

Specification for Approval (ROHS Compliance & Halogen Free)

Component Name: Dynamic Microspeaker

GoerTek Inc. Model No.: GS181325L-104

Customer Code: A28

Customer Model No.: /

| | Designed by | Checked by | Standard by | Approved by |
|-----------|-------------|------------|-------------|-------------|
| Signature | Blade | Ryan | Daisy | Sinbad |
| Date | 2017.04.17 | 2017.04.17 | 2017.04.17 | 2017.04.17 |

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Restricted

1. Security Warning

The information contained in this document is the exclusive proprietary to GoerTek Inc., and should not be disclosed to any third party without the written consent of GoerTek Inc.

2. Record Update

| Version | Description | Date | Author | Approved |
|---------|-------------|------------|--------|----------|
| 1.0 | New Release | 2017.04.17 | Blade | Sinbad |
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1 Introduction

This product works on the principle of permanent magnet. When electro-magnetic field and voice coil, on which a vibration membrane is attached, receive a current signal, the membrane vibrates and the air around the diaphragm will be compressed. Sound will be induced through such kind of compression and then the electronic signal is transformed into sound signal. This product can be used in small electronic products such as mobile phone, mp3 and VoIP phones.

2 Electro-acoustic Characteristics

2.1 Test Conditions

Unless other specified the test conditions should be 15~25°C (normal temperature), R.H.=25%~75%(normal humidity), and 86kPa~106kPa (normal atmospheric pressure). However, if there arises a doubt in judgment, the test conditions should be as follows: Temperature: 23±2°C; Relative humidity: 60~70%; Atmosphere: 86~106kPa.

Any unspecified test condition should be correlated to nominal conditions specified In this specification.

2.2 Extreme Ranges

Operating Temperature Range: -20°C~65°C (Without Loss of Function)

Storage Temperature Range: -40°C~85°C (Without Loss of Function)

2.3 Specifications

Test standard references 2.1/2.5/2.6

| | |
|------------------------------------|---|
| Impedance | 8±15% ohm @2kHz, 2.83Vrms |
| DCR | 7 ± 15%Ω |
| Rated Power | 1W |
| Max Short Term Power | 1.5W |
| F0 (in 0.8CC box) | 800±15%Hz @2.83Vrms |
| Sensitivity (in 0.8CC box) | 94± 3dB @2kHz,2.83Vrms/10cm/baffle |
| Work Band | F0-20kHz |
| Frequency Response (in 0.8 CC box) | See Figure 1 |
| THD (in 0.8CC box) | See Figure 2 |
| Listening Test | 200Hz~10kHz, 2.83Vrms, in 0.8CC box, Should be no abnormal sound. |

2.4 Reliability Test Criteria

| | |
|--|---|
| <p>2.4.1 High temperature Storage</p> | <ul style="list-style-type: none"> ☆ 96h@+85°C,DUTs powered off ☆ Measurements to be taken at least after 2h recovery time. ☆ 10PCS |
| <p>2.4.2 Low temperature Storage</p> | <ul style="list-style-type: none"> ☆ 96h@-40°C, DUTs powered off ☆ Measurements to be taken at least after 2h recovery time. ☆ 10PCS |
| <p>2.4.3 Steady humidity & temperature</p> | <ul style="list-style-type: none"> ☆ 96h @55°C , 90%~95%RH. DUTs powered off ☆ Measurements to be taken at least after 2h recovery time. ☆ 10PCS |
| <p>2.4.4 Thermal Shock</p> | <ul style="list-style-type: none"> ☆ 30min@-40°C, 30min@+85°C, 30 seconds transition time, 20 cycles. DUTs powered off ☆ Measurements to be taken at least after 2h recovery time. ☆ 10PCS |
| <p>2.4.5 Sweep Test</p> | <ul style="list-style-type: none"> ☆ 12h @+25°C,Range:100Hz~20kHz, 1 second per cycle, with 1W sine signal ☆ Measurements to be taken at least after 2h recovery time. ☆ 10PCS |
| <p>2.4.6 DC Test</p> | <ul style="list-style-type: none"> ☆60s, with DC 3.5V @ +25°C. ☆Measurements to be taken at least after 2h recovery time. ☆ 10PCS |

