effectively, and can get ultrasonic wave in the center of the oscillator together effectively. The follow is the sketch map Of Open Structure Ultrasonic sensor.



Open Structure Ultrasonic Sensor



Oscil ator simulation

3.2 Features

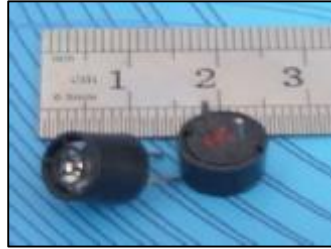
1. compact and light weight
2. high sensitivity and sound pressure
3. less power consumption
4. high reliability

3.3 Application

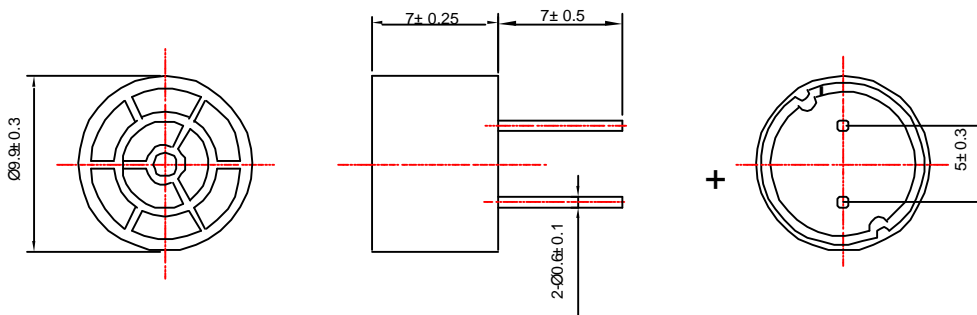
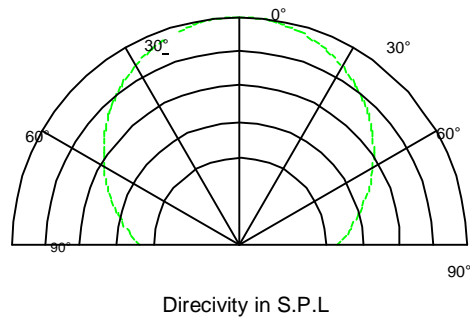
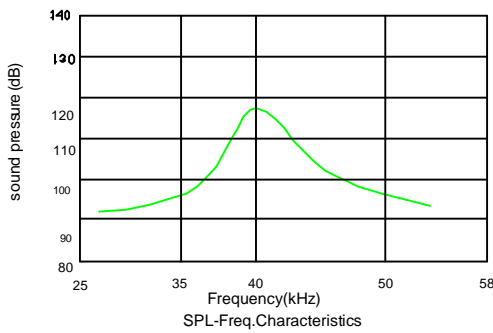
Burglar alarms, Range finders, Automatic doors and so on

3.4 Specification

PSO-1040T-1



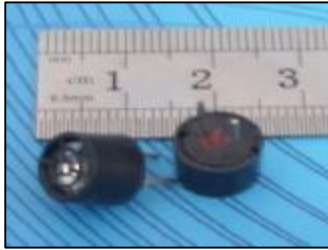
No.	Item	Specification
1.	Construction	Open Structure
2.	Using Method	Transmitter
3.	Center Frequency	40 KHz
4.	Output Sound Pressure	min.103dB (40KHZ) 0dB=0.0002μ bar
5.	Capacitance	2000pF± 25% at 1KHz
6.	Directivity	80deg
7.	Operating Tem.Range	-35 to +85 °C
8.	Housing Material	Plastic



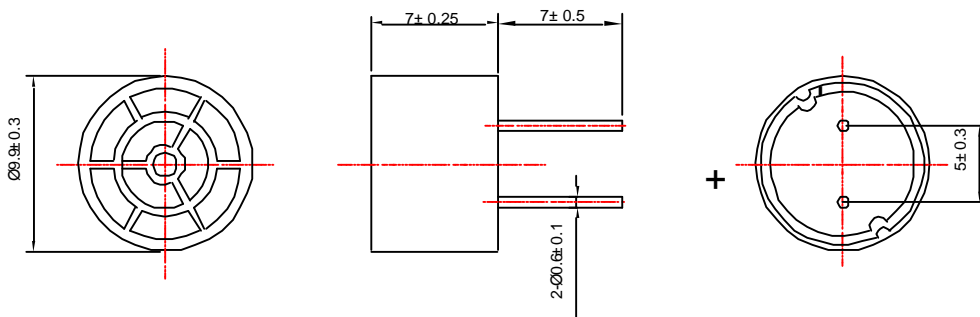
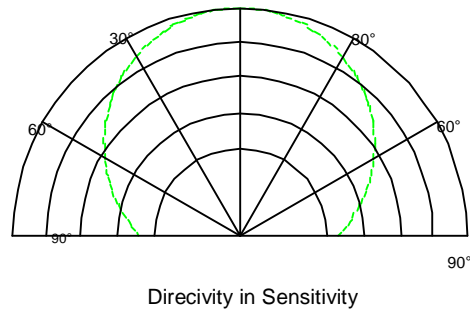
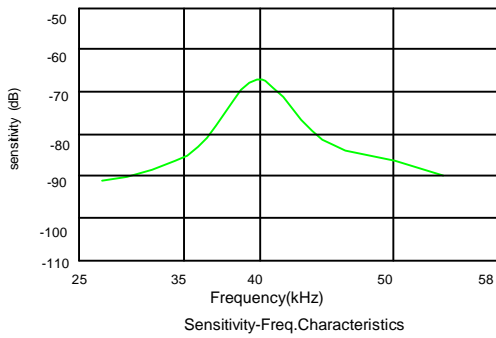
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sound pressure (dB)

PSO-1040R-1



No.	Item	Specification
1.	Construction	Open Structure
2.	Using Method	Receiver
3.	Center Frequency	40 KHz
4.	Sensitivity	min.-70dB (effective value 10v/30cm)
5.	Capacitance	2000pF± 25% at 1KHz
6.	Directivity	80deg
7.	Operating Tem.Range	-35 to +85 °C
8.	Housing Material	Plastic

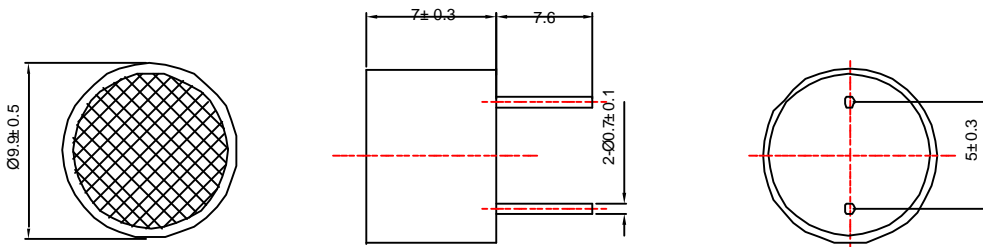
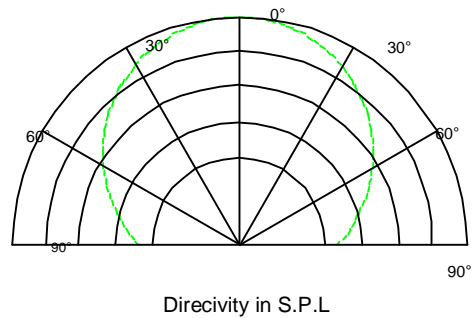
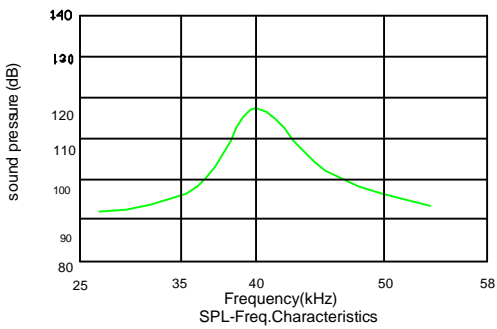


