

## PIEZO ULT RASONIC SENSOR

Part Number: VT-US40D1402



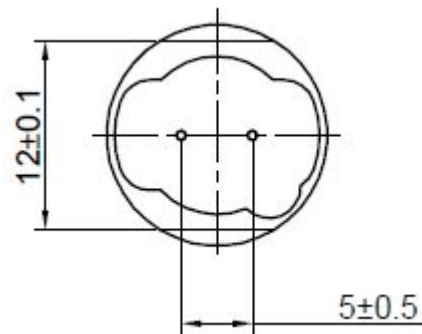
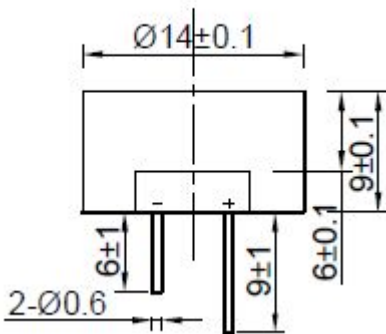
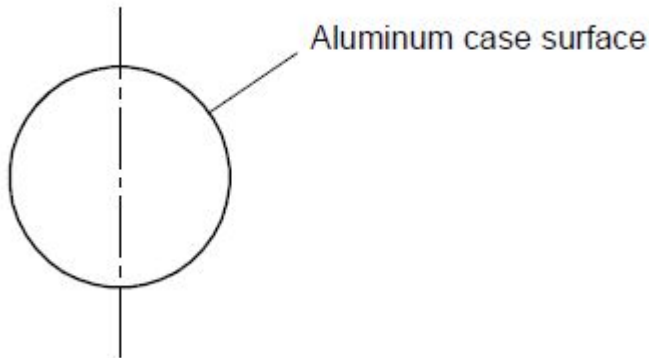
### Applications

This specification covers the water proof type ultrasonic ceramic transducer which are used for ultrasonic ranging and parking sensor of automobile.

### Features

- 2.1) Water proof and dual use
- 2.2) Compact and light weight.
- 2.3) High sensitivity and sound pressure.
- 2.4) Less power consumption
- 2.5) High reliability

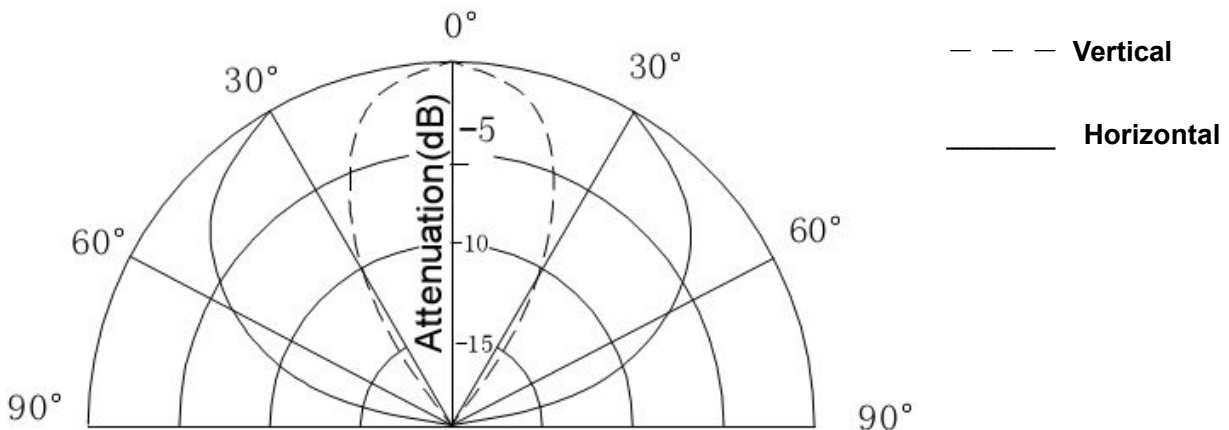
1.Dimension (Unit: mm)



