



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

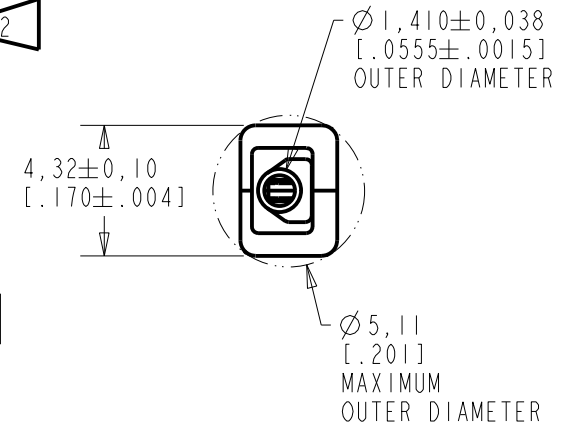
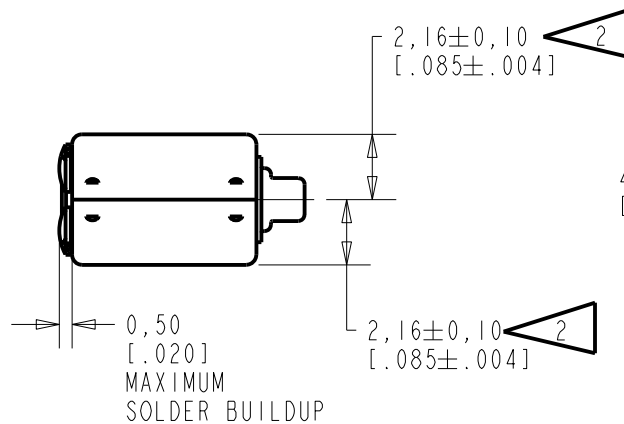
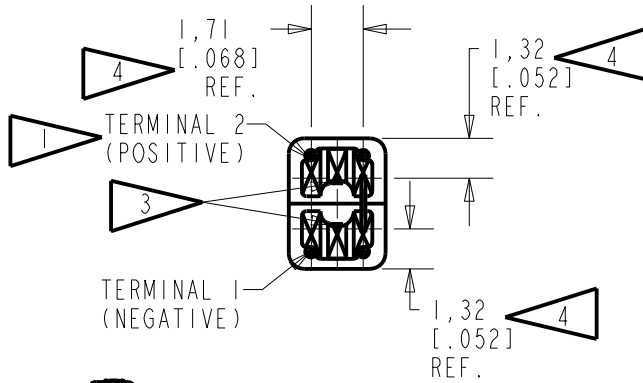
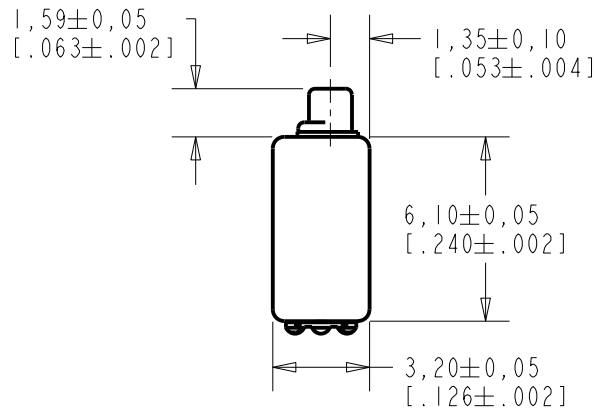


**GR-31587-000**

**SHT 1.1**

NOTES:

- 1 A POSITIVE GOING VOLTAGE AT TERMINAL 2, RELATIVE TO TERMINAL 1, CAUSES A DECREASE IN PRESSURE AT THE SOUND OUTLET.
- 2 LOCATED FROM TWO SURFACE FOR CUSTOMER CONVENIENCE. ONLY APPLICABLE FROM ONE SURFACE, NOT TO BE USED TOGETHER.
- 3 TERMINAL ELECTRICALLY CONNECTED TO CASE.
- 4 DIMENSION TO APPROXIMATE CENTER OF TERMINAL PAD.



SCALE 2:1  
 NOMINAL WEIGHT 0.25 GRAMS  
 DIMENSIONS IN MILLIMETERS [INCHES]

| Revision | C.O. #    | Implementation Date | RELEASE LEVEL | REVISION |
|----------|-----------|---------------------|---------------|----------|
| B        | CI0114522 | 3-19-13             | Active        | B        |
| A        | CI0113458 | 5-23-12             |               |          |

|                      |  |              |               |
|----------------------|--|--------------|---------------|
| SCALE: 4:1           |  | DR. BY: OO   | DATE: 5-23-12 |
| DO NOT SCALE DRAWING |  |              |               |
| TITLE: RECEIVER      |  | GJP          | 5-24-12       |
| OUTLINE DRAWING      |  | APP. BY: GJP | DATE: 5-25-12 |
| GR-31587-000         |  | SHT 1.1      |               |