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PSO-1040T-2



No.	Item	Specification
1.	Construction	Open Structure
2.	Using Method	Transmitter
3.	Center Frequency	40 KHz
4.	Output Sound Pressure	min.103dB (40KHZ) 0dB=0.0002μ bar
5.	Capacitance	2000pF± 25% at 1KHz
6.	Directivity	80deg
7.	Operating Tem.Range	-35 to +85 °C
8.	Housing Material	Aluminium

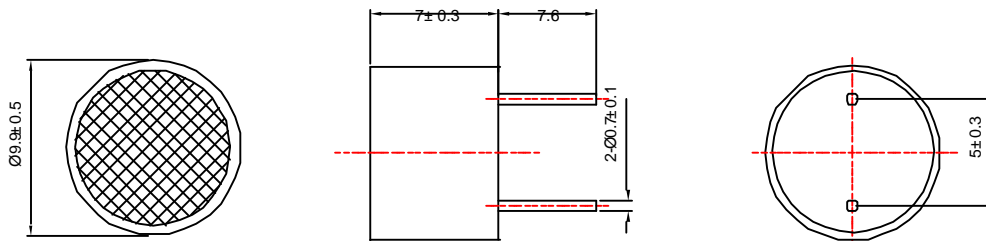
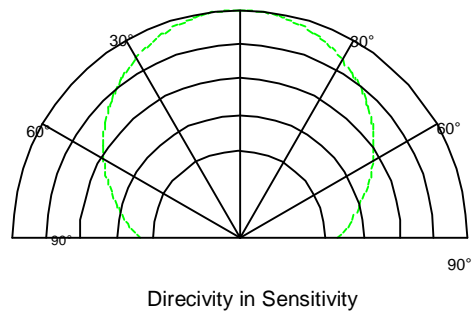
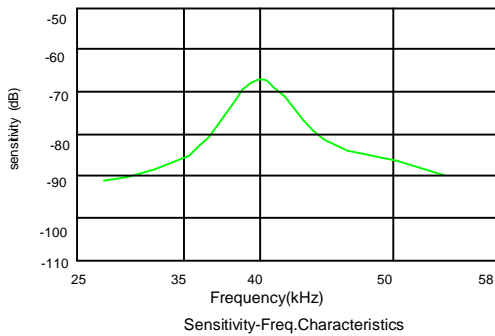


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PSO-1040R-2



No.	Item	Specification
1.	Construction	Open Structure
2.	Using Method	Receiver
3.	Center Frequency	40 KHz
4.	Sensitivity	min.-70dB (effective value 10v/30cm)
5.	Capacitance	2000pF± 25% at 1KHz
6.	Directivity	80deg
7.	Operating Tem.Range	-35 to +85 °C
8.	Housing Material	Aluminium

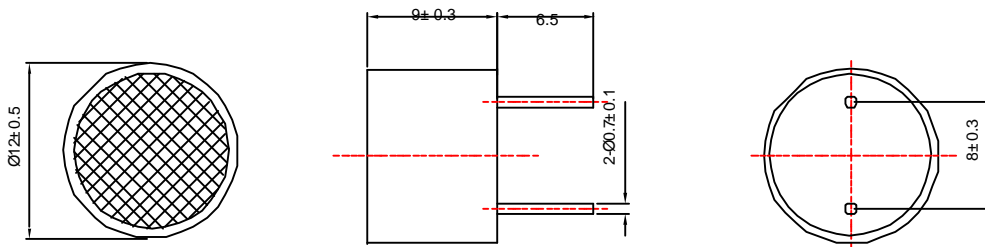
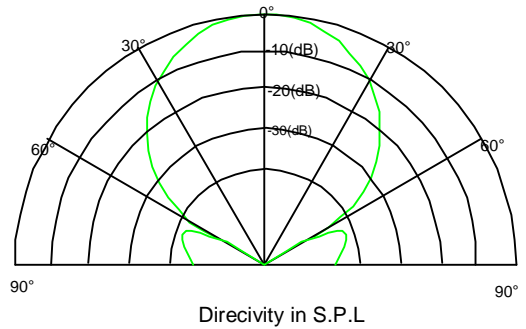
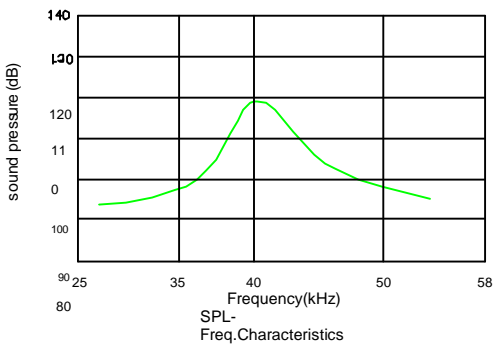


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PSO-1240T-1



No.	Item	Specification
1.	Construction	Open Structure
2.	Using Method	Transmitter
3.	Center Frequency	40 KHz
4.	Output Sound Pressure	min.110dB (40KHZ) 0dB=0.0002μ bar
5.	Capacitance	2000pF± 25% at 1KHz
6.	Directivity	80deg
7.	Operating Tem.Range	-35 to +85 °C
8.	Housing Material	Aluminium

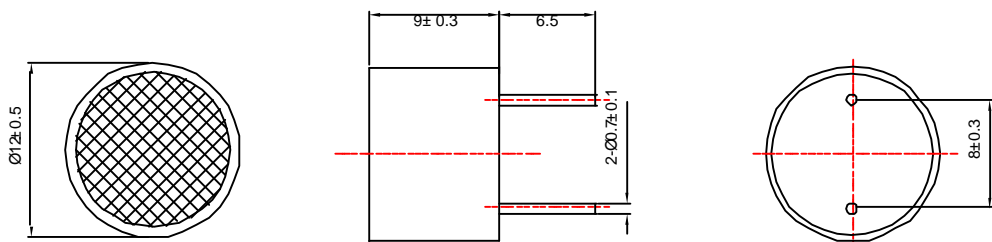
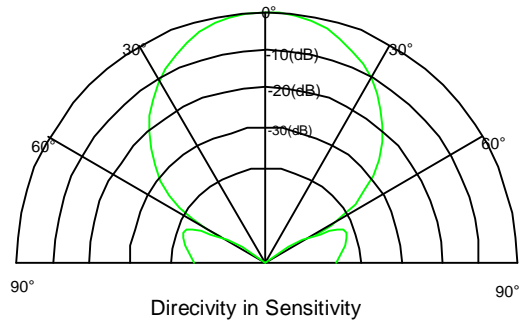
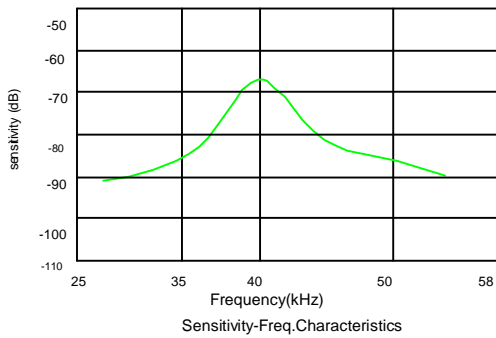