2.Electrical Characteristics

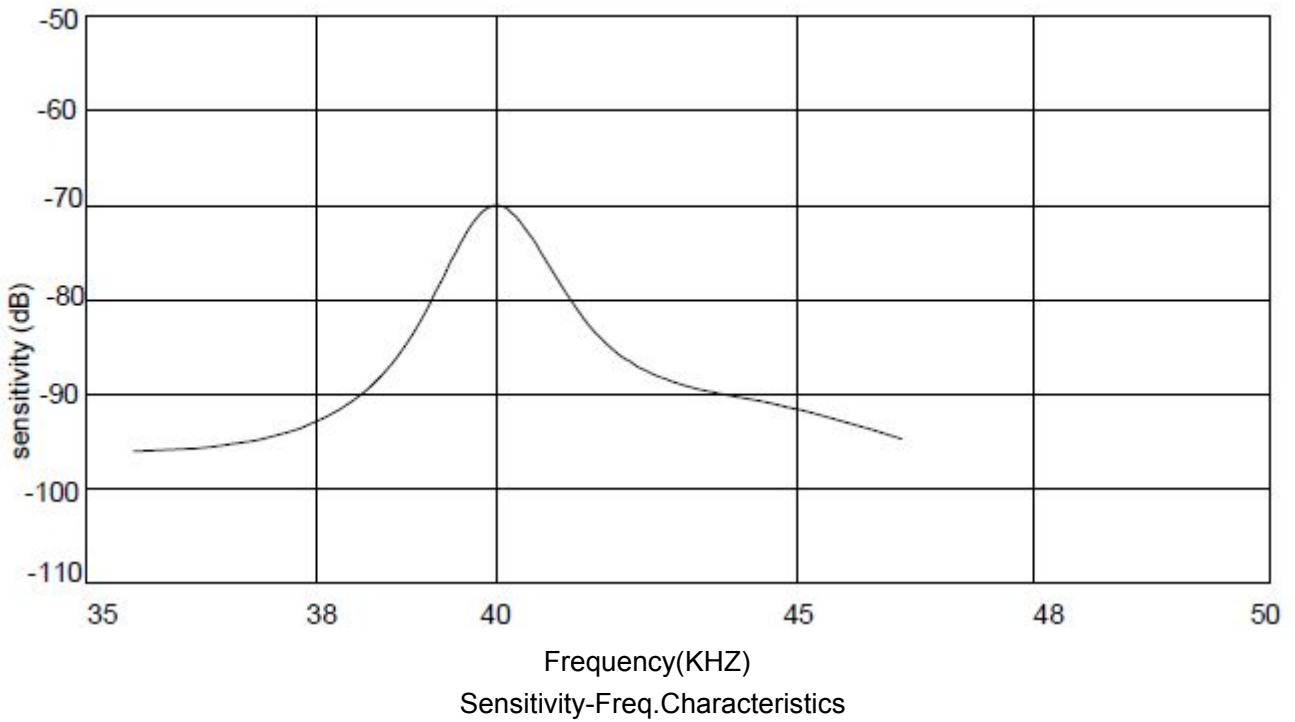
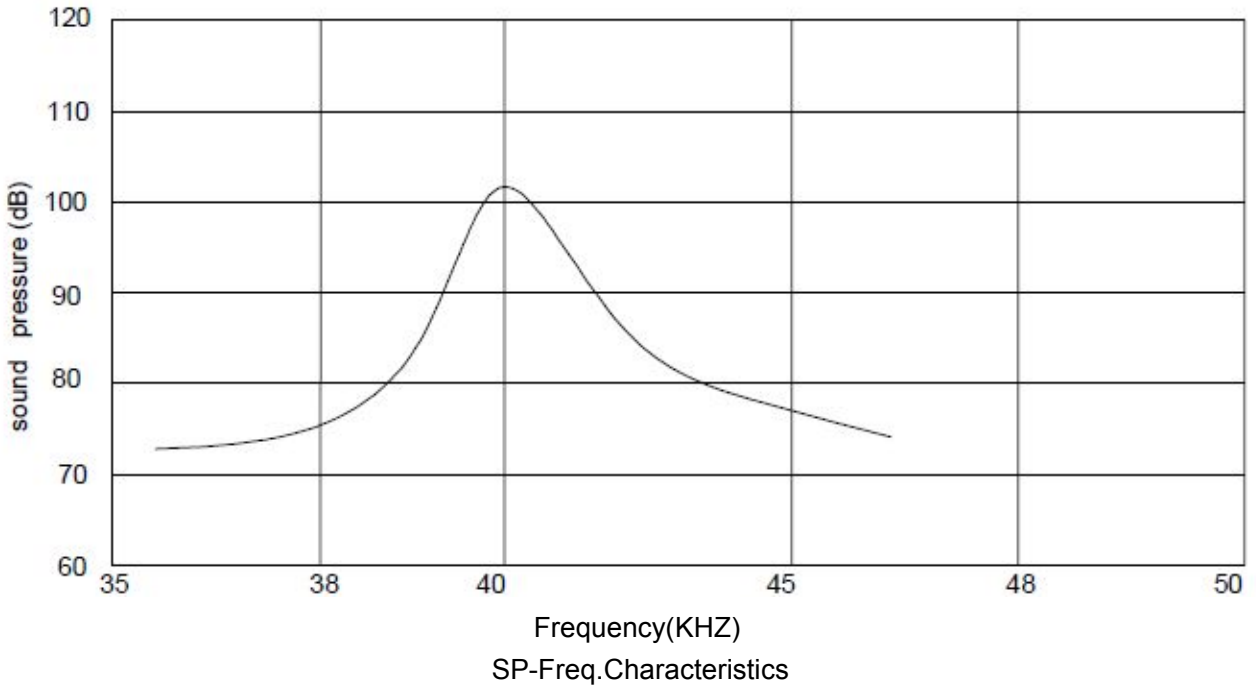
No.	Item	Unit	Specifications
1	Construction		Water Proof
2	Using Method		Dual Use
3	Center Frequency	Khz	40±1khz
4	Sound Pressure Level	dB	≥90(30cm/10Vrms)
5	Sensitivity	dB	≥-75dB /V/ μ bar
6	Echo Pulse Width	us	≥360us(at 1.2m)
7	Ringing Time	ms	≤1.72ms
8	Capacitance	pF	2100pF±25% at 1KHz
9	Directivity	°	110×50deg
10	Operating Tem.Range	°C	-40 to +85°C
11	Storage Tem.Range	°C	-40 to +85°C
12	Allowable Input Voltage	Vp-p	160Vp-p
13	Housing Material		Aluminum

