



Greip SPK Module

OBO-A1-0010-08 Product Specification

Approved By	Checked By	Prepared By

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Establish Dep.	Engineering	Establish Date	2025/2/13	Rev.	X1	Sheet No.	1/11



Revision History

Version	Date	Description	Author
X1	2025-2-13	Performance tuning	HSJ

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1.Scope

This specification contains electrical, mechanical, acoustical, and environmental requirements for this model

2.Environmental Requirements

Every material used in the speaker is in accordance with the RoHS. °

3.Electrical Requirements

3.1 Greip Module

Rater Power :	1mW	(0.179Vrms)
Max Power	3mW	(0.31 Vrms)
Short Term Max Power :	5mW	(0.4 Vrms)

3.2 LSR SPK

Impedance :	32 Ω ±15% ohm at 1KHz
Rater Power :	1mW (0.179Vrms)
Short Term Max Power :	8mW (0.51 Vrms)

3.3 MEMS SPK

Maximum positive voltage :	20 V
Upper operating frequency limit :	80K Hz

4.Acoustical Requirements

4.1 Sound Pressure Level: 103±2dB @1mW (0.179Vrms) 1KHz.

4.2Rated Frequency Range : 20–40KHz
Frequency Response See Figure 1, Table

4.3THD: @20 Hz -1.5K Hz<1% 2.5KHz-10KHz<2.5% 1mW (0.179Vrms). See Figure 2, Table

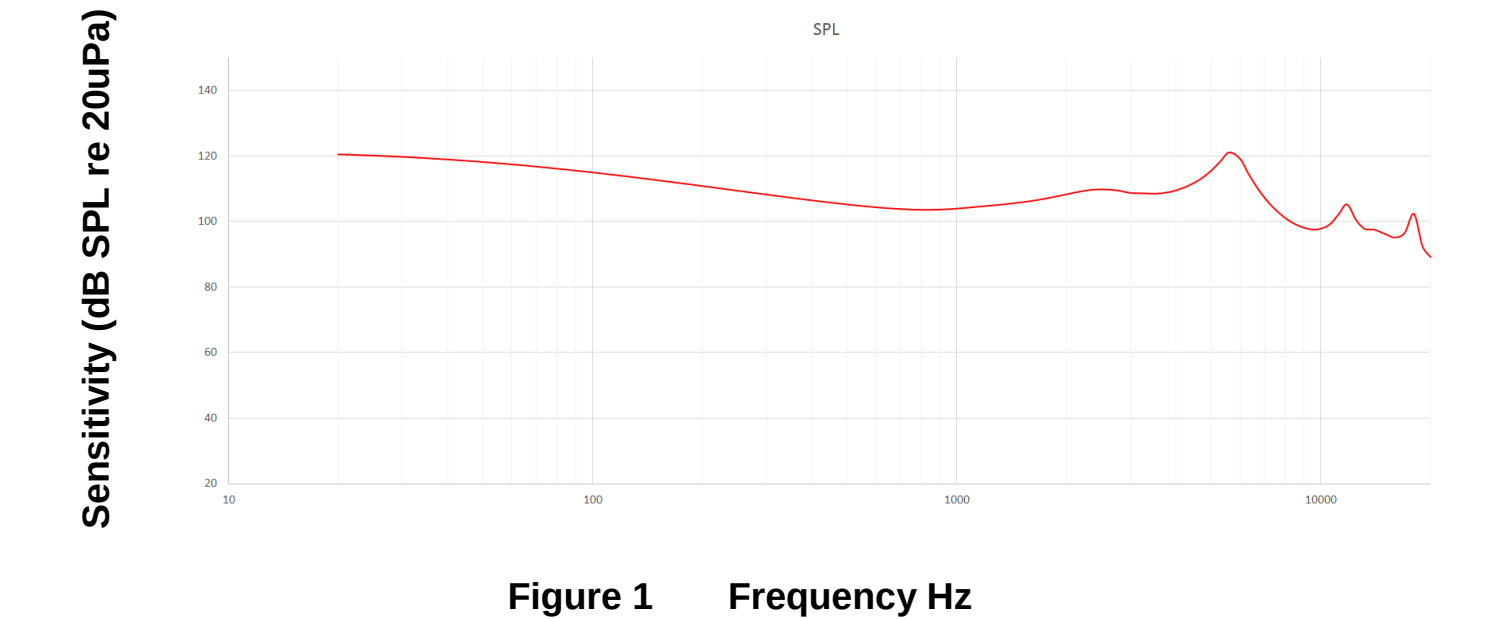
4.4Rub &Buzz :