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No.	Item	Specification
1.	Construction	Open Structure
2.	Using Method	Receiver
3.	Center Frequency	40 KHz
4.	Sensitivity	min.-75dB (effective value 10v/30cm)
5.	Capacitance	2000pF± 25% at 1KHz
6.	Directivity	80deg
7.	Operating Tem.Range	-35 to +85 °C
8.	Housing Material	Aluminium

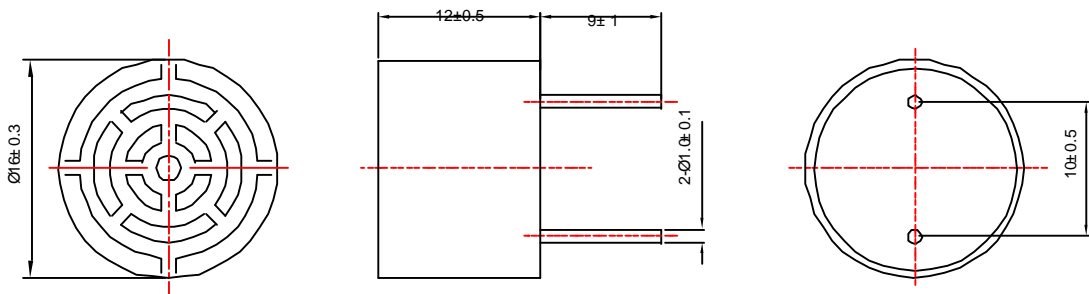
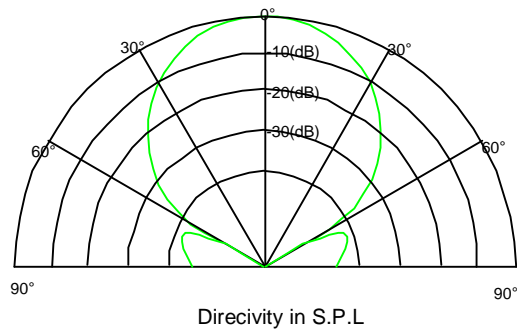
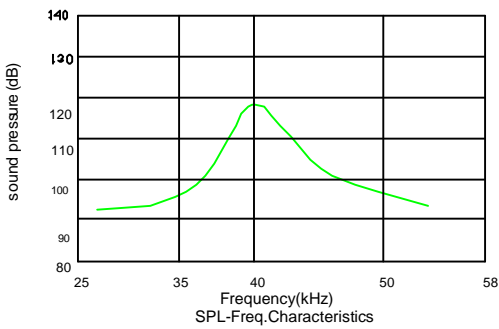


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No.	Item	Specification
1.	Construction	Open Structure
2.	Using Method	Transmitter
3.	Center Frequency	40 KHZ
4.	Output Sound Pressure	min.110dB (40KHZ) 0dB=0.0002μ bar
5.	Capacitance	2500pF± 25% at 1KHz
6.	Directivity	50deg
7.	Operating Tem.Range	-35 to +85 °C
8.	Housing Material	Plastic



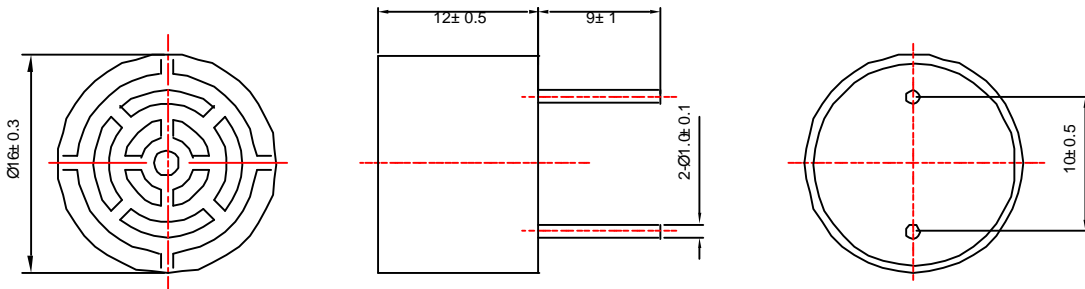
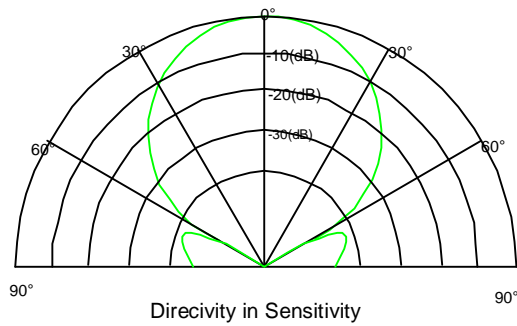
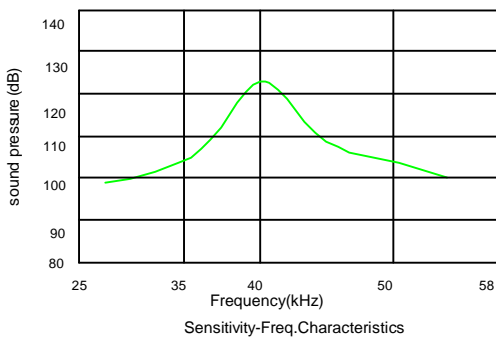
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sound pressure (dB)

PSO-1640R-1



No.	Item	pecification
1.	Construction	Open Structure
2.	Using Method	Receiver
3.	Center Frequency	40 KHz
4.	Sensitivity	min.-65dB (effective value 10v/30cm)
5.	Capacitance	2500pF± 25% at 1KHz
6.	Directivity	50deg
7.	Operating Tem.Range	-35 to +85 °C
8.	Housing Material	Plastic

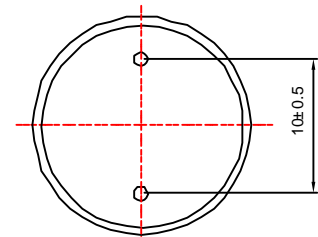
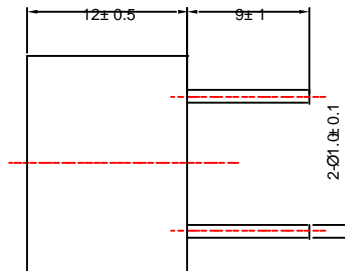
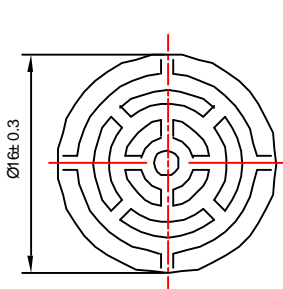
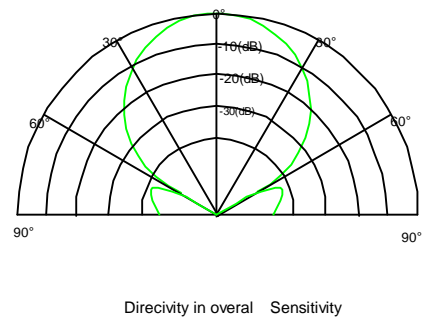
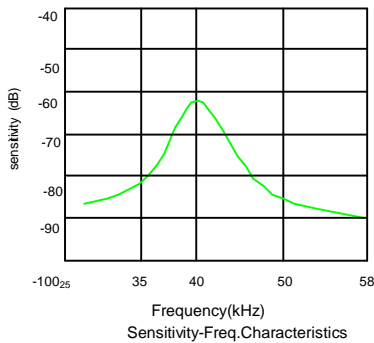
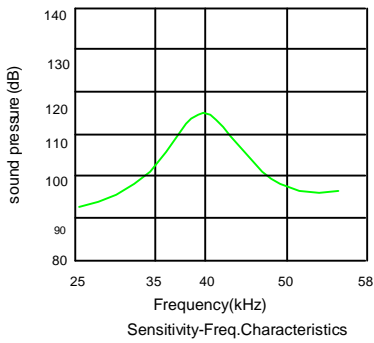