3.Directivity



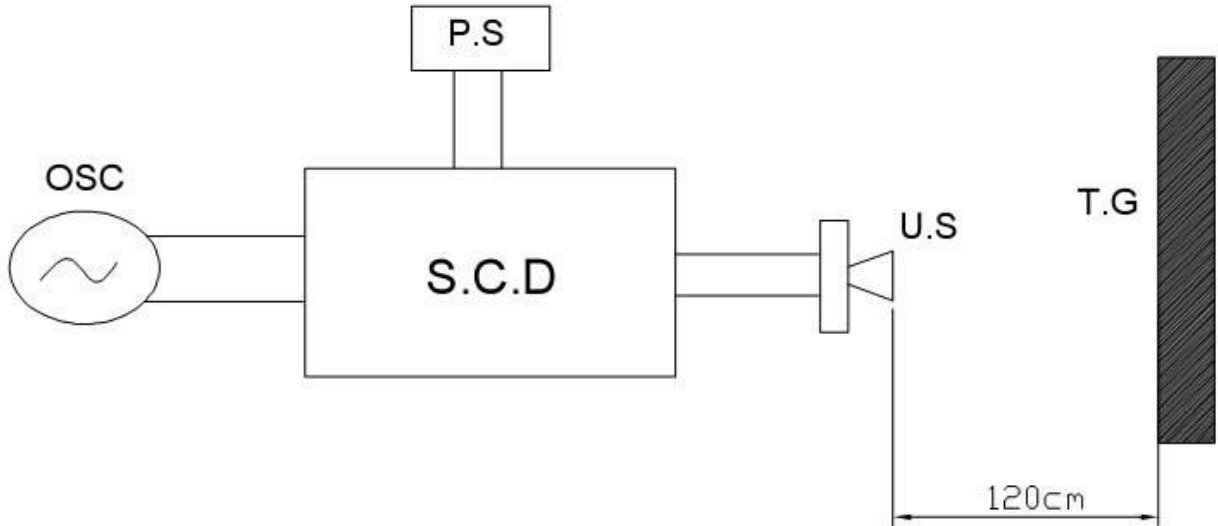
Directivity in Overall Sensitivity

4. Beam pattern



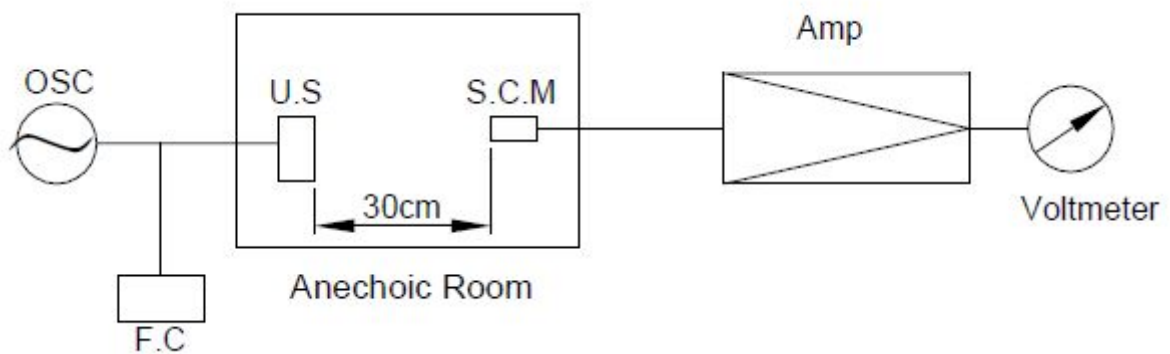
5. Test circuit

Echo&Resonant Time test circuit



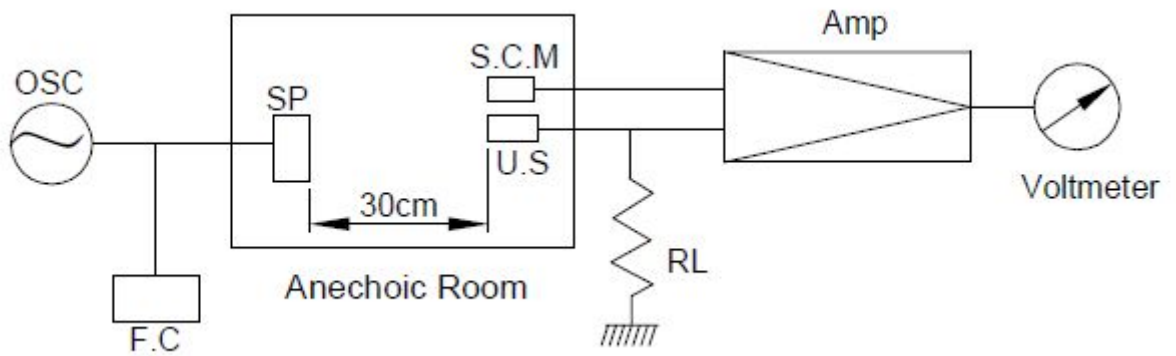
OSC:Oscillator  
P.S:Power supply  
S.C.D:Special circuit diagram  
U.S :Ultrasonic Sensor  
T.G:Target

S.P.L test circuit



OSC. :Oscillator  
F.C :Frequency Counter  
U.S :Ultrasonic Sensor  
S.C.M:Standard Cappacitor Microphone  
Amp.:Amplifier

Sensitivity test circuit



- OSC.:Oscillator
- F.C :Frequency Counter
- U.S :Ultrasonic Sensor
- S.C.M:Standard Cappacitor Microphone
- Amp.:Amplifier
- SP:Tweeter
- RL:3.9KΩ

6. Reliability Test

6.1 High temp. life test

Temperature + 85±3°C  
Duration 500hrs

6.2 Low temp. life test

Temperature -40±3°C  
Duration 500hrs

6.3 Heat Cycle Test

Temperature + 85±3°C 1hour  
-40±3°C 1hour  
Cycles 100cycles

6.4 Humidity Test

Temperature +65±2°C  
Relative Humidity 90~95%  
Duration 500hrs

6.5 Vibration Test

Vibration Frequency 10~ 200Hz  
Sweep Period 1 5min  
Acceleration 43.12m/s<sup>2</sup> (4.4G)  
Direction 3(x.y&z)  
Time 96hours/direction

6.6 Shock test

Acceleration sine 980 m/s<sup>2</sup>(100G)  
Direction 3directions  
Shock time 3 time/directions

6.7 Drop test

Height 1m onto concrete floor  
Times 10 times

6.8 Connector soldering check:

Immersing terminal up to 1mm below base in soldering bath at 260 °C 10seconds

Notice:

The variation of the S.P.L at 40 kHz is within 3dB compared with initial figures at 25°C in 2 4 hours after above test condition.

## 7. Notice

### 7.1 Export Control <For customers outside The People's Republic of China>

No BeStar products should be used or sold, through any channels, for use in the design, development, production, utilization, maintenance or operation of, or otherwise contribution to

(1) any weapons (Weapons of Mass Destruction [nuclear, chemical or biological weapons or missiles] or conventional weapons) or

