

MESSRS.

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## SPECIFICATION FOR APPROVAL

### 承 认 书

Product	DYNAMIC SPEAKER
Part No.	HDK-2008EA-2 (RoHS)
Customer Approval	

Approved By	Checked By	Made By
王台平 APR-08-2016	曹丽萍 APR-08-2016	LILY APR-08-2016

常 州 华 龙 电 子 有 限 公 司

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EDITION:1.1

## 1. Specification

**HDK-2008EA-2(RoHS)**

ITEM		SPECIFICATIONS	
01	Type	Dynamic speaker	
02	Dimension	External diameter 20 mm	
03	Rated Input Power	0.5W	
04	Max. Input Power	0.8W	
05	Impedance	8 ohm $\pm$ 15% at 1500Hz.	
06	Resonance Frequency (Fo)	550Hz $\pm$ 20% at Fo, 1V	
07	Sensitivity (S.P.L.)	92dB (0.5W / 0.1m) $\pm$ 3 dB	at AVE 1.0K 1.2K 1.5K 2.0KHz.
08	Frequency Range	Fo – 20KHz	
09	Total Harmonics Distortion	Max 8 % at 1 KHz, 0.5W.	
10	Voice Coil	Diameter 8.7 mm	
11	Magnet	Rare earth permanent (Nd-Fe-B) magnet $\Phi$ 8.2 x 1.4 mm	
12	Weight	2.5g $\pm$ 0.5g	
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 – 0.5W	
15	Buzz, Rattle, etc.	Should not be audible at 2.0V 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 +60°C  Storage temperature: -30°C to +70°C	

## 2-1. Test Condition

### Standard

Temperature : 15 ~ 35℃

Relative humidity : 25% ~ 85%,

Atmospheric pressure : 860mbar to 1060mbar.

### Basic

Temperature : 20±3℃

Relative humidity : 60% ~ 70%,

Atmospheric pressure : 860mbar to 1060mbar

## 2-2. Standard Test Fixture

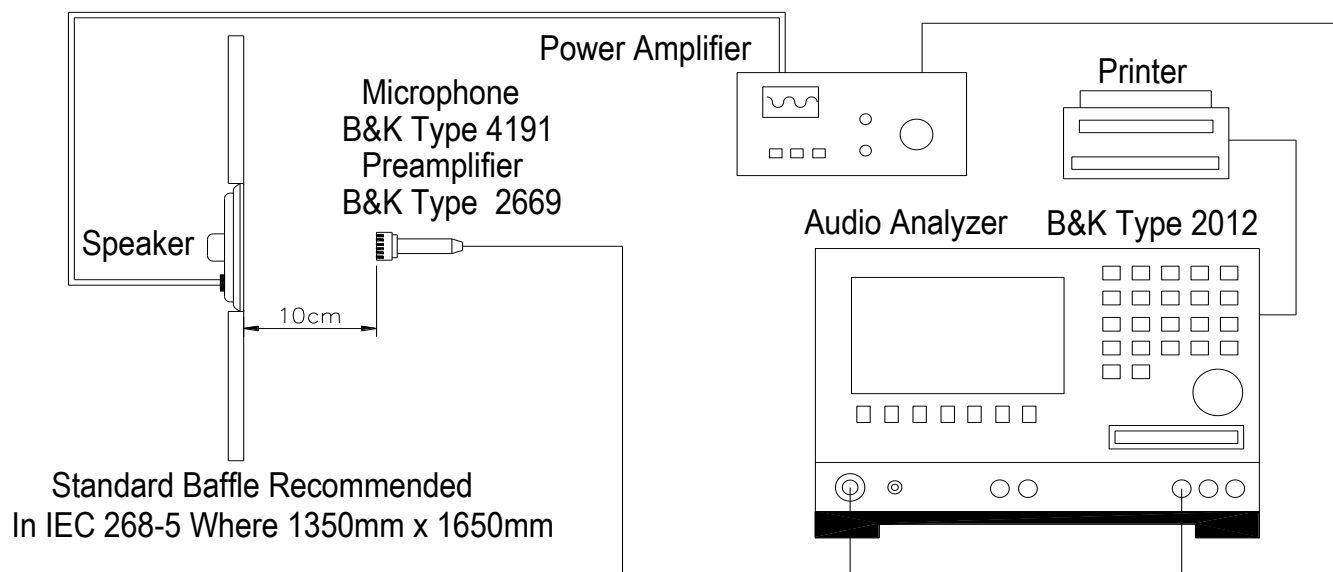
1. Input Power : 0.5W ( 2.0V )