The input power shall be set at 3 mW (0.31Vrms). Using an audio oscillator Sweep from 50 to 2K Hz in the free air. There shall be no buzzes, rattles, nor spurious noises.

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Rated Frequency Response Curve

@Level=0.179 Vrms (1mW)



UP Limit													
	20	30	40	60	80	100	200	300	600	1000	1500	2000	2800
UP Limit													
	4000	5600	6000	7000	8500	10000	11800	12300	13500	16500	18000	19000	20000
UP Limit													

LOW Limit													
	20	30	40	60	80	100	200	300	600	1000	1500	2000	2800
LOW Limit													
	4000	5600	6000	7000	8500	10000	11200	12000	13500	16500	18000	20000	/
LOW Limit													/

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Total Harmonic Distortion Curve
@Level=0.179Vrms(1mW)

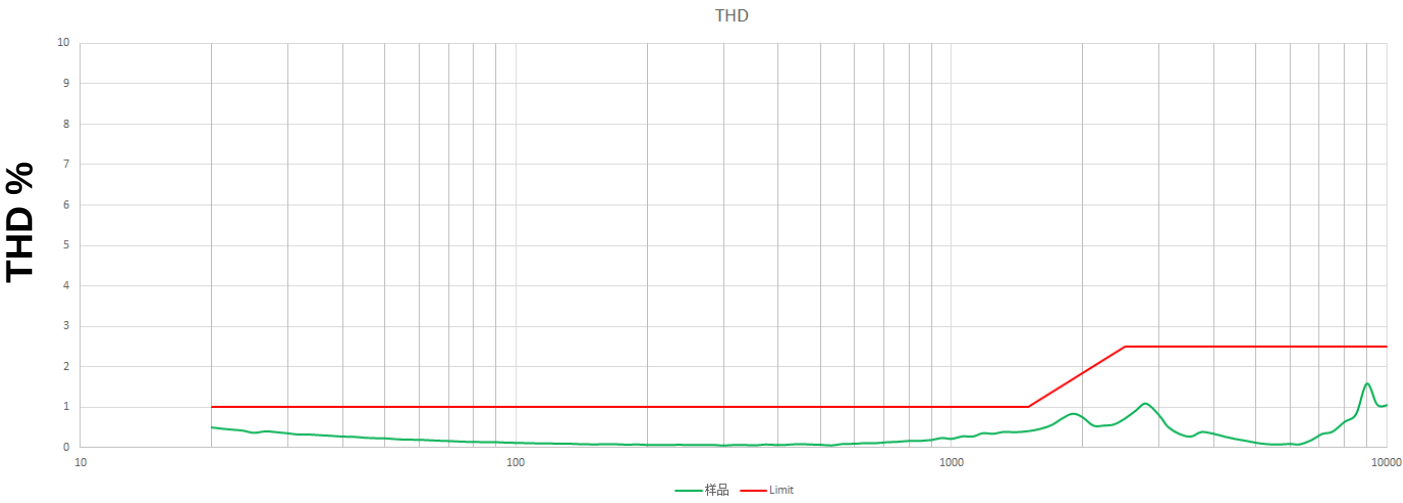


Figure 2 Frequency Hz

Limit				
	20	1500	2500	10000
Limit	1	1	2.5	2.5

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5.Drive circuit

In Figure 3 the driving circuit is shown.