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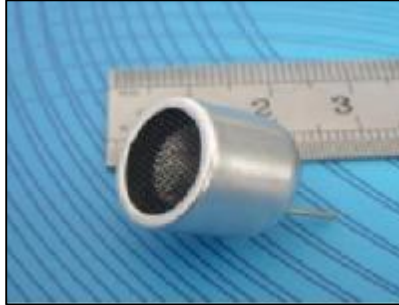


No.	Item	pecification
1.	Construction	Open Structure
2.	Using Method	Dual Use
3.	Center Frequency	40 KHz
4.	Output sound pressure	min.110dB (40KHZ) 0dB=0.0002μ bar
5.	Sensitivity	min.-65dB (effective value 10v/30cm)
6.	Capacitance	2500pF± 25% at 1KHz
7.	Directivity	50deg
8.	Operating Tem.Range	-35 to +85 °C
9.	Housing Material	Plastic

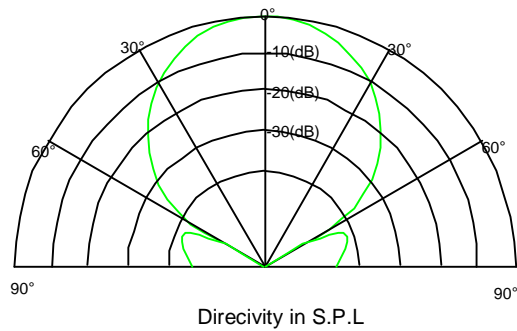
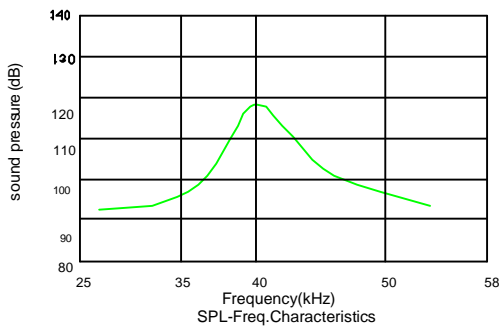


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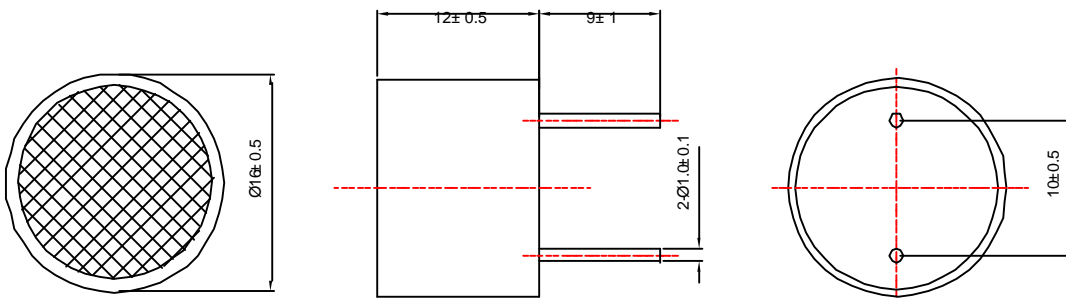
PSO-1640T-2



No.	Item	Specification
1.	Construction	Open Structure
2.	Using Method	Transmitter
3.	Center Frequency	40 KHZ
4.	Output Sound Pressure	min.110dB (40KHZ) 0dB=0.0002μ bar
5.	Capacitance	2500pF± 25% at 1KHz
6.	Directivity	50deg
7.	Operating Tem.Range	-35 to +85 °C
8.	Housing Material	Aluminium

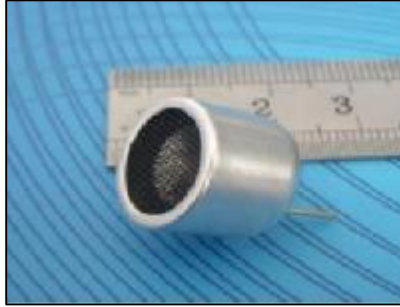


sound pressure (dB)

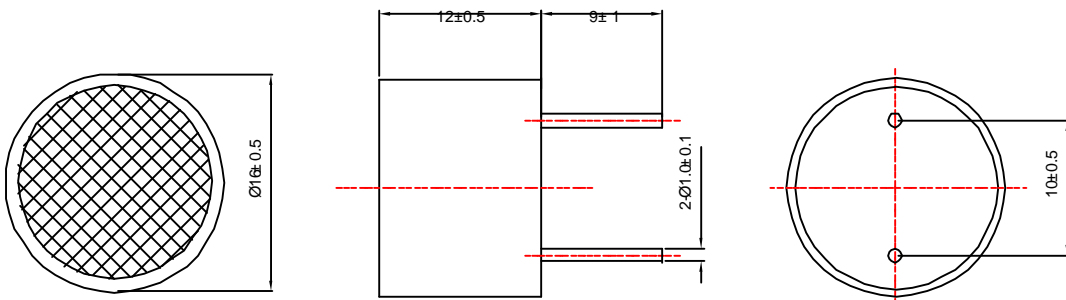
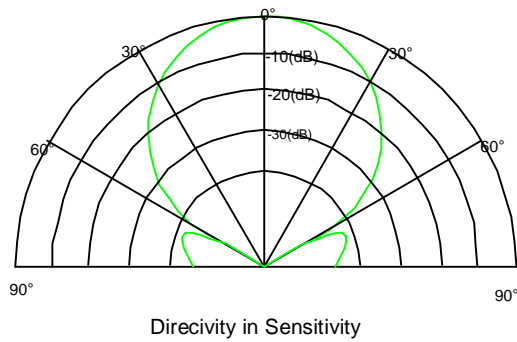
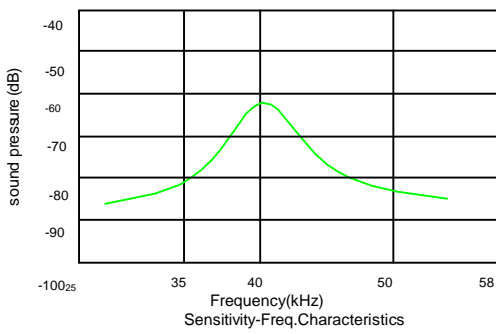


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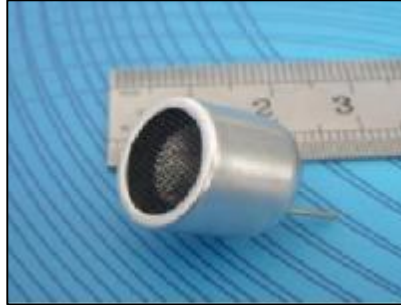


No.	Item	Specification
1.	Construction	Open Structure
2.	Using Method	Receiver
3.	Center Frequency	40 KHz
4.	Sensitivity	min.-65dB (effective value 10v/30cm)
5.	Capacitance	2500pF± 25% at 1KHz
6.	Directivity	50deg
7.	Operating Tem.Range	-35 to +85 °C
8.	Housing Material	Aluminium