(2) goods or systems specially designed or intended for military end-use or utilization by military end-users.

7.2 Please contact our sales representatives or product engineers before using the products in the specification or catalogue for the applications listed below, which require especially high reliability for the prevention of defects which might directly damage a third party's life, body or property, or when one of our products is intended for use in applications other than those specified in this specification.

a) Aircraft equipment or Aerospace equipment

b) Undersea equipment and Power plant equipment

c) Medical equipment and Transportation equipment (vehicles, trains, ships, etc.)

d) Traffic signal equipment i Disaster prevention / crime prevention equipment

e) Data-processing equipment including Application of similar complexity and/or reliability requirements to the applications listed above

7.3 Product specifications and catalogues are subject to change and our products in them may be discontinued without advance notice.

Please check with our sales representatives or product engineers before ordering. If there are any questions, please contact our sales representatives or product engineers.

7.4 Please read rating and CAUTION (for storage, operating, rating, soldering, mounting and handling) in this specifications in order to prevent smoking and/or burning, etc.

7.5 Please note that unless otherwise specified, we shall assume no responsibility whatsoever for any conflict or dispute that may occur in connection with the effect of our and/or a third party's intellectual property rights and other related rights in consideration of your use of our products and/or information described or contained in our specifications and catalogues. In this connection, no representation shall be made to the effect that any third parties are authorized to use the rights mentioned above under licenses without our consent.

7.6 No ozone depleting substances (ODS) under the Montreal Protocol are used in our manufacturing process.