

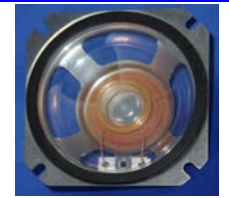


PRODUCT INFORMATION

| | | |
|---------------|--------------------------------|-------------------------|
| PART # | CES870S285KG08SMN400TGR | Revision: 0-2012 |
|---------------|--------------------------------|-------------------------|

| | |
|---|---------------------------------------|
|  | 3.5" SQUARE WATERPROOF SPEAKER |
|---|---------------------------------------|

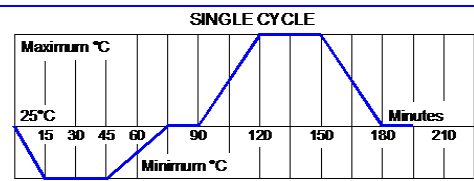
DESCRIPTION: Challenge Electronics Speaker, 87.0 mm Long, Square shape, 87.0 mm Wide, 28.5 mm High, KG = 16 W maximum power, 8 Ohm, Steel Frame (Zinc-Plated), Mylar Cone, NdFeB Ferrite magnet, 400 Hz. (Fo) Resonant Frequency, Terminal Lugs Termination, Hermetically Sealing Gasket available for Waterproofing, RoHS Lead Free Compliant



SPECIFICATIONS

| | | | | | | | | | | | | | | | |
|---------------------------------|--|---|--------------------------------------|------------------|--------------------------------|----------------------|---------------------------------|-----------------------|----------------|--|----------|--|------------|--|-----------|
| Shape | Square | Impedance | 8 Ω ± 15%, at 1,000 Hz, 1.0 V | | | DC Resistance | 7.2 Ω ± 15% | | | | | | | | |
| Rated Power | Sine Wave | 8 W | Square Wave | W | Maximum Power | Sine Wave | 16 W | Square Wave | | | | | | | |
| Effective Frequency Band | 400 Hz. to 6,000 Hz. | | Resonant Frequency (Fo) | | 400 Hz. ± 20%, at 1.0 V | | | | | | | | | | |
| Sound Pressure Level | 87 ± 3.0 dB(A), at: 1 W, 100 cm, Average 400, 600, 800, 1,000, and 1,500 (Hz), at 25°C, Baffle board (IEC) | | | | | | | | | | | | | | |
| Operating Temperature | -25°C to + 65°C | | Storage Temperature | | -30°C to +70°C | | | | | | | | | | |
| Physical Dimensions | Length or Diameter (L /D) | | 87.0 mm | Width (W) | | 87.0 mm | Height (H) | | 28.5 mm | | | | | | |
| Baffle Opening | Length or Diameter (L /D) | | mm Ø | Width (W) | | mm | Minimum Opening Recessed | | 3.0 mm | | | | | | |
| Mounting | Length or Diameter (L /D) | | 70.7 mm | Width (W) | | 70.7 mm | Holes size | 4.9 Ø X 8.3 mm | Holes 4 | | | | | | |
| Distortion | Less than 5% at 1,000 Hz. at 1.0 W. | | | | | | | | | | | | | | |
| Buzz & Rattle | Not be audible at 4 V sine wave between 20 Hz and 6,000 Hz. | | | | | | | | | | | | | | |
| Polarity | When a positive DC Current is applied to the voice coil terminal marked +or red, the diaphragm shall move forward | | | | | | | | | | | | | | |
| Material | Magnet | N38 NdFeB Ferrite, OD 19.5 mm Ø, H 5.5 mm, 12 grams | | | | | Flux Density | ± 10% Gauss | | | | | | | |
| | Frame | Steel (Zinc- Plated) | | | Cone Material | | PEI Mylar | | | | | | | | |
| | Termination | Terminal Lugs for wire leads soldering. (Caution, overheating the terminal may damage connections of voice coil leads) | | | | | | | | | | | | | |
| | Optional Gasket | Yes, OD 87 mm Ø, H 0.5 mm, Rubber | | | | | | | | | | | | | |
| Speaker Parameters | Qms | 6.1 | Qes | 3.12 | Qts | 2.08 | Vas | | Cms | | M | | M/N | | BL |
| Approximate Weight | 102 grams | | Shielding | No | | Compliance | | RoHS Lead Free | | | | | | | |
| Options | | | | | | | | | | | | | | | |

