

## 常州华龙电子有限公司

## SPECIFICATION FOR APPROVAL

## 规格承认书

|                            |                         |
|----------------------------|-------------------------|
| Customer<br>客户:            |                         |
| Customer Part No.<br>客户型号: |                         |
| PART NO.<br>产品型号:          | HDK-151008RA-1W5        |
| FUNCTION.<br>产品功能          | WATERPROOF TYPE SPEAKER |
| SPEC. NO.<br>规格书号:         | DSS056-2014             |

| Drawn by<br>制作     | Checked by<br>审核  | Approved by<br>批准 | Customer approved<br>客户承认 |
|--------------------|-------------------|-------------------|---------------------------|
| Lily<br>2014-04-15 | 曹丽萍<br>2014-04-15 | 王台平<br>2014-04-15 |                           |

Our products meet the latest RoHS compliance

我司生产产品均符合欧盟 RoHS 最新要求



ISO 9001 Certified

总公司地址: 台北市北投区中央南路 2 段 33 号 3 楼

大陆分公司地址: 中国江苏省常州市新北区电子园新四路 36 号

一厂: 江苏省常州市新北区电子园新四路 36 号

二厂: 江苏省常州市溧阳市社渚经济开发区社农路 1 号

电话: +86-519-85106698 85111259 85110078

传真: +86-519-85101081 85107616

网址: [www.dshualong.com](http://www.dshualong.com)

**Approval 承認內容:**

1. History change record 变更记录
2. Characteristics 技术参数
3. Typical Frequency Response Curve 频率曲线
4. Dimension 外观尺寸
5. Reliability Test 可靠性测试

**1. History change record**

| Change Items | Date       | Note        | Drawn by | Checked by        |
|--------------|------------|-------------|----------|-------------------|
|              | 2014-04-15 | First Issue | Lily     | 王台平<br>2014-04-15 |
|              |            |             |          |                   |
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## 2. Characteristics

### 2.1 Electrical and Mechanical Characteristics

| ITEM |                            | SPECIFICATIONS                                                                                                |                                  |
|------|----------------------------|---------------------------------------------------------------------------------------------------------------|----------------------------------|
| 01   | Type                       | Dynamic speaker                                                                                               |                                  |
| 02   | Dimension                  | External diameter 15*10 mm                                                                                    |                                  |
| 03   | Rated Input Power          | 0.3W (Long Time)                                                                                              |                                  |
| 04   | Max. Input Power           | 0.5W for 1 minute                                                                                             |                                  |
| 05   | Impedance                  | 8 ohm $\pm$ 15% at 2000Hz.                                                                                    |                                  |
| 06   | Resonance Frequency (Fo)   | Fo at 1100Hz $\pm$ 20% @ 1V                                                                                   |                                  |
| 07   | Sensitivity (S.P.L.)       | 86dB (0.1W / 0.1m) $\pm$ 3 dB                                                                                 | atAVE, 1.0K, 1.2K, 1.5K, 2.0KHz. |
|      |                            | 90dB (0.3W / 0.1m) $\pm$ 3 dB                                                                                 |                                  |
| 08   | Frequency Range            | Fo - 20KHz                                                                                                    |                                  |
| 09   | Total Harmonics Distortion | Max 8 % at 1 KHz, 0.3W.                                                                                       |                                  |
| 10   | Voice Coil                 | Diameter 6.0mm                                                                                                |                                  |
| 11   | Magnet                     | Rare earth permanent (Nd-Fe-B) magnet $\Phi$ 5.5 x1.3mm                                                       |                                  |
| 12   | Weight                     | 1.0g $\pm$ 0.2g                                                                                               |                                  |
| 13   | Appearance                 | Should not exist any obstacle to be harmful to normal operation; damages, cracks, rusts and distortions, etc. |                                  |
| 14   | Operation Test             | Must be normal at program source - 0.3W                                                                       |                                  |
| 15   | Buzz, Rattle, etc.         | Should not be audible at 1.56V sine Wave between Fo to 20KHz                                                  |                                  |
| 16   | Polarity                   | When positive voltage is applied to the terminal marked (+), diaphragm should move to the front.              |                                  |
| 17   | Terminal Strength          | Capable of withstand 1kg load for 30 seconds without resulting in any damage or rejection.                    |                                  |
| 18   | Temperature                | Operating temperature: -20°C to +70°C                                                                         |                                  |
|      |                            | Storage temperature: -30°C to +80°C                                                                           |                                  |

