

BeStar Electronics Industry Co., Ltd.

Manufacturing various kinds of acoustic components like buzzer, speaker, receiver, alarm and specially of latest technology of SMD buzzer, mini receiver for mobilephone.

Products widely used in telecommunication, automotive industry, household application, security system, music device and so on. Manufacturing various kinds of acoustic components like buzzer, speaker, receiver, alarm and specially of latest

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Products widely used in



BeStar Ultrasonic Sensor



Introduction

1. Prologue

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 transmitter and receiver of Ultrasonic for Remote controls of Home appliance and Electric devices, Distance measurement, Parking aid system, proximity switch, liquid level measurement and so on.

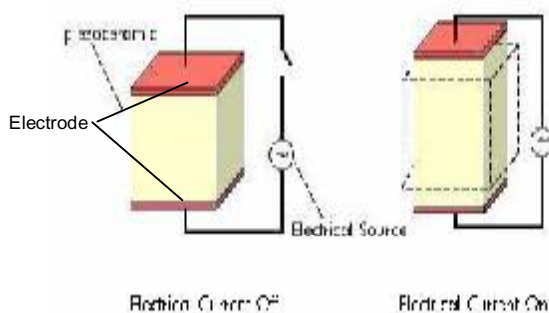
With the information technology developing rapidly, the areas of new Ultrasonic sensors applying for automatic equipments in factories and electrical devices in cars, are increasing day by day, and will go on.

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.

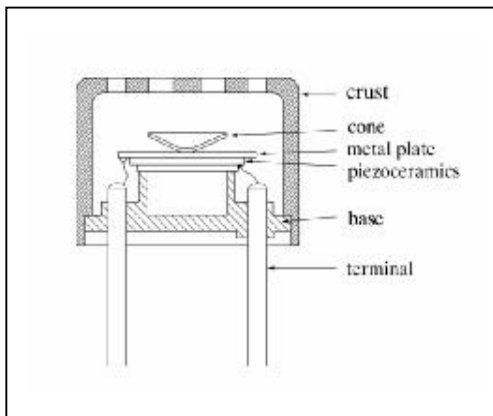
The Ultrasonic sensor application theory

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 the piezoceramics in the ultrasonic sensor.

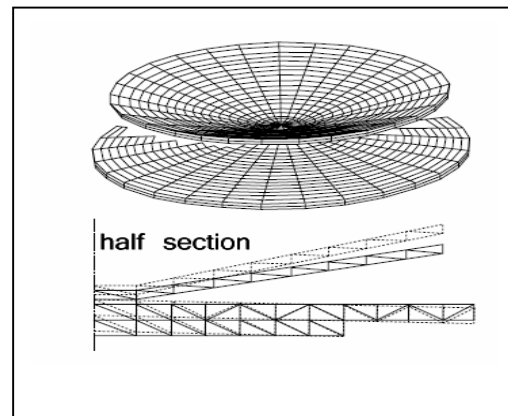
3. Structure of Ultrasonic Sensor

Open Structure 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.



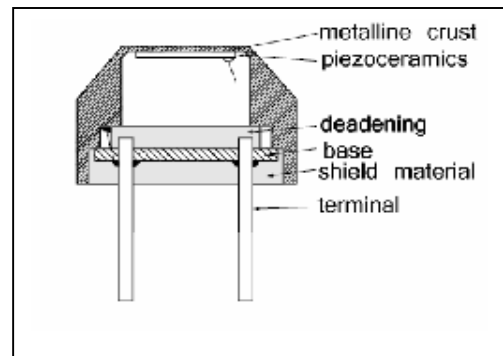
Open Structure Ultrasonic Sensor



Oscillator simulation

Water Proof Type 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



ISO/TS16949:2002 Certificated
BeStar Electronics Industry Co.,Ltd.