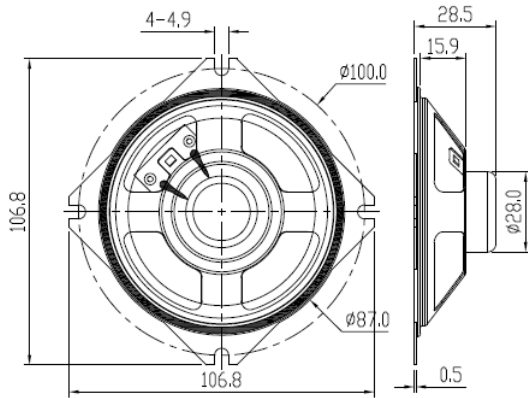
RELIABILITY

| | |
|---|--|
| Maximum Power Test | With program White-Noise source Maximum Power , 1 minute on, 2 minutes off, 10 cycles , per (EIA) * |
| Thermal Operating Temperature Test | 96 hours continuous operation at Rated Power , at Maximum Rated Operating Temperature * |
| | 96 hours continuous operation at Rated Power , at Minimum Rated Operating Temperature * |
| Thermal Storage Temperature Test | 96 hours at Maximum Rated Storage Temperatures * |
| | 96 hours at Minimum Rated Storage Temperatures * |
| Thermal Shock Test | <p>5 cycles of Minimum and Maximum Operating Temperature</p> <p>Each cycle shall be set per diagram below and is three (3) hours long *</p> |
| |  |
| Humidity Test | 96 Hours at +40°C±2°C. 90-95% RH * |
| Operation Life Test | Must perform normal with program White-Noise source at Rated Power for 100 Hours per (EIA) * |
| Insulation Test | A minimum of 1 MΩ, measured with 100 Vdc Insulation Resistance Meter, between the Electrical Terminals and the Transducer Case |
| Termination Strength | Maximum of 9.8 N (1.0 Kg) load pull test, applied to each terminal in axial direction for 10 seconds |
| Vibration Test | Parts in shipping Container are subjected to 15minutes of at 1.5 mm with 10 to 55 Hz. vibration frequency to each of 3 perpendicular directions * |
| Drop Test | Parts in shipping Container are subjected to dropped naturally from 1 meter height onto the surface of 40 mm wooden board, 3 axes (X,Y,Z) directions, 3 times (6 times total) * |
| * Reliability Test Performance | Parts should conform to original performance within ±5 dB tested with Rated Power, after 3 hours of recovery period. |
| Warranty | For a period of one (1) year from date of shipping under normal operations conditions This warranty does not apply to products damaged through misuse, abuse, improper installation, alteration, rework, or attempt to repair |

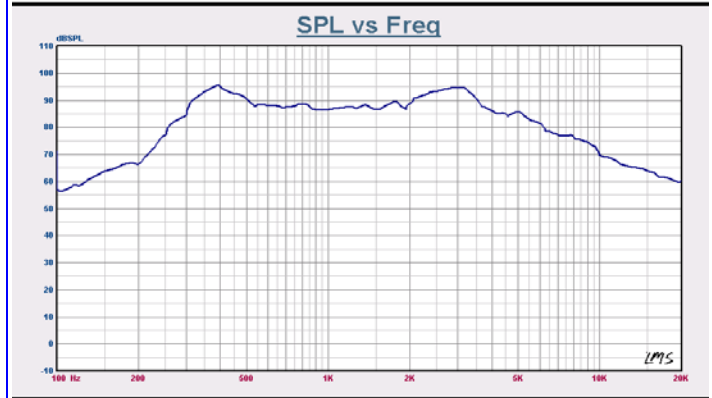
The information contained herein is believed to be correct, but no guarantee or warranty, express or implied, with respect to accuracy, completeness or results is extended and no liability is assumed. Challenge Electronics reserves the right to make changes in any specification, data or material contained herein.



