



# PRODUCT INFORMATION

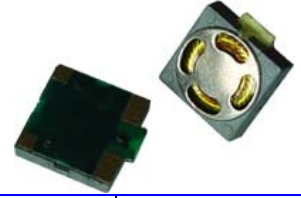
|               |                               |                         |
|---------------|-------------------------------|-------------------------|
| <b>PART #</b> | <b>CSMS15S4.3-8S0.3-P950F</b> | <b>Revision: 1-2012</b> |
|---------------|-------------------------------|-------------------------|



## DYNAMIC MINI SQUARE SPEAKER

**DESCRIPTION:** Challenge Electronics Speaker, 15.0 mm Long, Dynamic SQUARE shape, 15.0 mm Wide, 4.3 mm High, AE = 0.5 W maximum power, 8 Ohm, Plastic Frame, Mylar Cone, NdFeB Ferrite magnet, 450 Hz. (Fo) Resonant Frequency, PCB Solder Points Termination

- ◆ RoHS complaint
- ◆ Water-proof
- ◆ Small size
- ◆ Lead Free Reflowing Solderable



### SPECIFICATIONS

|                                 |   |  |                                      |                  |  |                                 |                      |                    |          |  |
|---------------------------------|---|--|--------------------------------------|------------------|--|---------------------------------|----------------------|--------------------|----------|--|
| <b>Shape</b>                    | <b>Square</b>   | <b>Impedance</b>                           | <b>8 Ω ± 15%, at 1.0 K Hz, 1.0 V</b> |                  |  | <b>DC Resistance</b>            |                      |                    |          |  |
| <b>Rated Power</b>              | <b>Sine Wave</b>  | <b>0.3 W</b>                               | <b>Square Wave</b>                   | <b>W</b>         | <b>Maximum Power</b>                       | <b>Sine Wave</b>                | <b>0.5 W</b>         | <b>Square Wave</b> | <b>W</b> |  |
| <b>Effective Frequency Band</b> | <b>Fo to 20,000 Hz.</b> Within SPL Average of 10 dB   |  |                                      |                  | <b>Resonant Frequency (Fo) in free air</b> |                                 | <b>950 ± 190 Hz.</b> |                    |          |  |
| <b>Sound Pressure Level</b>     | <b>89 ± 3 dB (A)</b> , at 0.3 W, 10 cm, Average of SPL values at 800, 1,000, 1,200 & 1,500 Hz.                            |  |                                      |                  |  |                                 |                      |                    |          |  |
| <b>Operating Temperature</b>    | <b>-30°C to + 80°C</b>  |  | <b>Storage Temperature</b>           |                  | <b>-40°C to +90°C</b>                      |                                 |                      |                    |          |  |
| <b>Physical Dimensions</b>      | <b>Length or Diameter (L /D)</b>  |  | <b>15.0 mm</b>                       | <b>Width (W)</b> | <b>15.0 mm</b>                             | <b>Height (H)</b>               | <b>4.3 mm</b>        |                    |          |  |
| <b>Baffle Opening</b>           | <b>Length or Diameter (L /D)</b>  |  | <b>mm Ø</b>                          | <b>Width (W)</b> |  | <b>Minimum Opening Recessed</b> |                      | <b>1.0 mm</b>      |          |  |
| <b>Mounting</b>                 | <b>Length or Diameter (L /D)</b>  |  | <b>mm</b>                            | <b>Width (W)</b> | <b>mm</b>                                  | <b>Holes size</b>               | <b>mm</b>            | <b>Holes</b>       |          |  |
| <b>Distortion</b>               | <b>Less than 15% at 0.3 W, 0.1 m</b>  |  |                                      |                  |  |                                 |                      |                    |          |  |
| <b>Buzz &amp; Rattle</b>        | <b>Not be audible at F0 ~ 20,000 Hz. frequency range, Input level 1.55 V (0.3W)</b>                                       |  |                                      |                  |  |                                 |                      |                    |          |  |
| <b>Polarity</b>                 | <b>When a positive DC Current is applied to the voice coil terminal marked +or red, the diaphragm shall move forward.</b> |  |                                      |                  |  |                                 |                      |                    |          |  |
| <b>Material</b>                 | <b>Magnet</b>   | <b>Ferrite, NdFeB, mm Ø OD, mm high</b>    |                                      |                  |  | <b>Flux Density</b>             | <b>Gauss</b>         |                    |          |  |
|                                 | <b>Frame</b>  | <b>Plastic, LCP Vectra E130i, or equal</b> |                                      |                  | <b>Cone Material</b>                       | <b>PEI Mylar</b>                |                      |                    |          |  |
|                                 | <b>Termination</b>  | <b>PCB, Gold Plated, Solder Points</b>     |                                      |                  |  |                                 |                      |                    |          |  |
|                                 | <b>Gasket</b>   |  |                                      |                  |  |                                 |                      |                    |          |  |
| <b>Approximate Weight</b>       | <b>2.3 grams</b>  |  | <b>Shielding</b>                     | <b>No</b>        | <b>Compliance</b>                          | <b>Lead Free, RoHS</b>          |                      |                    |          |  |
| <b>Options</b>                  |   |  |                                      |                  |  |                                 |                      |                    |          |  |