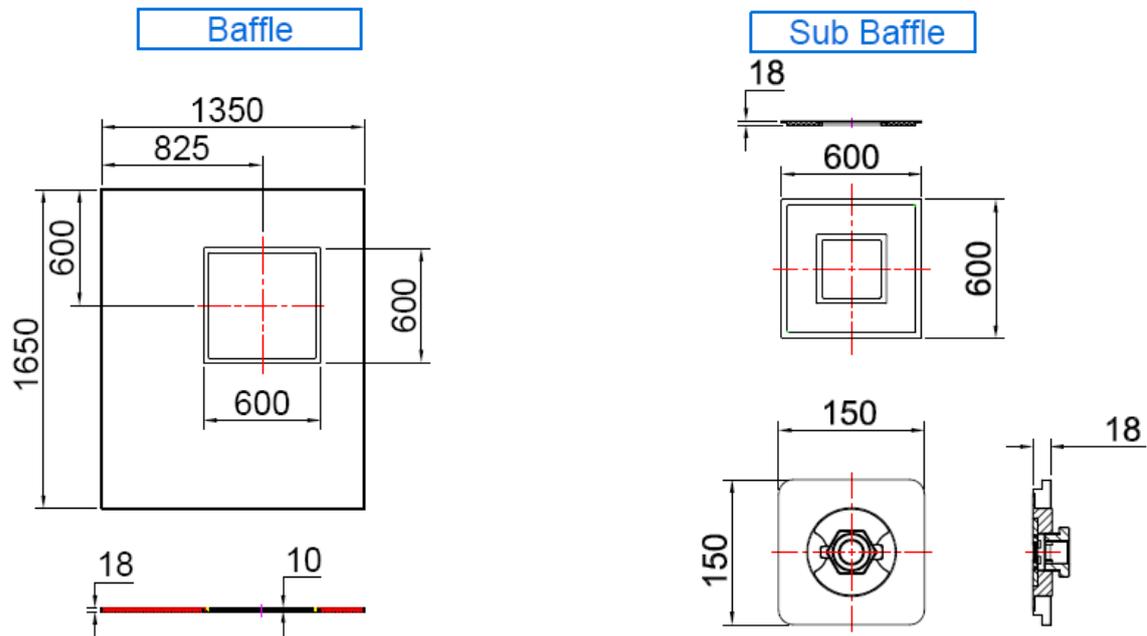
| | |
|--|---|
| <p>2.4.7 Drop test</p> | <ul style="list-style-type: none"> ☆ 1.5m drops in drop test box onto Marble, each side 3 times, DUTs powered off ☆ Measurements to be taken at least after 2h recovery time. ☆ 10PCS |
| <p>2.4.8 Contact Spring Durability</p> | <ul style="list-style-type: none"> ☆ Compressed from free area to the end of working area;60 times/min; 100 cycles. DUTs powered off ☆ Measurements to be taken at least after 2h recovery time. ☆ 10PCS |

Acceptable Standard

- (1) After reliability test, the measurement should be done after leaving tested samples under the standard condition for 2 hours.
- (2) After reliability test, all samples must be meet "2.3 specifications". Unless otherwise noted,
- (3) 2.4.8 - acceptable standar is: meet "3.6 Spring Contact Force"

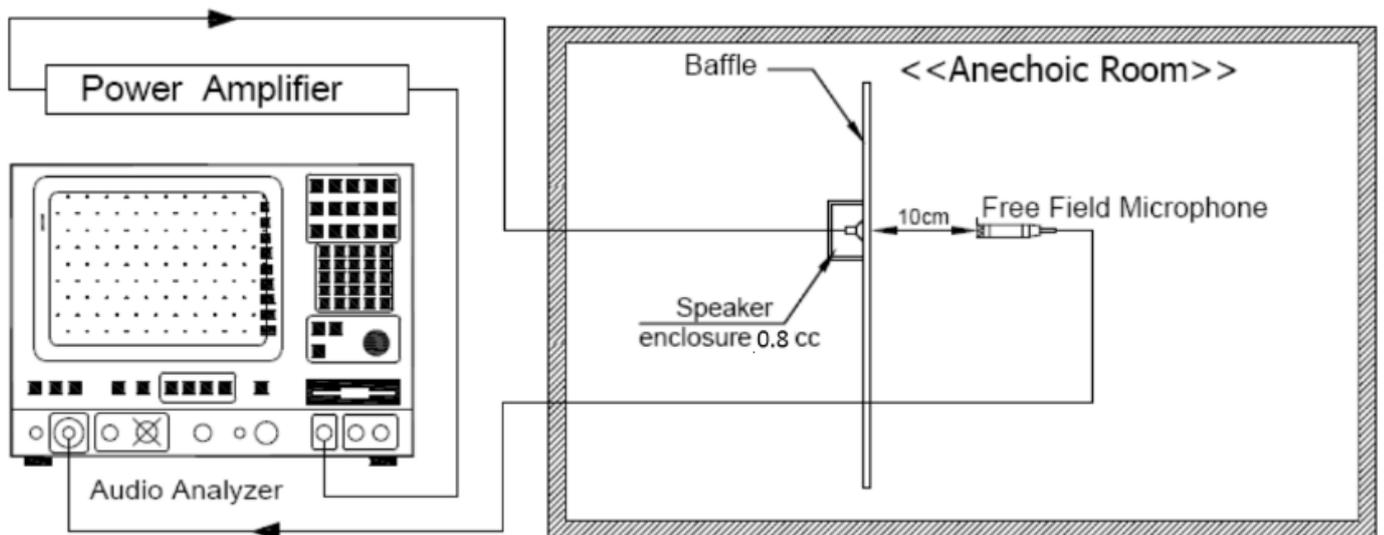
All component should comply with agreed reliability test criteria above. Please inform with any unspecified test. GoerTek do not make warranty for the test not listed in the specification or not informed to GoerTek.

2.5 Test Setup Drawings



Unit: mm

2.6 Test Method



Test Condition:

Input Voltage: 2.83Vrms

Sweep Range: Sweep range 100Hz to 20 kHz by Sine Wave, 1/12 OCT.

Product Form: Finished product in 0.8CC box.

Any unspecified test condition should be correlated to nominal conditions specified in this specification.

