

*MESSRS.*

## SPECIFICATION FOR APPROVAL

## 承 認 书

Product	DYNAMIC SPEAKER
Part No.	HDK-4004BB-2P (RoHS)
Customer	
Customer Part No.	

Approved By	Checked By	Made By
王台平 APR-28-2017	曹丽萍 APR-28-2017	LILY APR-28-2017

常州华龙电子有限公司

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## 1. Specification

HDK-4004BB-2P (RoHS)

ITEM		SPECIFICATIONS	
01	Type	Dynamic speaker	
02	Dimension	External diameter 40 mm	
03	Rated Input Power	2.0W	
04	Max. Input Power	2.2W for 1 minute	
05	Impedance	4 ohm $\pm$ 15% at 1000Hz.	
06	Resonance Frequency (Fo)	460Hz $\pm$ 20% at Fo, 1V	
07	Sensitivity (S.P.L.)	87dB (1W /1m) $\pm$ 2dB	at AVE 0.8, 1.0, 1.2, 1.5 KHz
08	Frequency Range	Fo - 4.5KHz	
09	Total Harmonics Distortion	Max 8 % at 1 KHz, 2.0W.	
10	Dustproof and Waterproof	IP54	
11	Voice Coil	Diameter 13.3 mm	
12	Magnet	Rare earth permanent (Nd-Fe-B) magnet $\Phi$ 12.5x1.5 mm	
13	Weight	9.0g $\pm$ 0.5g	
14	Appearance	Should not exist any obstacle to be harmful to normal operation; damages, cracks, rusts and distortions, etc.	
15	Operation Test	Must be normal at program source - 2.0W	
16	Buzz, Rattle, etc.	Should not be audible at 2.53V sine Wave between Fo to 20KHz	
17	Polarity	When positive voltage is applied to the terminal marked (+), diaphragm should move to the front.	
18	Terminal Strength	Capable of withstand 1kg load for 30 seconds without resulting in any damage or rejection.	
19	Temperature	Operating temperature: -20°C to +60°C Storage temperature: -30°C to +70°C	

## 2-1. Test Condition

### Standard

Temperature : 15 ~ 35°C

Relative humidity : 25% ~ 85%,

Atmospheric pressure : 860mbar to 1060mbar.

### Basic

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

Relative humidity : 60% ~ 70%,

Atmospheric pressure : 860mbar to 1060mbar

## 2-2. Standard Test Fixture

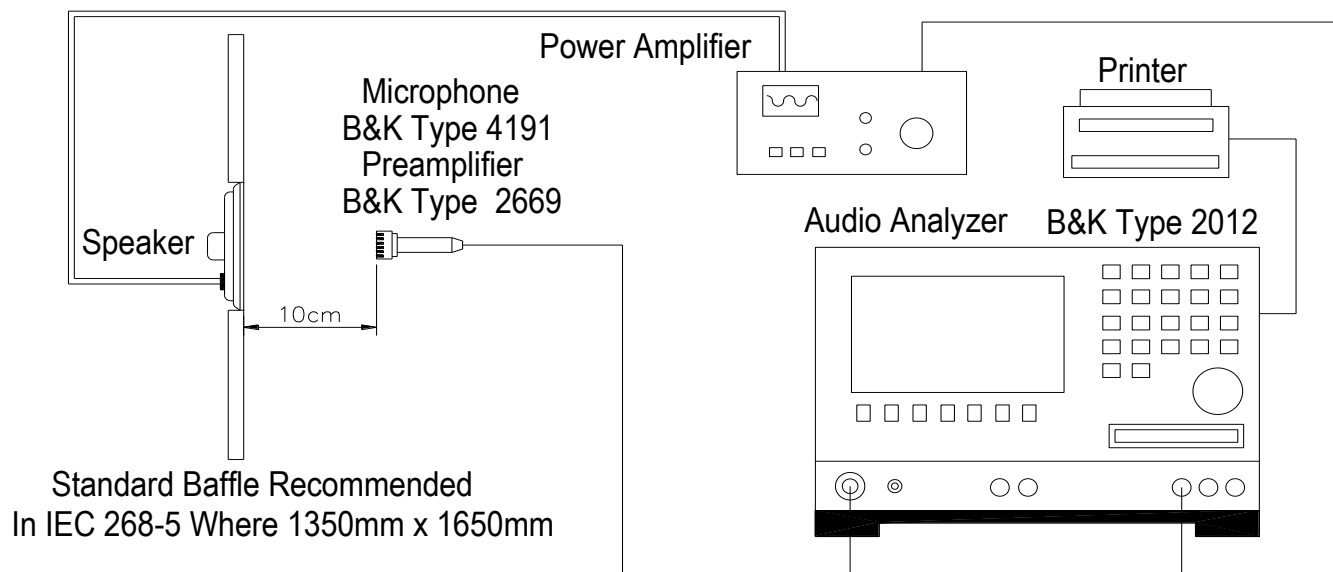
1. Input Power : 1.0W ( 2.53V )

