# SPECIFICATION FOR DYNAMIC SPEAKER

<table>
<thead>
<tr>
<th>Customer</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer P/N</td>
<td></td>
</tr>
<tr>
<td>BeStar Model Name</td>
<td>SMS1515-08H04 LF</td>
</tr>
<tr>
<td>Product No.</td>
<td>138700</td>
</tr>
<tr>
<td>Issue No.</td>
<td>BS/TES01.529A</td>
</tr>
<tr>
<td>Issue Date</td>
<td>06/01/03</td>
</tr>
</tbody>
</table>

## Approval:

1. Characteristics
2. Drawing
3. Reliability Test
4. Reflow condition
5. Tape on Reel Packing
6. MSL rating and Notice
7. History change record

<table>
<thead>
<tr>
<th>Drawn by</th>
<th>Checked by</th>
<th>Approved by</th>
<th>Customer approved</th>
</tr>
</thead>
<tbody>
<tr>
<td>周庆阳</td>
<td>王善梅</td>
<td>郭敏</td>
<td></td>
</tr>
</tbody>
</table>

For conform to the European Union Directive on the Restriction of Hazardous Substances (RoHS), this type of productions forbid use all the hazardous substances as follow:
- Lead
- Cadmium
- Mercury
- Hexavalent chromium
- Polybrominated biphenyls (PBB)
- Polybrominated diphenyl ethers (PBDE)

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Http:www.be-star.com
E-mail: wu@be-star.com, info@be-star.com
1. Characteristics

1.1 Electrical and Mechanical Characteristics

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dimensions</td>
<td>Please refer to profile drawing</td>
</tr>
<tr>
<td>2</td>
<td>AC Impedance</td>
<td>8 ohm±20% at 2KHz</td>
</tr>
<tr>
<td>3</td>
<td>Resonance Frequency</td>
<td>800±15%Hz</td>
</tr>
<tr>
<td>4</td>
<td>Rated Power</td>
<td>0.5W(2Vrms)</td>
</tr>
<tr>
<td>5</td>
<td>Maximum Power</td>
<td>0.8W(2.53Vrms)</td>
</tr>
<tr>
<td>6</td>
<td>Sound Pressure Level</td>
<td>87±3dB/0.5W/10cm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>at 1k,1.6k,2k,3.2kHz average</td>
</tr>
<tr>
<td>7</td>
<td>Buzzes&amp;Rattles</td>
<td>Must be normal at sine wave 2Vrms</td>
</tr>
<tr>
<td>8</td>
<td>Total Hamonics Distortion</td>
<td>Max.5%</td>
</tr>
<tr>
<td>9</td>
<td>Frequency Response</td>
<td>Refer to the attached figure</td>
</tr>
<tr>
<td>10</td>
<td>Operating Temperature</td>
<td>-30~+85°C</td>
</tr>
<tr>
<td>11</td>
<td>Storage Temperature</td>
<td>-40~+105°C</td>
</tr>
<tr>
<td>12</td>
<td>Weight</td>
<td>~1.5g</td>
</tr>
</tbody>
</table>

1.2 Test Method

Digital Audio Analysis System

Power amplifier

Audio analyzer

Microphone

Speaker

10cm

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1.3 Frequency response

<table>
<thead>
<tr>
<th>Frequency (Hz)</th>
<th>200</th>
<th>1K</th>
<th>2K</th>
<th>5K</th>
<th>10K</th>
<th>20K</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPL (dB)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Drawing

Unit: mm
tolerance: ±0.02
3. Reliability test

3.1 Low Temperature Test
- Temperature: -40°C
- Duration: 240hrs

3.2 High Temperature Test
- Temperature: +105±2°C
- Duration: 240hrs

3.3 Damp Heat
- Temperature: 40±2°C
- Relative Humidity: 90%-95% RH
- Duration: 240hrs

3.4 Room temperature life test
- Temperature: 15~35°C
- Relative Humidity: 25%-85% RH
- Voltage: 2Vrms
- Duration: 240hrs

3.5 Temperature Cycle
- Temperature: -20°C / +40°C
- Temperature Change: 1±2°/min
- Duration at +65°C: 2h (each cycle)
- Duration at -25°C: 2h (each cycle)
- Duration for one cycle: 8h
- Cycles: 10

All these tests above should be measured after leaving normal temperature for 2hrs.