2.7 Speaker Frequency Response and Limit

2.7.1 Frequency response with 0.8cc box, 2.83Vrms signal level

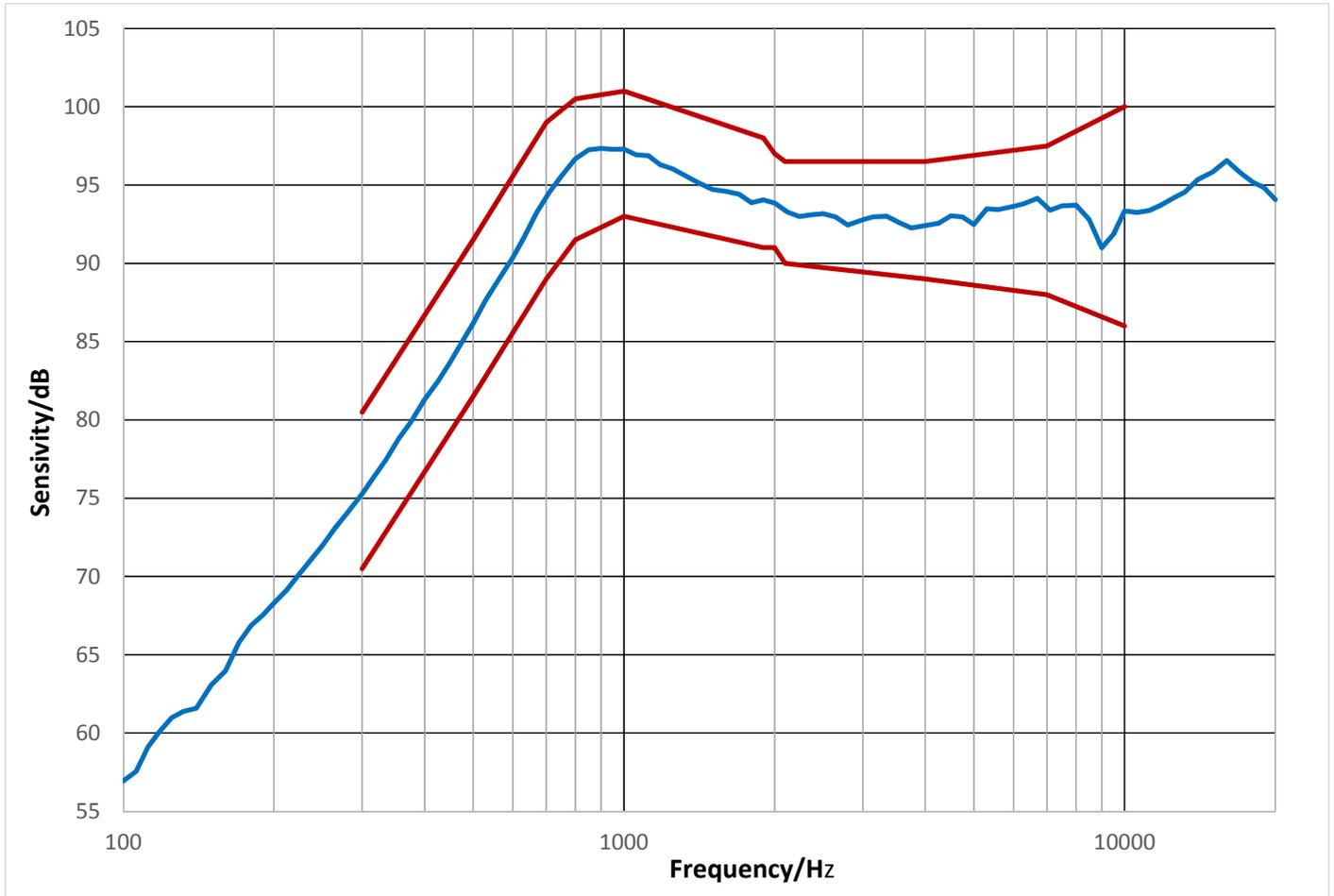


Figure 1 Typical FR curve

| Freq./Hz | 300 | 500 | 700 | 800 | 1000 | 1900 | 2000 | 2100 | 4000 | 7000 | 10000 |
|-------------|------|------|-----|-------|------|------|------|------|------|------|-------|
| Upper limit | 80.5 | 91.5 | 99 | 100.5 | 101 | 98 | 97 | 96.5 | 96.5 | 97.5 | 100 |
| Lower limit | 70.5 | 81.5 | 89 | 91.5 | 93 | 91 | 91 | 90 | 89 | 88 | 86 |