**KNOWLES ELECTRONICS**  
 ITASCA, ILLINOIS U.S.A.

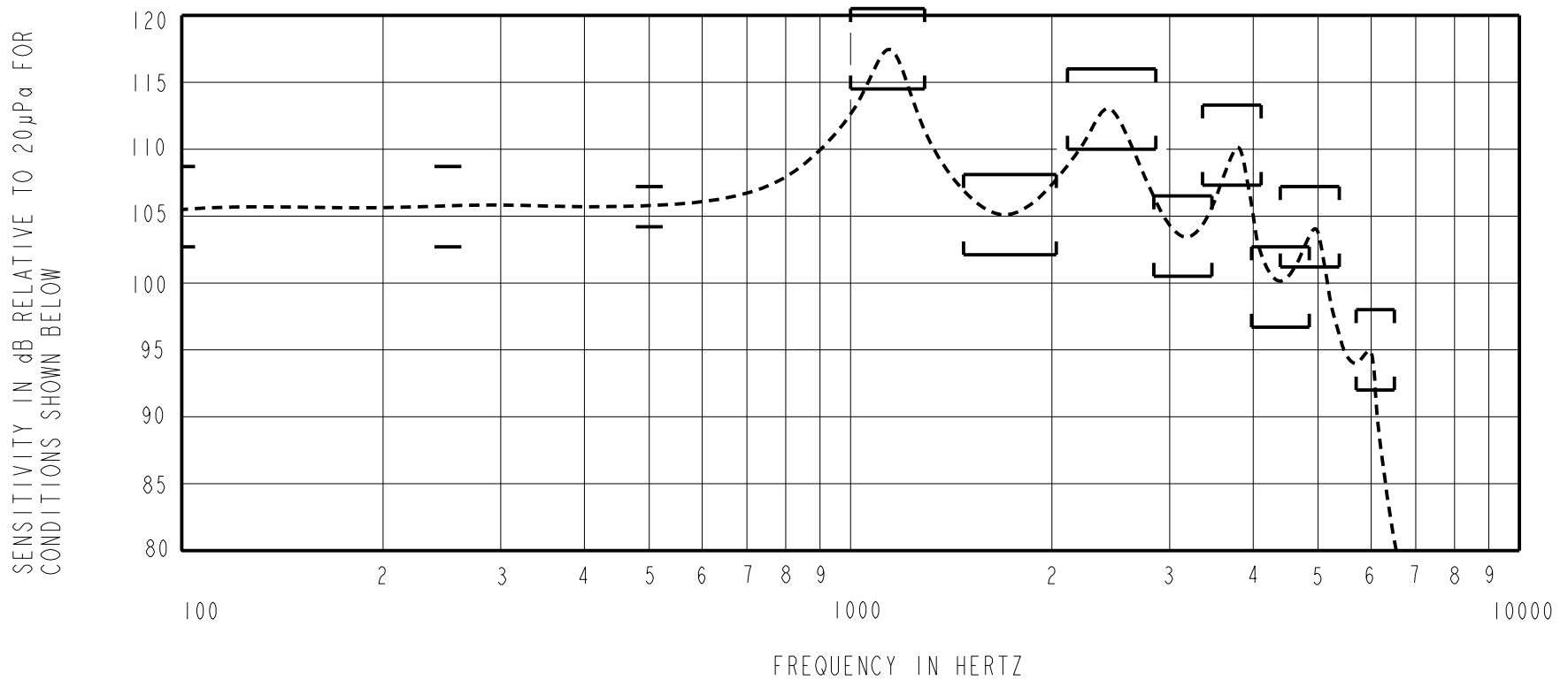
THIS IS A PAIR OF RECEIVERS WITH VERY LOW VIBRATION IN ALL DIRECTIONS, AND A QUADRAPOLE MAGNETIC RADIATION PATTERN.

NO DAMPING

GR-31587-000

SHEET 2.1

CONSTANT VOLTAGE DRIVE CONDITIONS



ACOUSTICAL

SENSITIVITY  
 DEVICE WILL PRODUCE THE SPL LISTED BELOW UNDER TEST CONDITIONS DESCRIBED IN TABLE 4. NOMINAL SENSITIVITY AT 1kHz IS dB RELATIVE TO 20µPa. ALL OTHER VALUES IN dB RELATIVE TO THE SENSITIVITY AT 500Hz.