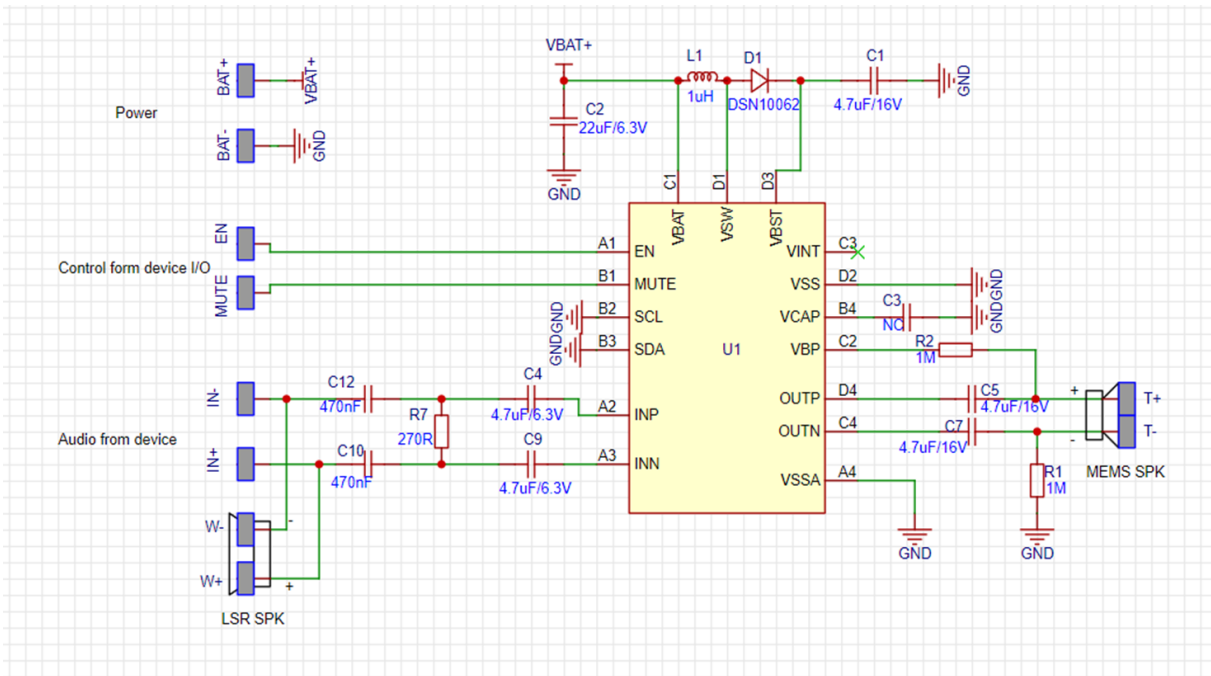


Figure 3

NO.	PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT	Remarks
1	Supply Voltage	In normal function	3.0	3.7	5.5	V	
2	Supply Current 1	En = low at 3.7V			2	uA	
3	Supply Current 2	En = High, Mute = low at 3.7V, Input lever = 0V	0.8		1	mA	
4	Supply Current 3	En = High, Mute = low at 3.7V Input lever = 0.179V Pink noise	0.9		1.5	mA	
5	Input lever				0.7	V	