### 2.2. MEASURING METHOD

Test Condition

#### A. STANDARD

Temperature : 15 ~ 35°C

Relative humidity : 25% ~ 85%,

Atmospheric pressure : 860mbar to 1060mbar.

Atmospheric pressure : 860mbar to 1060mbar.

## B. BASIC

Temperature :  $20 \pm 3^{\circ}\text{C}$

Relative humidity : 60% ~ 70%,

Atmospheric pressure : 860mbar to 1060mbar

## C. Standard Test Fixture

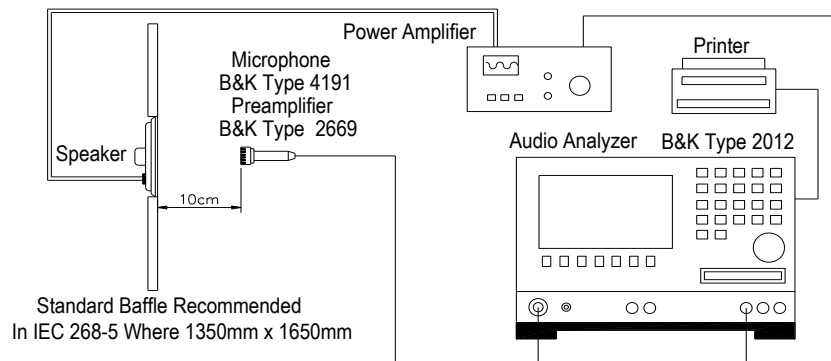
1. Input Power : 0.3W ( 1.56V )