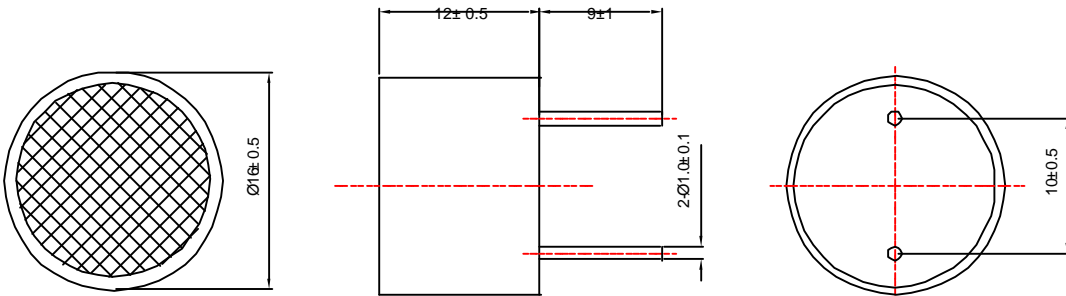
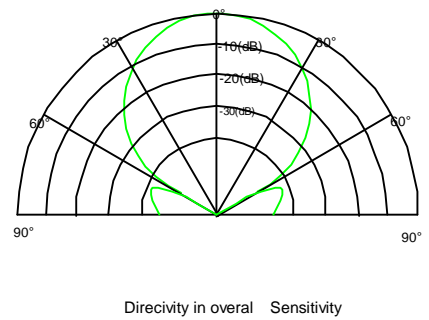
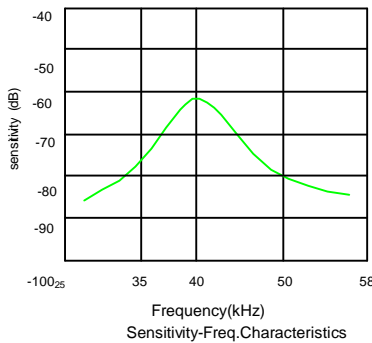
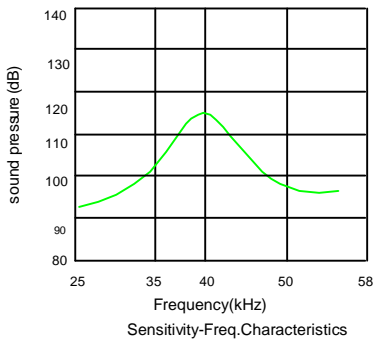


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PSO-1640TR-2



No.	Item	Specification
1.	Construction	Open Structure
2.	Using Method	Dual Use
3.	Center Frequency	40 KHz
4.	Output sound pressure	min.110dB (40KHZ) 0dB=0.0002μ bar
5.	Sensitivity	min.-65dB (effective value 10v/30cm)
6.	Capacitance	2500pF± 25% at 1KHz
7.	Directivity	50deg
8.	Operating Tem.Range	-35 to +85 °C
9.	Housing Material	Aluminium

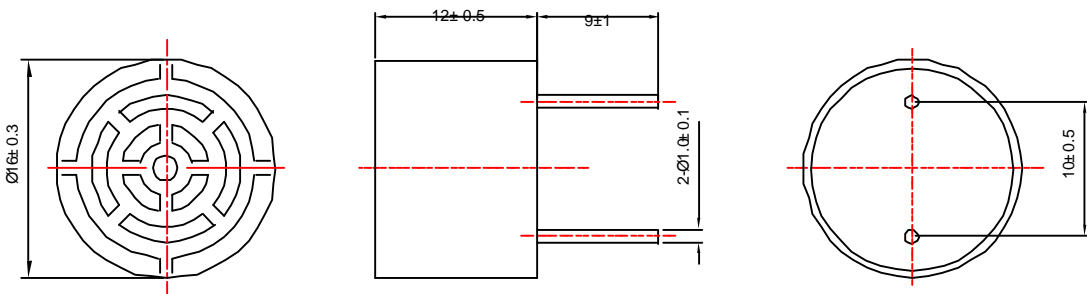
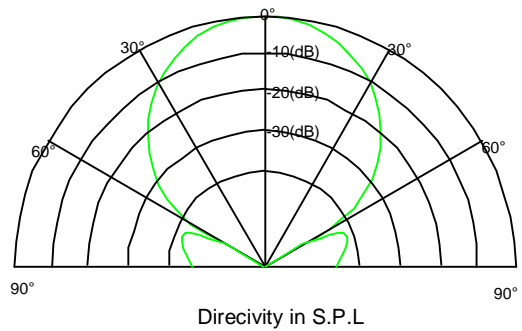
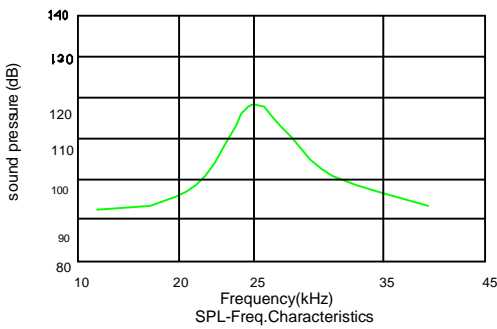


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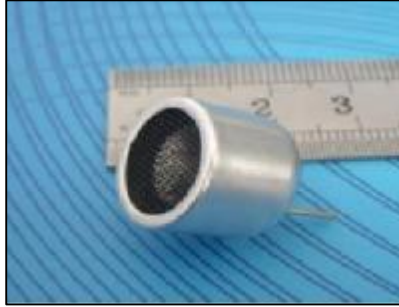
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1.	Construction	Open Structure
2.	Using Method	Transmitter
3.	Center Frequency	25 KHz
4.	Output Sound Pressure	min.107dB (25KHZ) 0dB=0.0002μ bar
5.	Capacitance	2500pF± 25% at 1KHz
6.	Directivity	50deg
7.	Operating Tem.Range	-35 to +85 °C
8.	Housing Material	Plastic



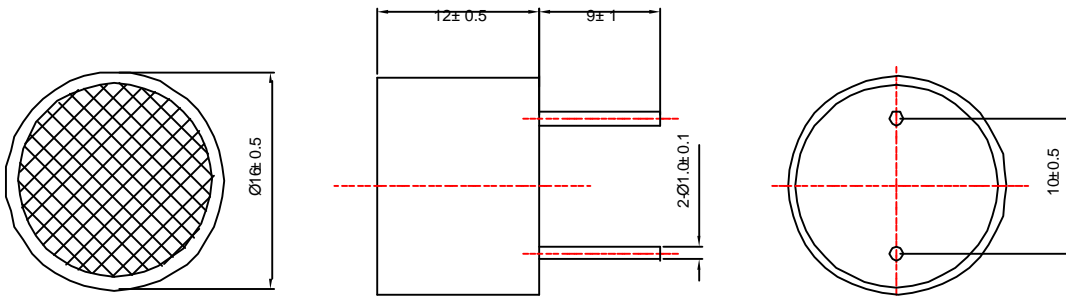
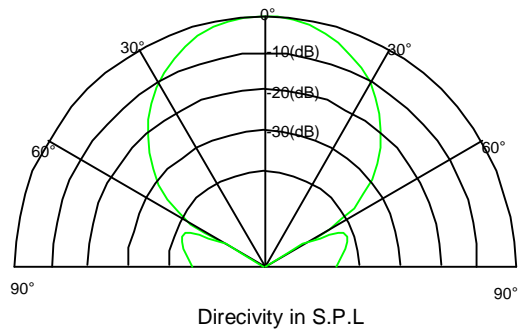
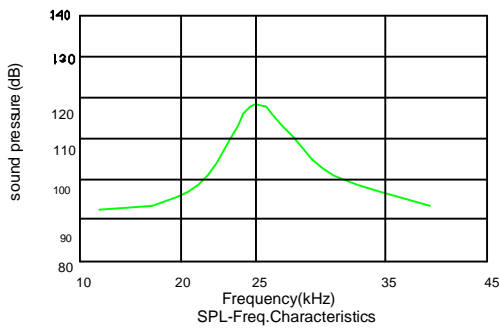
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sound pressure (dB)

