

MESSRS.**SPECIFICATION FOR APPROVAL****承 认 书**

Product	DYNAMIC SPEAKER
Part No.	HDK-121008ZA-3-FPC (RoHS)
Customer Approval	

Approved By	Checked By	Made By
王台平 SEP-12-2024	曹丽萍 SEP-12-2024	LILY SEP-12-2024

常 州 华 龙 电 子 有 限 公 司

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EDITION:1.1

HISTORY CHANGE RECORD

Change Items	Date	Note	Drawn by	Checked by
	2024-09-12	First Issue	Lily 2024-09-12	王台平 2024-09-12
手撕柄方向更改	2025-03-13	Second Issue	Lily 2025-03-13	王台平 2025-03-13

1. SPECIFICATION

HDK-121008ZA-3-FPC (RoHS)

ITEM		SPECIFICATIONS	
01	Type	Dynamic speaker	
02	Dimension	External diameter 20*14 mm	
03	Rated Input Power	0.058W in 5CC Box	
04	Max. Input Power	0.7W for 1 minute	
05	Impedance	6.5 ohm $\pm$ 10% at 2K Hz	
06	Resonance Frequency (Fo)	740 $\pm$ 100Hz at Fo, 0.59V n 5CC Box	
07	Sensitivity (S.P.L.)	73dB(0.59V/0.1m) $\pm$ 3 dB 85dB at EQ/0.1m $\pm$ 3 dB 92dB at EQ/0.1m $\pm$ 3 dB	At 300Hz At 500Hz At 2KHz
08	Frequency Range	Fo – 20K Hz	
09	Weight	0.83 $\pm$ 0.3g	
10	Total Harmonics Distortion	Max. 10% at 1K Hz ,0.058W.	
11	Appearance	Should not exist any obstacle to be harmful to normal operation; damages, cracks, rusts and distortions, etc.	
12	Operation Test	Must be normal at program source 0.058W	
13	Buzz, Rattle, etc.	Should not be audible at 1.4V sine Wave between 100 to 1KHz	
14	Polarity	When positive voltage is applied to the terminal marked (+), diaphragm should move to the front.	
15	Terminal Strength	Capable of withstand 1kg load for 30 seconds without resulting in any damage or rejection.	
16	Temperature	Operating temperature: -20℃ to +70℃ Storage temperature: -40℃ to +85℃	

2.MEASURING METHOD

2-1 .Test Condition

STANDARD

Temperature : 15 ~ 35℃

Relative humidity : 45% ~ 85%,

Atmospheric pressure : 860mbar to 1060mbar.

JUDGEMENT

Temperature : 20±3℃

Relative humidity : 60% ~ 70%,

Atmospheric pressure : 860mbar to 1060mbar

2-2 . Standard Test Fixture

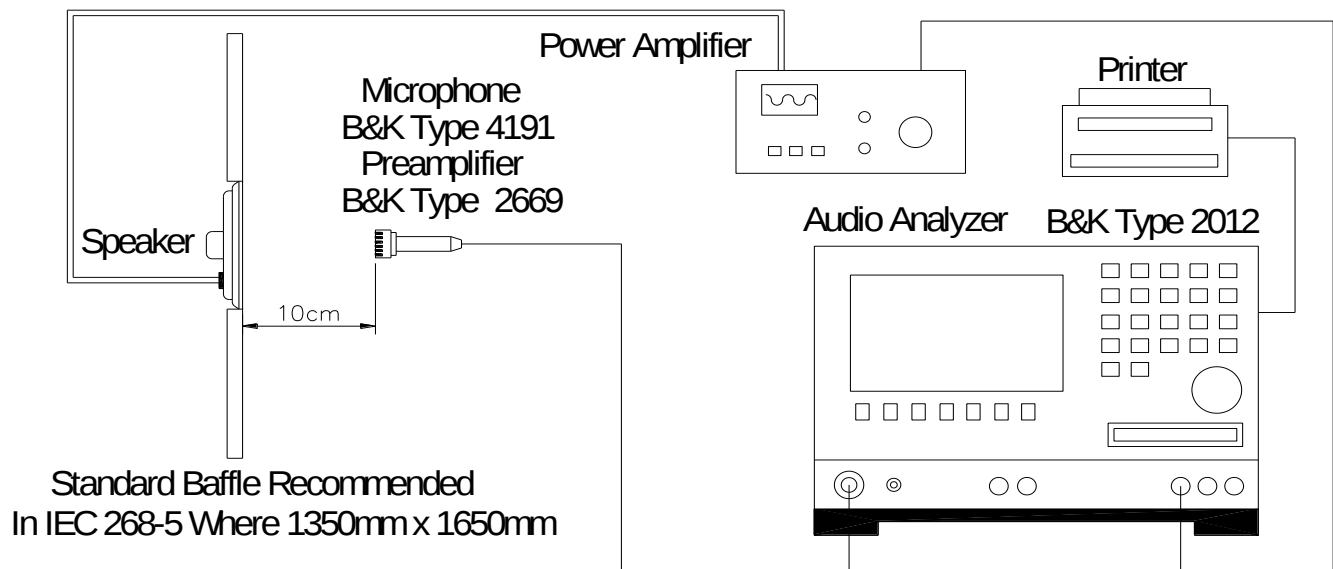
1.Input Power : 0.058W(0.59V)

