



# PRODUCT INFORMATION

<b>PART #</b>	<b>CES102S470KF4APN110TGR</b>	<b>Revision: 1-2012</b>
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## 4" SQUARE SPEAKER

**DESCRIPTION:** Challenge Electronics Speaker; 102.0 mm Long; Square shape; 102 mm Wide; 47.0 mm High; KF = 15 W maximum power; 4 Ohm; Black Anodized Steel Frame; Paper Cone; NdFeB Ferrite magnet; (Fo) 110 Hz. Resonant Frequency; Terminal Lugs Termination; Gasket for mounting; RoHS Lead Free Compliant



### SPECIFICATIONS

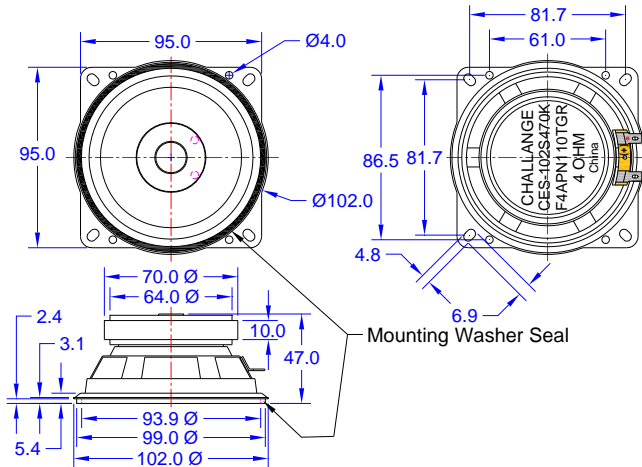
<b>Shape</b>	<b>Square</b>	<b>Impedance</b>	<b>4 Ω ± 15%, at 1,000 Hz, 1.0 V</b>			<b>DC Resistance</b>	<b>3.6 Ω ± 15%</b>				
<b>Rated Power</b>	<b>Sine Wave</b>	<b>8 W</b>	<b>Square Wave</b>	<b>W</b>	<b>Maximum Power</b>	<b>Sine Wave</b>	<b>15 W</b>	<b>Square Wave</b>	<b>W</b>		
<b>Effective Frequency Band</b>	<b>100 Hz. to 18,000 Hz.</b>				<b>Resonant Frequency (Fo)</b>	<b>110.8 Hz. ± 20%, at 1.0 V</b>					
<b>Sound Pressure Level</b>	<b>83.5 ± 3.0 dB(A), at 1 W, 1.0 m, Average 1,000, 1,500, and 2,000 (Hz), at 25°C, Baffle board (IEC)</b>										
<b>Operating Temperature</b>	<b>-20°C to + 60°C</b>		<b>Storage Temperature</b>		<b>-30°C to +70°C</b>						
<b>Physical Dimensions</b>	<b>Length or Diameter (L/D)</b>	<b>102.0 mm</b>	<b>Width (W)</b>	<b>102.0 mm</b>	<b>Height (H)</b>	<b>47.0 mm</b>					
<b>Baffle Opening</b>	<b>Length or Diameter (L/D)</b>	<b>99.0 mm Ø</b>	<b>Width (W)</b>	<b>mm</b>	<b>Minimum Opening Recessed</b>	<b>3.0 mm</b>					
<b>Mounting</b>	<b>Length or Diameter (L/D)</b>	<b>81.7 mm</b>	<b>Width (W)</b>	<b>81.7 mm</b>	<b>Holes size</b>	<b>7.0 L X 4.8 W mm</b>	<b>Holes</b>	<b>4</b>			
<b>Distortion</b>	<b>Less than 5% at 1,000 Hz. at 1.0 W.</b>										
<b>Buzz &amp; Rattle</b>	<b>Not be audible at 4 V sine wave between 20 Hz and 10,000 Hz.</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>Y20 NdFeB Ferrite, OD 70 mm Ø, ID 32 mm Ø, H 10 mm</b>				<b>Flux Density</b>	<b>± 10% Gauss</b>				
	<b>Frame</b>	<b>Black Anodized Steel</b>			<b>Cone Material</b>	<b>Paper</b>					
	<b>Termination</b>	<b>Terminal Lugs for wire leads soldering. (Caution, overheating the terminal may damage connections of voice coil leads)</b>									
	<b>Optional Gasket</b>	<b>Yes, OD 100 mm Ø, ID 94 mm Ø, H 2.4 mm, Plastic</b>									
<b>Speaker Parameters</b>	<b>Qts</b>	<b>1.789</b>	<b>Vas</b>	<b>2.33L</b>	<b>BL</b>	<b>1.89 T</b>	<b>Vas</b>	<b>Cms</b>	<b>M</b>	<b>M/N</b>	<b>BL</b>
<b>Approximate Weight</b>	<b>400 grams</b>		<b>Shielding</b>	<b>None</b>	<b>Compliance</b>	<b>RoHS Lead Free</b>					
<b>Options</b>											

### RELIABILITY

<b>Maximum Power Test</b>	With program White-Noise source <b>Maximum Power</b> , 1 minute on, 2 minutes off, <b>10 cycles</b> , per (EIA) *
<b>Thermal Operating Temperature Test</b>	<b>96 hours</b> continuous operation at <b>Rated Power</b> , at <b>Maximum Rated Operating Temperature</b> *
	<b>96 hours</b> continuous operation at <b>Rated Power</b> , at <b>Minimum Rated Operating Temperature</b> *
<b>Thermal Storage Temperature Test</b>	<b>96 hours</b> at <b>Maximum Rated Storage Temperatures, no Power</b> *
	<b>96 hours</b> at <b>Minimum Rated Storage Temperatures, no Power</b> *
<b>Thermal Shock Test</b>	<p><b>5 cycles</b> of <b>Minimum and Maximum Operating Temperature</b>          Each cycle shall be set per diagram below and is three (3) hours long *</p>
<b>Humidity Test</b>	<b>96 Hours</b> at +40°C±2°C. 90-95% RH *
<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>	<b>15 minutes</b> 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>	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) *
<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>Operation Life Test</b>	Must perform normal with program White-Noise source at <b>Rated Power</b> for <b>100 Hours</b> per (EIA) *
<b>Warranty</b>	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



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



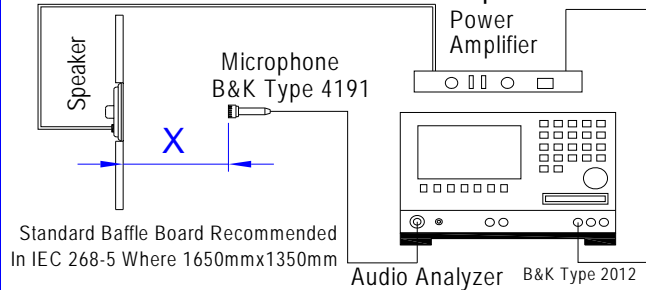
**SPL vs. FREQUENCY RESPONSE**



**IMPEADANCE vs. FREQUENCY RESPONSE**

**TEST PROCESS**

**Standard test condition of speaker**



Test Condition	
<b>STANDARD</b>	
Temperature:	15 ~ 35°C
Relative humidity:	45% ~ 85%
Atmospheric pressure:	860 mbar to 1060mbar
<b>JUDGEMENT</b>	
Temperature :	20±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

<b>Input Power:</b>
<b>1 W</b>
<b>Microphone Distance:</b>
<b>X = 100 cm</b>



**PACKAGING**

**ONE TRAY:**

**TWO BUNDLE**

**ONE BUNDLE:**

**SHIPPING BOX**

**TOP COVER**

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