PSO-1625T-2



No.	Item	Specification
1.	Construction	Open Structure
2.	Using Method	Transmitter
3.	Center Frequency	25 KHz
4.	Output Sound Pressure	min.107dB (25KHZ) 0dB=0.0002μ bar
5.	Capacitance	2500pF± 25% at 1KHz
6.	Directivity	50deg
7.	Operating Tem.Range	-35 to +85 °C
8.	Housing Material	Aluminium



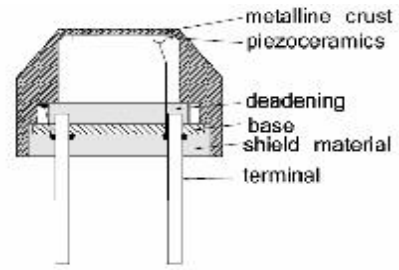
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sound pressure (dB)

4. Water Proof Type Ultrasonic Sensor

4.1 Structure of Ultrasonic Sensor

The Ultrasonic sensor using outside must be better sealed, so that prevent dew, rain and dust from the outside. The piezoelectric ceramic is fixed inside of the top of a metal box. The base is fixed in the hatch of the metal box, and cover with the resin. The right sketch map is the water proof structure ultrasonic sensor.



Water proof Ultrasonic Sensor

4.2 Features

1. compact and light weight
2. high sensitivity and sound pressure
3. less power consumption
4. high reliability
5. Compressed directivity by itself

4.3 Application

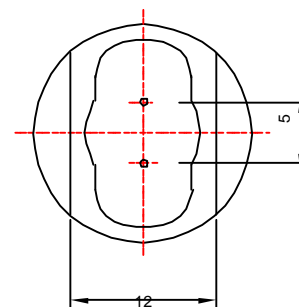
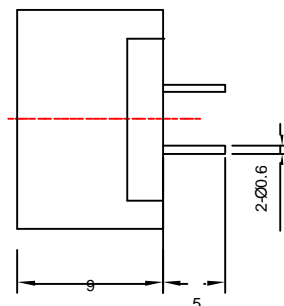
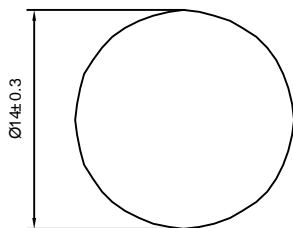
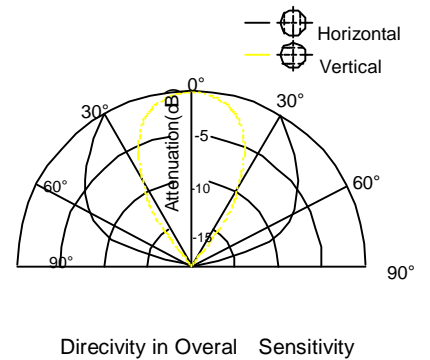
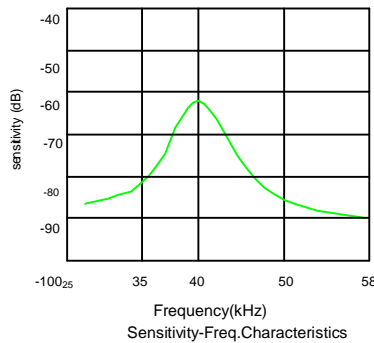
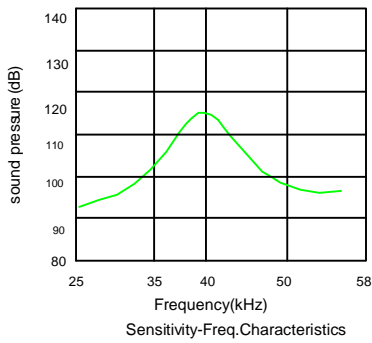
Back sonar of automobiles ,
Parking meters,
Parking sensor,
Water level meters and so on

4.4 Specification

PSF-1440TR-1



No.	Item	Specification
1.	Construction	Water proof
2.	Using Method	Dual Use
3.	Center Frequency	40 KHz
4.	Output sound pressure	min.97dB (40KHZ) 0dB=0.0002μ bar
5.	Sensitivity	min.-75dB (effective value 10v/30cm)
6.	Capacitance	2200pF± 20% at 1KHz
7.	Directivity	110 X45deg
8.	Operating Tem.Range	-40 to +85 °C
9.	Housing Material	Aluminium



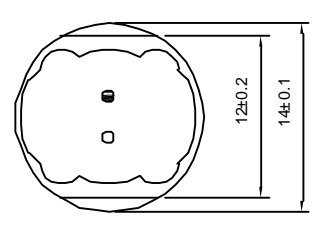
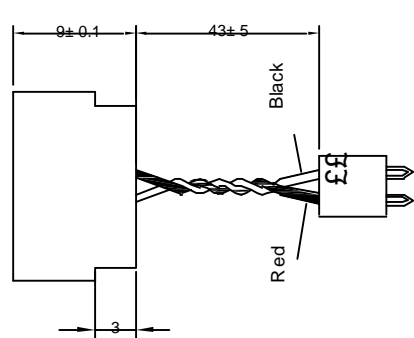
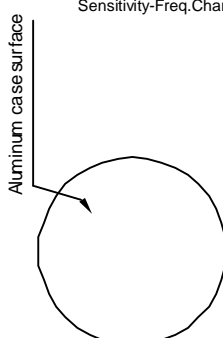
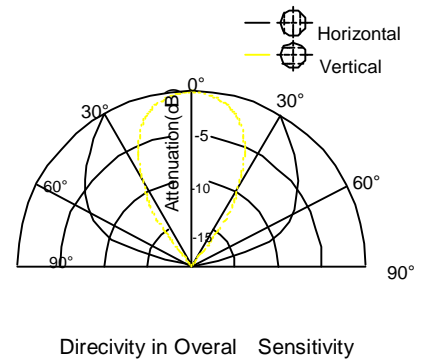
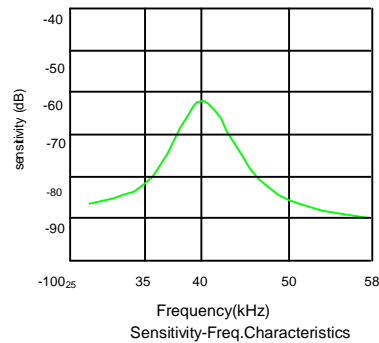
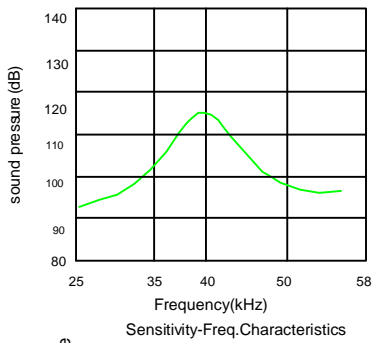
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sound pressure (dB)