### RELIABILITY

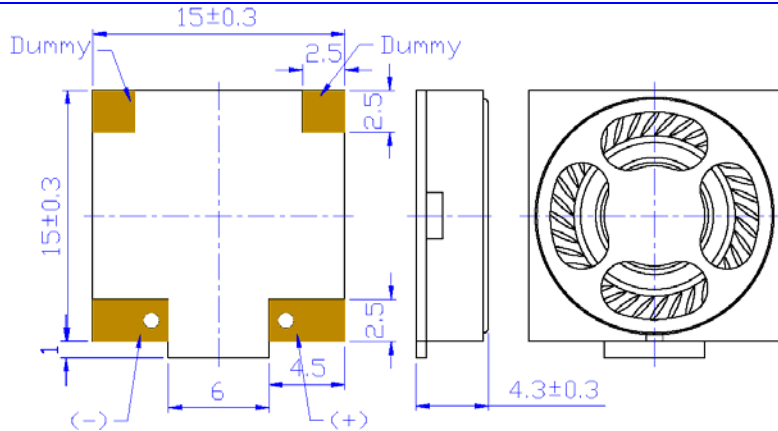
|   |  |
|---|--|
| <b>Maximum Power Test</b>                 | With <b>White-Noise</b> simulated program signal source (per IEC 268-1), <b>at Maximum Power</b> , with crest factor of 1.8 to 2.2 in rated frequency response, 1 second ON, 1 minutes OFF, 60 cycles, (per IEC 268-5) *         |
| <b>Thermal Operating Temperature Test</b> | <b>96 hours</b> continuous operation <b>at Rated Power</b> , at Maximum Rated Operating Temperature *  |
| <b>Thermal Storage Temperature Test</b>   | <b>96 hours</b> storage at Maximum Rated Storage Temperatures *  |
| <b>Thermal Shock Test</b>                 | <b>5 cycles of Minimum and Maximum Operating Temperature</b>   |
|   | Each cycle shall be set per diagram below and is three (3) hours long, (per IEC 68-2-14) *   |
|   |  |
| <b>Humidity Test</b>                      | <b>48 Hours</b> at +40°C±2°C. 90-95% RH, (per IEC 68-2-67) *   |
| <b>Operation Life Test</b>                | Must perform normal with program White-Noise source <b>at Rated Power</b> for 96 Hours per (EIA) *   |
| <b>Insulation Test</b>                    | A minimum of 1 MΩ, measured with 100 Vdc Insulation Resistance Meter, between the Electrical Terminals and the Transducer Case   |
| <b>Vibration Test</b>                     | After parts are subjected to 15minutes of at 1.5 mm with 10 to 55 Hz. vibration frequency to each of 3 perpendicular directions *  |
| <b>Termination Strength</b>               | Maximum of 9.8 N (1.0 Kg) load pull test, applied to each terminal in axial direction for 10 seconds   |
| <b>Drop Test</b>                          | Part mounted in a 100 g fixture and dropped naturally from 1.5 meter height onto the surface of 40 mm wooden board, 3 axes (X,Y,Z) directions, 3 times (9 times total) *   |
| <b>* Reliability Test Performance</b>     | <b>Parts should conform to original performance within ±5 dB tested with Rated Power, after 3 hours of recovery period.</b>  |
| <b>Life Test</b>                          | <b>96 hours</b> continuous operation <b>at Rated Power</b> , with <b>White-Noise</b> simulated program signal source (per IEC 268-1) with a Vp to Vrms ratio of 1.8 to 2.2 in rated frequency range, (per IEC 268-5)             |
| <b>Warranty</b>                           | For a period of one (1) year from date of shipping under normal operations conditions<br>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.