2.Zero Level : -dB

3.Mode : SPEAKER

4.potentiometer Range : 50dB

5.Sweep Time : 0.5sec



2-3. Frequency Response Curve

Table 1 0.59V Tolerance Limits Data for FR

upper LIMITS			lower LIMITS	
200	59		200	52.5
300	66		300	59.5
500	76		500	69.5
710	83		710	77
800	84		800	78
900	85		900	78.5
1000	84		1000	78
1500	82		1500	76
2000	81		2000	75.3
3000	81		3000	74.5
5000	79		5000	73
6000	80		6000	74
10000	83		10000	77

Figure 1 Typical FR in 0.59V Tolerance Window

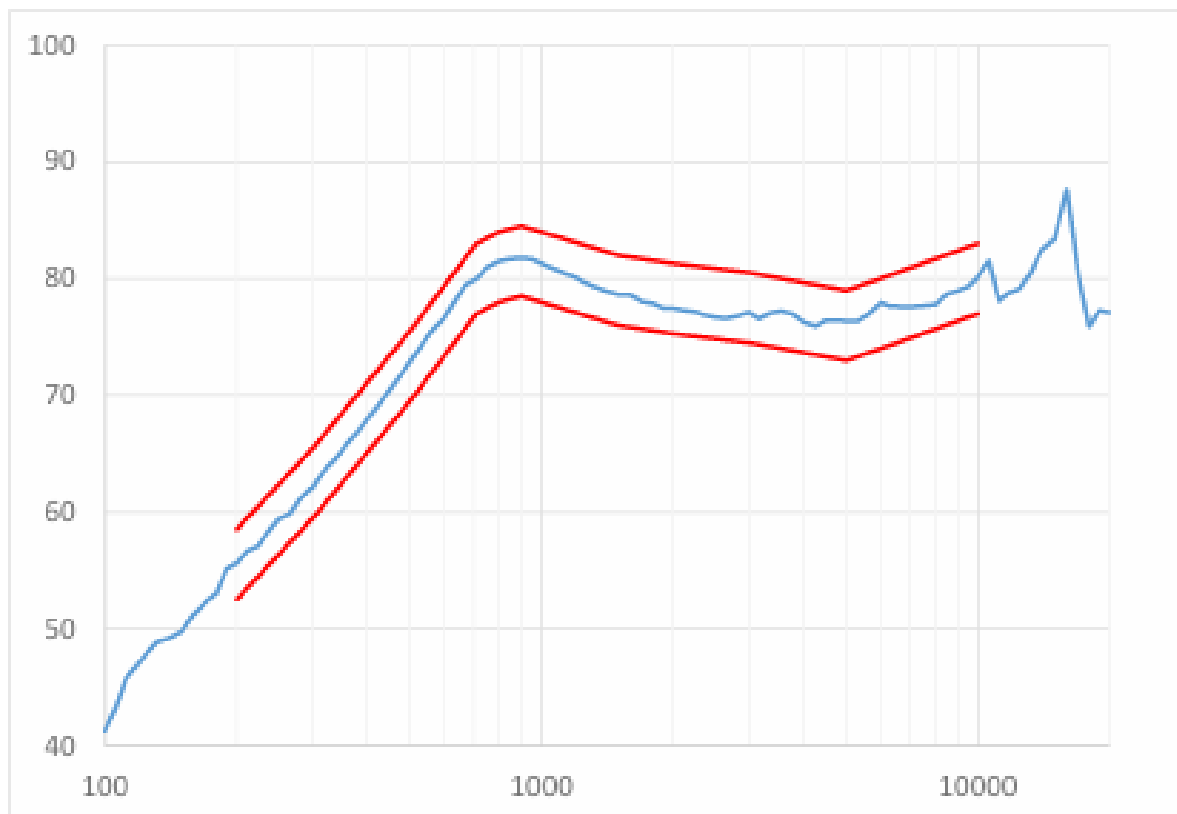


Table 2 0.59V Tolerance Limits Data for THD2-5

Frequency(Hz)	Limit (%)
200	16
500	16
800	10
1000	8
2000	3
10000	3

Figure 2 Typical THD2-5 in Tolerance Window

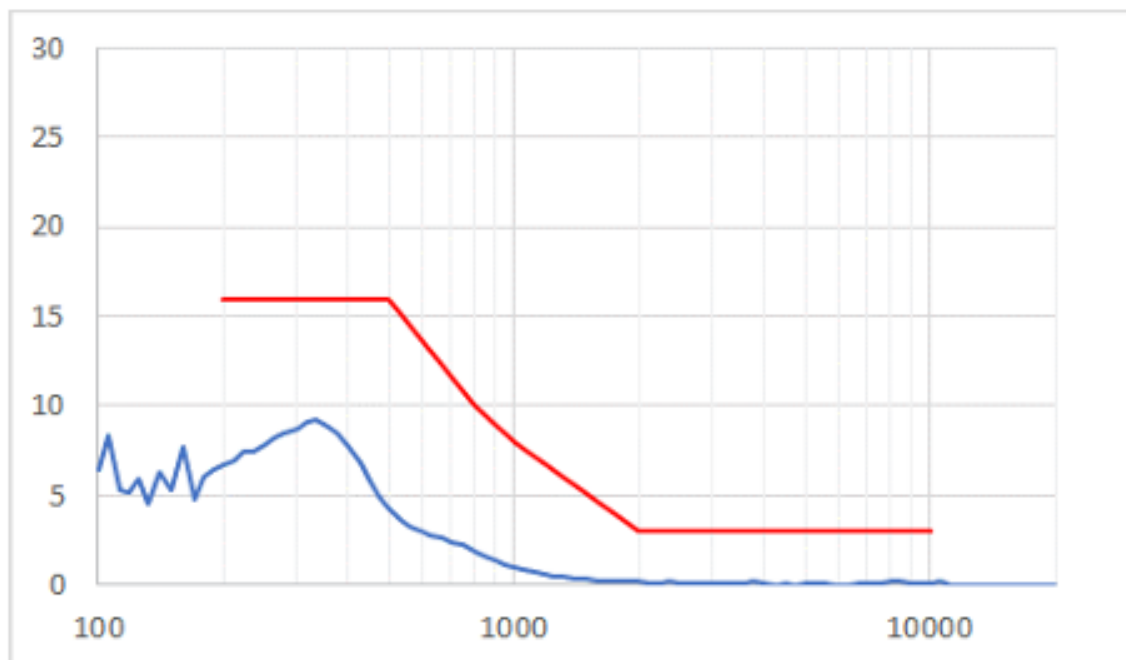


Table 3 0.59V Tolerance Limits Data for HOHD10-35

Frequency(Hz)	Limit (%)
200	0.7
300	0.7
400	0.45
700	0.45
1000	0.3
2000	0.3