2. Zero Level : -dB

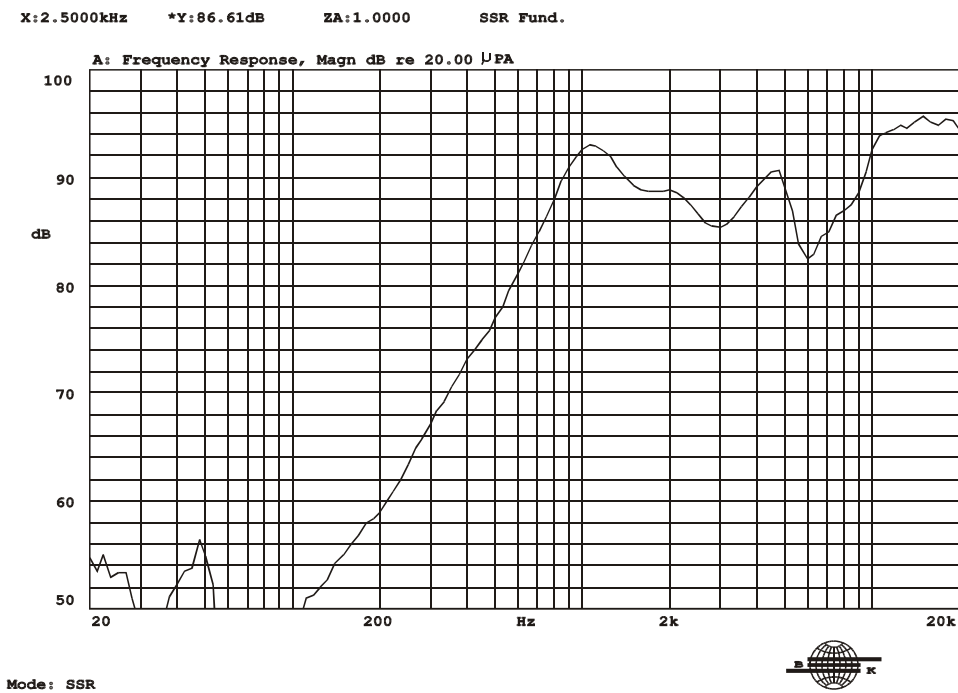
3. Mode : SPEAKER

4. potentiometer Range : 50dB

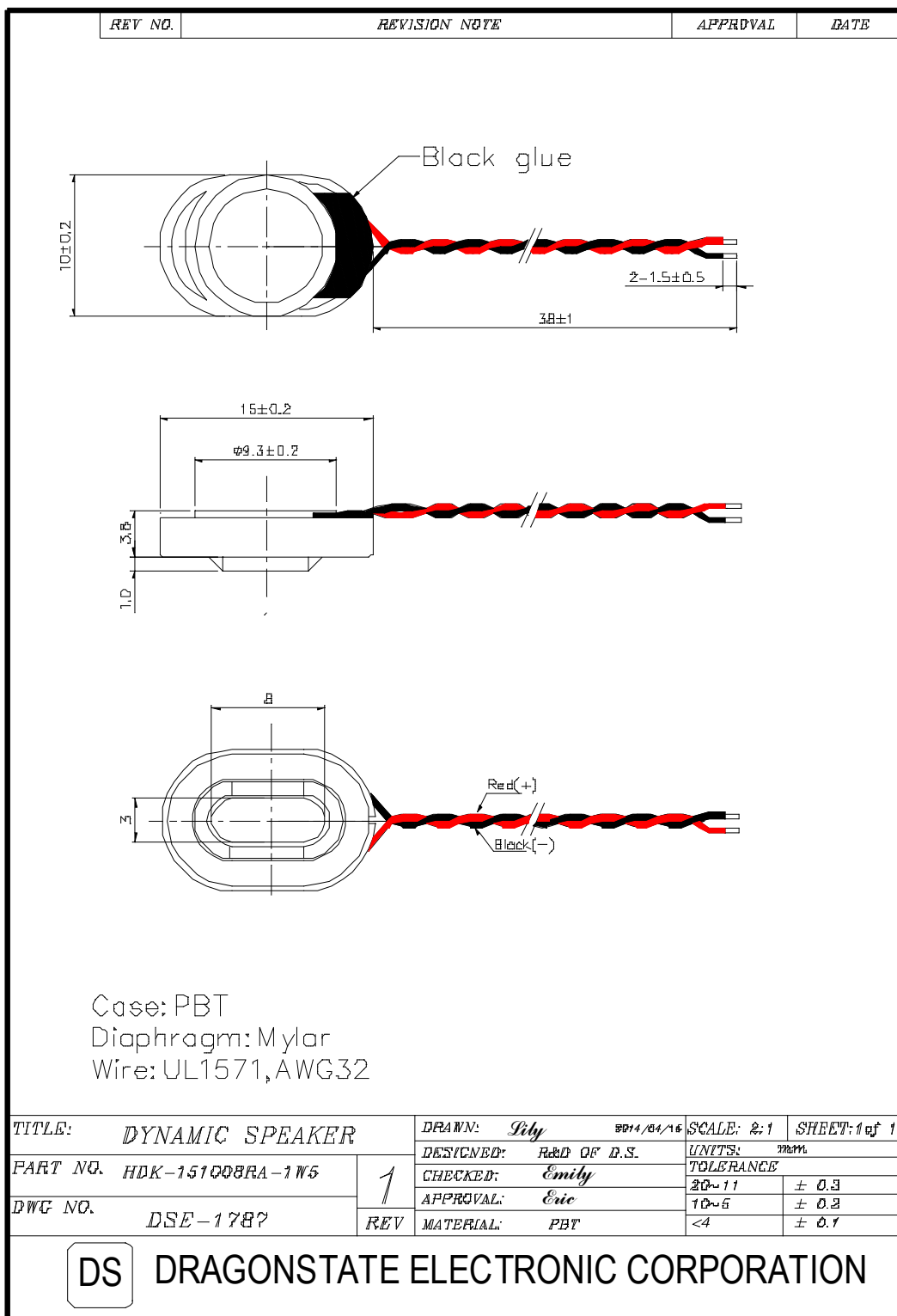
5. Sweep Time : 0.5sec



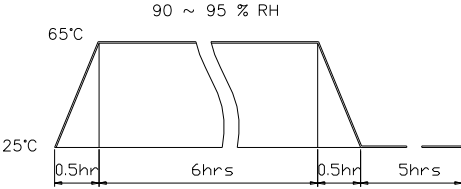
## 3. FrequencyResponse Curve



#### 4. Dimension



**5. Reliability test**

| Items.                                                                                                  |                            | Specifications                                                                                                                                                                        |
|---------------------------------------------------------------------------------------------------------|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 01                                                                                                      | High temp. Test            | Keep 96 hours at $+80^{\circ}\text{C} \pm 3^{\circ}\text{C}$ and leave 3 hours in normal temperature and then check                                                                   |
| 02                                                                                                      | Low temp. Test             | Keep 96 hours at $-30^{\circ}\text{C} \pm 3^{\circ}\text{C}$ and leave 3 hours in normal temperature and then check                                                                   |
| 03                                                                                                      | Humidity test              | Keep 96 hours at $+60^{\circ}\text{C} \pm 3^{\circ}\text{C}$ relative humidity 95% and leave 3 hours in normal temperature and then checked.                                          |
| 04                                                                                                      | Temp./Humidity cycle       | <p>The part shall be subjected 5 cycles. One cycle shall be 12 hours and consist of;</p>            |
| 05                                                                                                      | Thermal cycle test.        | Low temperature: $-30^{\circ}\text{C} \pm 3^{\circ}\text{C}$ , temperature: $+70^{\circ}\text{C} \pm 3^{\circ}\text{C}$ , cycle: 1 hour/cycle each, and then keep 5 cycles in a room. |
| 06                                                                                                      | Vibration                  | 10~200~10Hz sin-wave sweep 15min. 5G(constant)<br>X,Y, Z 3 direction. 2 hours each, total 6 hours.                                                                                    |