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PCB Layout and connect

Working voltage : 3.0~5.5V

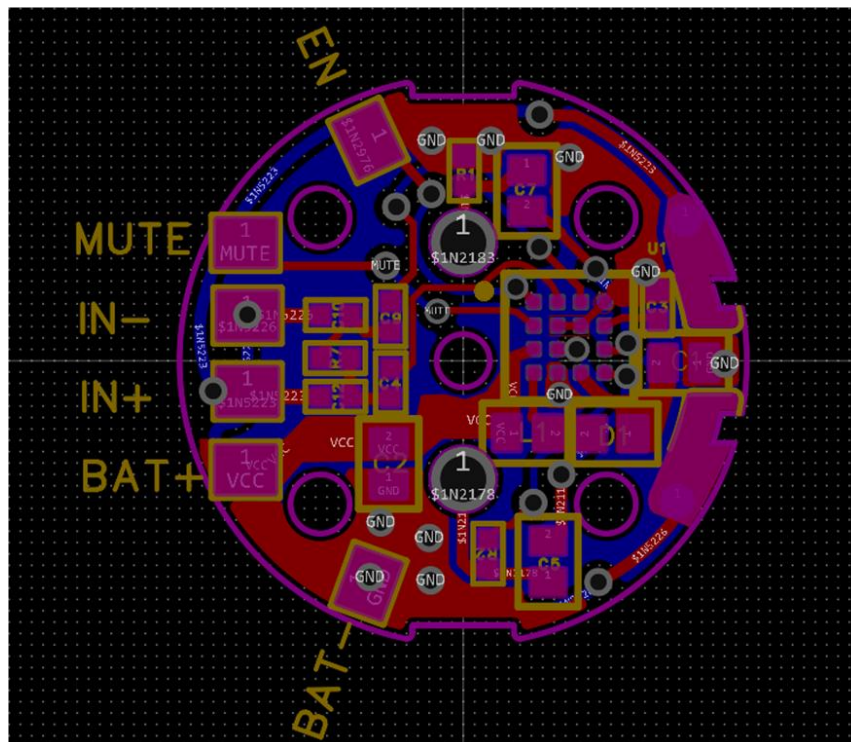
EN+ = High, PA Working

EN+ = Low, PA Sleep

Note: When the device in mute, EN+ need Low to reduce power dissipation.

Using time sequence:

- 1.EN=0, MUTE = 1
- 2.EN=1, MUTE = 1 (at least ca. 15ms)
- 3.EN=1, MUTE = 0
- 4.Signals or music can be played



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6.Polarity

When a DC source “+” polarity is attached to speaker’s “+” polarity, and “-” polarity is attached to speaker’s “-”polarity, the diaphragm will move forward

7.Test Climatic Condition

Ambient temperature: 21°C- 25°C,preferably at 23°C
Humidity 25%- 75%, atmosphere, 86kPa ~ 106kPa, Refer to IEC 268-1

8.Test Method

8.1 SPL and Frequency Response Curve, with IEC 60318-4.

The drive power is 1 mW , and swept sine-wave rang is 20Hz to 20K Hz ,with a R40 of test sequence

8.2 THD

Tested per Section 7.1 and driven at rated power , sweep at specified
Frequency rang with R40 test sequence

Test setup



GRAS RA0045-S1
IEC 60318-4 Ear
Simulator

GRAS 42AG
Multifunction Sound
Calibrator



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9. General Requirements

9.1 Operating Temperature Range : -20°C to +60°C

9.2 Storage Temperature Range : -25°C to +65°C

10. General Reliability

Immediately after reliability test, the samples shall be stored under climatic Conditions such as normally exist in ordinary rooms or laboratories. Unless otherwise noted, the recovery period shall be 4 hours at least before Performance testing.

10.1 Load Test: Input power 3mW(0.31 Vrms), Pink Noise signal, Duration 96 hours, Duration of recovery 2hours at 25°C (room temperature).

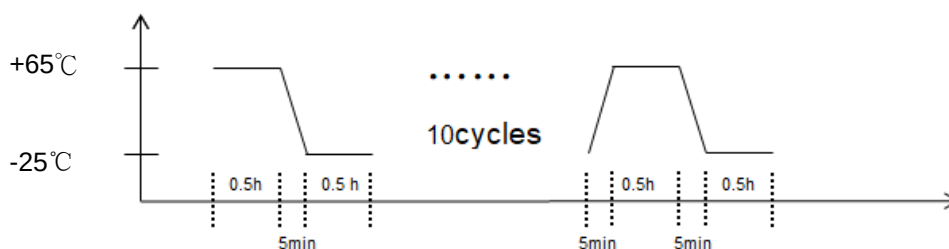
10.2 Max Power Test: Input power 5mW (0.4Vrms), Pink Noise signal1 min ON,2 min OFF for 10 cycle times, Duration of recovery 2hoursat 25°C(room temperature).

