

# Ultrasonic Sensor Transceiver

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## Applications

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

## Features

- Water proof and dual use
- Compact and light weight
- High sensitivity and sound pressure
- Less power consumption
- High reliability

## Specifications

|                         |                              |
|-------------------------|------------------------------|
| Construction            | : Water Proof                |
| Using Method            | : Dual Use                   |
| Centre Frequency        | : 40kHz $\pm$ 1kHz           |
| Sound Pressure Level    | : $\geq$ 90dB (30cm/10V rms) |
| Sensitivity             | : $\geq$ -75dB/V/ $\mu$ bar  |
| Echo Pulse Width        | : $\geq$ 360us (at 1.2m)     |
| Ringing Time            | : $\leq$ 1.72ms              |
| Capacitance             | : 2100pF $\pm$ 25% at 1kHz   |
| Directivity             | : 110 $\times$ 50deg         |
| Operating Temp. Range   | : -40°C to +85°C             |
| Storage Temp. Range     | : -40°C to +85°C             |
| Allowable Input Voltage | : 160Vp-p                    |
| Housing Material        | : Aluminium                  |

## Reliability Test

### High temp. life test

|             |                   |
|-------------|-------------------|
| Temperature | : +85°C $\pm$ 3°C |
| Duration    | : 500hrs          |

### Low temp. life test

|             |                   |
|-------------|-------------------|
| Temperature | : -40°C $\pm$ 3°C |
| Duration    | : 500hrs          |

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## Heat Cycle Test

|             |                                    |
|-------------|------------------------------------|
| Temperature | : +85±3°C 1 hour<br>-40±3°C 1 hour |
| Cycles      | : 100 Cycles                       |

## Humidity Test

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

## Vibration Test

|                     |                                |
|---------------------|--------------------------------|
| Vibration Frequency | : 10~200Hz                     |
| Sweep Period        | : 15min                        |
| Acceleration        | : 43.12m/s <sup>2</sup> (4.4G) |
| Direction           | : 3(x.y&z)                     |
| Time                | : 96 hours/direction           |

## Shock test

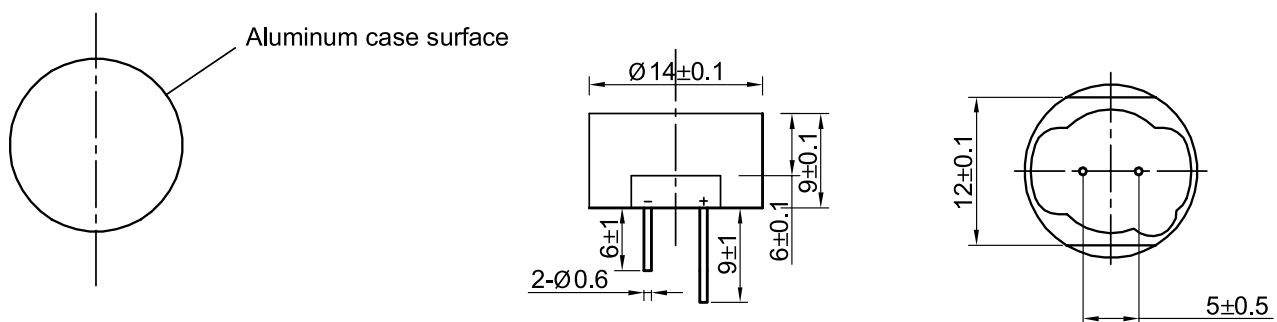
|              |                                    |
|--------------|------------------------------------|
| Acceleration | : sine 980 m/s <sup>2</sup> (100G) |
| Direction    | : 3 directions                     |
| Shock time   | : 3 time/directions                |

## Drop test

|                           |                                                                                 |
|---------------------------|---------------------------------------------------------------------------------|
| Height                    | : 1m onto concrete floor                                                        |
| Times                     | : 10 times                                                                      |
| Connector Soldering Check | : Immersing terminal up to 1mm below base in soldering bath at 260°C 10 seconds |

Note: The variation of the S.P.L at 40kHz is within 3dB compared with initial figures at 25°C in 24 hours after above test condition.

## Diagram



Dimensions : Millimetres

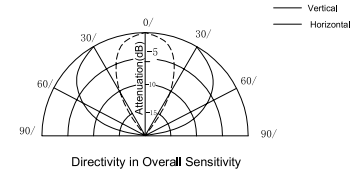
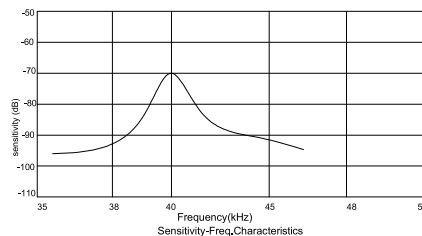
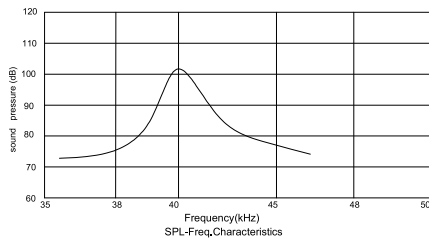
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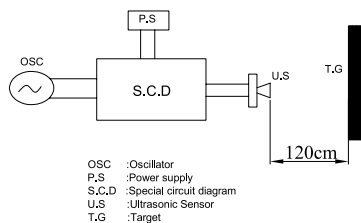
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## Beam Pattern

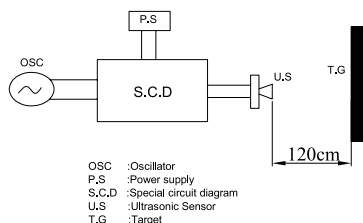


## Test Circuit

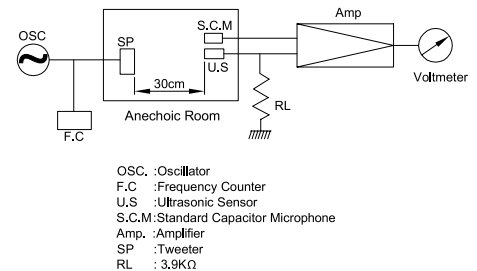
Echo&Rest.Resonant Time test circuit



Echo&Rest.Resonant Time test circuit



sensitivity test circuit



## Part Number Table

| Description                     | Part Number     |
|---------------------------------|-----------------|
| Transceiver, 40kHz, 14mm, Metal | MCUSD14A40S09RS |

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