Figure 3 Typical HOHD10-35 in 0.59V Tolerance Window

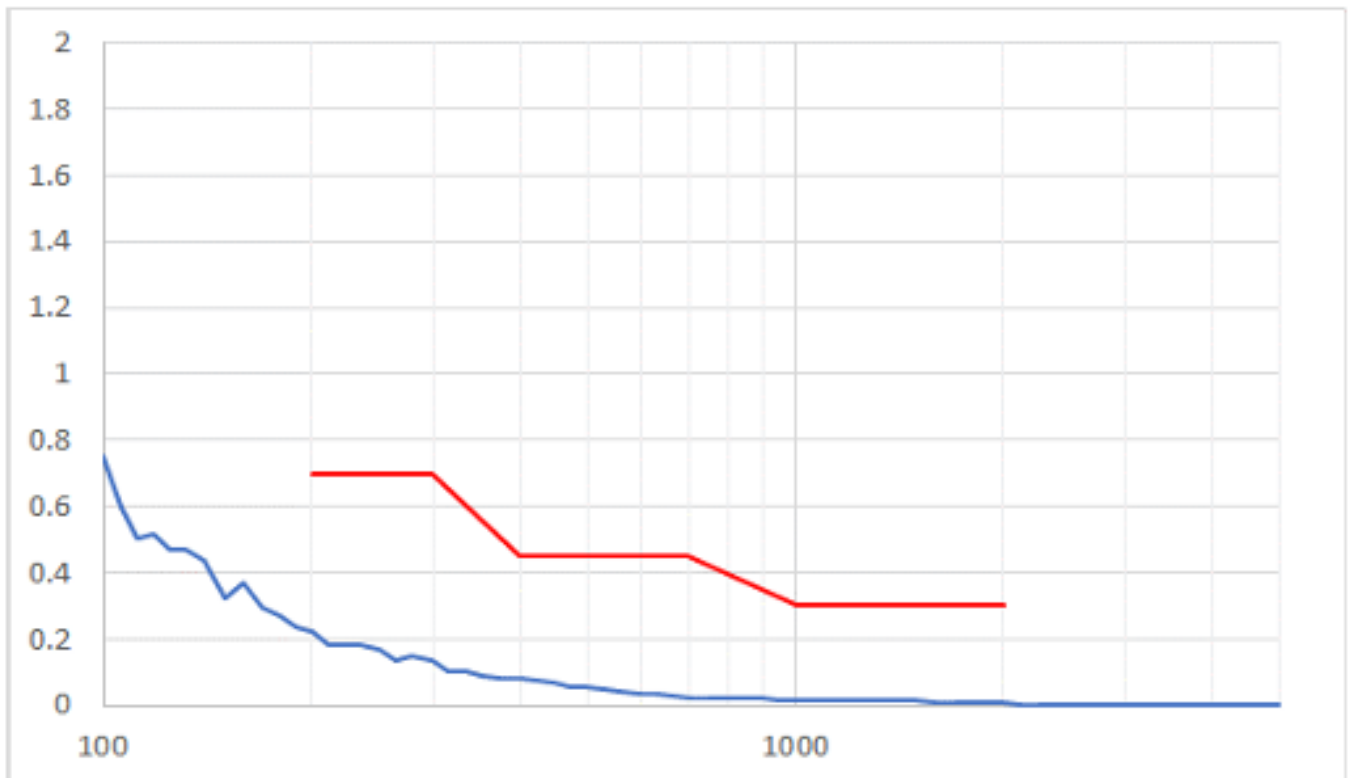


Table 4 EQ Tolerance Limits Data for THD2-5

Frequency(Hz)	Limit (%)
200	78
300	59
475	40
710	26
1000	24
2000	11

Figure 4 Typical THD2-5 in EQ Tolerance Window

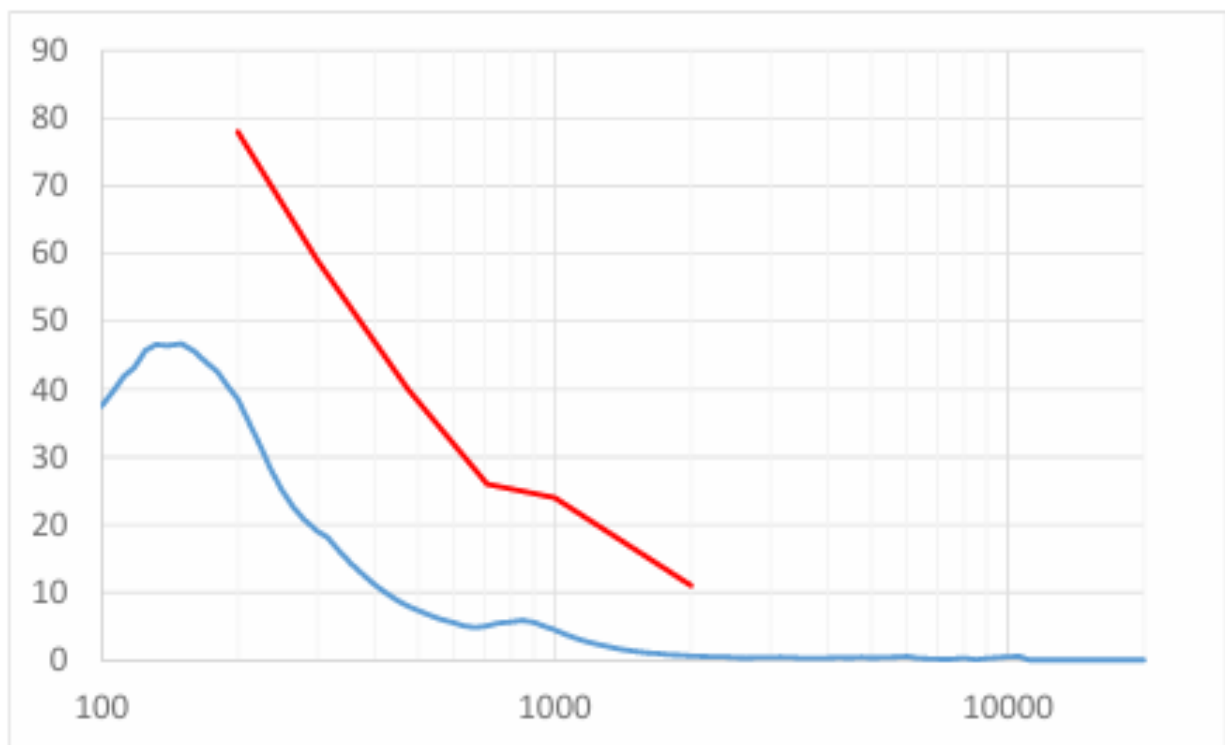


Table 5 EQ Tolerance Limits Data for HOHD10-35

Frequency(Hz)	Limit (%)
200	1.4
400	0.8
530	1.4
1000	1.4
2000	0.6