PSF-1440TR-2



No.	Item	Specification
1.	Construction	Water proof
2.	Using Method	Dual Use
3.	Center Frequency	40 KHz
4.	Output sound pressure	min.97dB (48KHZ) 0dB=0.0002μ bar
5.	Sensitivity	min.-75dB (effective value 10v/30cm)
6.	Capacitance	2200pF± 20% at 1KHz
7.	Directivity	110 X45deg
8.	Operating Tem.Range	-40 to +85 °C
9.	Housing Material	Aluminium



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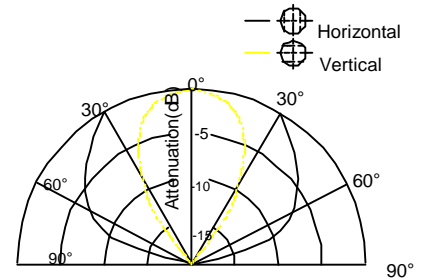
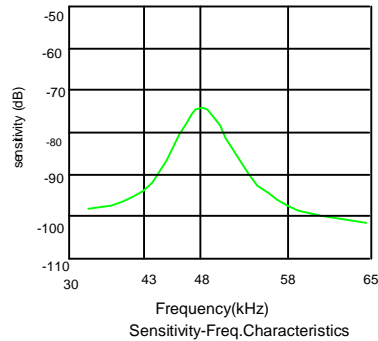
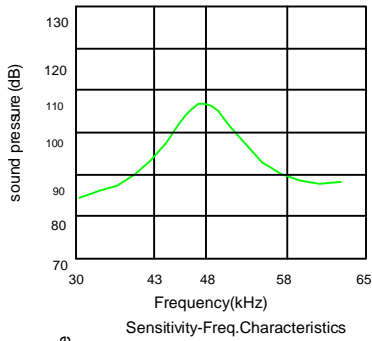
sound pressure (dB)

PSF-1448TR-1

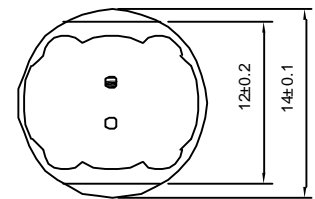
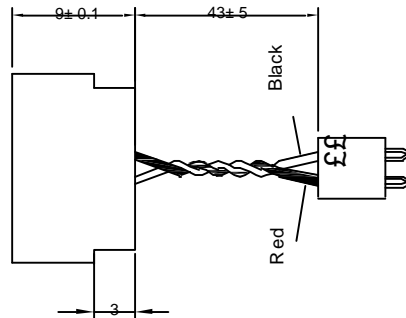
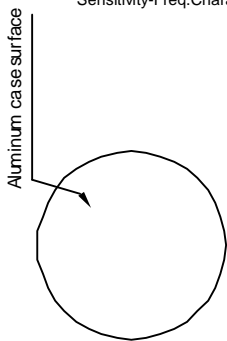


No.	Item	Specification
1.	Construction	Water proof
2.	Using Method	Dual Use
3.	Center Frequency	48 KHz
4.	Output sound pressure	min.101dB (48KHZ) 0dB=0.0002μ bar
5.	Sensitivity	min.-90dB (effective value 10v/30cm)
6.	Capacitance	2200pF± 20% at 1KHz
7.	Directivity	110 X45deg
8.	Operating Tem.Range	-40 to +85 °C
9.	Housing Material	Aluminium

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Directivity in Overall Sensitivity



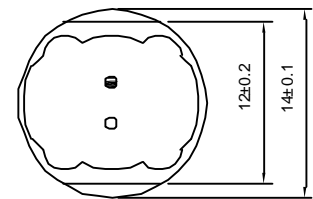
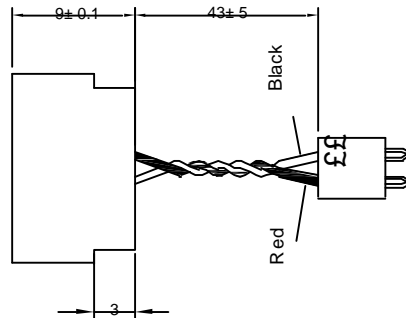
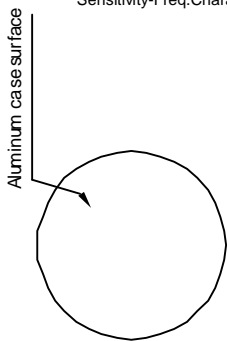
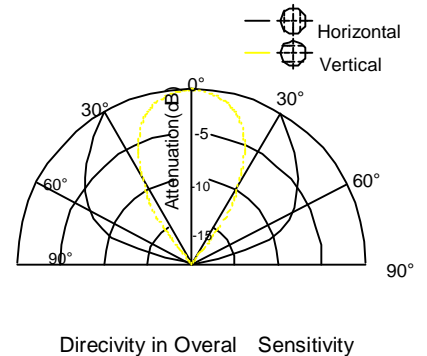
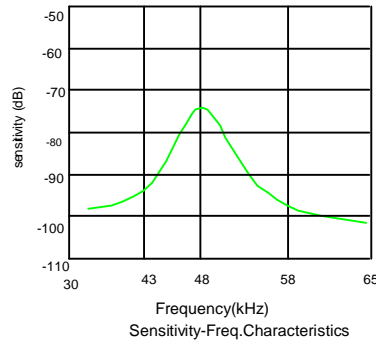
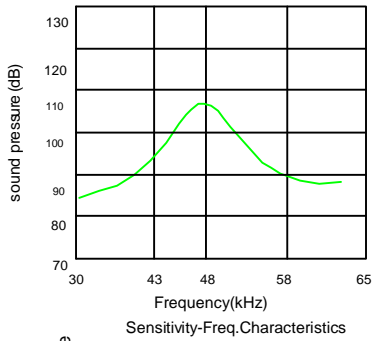
sound pressure (dB)

PSF-1448TR-2



No.	Item	Specification
1.	Construction	Water proof
2.	Using Method	Dual Use
3.	Center Frequency	48 KHz
4.	Output sound pressure	min.100dB (48KHZ) 0dB=0.0002μ bar
5.	Sensitivity	min.-90dB (effective value 10v/30cm)
6.	Capacitance	2600pF± 20% at 1KHz
7.	Directivity	110 X45deg
8.	Operating Tem.Range	-40 to +85 °C
9.	Housing Material	Aluminium

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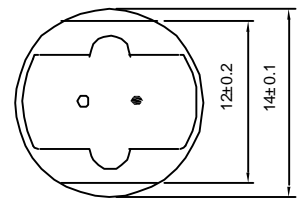
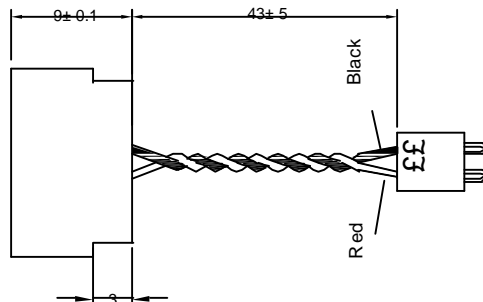
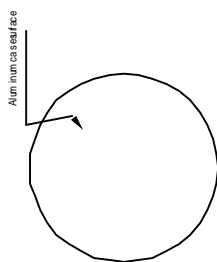
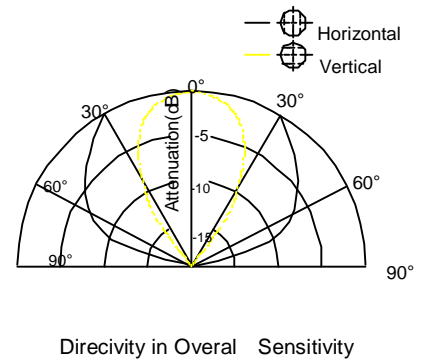
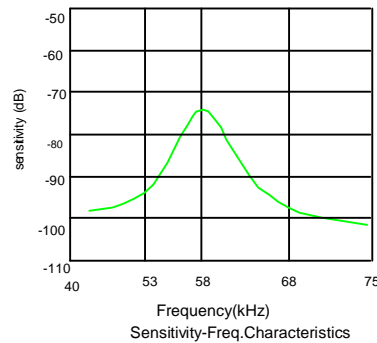
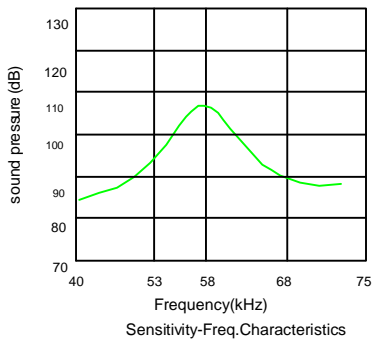


sound pressure (dB)