10.3 Humidity Test: Temperature +40°C, Relative Humidity 90% ~ 95% Duration 96 hours, Duration of recovery - 2hours at 25°C (room temperature).

10.4 Heat Resistance Test: +65°C Duration 96 hours, Duration of recovery - 2hours at 25°C (room temperature).

10.5 Cold Resistance Test: -25°C Duration 96 hours, Duration of recovery - 2 hours at 25°C (room temperature).

10.6 Temperature Shock Test: (-25°C/+65°C) 10cycles. 0.5 hour at each temperature, Transition time <5 min, Duration of recovery 2 hours.

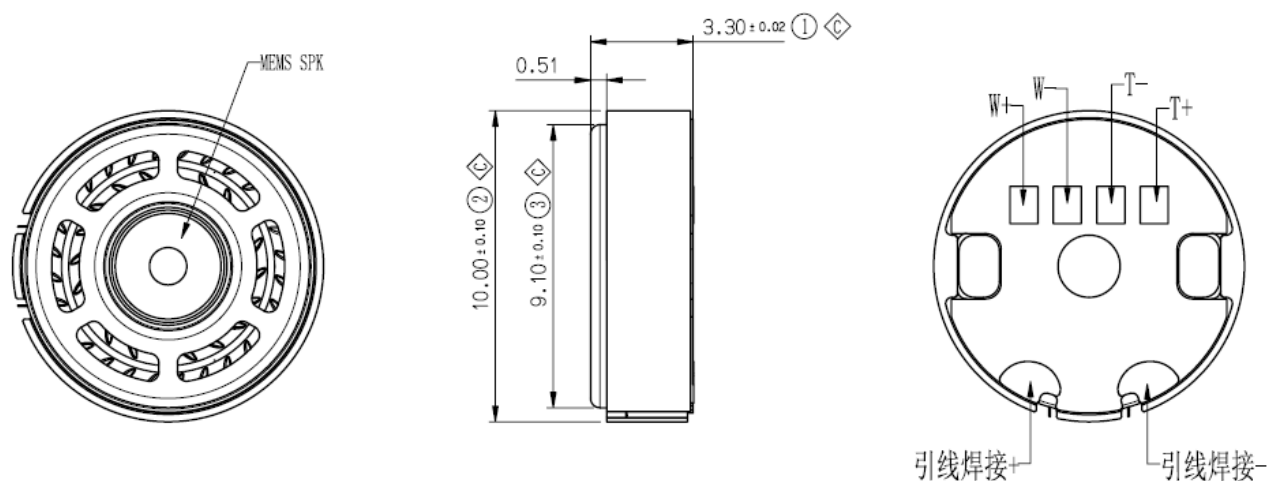


10.7 Drop Test: Drop form height 0.8m to the ground (concrete surface) in 3 angles. Each angle for 3 cycle times.

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11. Mechanical Layout and Dimensions

Unit: mm



10	PCBA	1	FR4 With Travos PA
9	Frame	1	PC+GF
8	Ring	1	Aluminum alloy
7	Edge	1	Silicon dioxide
6	Voice Coil	1	CCAW
5	Cover	1	Aluminum alloy
4	Washer	1	SPCC + Nickel plating
3	Magnet	1	NdFeB + Nickel plating
2	T-iron	1	SPCC + Nickel plating
1	Mesh	1	Nylon
NO	LSR PART NAME	Q'TY	MATERIAL