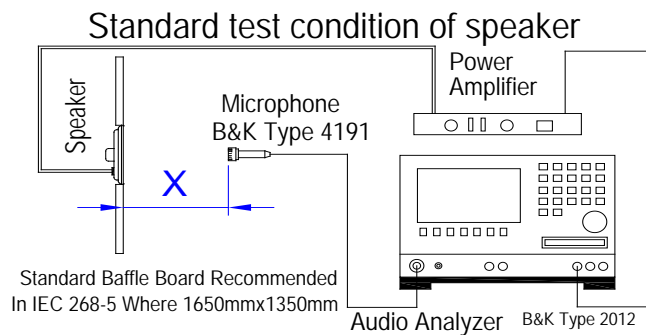
DIMENSIONS Units in: mm, Tolerance: ± 0.3 mm unless specified otherwise.



SPL vs. FREQUENCY RESPONSE



TEST PROCESS



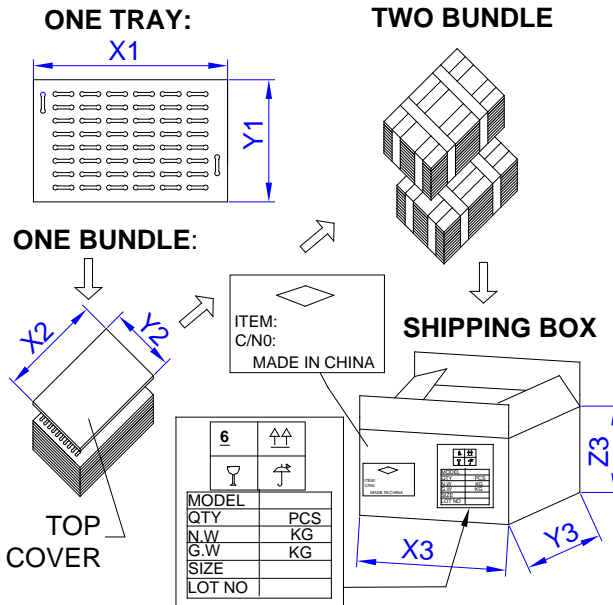
| Test Condition | |
|-----------------------|----------------------|
| STANDARD | |
| Temperature: | 15 ~ 35°C |
| Relative humidity: | 45% ~ 85% |
| Atmospheric pressure: | 860 mbar to 1060mbar |
| JUDGEMENT | |
| Temperature : | 20 \pm 3°C |
| Relative humidity: | 60% ~ 70% |
| Atmospheric pressure: | 860mbar to 1060mbar |

| Standard Test Fixture | |
|-----------------------|--------|
| Zero Level: | -dB |
| Mode: | TSR |
| potentiometer Range: | 50dB |
| Sweep Time: | 0.5sec |

Input Power:
1 W (0.89 V)

Microphone Distance:
X = 100 cm

PACKAGING



| MARKING | TRAY | |
|------------------------|---------------------|-------|
| Bundle | | |
| Customer PN | Dimensions | X1 cm |
| Other PN if required | | Y1 cm |
| Quantity | Z1 cm | |
| Lot and/or Date Code | Quantity | |
| Bundle Number | BUNDLE | |
| Shipping Box | Dimensions | X2 cm |
| Customer Part Number | | Y2 cm |
| Other PN (if required) | | Z2 cm |
| Quantity | Quantity | |
| Lot and/or Date Code | SHIPPING BOX | |
| PO Number | Dimensions | X3 cm |
| Net Weight | | Y3 cm |
| Gross Weighjt | | Z3 cm |
| Box Number | Number of Bundles | |
| of Number of Boxes | Quantity | |
| Made in China | Approximate Weight | |