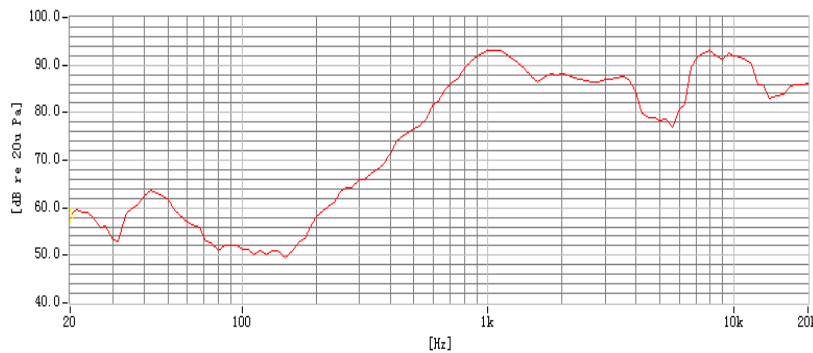
**DIMENSIONS**

Units in: mm, Tolerance: ± 0.15 mm unless specified otherwise.



**RECOMMENDED LAND PATTERN**

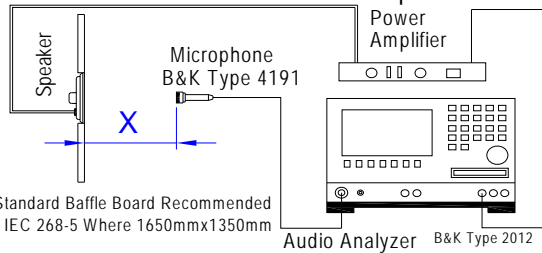
**SPL vs. FREQUENCY RESPONSE**



**HARMONIC DISTORTIONS**

**TEST PROCESS**

Standard test condition of speaker



Standard Baffle Board Recommended  
 In IEC 268-5 Where 1650mmx1350mm

**Test Condition**

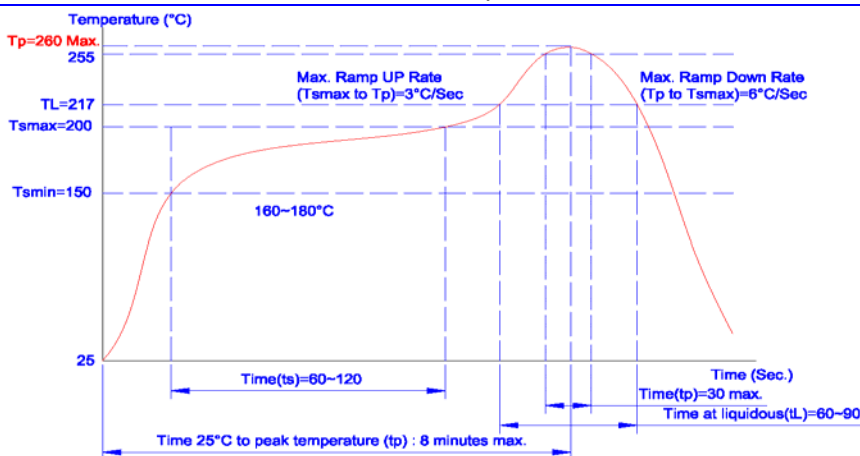
**STANDARD**  
 Temperature: 15 ~ 35°C  
 Relative humidity: 45% ~ 85%  
 Atmospheric pressure: 860 mbar to 1060mbar  
**JUDGEMENT**  
 Temperature : 20±3°C  
 Relative humidity: 60% ~ 70%  
 Atmospheric pressure: 860 mbar to 1060 mbar

**Standard Test Fixture**

In  
 Zero Level: -dB  
 Mode: TSR  
 potentiometer Range: 50 dB  
 Sweep Time: 0.5 sec