2.8 Speaker THD Response and Limit

2.8.1 THD with 0.8cc box, 2.83Vrms signal level, 2~5th, IEC standard

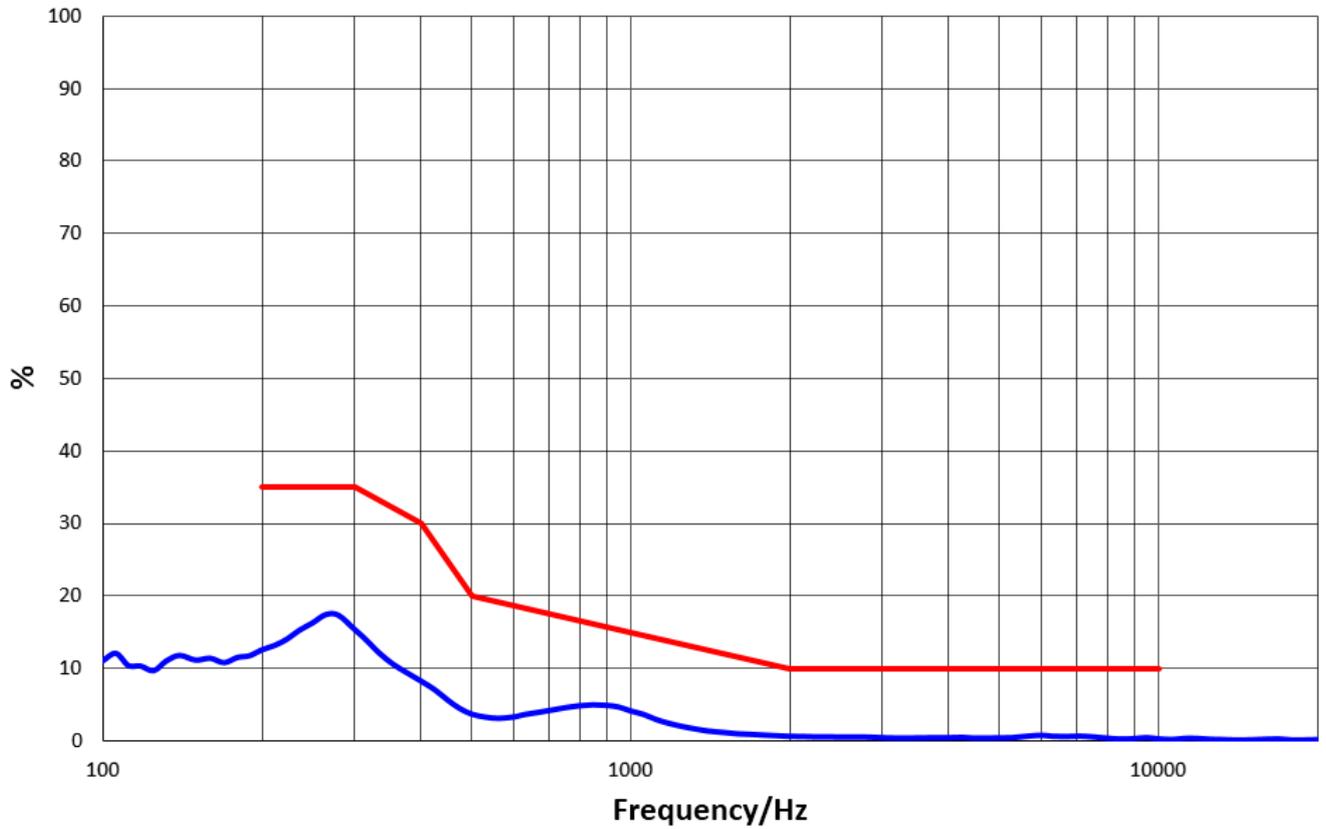
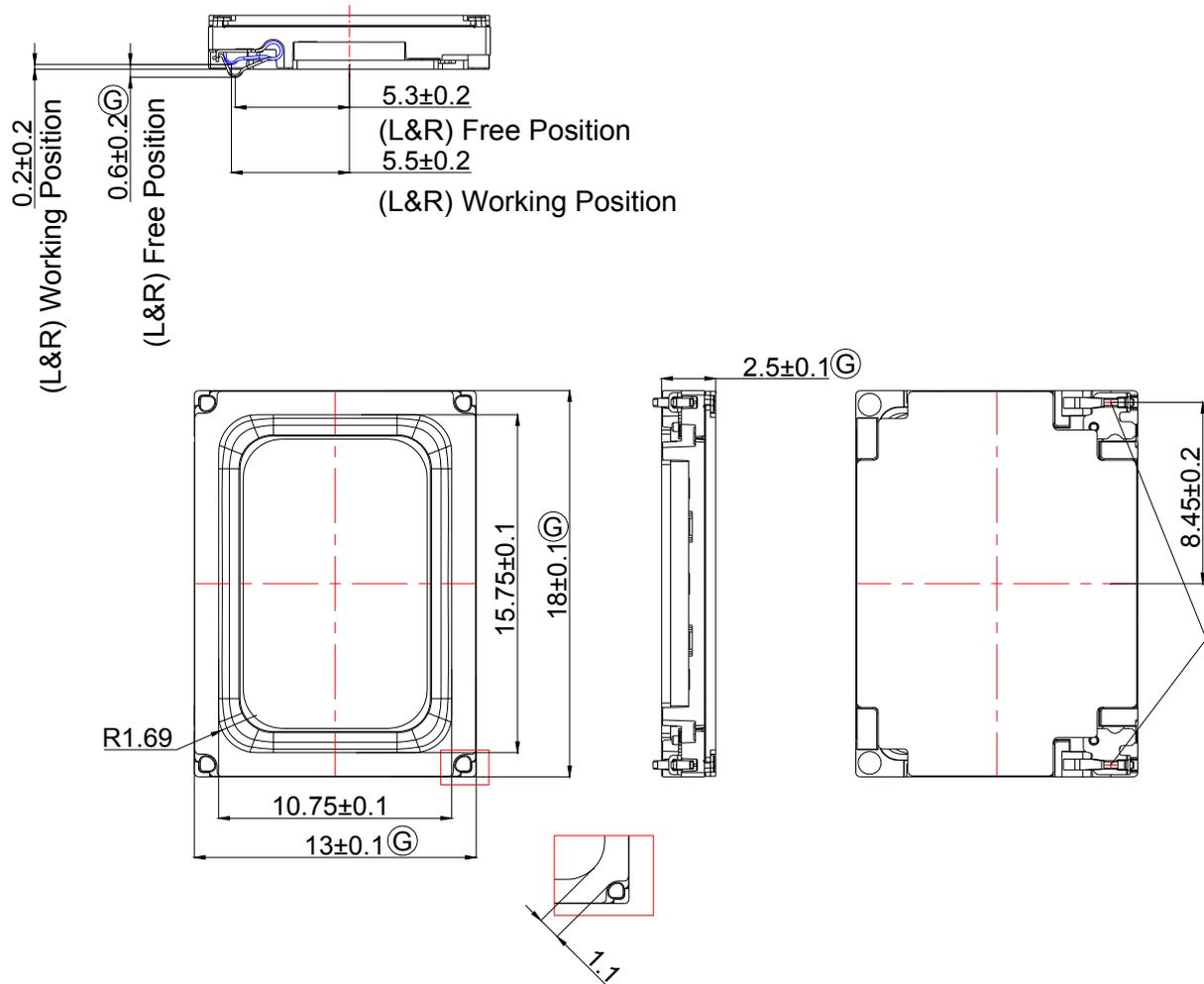