| 07                                                                                                      | Fix drop test              | Fix on jig. Then drop from 152cm height to the concrete floor<br>X, y, z 6 direction. 5 times each, total 30 times.                                                                   |
| 08                                                                                                      | Free drop test             | Free drop from 100cm height to the concrete floor<br>X, y, z 6 direction. 1 times each, total 6 times.                                                                                |
| 09                                                                                                      | Rated Power test           | Rated Power white noise is applied for 96 hours                                                                                                                                       |
| 10                                                                                                      | Max Power test             | Max power 1 min on - 2 min off 10 cycles.                                                                                                                                             |
| 11                                                                                                      | Terminal strength test     | Capable of withstand 1kg load for 30 seconds without resulting in any damage or rejection.                                                                                            |
| 12                                                                                                      | Protection against liquids | Protected against 2 hours of immersion under 7M pressure<br>Product without leakage                                                                                                   |
| 13                                                                                                      | High impact test           | Product loaded 165g, to be drop free into the water from the height of 3m.                                                                                                            |
| <p>Criterion:</p> <p>After these test , the change of S.P.L shall be within <math>\pm 3</math> dB .</p> |                            |                                                                                                                                                                                       |

**SOLDERING CONDITION**

Recommend using branding iron at 30W, and at temperature range  $350^{\circ}\text{C}$ .

Soldering time not over 2 seconds.