### Approval:

1. Applications
2. Features
3. Technical terms
4. Drawing
5. Directivity
6. Test Circuit
7. Reliability Test
8. Notice
9. Packing
10. History change record

### Specifications:

<table>
<thead>
<tr>
<th>Customer</th>
<th>Model Name</th>
<th>BPU1640IFAH10-02</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer P/N</td>
<td>Product No.</td>
<td>100918</td>
</tr>
<tr>
<td>Date</td>
<td>Issue No.</td>
<td>BS/TEY01.408A</td>
</tr>
<tr>
<td>Page</td>
<td>Issue Date</td>
<td>2016/12/03</td>
</tr>
</tbody>
</table>

**BESTAR SENSORTECH CO., LTD**
Room 706, No. 178, YuLong South Road, Zhonglou District, ChangZhou, JiangSu Province, P.R. China
Tel: +86 519 88990131  Fax: +86 519 88990133
E-mail: li@bestarsensor.com  http://www.bestarsensor.com

文件号：BS/QDTE045B
BPU1640IFAH10-02

1. Applications

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

2. 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.

3. Technical terms

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Unit</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Construction</td>
<td></td>
<td>Water Proof</td>
</tr>
<tr>
<td>2.</td>
<td>Using Method</td>
<td></td>
<td>Dual Use</td>
</tr>
<tr>
<td>3.</td>
<td>Center Frequency</td>
<td>KHz</td>
<td>40±1KHz</td>
</tr>
<tr>
<td>4.</td>
<td>Echo Pulse Amplitude</td>
<td>mV</td>
<td>≥600mV(750mmx1200mm baffle at 2000mm)</td>
</tr>
<tr>
<td>5.</td>
<td>Ringing Time</td>
<td>ms</td>
<td>≤1.2ms</td>
</tr>
<tr>
<td>6.</td>
<td>Capacitance</td>
<td>pF</td>
<td>2100pF±25% at 1KHz</td>
</tr>
<tr>
<td>7.</td>
<td>Directivity</td>
<td>°</td>
<td>60deg</td>
</tr>
<tr>
<td>8.</td>
<td>Operating Tem.Range</td>
<td></td>
<td>-40 to +85°C</td>
</tr>
<tr>
<td>9.</td>
<td>Storage Tem.Range</td>
<td></td>
<td>-40 to +85°C</td>
</tr>
<tr>
<td>10.</td>
<td>Maximum Input Voltage</td>
<td>Vp-p</td>
<td>160Vp-p</td>
</tr>
<tr>
<td>11.</td>
<td>Housing Material</td>
<td></td>
<td>Aluminum</td>
</tr>
</tbody>
</table>
4. Drawing

Ultrasonic Sensor

BPU1640IFAH10-02

Date: 2016.12.03

Drawn by: 张秀琴

Checked by: 陈红

Approved by: 陈红

BESTAR SENSORTECH CO., LTD
www.bestarsensor.com li@bestarsensor.com

DRG NO: BS/TEY01.408A  Page: 3 of 8

文件号：BS/QDTE045B
5. Directivity

![Diagram showing directivity in overall sensitivity]

6. Test circuit

Echo & Rest. Resonant Time test circuit

- **OSC**: Oscilloscope
- **P.S**: Power supply (12V DC)
- **S.C.D**: Special circuit diagram
- **U.S**: Ultrasonic Sensor
- **T.G**: Target (750mm x 1200mm baffle)

---

This print and information therein are proprietary to Bestar Sensortech Co., Ltd. and shall not be used in whole or in part without its written consent.
7. Reliability Test

7.1 High temp. life test
Temperature: +85 ± 3°C
Duration: 500hrs

7.2 Low temp. life test
Temperature: -40 ± 3°C
Duration: 500hrs

7.3 Heat Cycle Test
Temperature: +85 ± 3°C 1 hour
-40 ± 3°C 1 hour
Cycles: 100 cycles

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

7.5 Vibration Test
Vibration Frequency: 10~200Hz
Sweep Period: 15 min
Acceleration: 43.12 m/s^2 (4.4 G)
Direction: 3 (x, y, & z)
Time: 96 hours/direction

7.6 Drop test
Height: 1m onto concrete floor
Times: 10 times

7.7 Connector soldering check:
Immersing terminal up to 1 mm below base in soldering bath at 260°C for 10 seconds

Notice:
The variation of the S.P.L at 48 kHz is within 3dB compared with initial figures at 25°C in 24 hours after above test condition.
8. Notice

8.1 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.

8.2 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

8.3 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.

8.4 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.

8.5 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.

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

1) 50 pcs/tray
2) 40 trays/carton
3) 2000 pcs/carton in total
4) carton size: 500X280X340mm
### BPU1640IFAH10-02

#### 10. History change record

<table>
<thead>
<tr>
<th>version No.</th>
<th>Change Items</th>
<th>Date</th>
<th>Drawn</th>
<th>Approved</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td>2016.12.03</td>
<td>邱俊</td>
<td>李红元</td>
</tr>
</tbody>
</table>

This print and information therein are proprietary to Bestar Sensortech Co., Ltd. and shall not be used in whole or in part without its written consent.