2. Zero Level : -dB

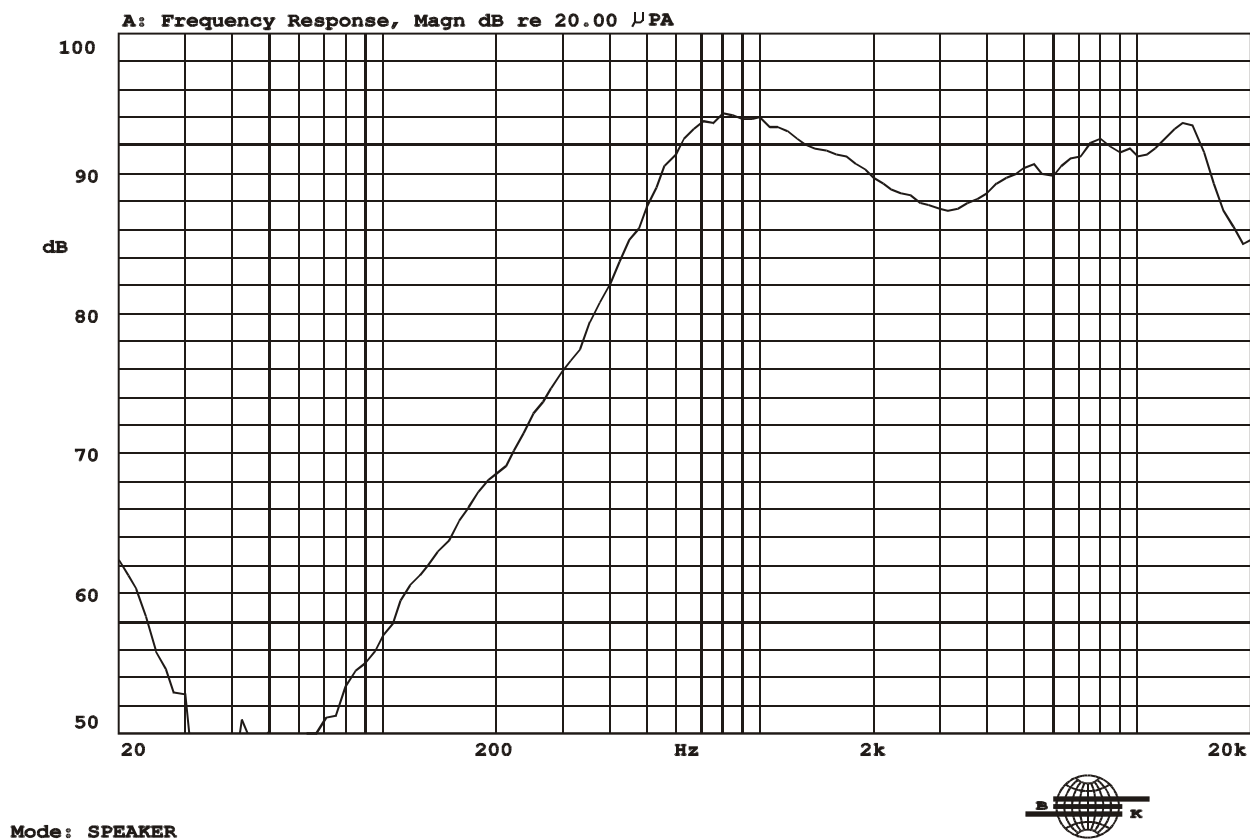
3. Mode : SPEAKER

4. potentiometer Range : 50dB

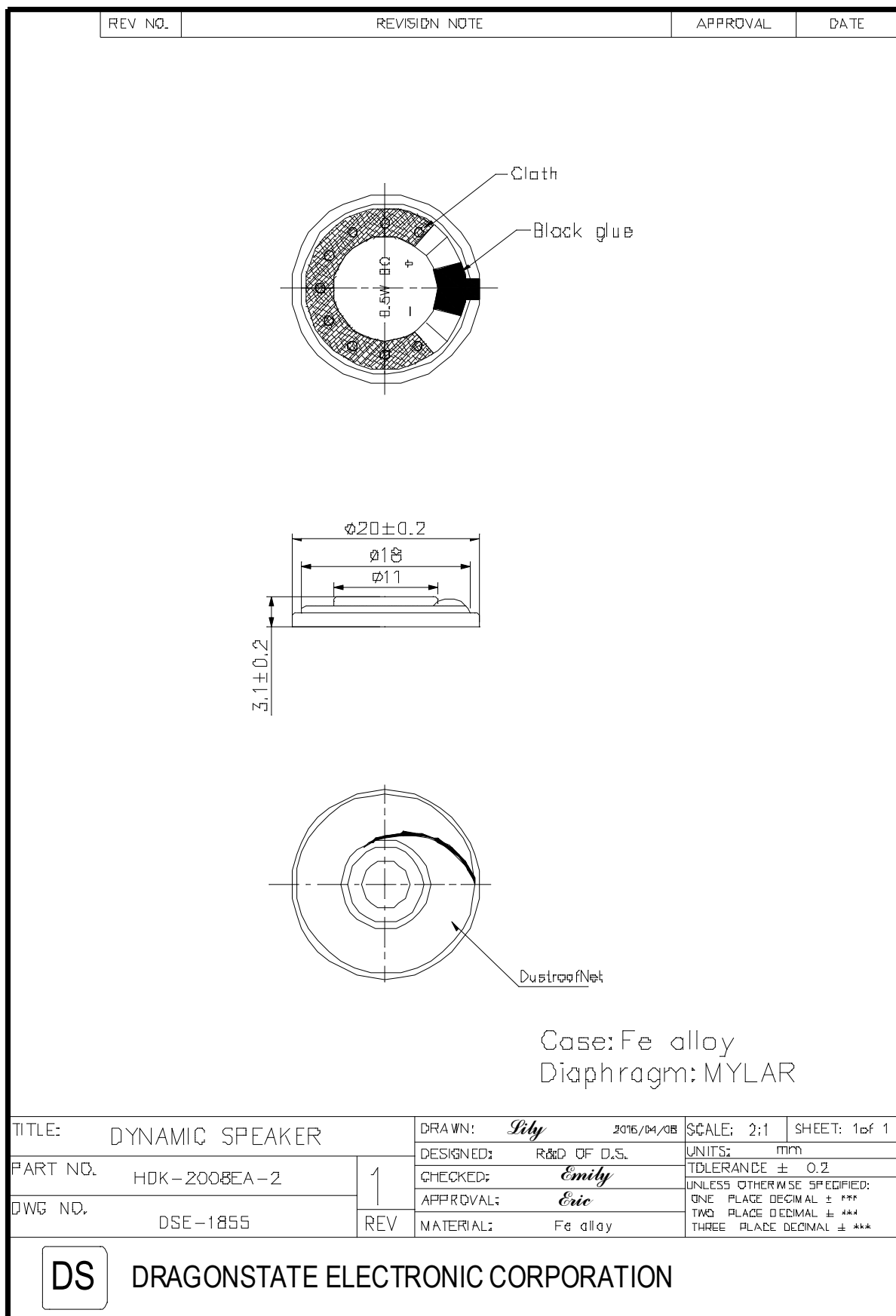
5. Sweep Time : 0.5sec



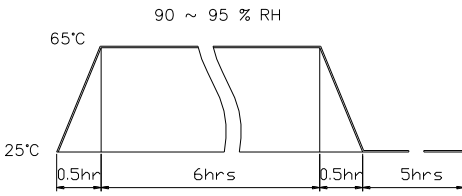
## 2-3.Frequency Response Curve



### 3.Dimension



#### 4. Reliability Tests


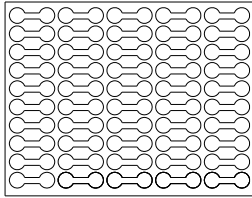
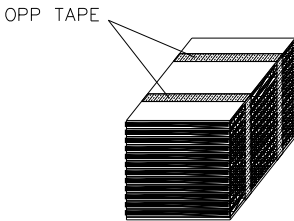
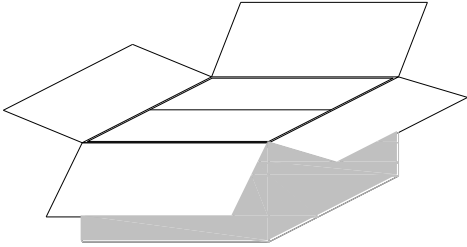
Items.		Specifications
01	High temp. Test	Keep 96 hours at $+70^{\circ}\text{C} \pm 3^{\circ}\text{C}$ and leave 3 hours in normal temperature and then check
02	Low temp. Test	Keep 96 hours at $-30^{\circ}\text{C} \pm 3^{\circ}\text{C}$ and leave 3 hours in normal temperature and then check
03	Humidity 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) 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 X,y, z 6 direction. 5 times each, total 30 times.
08	Free drop test	Free drop from 100cm height to the concrete floor 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.
Criterion: After these test , the change of S.P.L shall be within $\pm 3$ dB .		

#### Soldering Condition

Recommend using constant branding iron in 15 ~ 30W, and in temperature range  $350 \pm 10^{\circ}\text{C}$ .

Soldering time not over 3 seconds.