PSF-1458TR-1



No.	Item	Specification
1.	Construction	Water proof
2.	Using Method	Dual Use
3.	Center Frequency	58 KHz
4.	Output sound pressure	min.100dB (58KHZ) 0dB=0.0002μ bar
5.	Sensitivity	min.-90dB (effective value 10v/30cm)
6.	Capacitance	2000pF± 20% at 1KHz
7.	Directivity	110 X45deg
8.	Operating Tem.Range	-40 to +85 °C
9.	Housing Material	Aluminium



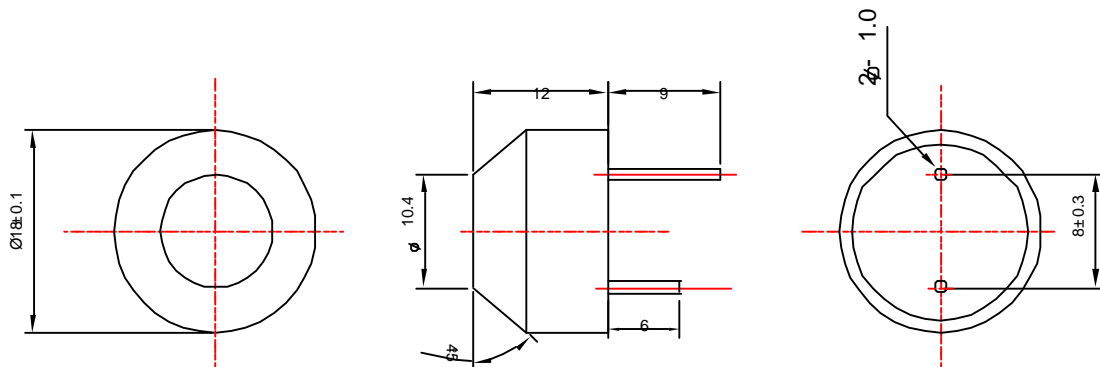
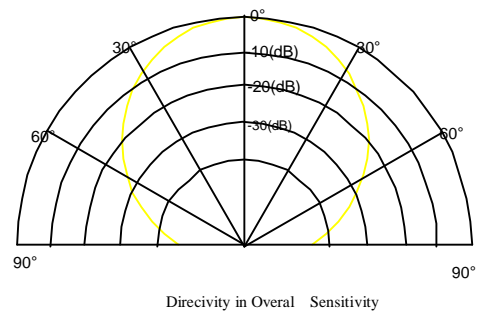
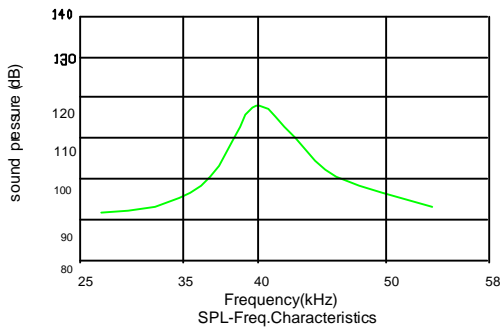
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sound pressure (dB)

PSF-1840TR-1



No.	Item	Specification
1.	Construction	Water proof
2.	Using Method	Dual Use
3.	Center Frequency	40 KHz
4.	Output sound pressure	min.100dB (40KHZ) 0dB=0.0002μ bar
5.	Sensitivity	min.-70dB (effective value 10v/30cm)
6.	Capacitance	2200pF± 20% at 1KHz
7.	Directivity	100deg
8.	Operating Tem.Range	-40 to +85 °C
9.	Housing Material	Aluminium



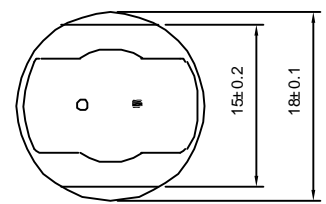
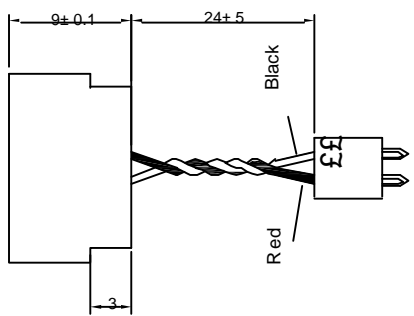
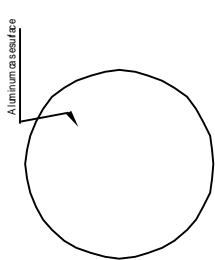
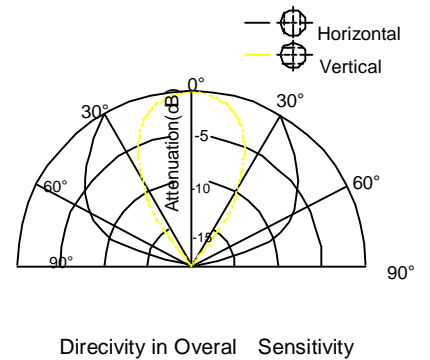
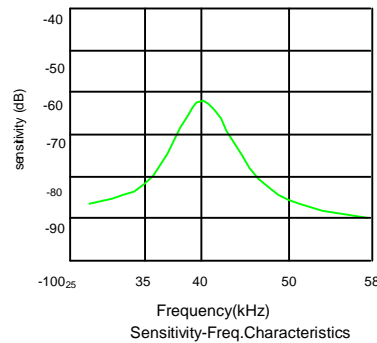
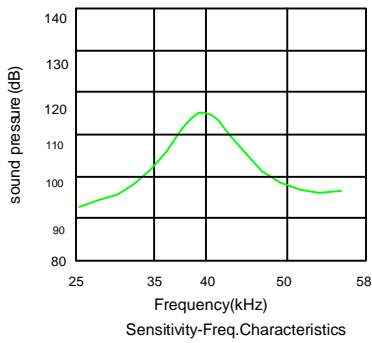
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sound pressure (dB)

PSF-1840TR-2



No.	Item	Specification
1.	Construction	Water proof
2.	Using Method	Dual Use
3.	Center Frequency	40 KHz
4.	Output sound pressure	min.90dB (40KHZ) 0dB=0.0002μ bar
5.	Sensitivity	min.-70dB (effective value 10v/30cm)
6.	Capacitance	2200pF± 20% at 1KHz
7.	Directivity	110 X50deg
8.	Operating Tem.Range	-40 to +85 °C
9.	Housing Material	Aluminium



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sound pressure (dB)