Figure 5 Typical HOHD10-35 in EQ Tolerance Window

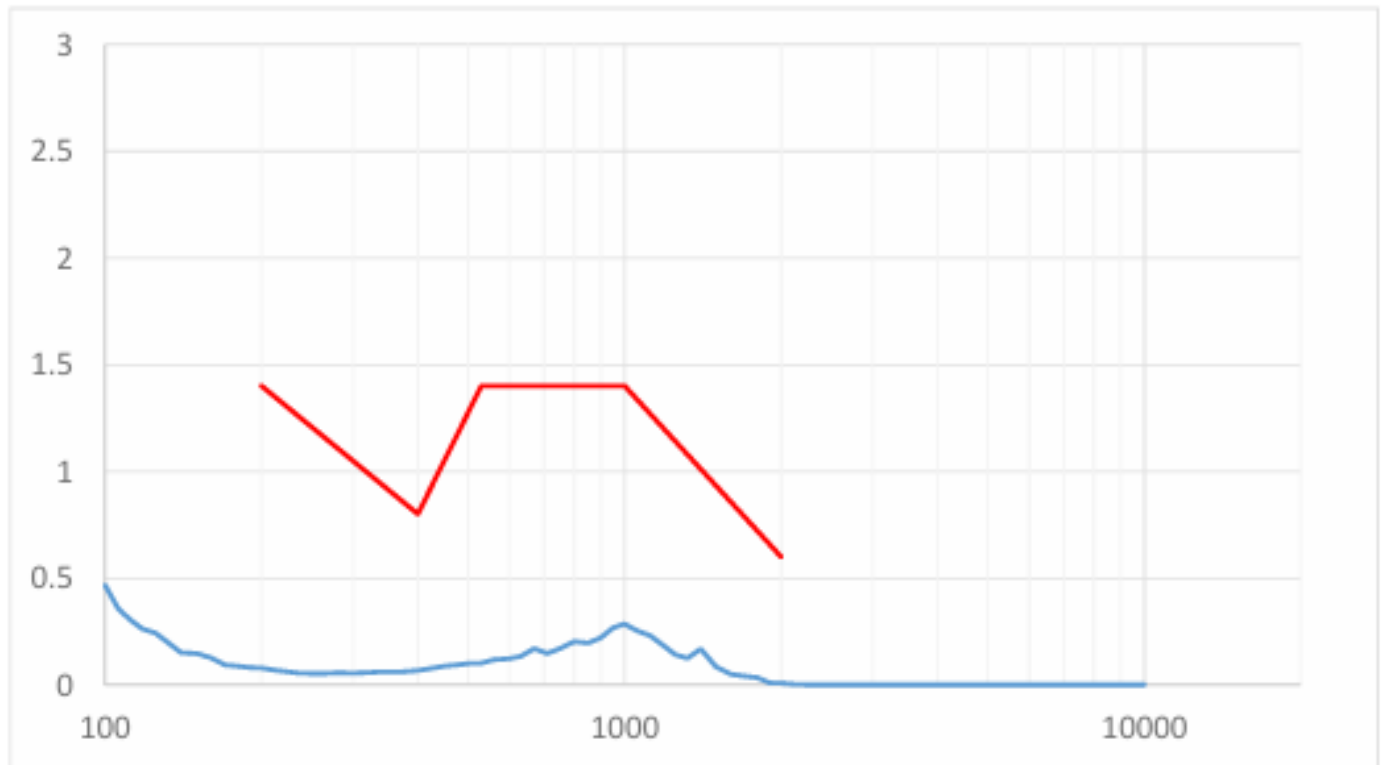


Figure 6 speaker IMP in 0.59V Tolerance Window

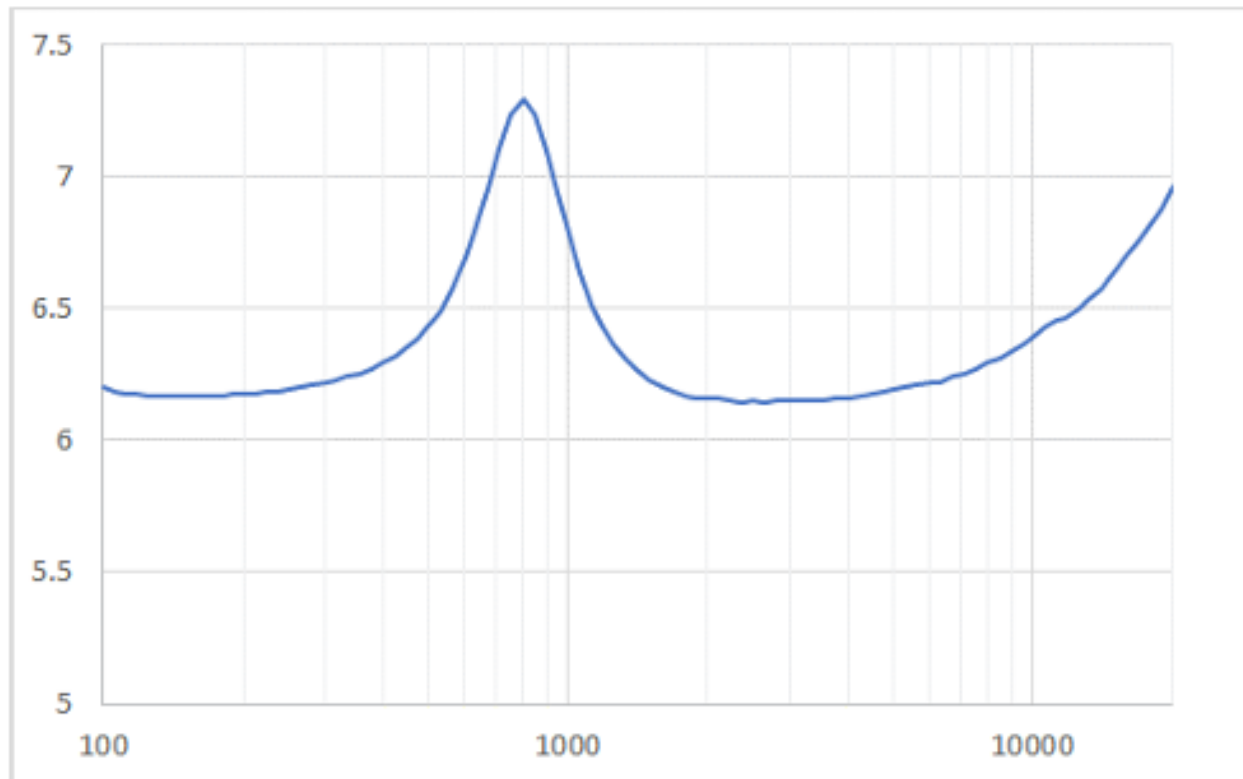


Table 6 TS parameter

5cc 1.6V TS parameter			
	Item	Value	Unit
1	Re	6	Ω
2	Fs	750	Hz
3	Mms	36	mg
4	Cms	0.00177	s ² /kg
5	Bl	0.4	N/A
6	Sd	75	mm ²

Modeling parameter			
	Item	Value	Unit
1	Xmax	0.4	mm
2	Tmax	100	°C
3	Tcoef	0.00393	1/°C