Figure 2 Typical THD curve

| Freq./Hz | 200 | 300 | 400 | 500 | 1000 | 2000 | 10000 |
|-----------|-----|-----|-----|-----|------|------|-------|
| THD limit | 35 | 35 | 30 | 20 | 15 | 10 | 10 |

3 Mechanical Specification & Phase

3.1 Drawings

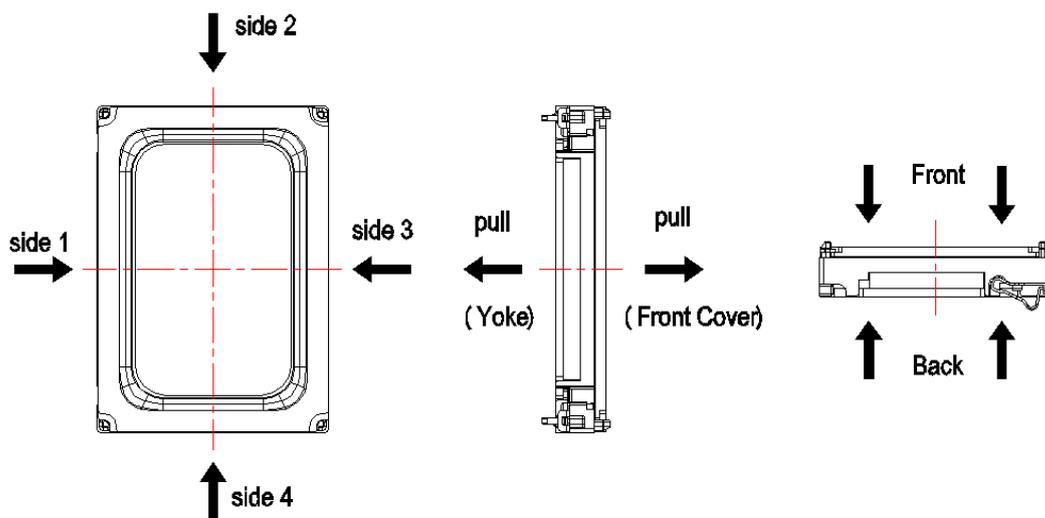


Note:

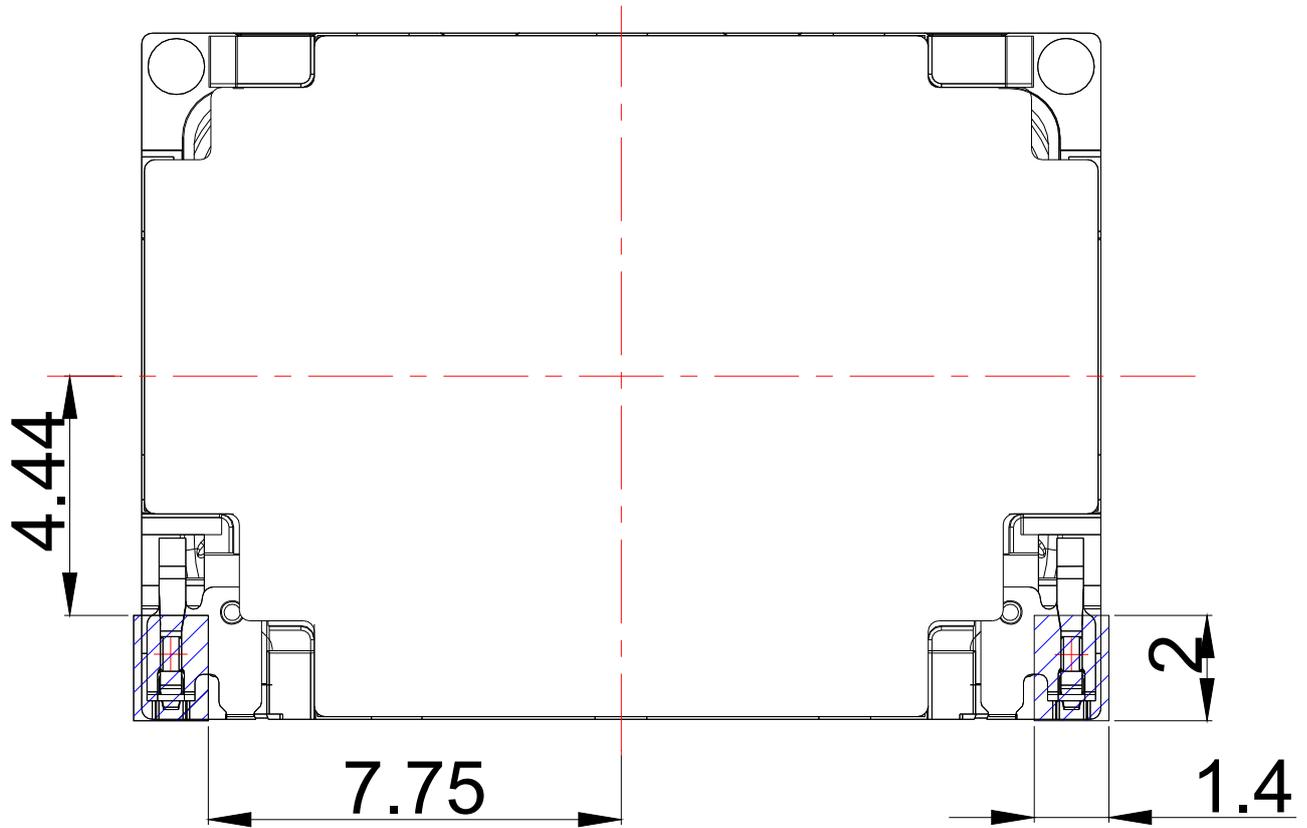
1. \textcircled{G} Key Dimension;
2. The spring circled in the A area should not exceed the sides of the product, both free position and working position; no interference between the spring and the product;
3. At the working position, only the contactor circled in the B area can get in touch with the PAD;
4. Unit: mm, Tolerance general unless otherwise ± 0.1 mm.
5. Overshot: 0.4mm.