Performance Table

Part Number	Construction	Using Method	Center Freq(KHz)	Sensitivity (dB) (0dB=V/ubar)	S.P.L. (dB) (0dB=0.02mPa)	Directivity (°)	Cap. (pF)	Operating TempRange (°C)
BPU1040TOPBH07	Open struct.	Transmitter	40	--	103	80	2000	-35~+85
BPU1040ROPBH07		Receiver		-70	--			
BPU1640TOAWH12	Open struct.	Transmitter	40	--	117	50	2500	-40~+85
BPU1640ROAWH12		Receiver		-65	--			
BPU1640IOAWH12		Dual Use		-65	117			
BPU1625TOAWH12	Open struct.	Transmitter	25	--	115	80	2500	-40~+85
BPU1625ROAWH12		Receiver		-75	--			
BPU1625IOAWH12		Dual Use		-75	115			

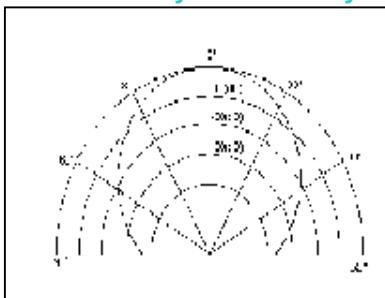
Driving Voltage: 10Vp-p, Distance: 30cm.

The sensor can be used in the operating temperature range.

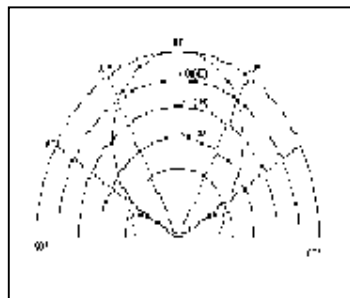
Please refer to individual specifications for the temperature drift of sensitivity/sound pressure levels or environmental characteristics in that temperature range.

Directivity, detectable range and resolution are typical values. They can be changed by application circuit and fixing method of the sensor.

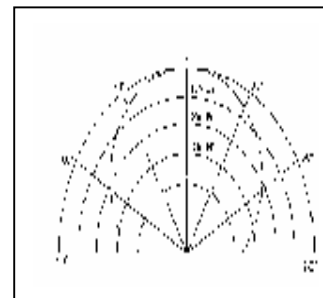
Directivity in Sensitivity



BPU1040T/ROPBH07



BPU1640T/ROAWH12
BPU1640IOAWH12



BPU1625T/ROAWH12
BPU1625IOAWH12

Water Proof Type

Features

- compact and light weight,
- high sensitivity and sound pressure,
- less power consumption
- high reliability
- Compressed directivity by itself