12. Weight

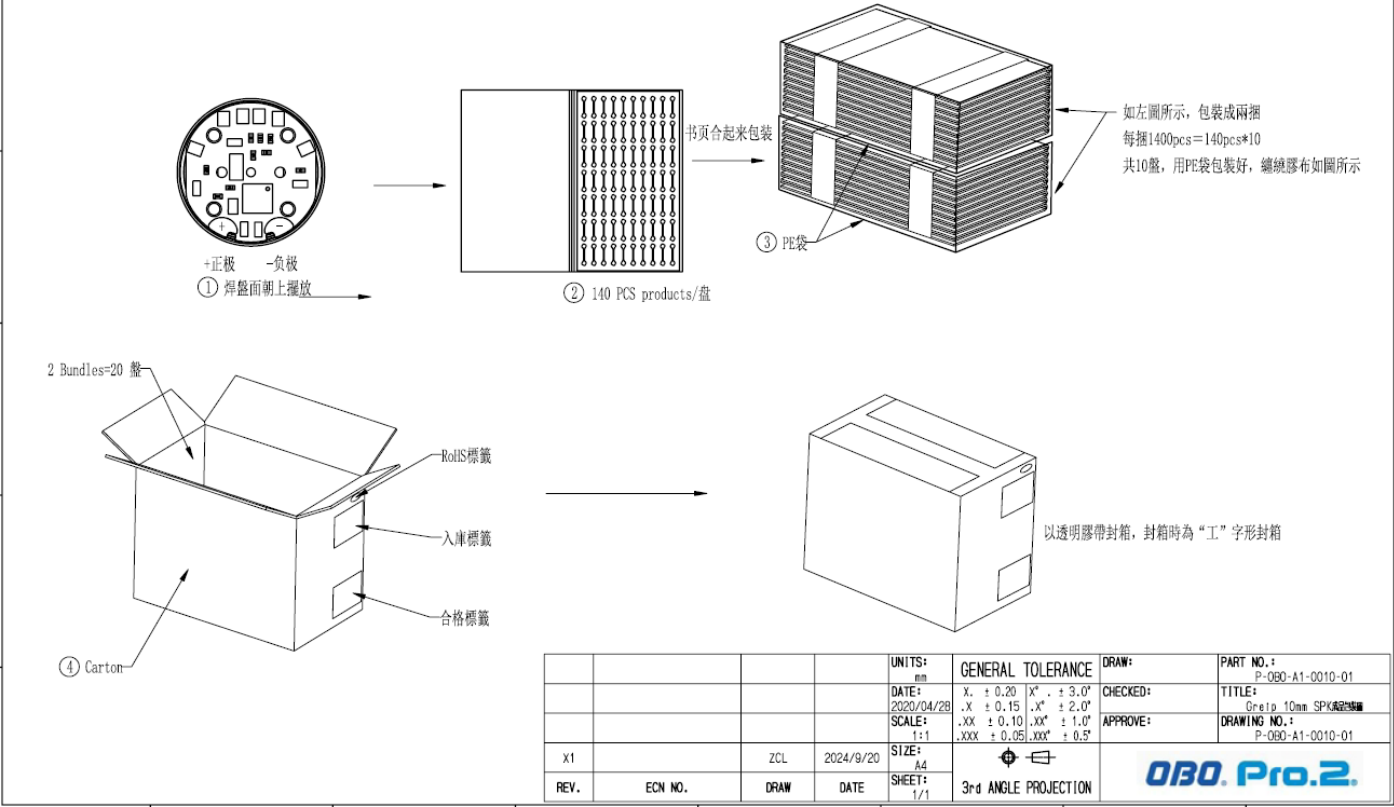
±0.05 g

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13. Package

	MATERIAL	P/N	REMARKS
1	Product	92-80-0035	2800 pcs
2	TRAY	55-80-5006	20 pcs
3	PE Bag	56-00-5001	2pcs/Carton
4	Carton	55-00-5000	Carton/20 Tray/2800pcs



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