3.2 Permitted Force Speaker

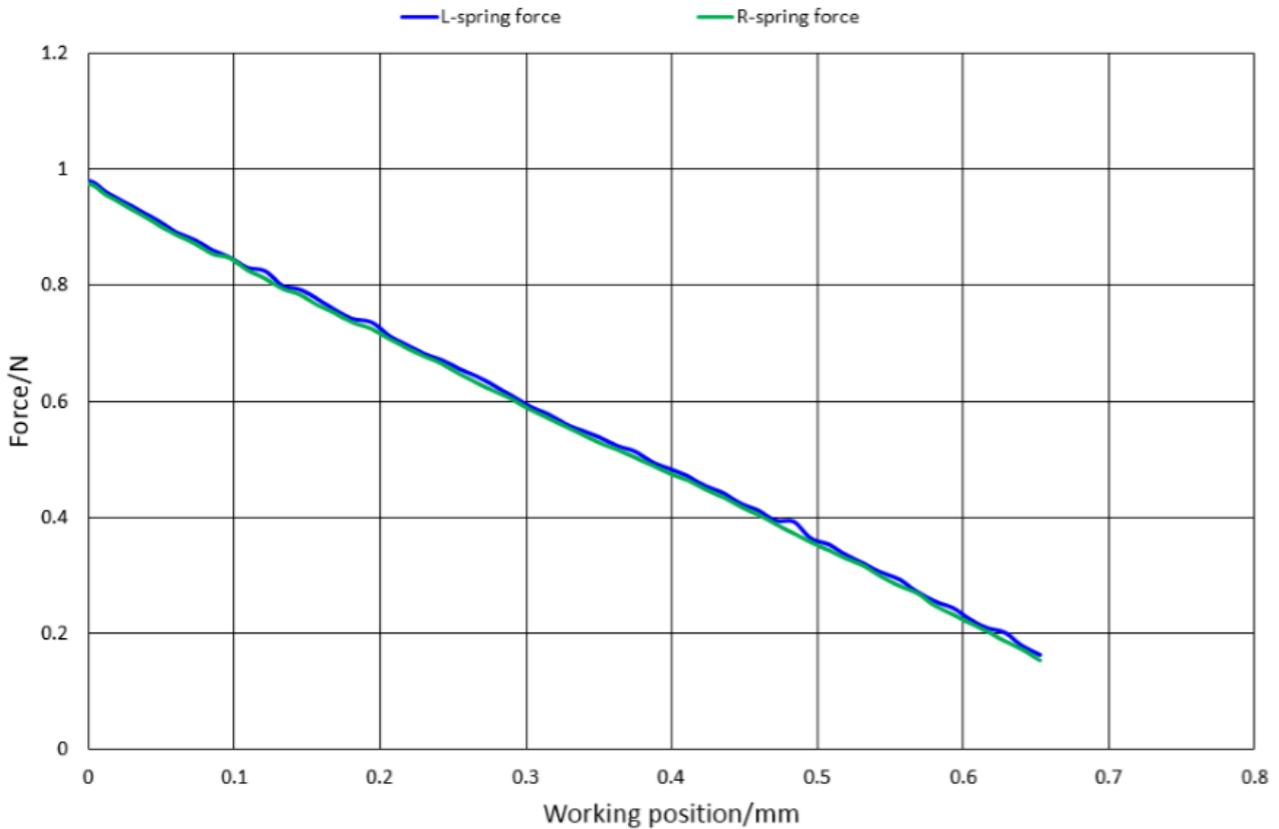
| NO. | From | To | Maximum Permanent Force[N] | Maximum Handing Force[N] |
|-----|---|----|----------------------------|--------------------------|
| 1 | Side force on front Cover and Frame | | 10 | 15 |
| 2 | Push force on Cover | | 10 | 15 |
| 3 | Pull force on Cover | | 10 | 15 |
| 4 | Push force on Magnet and Frame backside | | 10 | 15 |
| 5 | Pull force on Magnet and Frame backside | | 10 | 15 |
| 6 | Force on Membrane and Suspension | | 0 | 0 |
| 7 | Force on Spring tail | | 0 | 0 |
| 8 | Sheer force on Front cover and Frame | | 10 | 10 |



3.3 Pad Layout

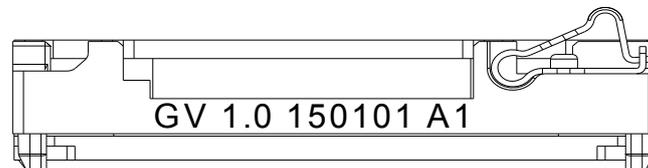


3.4 Spring Contact Force



Contact force: 1.0+/-0.3N at working position;
Cladding thickness: Au≥0.6um

3.5 Marks



Description of the digits:

G: GoerTek

V 1.0: Version number (1.0, 2.0 ...) P soft tooling, V hard tooling, A approved

15: Year (15: 2015, 16: 2016...)