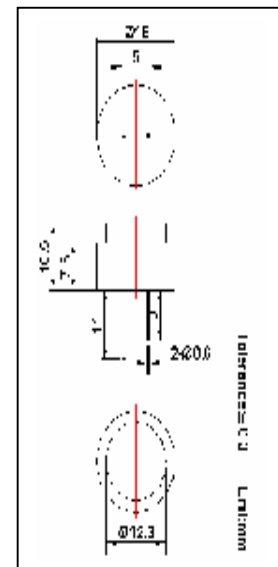
Application

Back sonar of automobiles, Parking meters,
Water level meters

Outline dimension

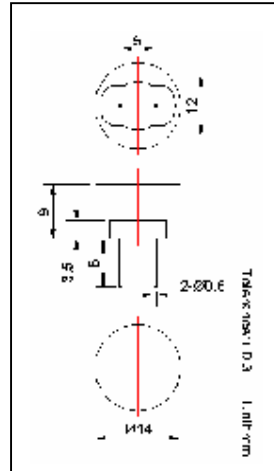


BPU1640IFAWH10.5S

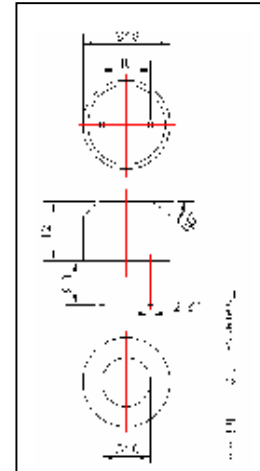




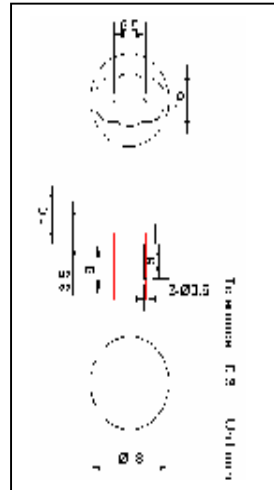
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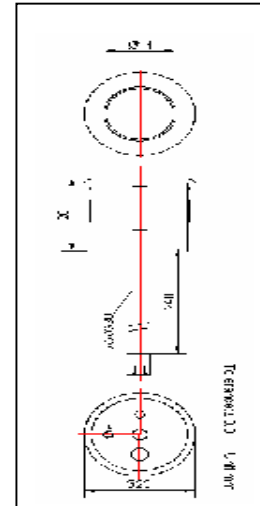
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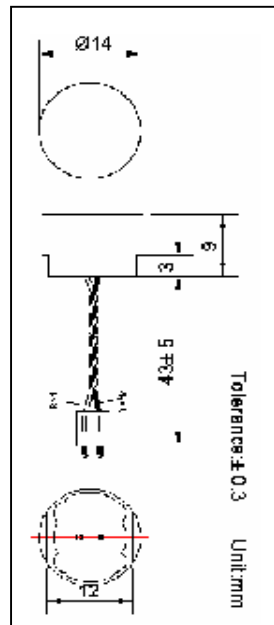
BPU1840IFAWH10-01



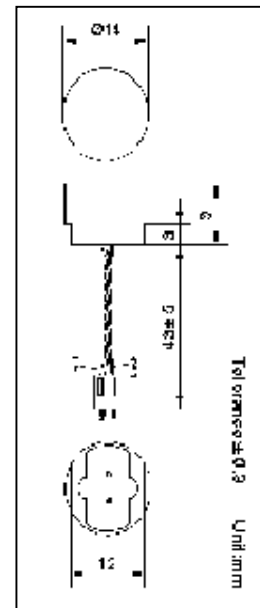
BPU1440IFABH10-01W



BPU1448IFAH09



BPU1458IFAH09





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Performance Table

Part Number	Construction	Using Method	Center Freq(KHz)	Sensitivity (dB) (0dB=V/ubar)	S.P.L. (dB) (0dB=0.02mPa)	Directivity (°)	Cap. (pF)	Operating TempRange (°C)
BPU1440IFAWH10-01	Water Proof	Dual Use	40	-75	97	110×45	2200	-30-+85
BPU1640IFAWH10.5S	Water Proof	Dual Use	40	-75	100	75	2000	-30-+85
BPU1840IFABH12	Water Proof	Dual Use	40	-70	100	100	2200	-30-+85
BPU1840IFAWH10-01	Water Proof	Dual Use	40	-87	100	100×50	2000	-30-+85
BPU1440IFABH10-01W	Water Proof	Dual Use	40	-75	94	110×45	2200	-30-+85
BPU1448IFAH09	Water Proof	Dual Use	48	-90	101	110×40	2600	-30-+85
BPU1458IFAH09	Water Proof	Dual Use	58	-90	100	110×35	2000	-30-+85

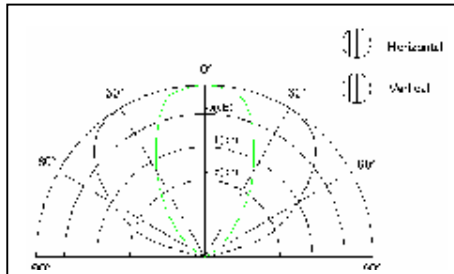
Driving Voltage: 10Vp-p, Distance: 30cm.

The sensor can be used in the operating temperature range.