**put Power:**  
**0.3 W**  
**Microphone Distance:**  
**X = 10 cm**

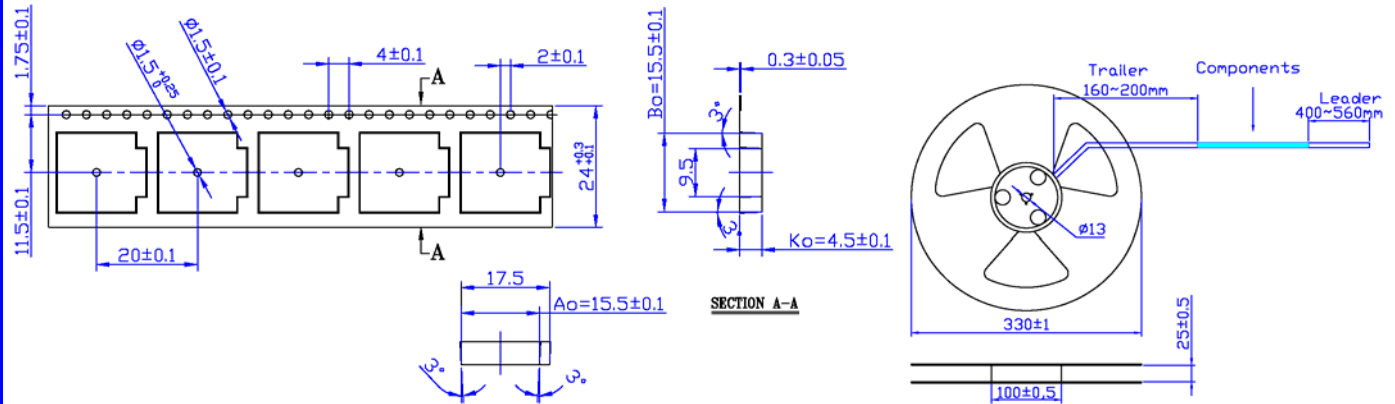
**SOLDER REFLOW PROFILE** as per IPC/JEDEC J-STD-020D



| Stage                 | Temperature Profile | Maximum Time      |
|-----------------------|---------------------|-------------------|
| Pre-heat              | 170~230°C           | 120 sec           |
| Solder Melt           | Above 230°C         | 100 sec           |
| Peak                  | 260°C Maximum       |                   |
| Cool Down             |                     | 100 sec           |
| Total Duration Period |                     | 6 Minutes Maximum |



**TAPE and REEL INFORMATION**



1. 110 sprocket holes pitch cumulative tolerance  $\pm 0.20$  mm
2. Carrier camber not to exceed 1 mm in 100 mm
3. Ao & Bo measured on a place 0.3 mm above the bottom of the pocket
4. Ko measured from a plane on the inside bottom of pocket to the top surface of the carrier
5. All dimensions meet EIA-481-2-A requirements
6. Thickness:  $0.40 \pm 0.05$  mm
7. Component loaded per 13" Reel: 750 parts

**PACKAGING**

|                        | MARKING                | Reel              |        |
|------------------------|------------------------|-------------------|--------|
| Bundle                 |                        | X1                | cm     |
| Customer PN            | Dimensions             | Y1                | cm     |
| Other PN if required   |                        | Z1                | cm     |
| Quantity               |                        | Quantity          |        |
| Lot and/or Date Code   | <b>BUNDLE</b>          |                   |        |
| Bundle Number          |                        | X2                | cm     |
| Shipping Box           | Dimensions             | Y2                | cm     |
| Customer Part Number   |                        | Z2                | cm     |
| Other PN (if required) |                        | Quantity          |        |
| Quantity               | <b>SHIPPING BOX</b>    |                   |        |
| Lot and/or Date Code   |                        | X3                | 31 cm  |
| PO Number              | Dimensions             | Y3                | 24 cm  |
| Net Weight             |                        | Z3                | 19 cm  |
| Gross Weight           |                        | Number of Bundles |        |
| Box Number             | Quantity               |                   | 500    |
| of Number of Boxes     | Approximate Weight     |                   | 4.8 kg |
|                        | Approximate Net Weight |                   | 3.6 kg |