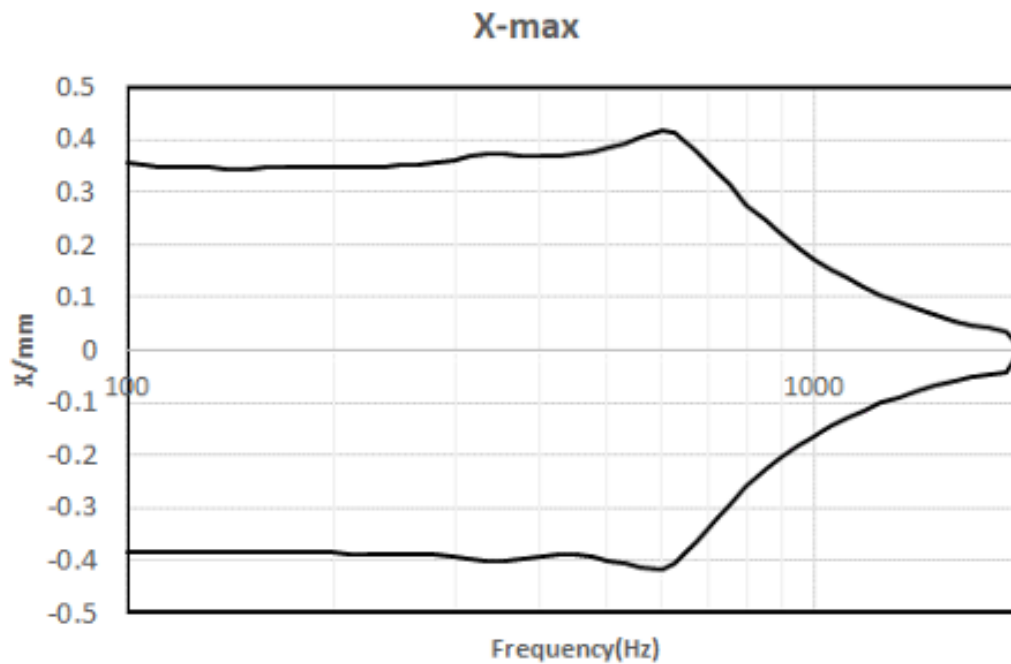
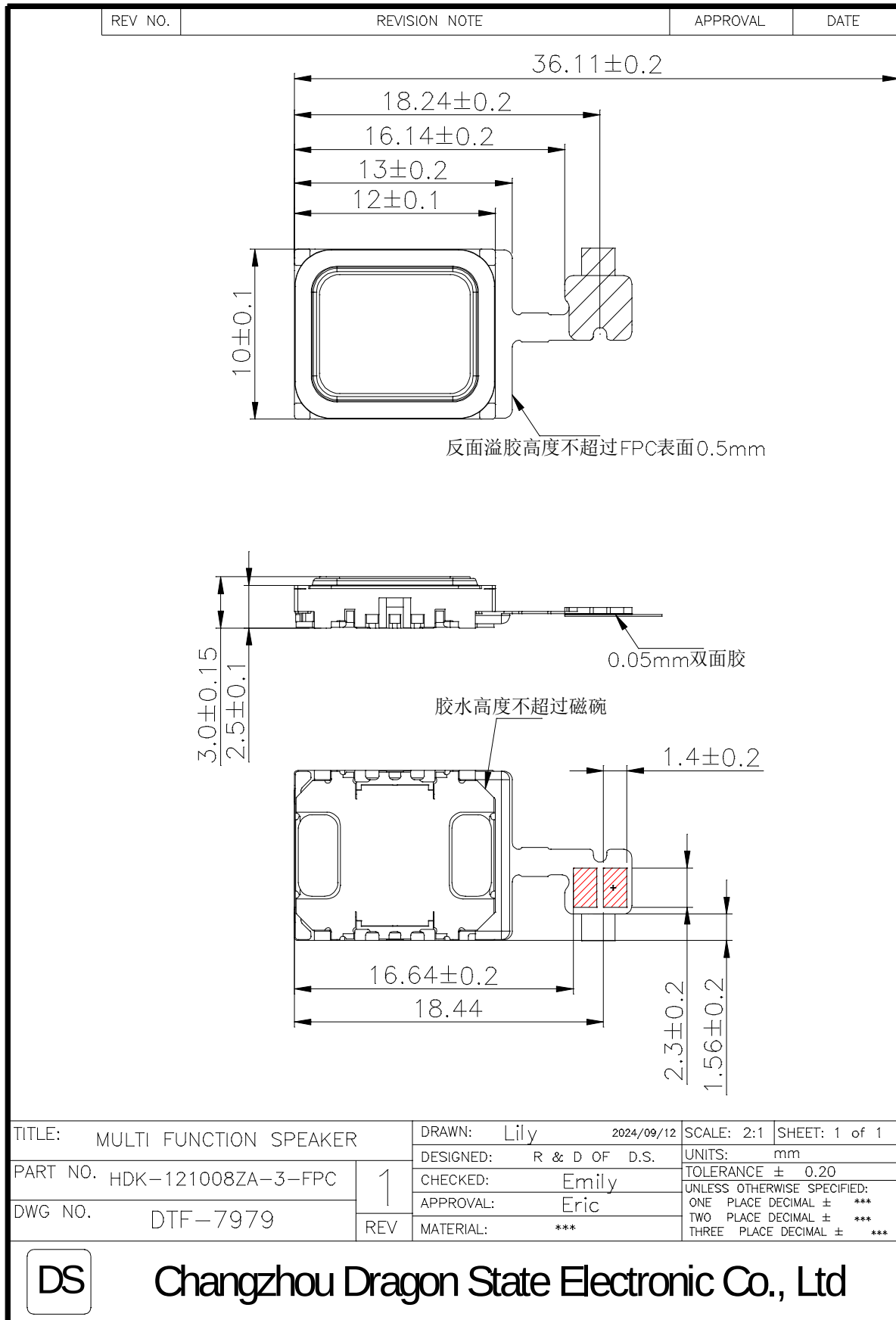


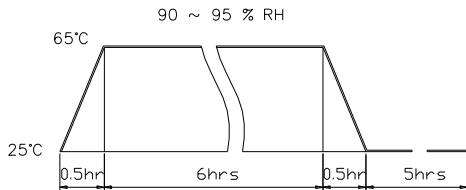
Table 7 EQ voltage

Frequency(Hz)	Vrms		Frequency(Hz)	Vrms
100	2.61		335	2.05
106	2.63		355	2
112	2.65		375	1.95
118	2.66		400	1.9
125	2.66		425	1.85
132	2.66		450	1.81
140	2.64		475	1.78
150	2.62		500	1.75
160	2.61		530	1.75
170	2.58		560	1.75
180	2.56		600	1.75
190	2.53		630	1.85
200	2.5		670	2.05
212	2.45		710	2.3
224	2.4		750	2.6
236	2.35		800	3
250	2.3		850	3.5
265	2.25		900	3.7
280	2.2		950	3.7
300	2.15		1k-20k	3.7
315	2.1			