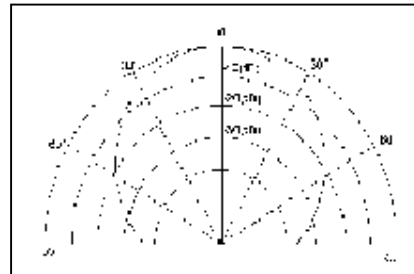
Please refer to individual specifications for the temperature drift of sensitivity/sound pressure levels or environmental characteristics in that temperature range.

Directivity, detectable range and resolution are typical values. They can be changed by application circuit and fixing method of the sensor.

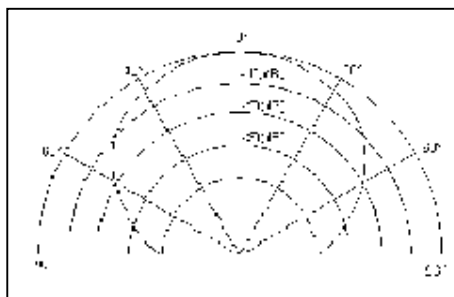
Directivity in Sensitivity



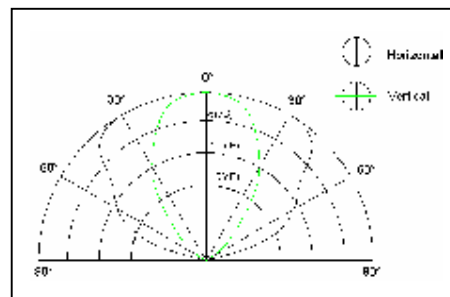
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BPU1440IFABH10-01W



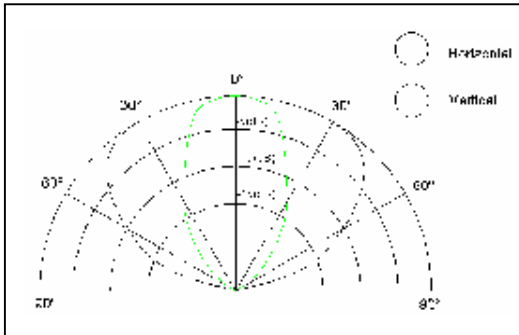
BPU1640IFAWH10.5S



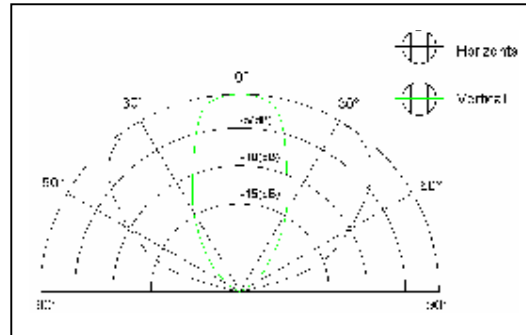
BPU1840IFABH12



BPU1840IFAWH10-01



BPU1448IFAH09



BPU1458IFAH09

6. Caution

■ Limitation of Applications

Please contact us before using our product for the applications listed below which require especially high reliability for the prevention of defects which might directly cause damage to the third party's life, body or property.


- 1) Aircraft equipment
- 2) Aerospace equipment
- 3) Undersea equipment
- 4) Power plant control equipment
- 5) Medical equipment
- 6) Transportation equipment (vehicles, train, ships, etc.)
- 7) Traffic signal equipment
- 8) Disaster prevention/crime prevention equipment
- 9) Data-processing equipment
- 10) Application of similar complexity and/or reliability requirement to the applications listed in the above

■ Fail -safe

Be sure to provide an appropriate fail-safe function on your product to prevent a second damage that may be caused by the abnormal function or the failure of our product

■ Caution in use

- 1) Please avoid applying an excessive stress to the transducer because it might be damaged.
- 2) The transducer may generate surge voltage by mechanical or thermal shock. Care should be taken to protect from it in designing your application circuit.
- 3) Please do not applying DC voltage to the transducer.
- 4) Please do not use the transducer in water.



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