## 5.Packing

REV NO.	REVISION NOTE	APPROVAL	DATE
<div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;">  <p>Cover(350*290*5mm) Material: Paper</p> </div> <div style="text-align: center;">  <p>Box(350*290*15mm) 100pcs Material: Paper+Epe</p> </div> </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 20px;"> <div style="text-align: center;">  <p>OPP TAPE</p> </div> <div style="text-align: center;"> <p>Middle(350*290*180mm) 1000pcs(10*100pcs) Material: Paper+Epe</p> </div> </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 20px;"> <div style="text-align: center;">  </div> <div style="text-align: center;"> <p>Outer Box(490*360*350mm) 5000pcs(5*1000pcs) Material: Paper</p> </div> </div> <div style="text-align: right; margin-top: 20px;"> <p>单位: mm</p> </div>			
TITLE: packing		DRAWN: <i>Lily</i> 2013/12/06 SCALE: 2:1 SHEET: 1 of 1	
PART NO.	1	DESIGNED: R&D OF D.S. UNITS: mm	
DWG NO.		CHECKED: <i>Emily</i> TOLERANCE	
		APPROVAL: <i>Eric</i> 20~11 ± 0.3	
REV		MATERIAL: ***	10~5 ± 0.2
			<4 ± 0.1
<div style="display: flex; align-items: center; justify-content: center;"> <div style="border: 1px solid black; padding: 2px 5px; margin-right: 10px;">DS</div> <div>DRAGONSTATE ELECTRONIC CORPORATION</div> </div>			