3.DIMENSION



4. RELIABILITY TESTS

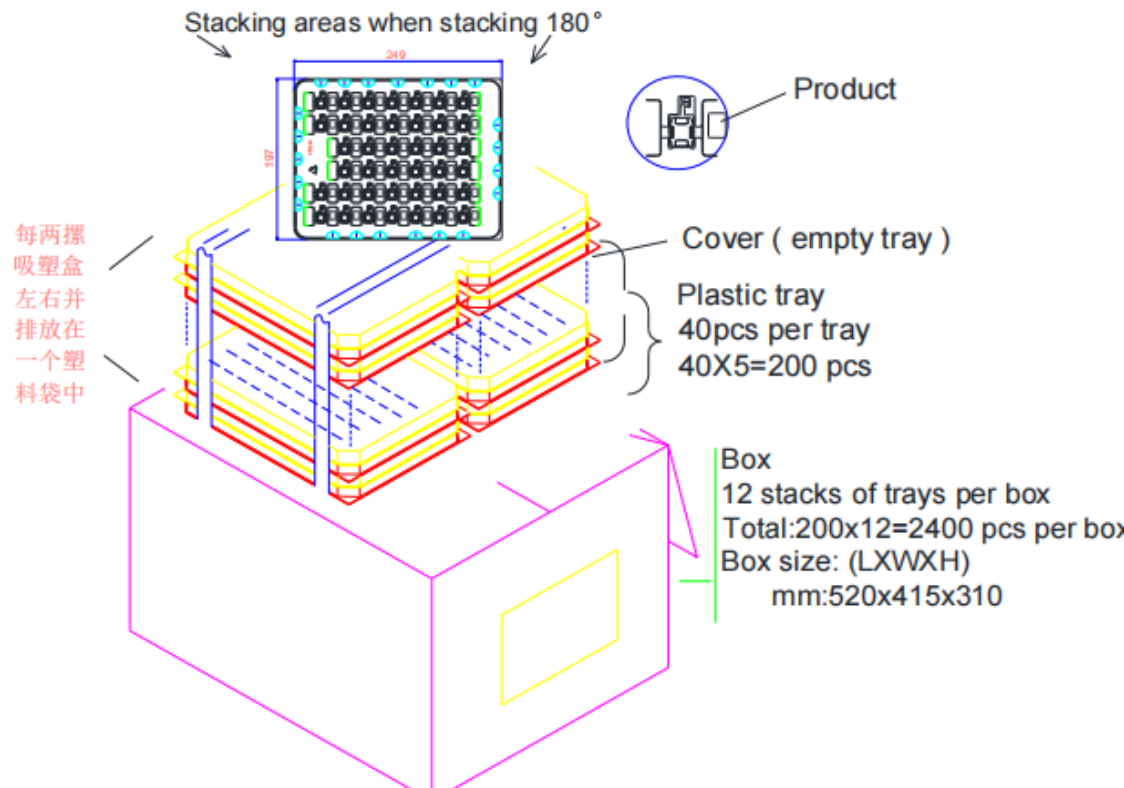
Items.		Specifications
01	High temp. Test	Keep 96 hours at $+70^{\circ}\text{C}\pm 3^{\circ}\text{C}$ and leave 3 hours in normal temperature and then check
02	Low temp. Test	Keep 96 hours at $-20^{\circ}\text{C}\pm 3^{\circ}\text{C}$ and leave 3 hours in normal temperature and then check
03	Humidity test	Keep 96 hours at $+60^{\circ}\text{C}\pm 3^{\circ}\text{C}$ relative humidity 90% and leave 3 hours in normal temperature and then checked.
04	Temp./Humidity cycle	The part shall be subjected 5 cycles. One cycle shall be 12 hours and consist of; 
05	Thermal cycle test.	Low temperature: $-40^{\circ}\text{C}\pm 3^{\circ}\text{C}$, temperature: $+85^{\circ}\text{C}\pm 3^{\circ}\text{C}$, cycle: 0.5 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	drop test	DUTs shall be mounted in a 150g fixture, 1.5m three times in each direction total 18 times
09	Load test	Rated Power Pink noise is applied for 100 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 $\pm 3\text{ dB}$		

SOLDERING CONDITION

Recommend using constant branding iron in **30W**, and in temperature range **$300\pm 10^{\circ}\text{C}$** .

Soldering time **2** seconds.

5.PACKING

REV NO.	REVISION NOTE	APPROVAL	DATE
			
TITLE: packing		DRAWN: Lily 2024/09/12	
PART NO.		DESIGNED: R&D OF D.S.	
DWG NO.		CHECKED: Emily	
REV		APPROVAL: Eric	
		MATERIAL: ***	
		SCALE: 2:1	SHEET: 1 of 1
		UNITS: mm	
		TOLERANCE	
		20~11	± 0.3
		10~5	± 0.2
		<4	± 0.1
 Changzhou Dragon State Electronic Co., Ltd			