3.6 Drop Test
- Height: 1m (on the concrete floor)
- Direction of drop: 1 each corner, 3 each sides, 6 plain

Notice:
- Sensitivity difference at 1kHz shall be within ±3dB from initial value after test.
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4. Reflow condition

4.1 Reflow Soldering

Preheating: 215°C for 120-150 seconds
Soldering Temperature: 235°C for 30-40 seconds
Peak Soldering Temperature: 260°C max for 10 seconds

4.2 Recommended Land Pattern Dimensions

Unit: mm

Note
1) Land pattern*1
2) Avoid any pattern on the shade area
*2 of PC board is highly recommended

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5. Tape on Reel Packing

5.1 packing drawing

- **Dimensions of carrier tape**

  ![](image1)

  - 4±0.1
  - 2±0.1
  - \(\phi 1.5\)
  - 1.75±0.1
  - 11.5±0.2
  - 24
  - 20±0.1
  - \(\text{min.}\phi 1.5\)

  - 15.5±0.1
  - \(\text{Max.} 5^\circ\)

  - 5.5±0.1

The cover film peel strength force 0.1-0.7N

The cover film peel speed 300mm/min.

- **Dimensions of reel**

  ![](image2)

  - 29 \(\text{Max}\)
  - \(\phi 13±0.2\)
  - \(\phi 100±0.5\)
  - 330 \(\text{Max}\)
  - 400-560 \text{Leader}
  - Components
  - Cover Film
  - 240-280
  - Trailer 160-200

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**Speaker**

SMS1515-08H04 LF

- **Date:** 06/01/03
- **Drawn by:** 王文邦
- **Checked by:** 高 正

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5.2 packing quantity
- 5.21 600pcs/reel
- 5.22 5reel/carton
- 5.23 3000 pcs/carton in total
- 5.24 carton size 38x28x37cm
- 5.25 12carton/tray
- 5.26 tray size 85x77x74cm

6. MSL rating and Notice

**Moisture Sensitivity Level and Floor Life**

<table>
<thead>
<tr>
<th>Level</th>
<th>Floor Life(out of bag) at Factory Ambient ≤30°C/85% RH or as Stated</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>168 hours</td>
</tr>
</tbody>
</table>

6.1 The products mustn’t be washed

6.2 Storage Condition
The products should be stored in the room, where the temperature/humidity is stable. And avoid such places where there are large temperature changes.

Please store the products at the following conditions:
- Temperature: -10 to +40°C
- Humidity: 15 to 85% R.H.

6.3 Expire Date on Storage
Expire date (Shelf life) of the products is six months after delivered under the conditions of a sealed and an unopened package. Please use the products within six months after delivered.

If you store the products for a long time (more than six months), use carefully because the products may be degraded in the solderability and/or rusty. Please confirm solderability and characteristics for the products regularly.

6.4 Notice on Product Storage
1. Please do not store the products in a chemical atmosphere (Acids, Alkali, Bases, Organic gas, Sulfides and so on), because the characteristics may be reduced at quality, and/or be degraded in the solderability due to the storage in a chemical atmosphere.
2. Please use the products immediately after the package is opened, because the characteristics may be reduced at quality, and/or be degraded in the solderability due to storage under the poor condition.
3. Please do not drop the products to avoid cracking of ceramic element.

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**A**

<table>
<thead>
<tr>
<th>Date</th>
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<th>SMS1515-08H04 LF</th>
<th>Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>06/01/03</td>
<td>周庆阳</td>
<td>DRG NO: BS/TES01.529A</td>
<td><a href="http://www.be-star.com">www.be-star.com</a> <a href="mailto:wu@be-star.com">wu@be-star.com</a></td>
</tr>
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</table>

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### SMS1515-08H04 LF

7. History change record

<table>
<thead>
<tr>
<th>version No.</th>
<th>Change Items</th>
<th>Date</th>
<th>Drawn</th>
<th>Approved</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Before</td>
<td>After</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td></td>
<td>06/1/3</td>
<td>周庆阳</td>
<td>郭敏</td>
</tr>
</tbody>
</table>

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**SMS1515-08H04 LF**

**Date:** 06/01/03

**Drawn by:** 周庆阳

**Checked by:** 王善梅

**Approved by:** 郭敏

**Speaker**

**BESTAR ELECTRONICS INDUSTRY CO., LTD**

**D/R/NO.:** BS/TEL01.529A

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