2. Zero Level : -dB

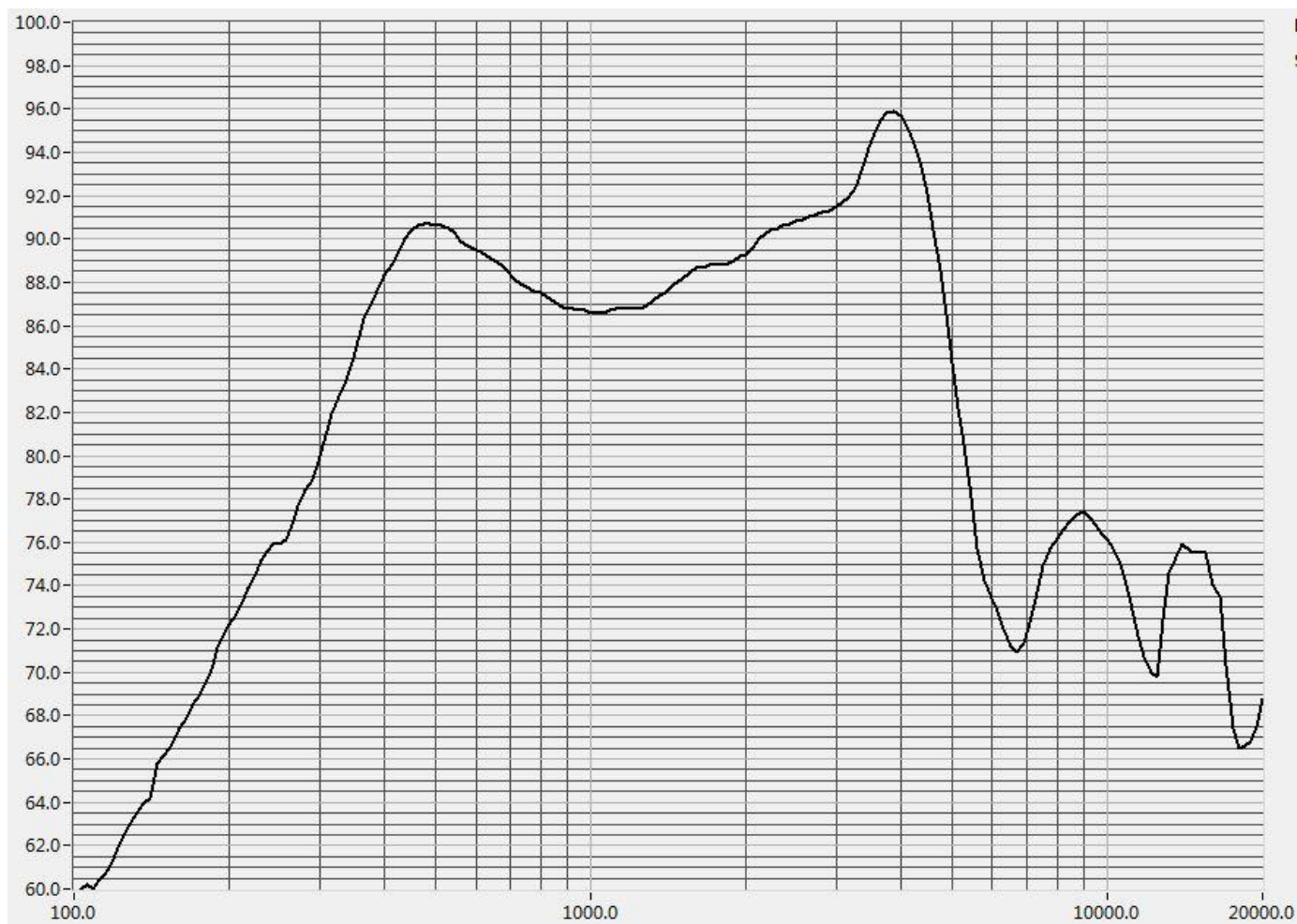
3. Mode : SPEAKER

4. potentiometer Range : 50dB

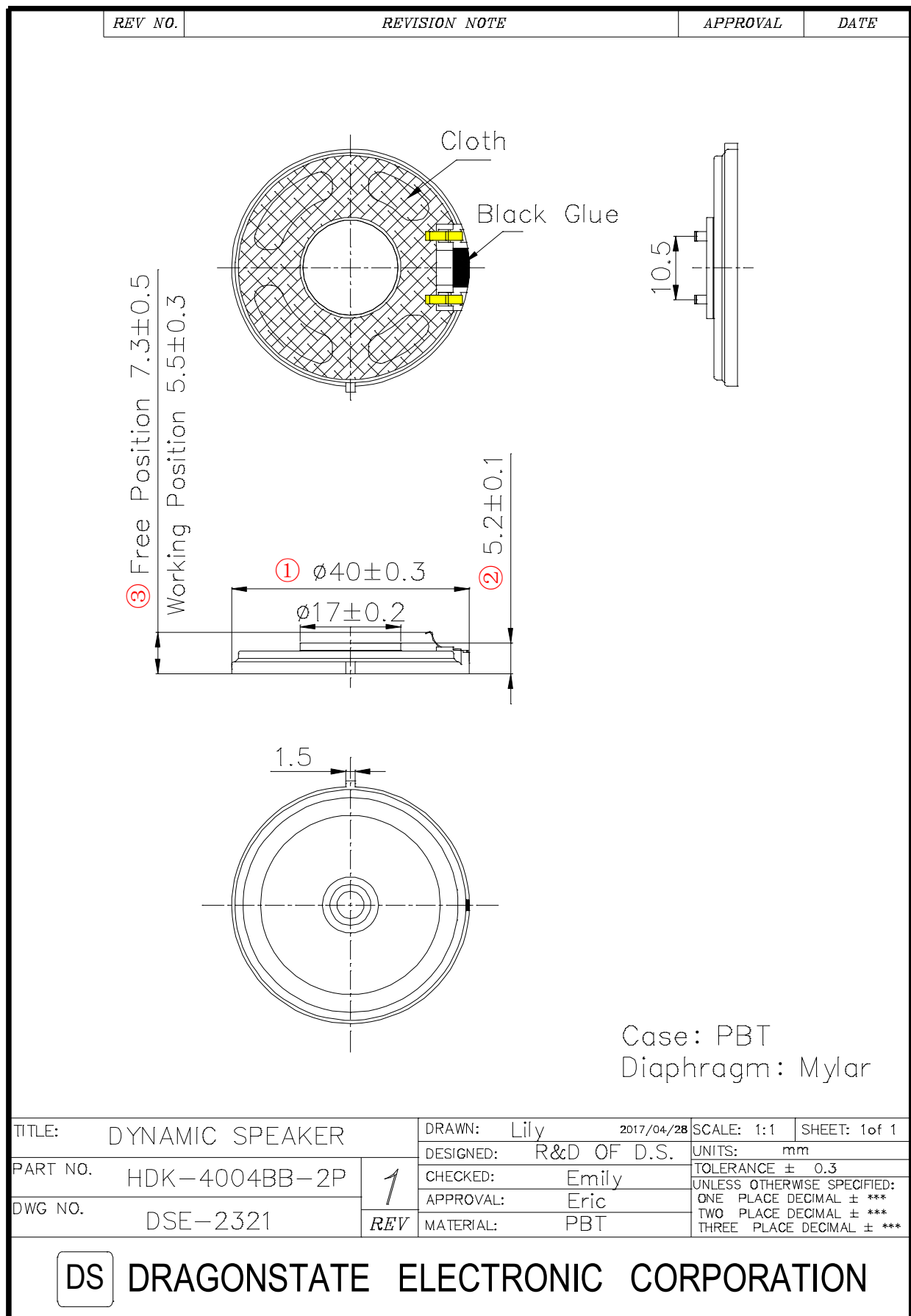
5. Sweep Time : 0.5sec



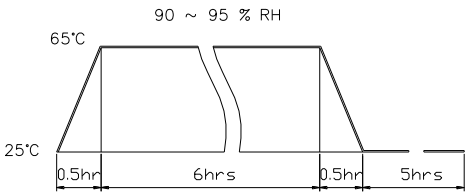
## 2-3. Frequency Response Curve



### 3. Dimension



#### 4. Reliability Tests


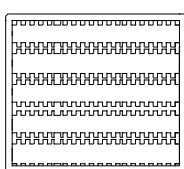
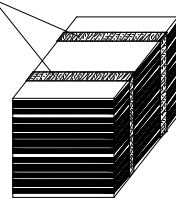
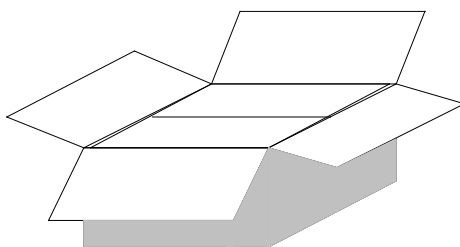
Items.		Specifications
01	High temp. Test	Keep 96 hours at $+70^{\circ}\text{C} \pm 3^{\circ}\text{C}$ and leave 3 hours in normal temperature and then check
02	Low temp. Test	Keep 96 hours at $-30^{\circ}\text{C} \pm 3^{\circ}\text{C}$ and leave 3 hours in normal temperature and then check
03	Humidity test	Keep 96 hours at $+40^{\circ}\text{C} \pm 3^{\circ}\text{C}$ 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.