01: Month (01: Jan, 02: Feb ...10: Oct,11: Nov, 12: Dec)

01: Day (01,02,03...)

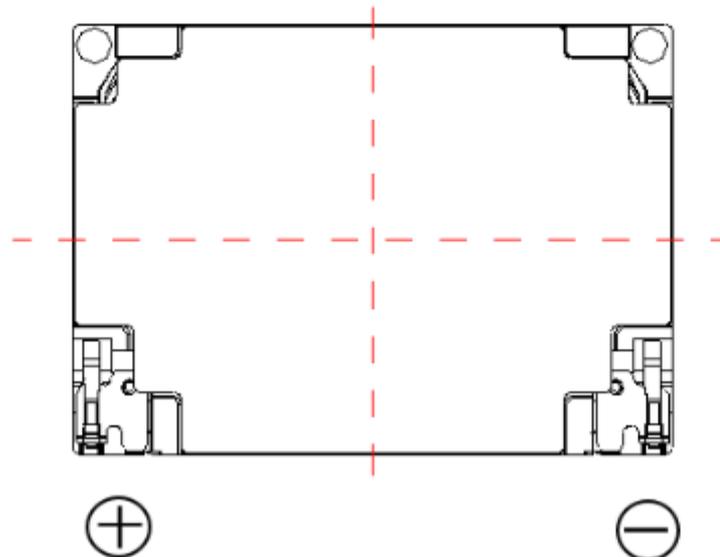
A: Line (A, B ...)

1: Shift (1:Day, 2:Night)

3.6 Polarity Requirements

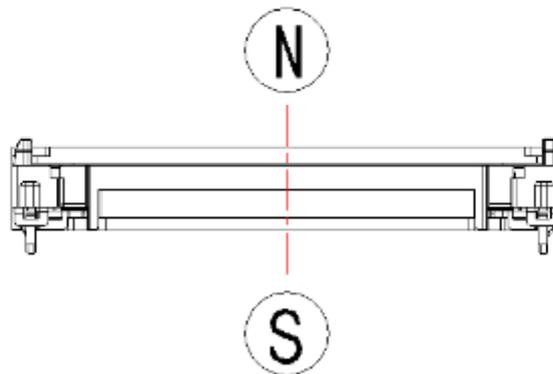
Polarity:

When a DC source's "+" polarity is attached to speaker's "+" polarity, "-" polarity is attached to speaker's "-" polarity, the membrane will move forward.

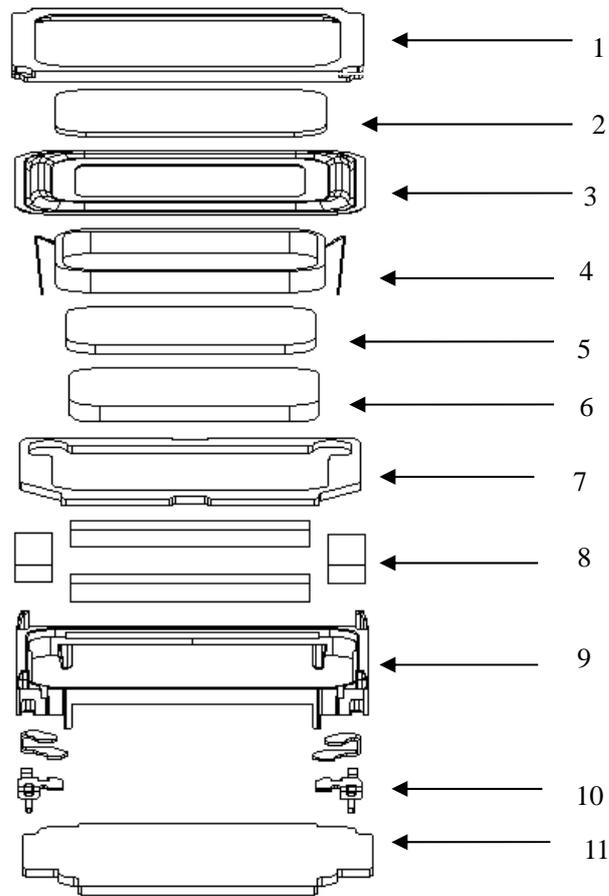


Magnetic Polarity:

Top of the magnet is the north pole

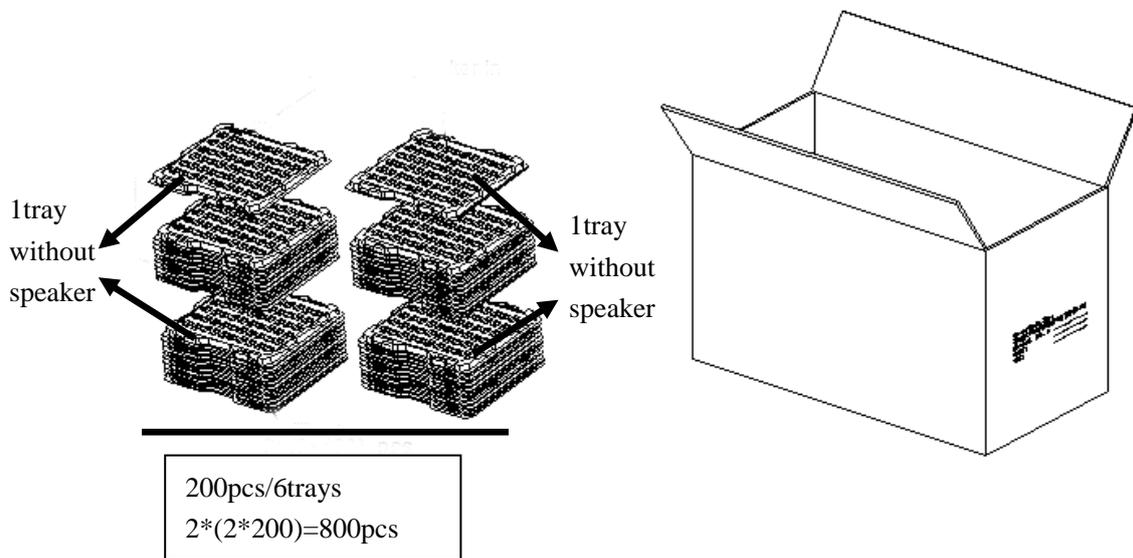
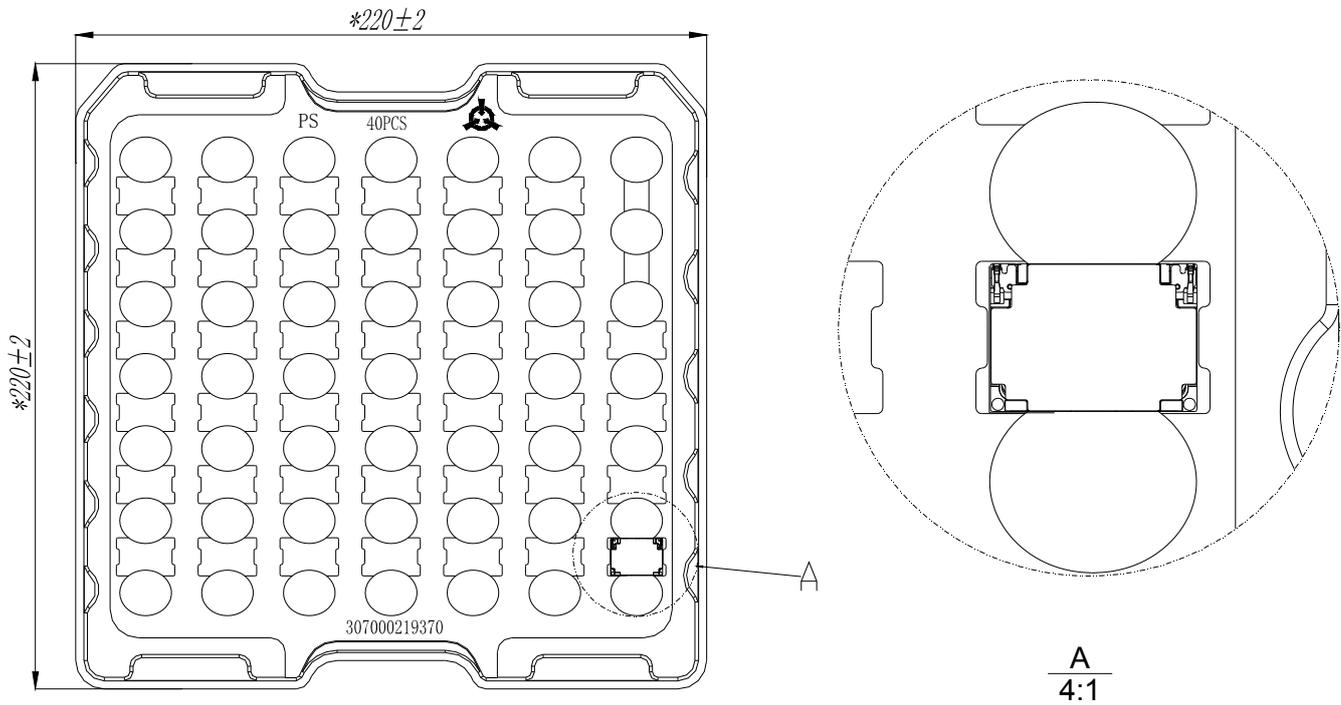


4 Bill of Materials



| No. | Part Name | Material | Quantity |
|-----|------------|-------------------|----------|
| 1 | Cover | Cu | 1 |
| 2 | Dome | Composite | 1 |
| 3 | Diaphragm | Polymer | 1 |
| 4 | Voice Coil | Cu | 1 |
| 5 | Plate | SPCC | 1 |
| 6 | Magnet | Nd-Fe-B | 1 |
| 7 | Plate | SPCC | 1 |
| 8 | Magnet | Nd-Fe-B | 4 |
| 9 | Frame | Plastics+ SUS 301 | 1 |
| 10 | Spring | SUS 301 | 2 |
| 11 | Yoke | SPCC | 1 |

5 Packing Information



| Packing | Material | Colour | Unit |
|-----------|-------------|-------------|--|
| Tray | PS | Blue | 40pcs/Tray |
| Clapboard | PET | Transparent | 20pcs |
| Outbox | Kraft paper | Brown | 800PCS [20Trays+4Trays (empty)+20clapboards/Out Box] |

6 Transportation and Storage and Others

1. Always keep the product in the tray. Damage to membrane and basket might happen if the products are not lined up in the tape.
2. Keep the product from exposing to the sun and keep it in the room with stable temperature and humidity. (Suggest temperature and humidity: 5~30℃, 40~60%).
3. Keep the product away from hazardous substances (gas/dust/water).
4. Do not add heavy load during storage and shipment. Heavy load will change the shape of product.
5. Do not add strong shock during shipment. Shock above the value listed in the instruction will change the shape of the product or disassemble the components inside.
6. This warranty runs for one year from the date of original purchase. This warranty does not cover damage caused by misuse or use other than as intended and described in the product instruction manual.