| LIMIT TYPE | FREQUENCY (Hz) | MINIMUM | NOMINAL | MAXIMUM |
|------------|----------------|---------|---------|---------|
| REL        | 100            | -3.0    | 0.0     | +3.0    |
| REL        | 250            | -3.0    | 0.0     | +3.0    |
| REF        | 500            | -1.5    | 105.7   | +1.5    |
| PEAK 1     | 990-1390       | +8.8    | +11.8   | +14.8   |
| VALLEY 1   | 1600-2200      | -3.6    | -0.6    | +2.4    |
| PEAK 2     | 2160-2900      | +4.3    | +7.3    | +10.3   |
| VALLEY 2   | 2900-3500      | -4.5    | -1.5    | +1.5    |
| PEAK 3     | 3390-4130      | +1.6    | +4.6    | +7.6    |
| VALLEY 3   | 4090-4890      | -8.7    | -5.7    | -2.7    |
| PEAK 4     | 4500-5460      | -4.1    | -1.1    | +1.9    |
| PEAK 5     | 5700-6500      | -13.1   | -10.1   | -7.1    |

TABLE 1

TOTAL HARMONIC DISTORTION  
 DEVICE WILL NOT EXCEED TOTAL HARMONIC DISTORTION LEVELS LISTED BELOW.

| FREQUENCY (Hz)       | AC DRIVE (Vrms) | DC BIAS (V) | LIMIT (%) |
|----------------------|-----------------|-------------|-----------|
| 1/3 PEAK1 (TYP. 391) | 0.112           | 0           | 3         |
| 1/2 PEAK1 (TYP. 586) | 0.112           | 0           | 3         |
| 1/3 PEAK1 (TYP. 391) | 0.224           | 0           | 8         |
| 1/2 PEAK1 (TYP. 586) | 0.315           | 0           | 10        |

TABLE 2

MAXIMUM OUTPUT LEVEL

| POWER (mW) | 500 Hz SPL (dB) | REQUIRED VOLTAGE (Vrms) | Peak SPL (dB) | REQUIRED VOLTAGE (Vrms) |
|------------|-----------------|-------------------------|---------------|-------------------------|
| 10         | 120.1           | 0.703                   | 135.9         | 0.925                   |

TABLE 3

TEST CONDITIONS

|                        |  |
|------------------------|--|
| NOMINAL SOURCE VOLTAGE | 0.112 Vrms, 0 mA DC BIAS   |
| SOURCE IMPEDANCE       | <1 Ohm   |
| TUBING                 | 8 mm X 1 mm ID + 28 mm X 1.5mm ID EAR HOOK SIMULATOR + 25 mm X 2 mm ID TUBE + 18 mm X 3 mm ID TUBE |
| COUPLER CAVITY         | 2 CM <sup>3</sup> , SIMULATED ANSI S3.7 TYPE HA-3 (IEC 60318-5)                                    |
| MAXIMUM DRIVE VOLTAGE  | 1.55 Vrms  |

TABLE 4

ELECTRICAL

|                      |                 |
|----------------------|-----------------|
| DC RESISTANCE @ 20°C | 40.9 Ohms ± 10% |
| IMPEDANCE @ 500 Hz   | 58.6 Ohms ± 15% |
| INDUCTANCE @ 500 Hz  | 10.8 mH TYPICAL |
| CAPACITANCE @ 10 MHz | 2.9 pF TYPICAL  |

TABLE 5

ISOLATION: CASE WILL BE ELECTRICALLY ISOLATED FROM THE COIL CIRCUIT.

MECHANICAL

PORT LOCATION: 12S

SOLDER TYPE: SAC305

TEMPERATURE

OPERATING: SENSITIVITY WILL NOT VARY MORE THAN +1/-3 dB AT 500 Hz FROM -17°C TO 63°C

STORAGE: -40°C TO 63°C

SHOCK RESISTANCE: 90% SURVIVAL RATE WITH THD @ 1/3 PEAK FREQUENCY LESS THAN 10%, THD @ 1/2 PEAK FREQUENCY LESS THAN 20% AND LESS THAN 3dB CHANGE IN SENSITIVITY AT 1kHz WHEN SUBJECTED TO 14,100 G.

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| Revision   | C.O. #    | Implementation Date | RELEASE LEVEL | REVISION |
|--|-----------|---------------------|---------------|----------|
| B  | C10114522 | 3-19-13             | Active        | B        |
| A  | C10113458 | 5-23-12             |               |          |
| WHEN TEST LIMITS ARE USED TO ESTABLISH INCOMING INSPECTION ACCEPTANCE/REJECTION CRITERIA, CORRELATION OF TEST EQUIPMENT WITH KNOWLES IS ALSO REQUIRED FOR ELIMINATION OF EQUIPMENT AND TEST METHOD VARIATION |           |                     | DR. BY        | DATE     |
| TITLE: <b>RECEIVER</b><br>PERFORMANCE SPECIFICATION  |           |                     | OQ            | 5-23-12  |
|  |           |                     | GR-31587-000  |          |
| SHT 2.1  |           |                     | GJP           | 5-24-12  |
|  |           |                     | GJP           |          |