12	Protection against liquids	The water flow is 10L/min, per square meter 1min product without leakage
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-between; align-items: center;"> <div style="text-align: center;">  </div> <div> <p>Cover(250*240*12mm) Material: Eps</p> </div> </div> <div style="text-align: center; margin: 10px 0;">↓</div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">  </div> <div> <p>Box(250*240*45mm) 50pcs Material: Eps</p> </div> </div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;"> <p>OPP TAPE</p>  </div> <div> <p>Middle(375*275*260mm) 250pcs(5*50pcs) Material: Eps</p> </div> </div> <div style="text-align: center; margin: 10px 0;">↓</div> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">  </div> <div> <p>Outer Box(500*270*280mm) 500pcs(2*250pcs) Material: Paper</p> </div> </div>			
单位: mm			
TITLE: packing		DRAWN: Lily 2013/12/06	
PART NO.		DESIGNED: R&D OF D.S.	
		CHECKED: Emily	
DWC NO.		APPROVAL: Eric	
		MATERIAL: ***	
<div style="border: 1px solid black; padding: 5px; display: inline-block;">DS</div> <div style="display: inline-block; vertical-align: middle;"> <div style="font-size: 2em; font-weight: bold; margin-right: 5px;">1</div> <div style="font-size: 0.8em;">REV</div> </div>		SCALE: 2:1	
		SHEET: 1 of 1	
		UNITS: mm	
		TOLERANCE	
		20~11	± 0.3
		10~5	± 0.2
		<4	± 0.1
<div style="border: 1px solid black; padding: 5px; display: inline-block; margin-right: 10px;">DS</div> <div style="font-size: 1.2em; font-weight: bold;">DRAGONSTATE ELECTRONIC CORPORATION</div>			