Challenge Electronics
95 East Jefryn Boulevard
Deer Park, NY 11729

Tel: 1-800-722-8197
1-631-595-2217
Fax: 1-631-667-5484

EMAIL: SALES@CHALLELEC.COM
WEB: WWW.CHALLENGEELECTRONICS.COM

PRODUCT INFORMATION

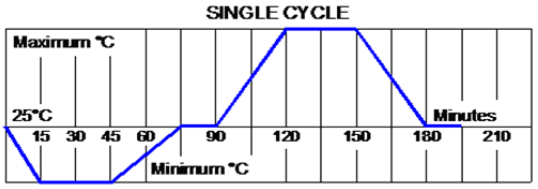
PART #	CES151504S08M800MR	Revision: 4-2017
Lead Free RoHS COMPLIANCE	**SMD SPEAKER**	

DESCRIPTION: **C**hallenge **E**lectronics **S**peakers, **15.0** mm D, **15.0** mm W, **4.0** mm H, **S**quare, **0.8** W maximum input power, **08** Ohms, LCP Plastic Frame, Polyimide **M**ylar Cone, **NdFeB** Magnet, **850** Hz. (Fo) Resonant Frequency, S**M**D Termination, **R**oHS Lead Free Compliant.

SPECIFICATIONS

Shape		Square					
Impedance		8 Ω ± 15%, at 1V, 2,000 Hz.		**Rated Power**	0.5 W	**Maximum Power**	0.8 W
Effective Frequency Band		850 Hz. to 20,000 Hz. within 10 dB Maximum deviations				**Resonant Frequency (Fo)**	850 Hz. ± 20%, at 1.0 V, without Baffle
Sound Pressure Level		87 ± 3.0 dB (A), at 0.5 W, 10 cm, Average 1.0,1.6, 2.0, 3.2 (kHz), at 25°C., Baffle board (IEC)					
Operating Temperature		-35ºC to + 85ºC				**Storage Temperature**	-40ºC to +85ºC
Physical Dimensions		**Length (L)**	15.0 mm	**Width (W)**	15.0 mm	**Height (H)**	4.0 mm
Distortion		Less than 5% at 2,000 Hz. at 0.1 W.					
Buzz & Rattle		Not be audible at 2.0 V sine wave between 850 Hz and 20,000 Hz.					
Polarity		When a positive DC Current is applied to the voice coil terminal marked + or red, the diaphragm shall move forward.					
Material	**Magnet**	Neodymium Iron Boron (NdFeB)				**Flux Density**	T
	Termination	SMD, 4 Landings [(+), (-), and 2 (NC)]					
	Housing	LCP Plastic					
	Cone	Polyimide (PI)					
Approximate Weight		1.5 grams	**Shielding**	None	**Compliance**	RoHS, Lead Free	
Options							

RELIABILITY

Power Test	With program White-Noise source **Rated 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** (per GB2423.2-81) *
	96 hours continuous operation at **Rated Power**, at **Minimum Rated Operating Temperature** (per GB2423.1-81) *
Thermal Storage Temperature Test	**96 hours** storage at **Maximum Rated Storage Temperatures** (per GB2423.2-81) *
	96 hours storage at **Minimum Rated Storage Temperatures** (per GB2423.1-81) *
Thermal Shock Test	5 cycles of **Minimum and Maximum Operating Temperature** Each cycle shell be set per diagram below and is three (3) hours long (per GB5170.18-87) * 
Humidity Test	**96 Hours** at +40°C±2°C. 90-95% RH (per GB5170.18-87) *
Operation Life Test	Must perform normal with program White-Noise source **at Rated Power** for **96 Hours**
Insulation Test	A minimum of 1 MΩ, measured with 100 Vdc Insulation Resistance Meter, between the Electrical Terminals and the Transducer Case
Vibration Test	Frequency 30 ± 15 Hz, Amplitude 1.5 mm for 3 Hours (per GB11606.8-89) *
Termination Strength	Maximum of 9.8 N (1.0 Kg) load pull test, applied to each terminal in axial direction for 10 seconds
Drop Test	75 CM free falling on Concrete floor, 3 axes (X,Y,Z) directions, 3 times (9 times total) (per GB2423.8-81) *
Solderability	Samples put through reflowing soldering oven 2 twice
Soldering Heat Resistance	Samples put through reflowing soldering oven 1 times
* **Reliability Test Performance**	**Parts should conform to original performance within ±5 dB tested with Rated Power, after 3 hours of recovery period**
Life Test	**96 hours** continuous operation at **Rated Power**, with White Noise source, per (EIA) *
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

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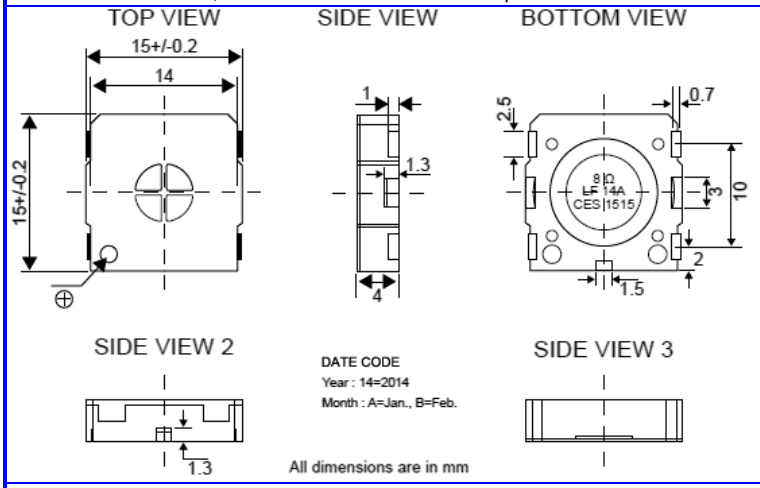
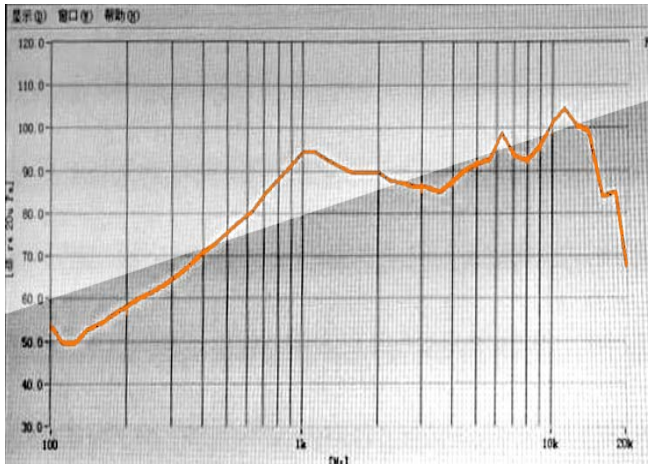
DIMENSIONS

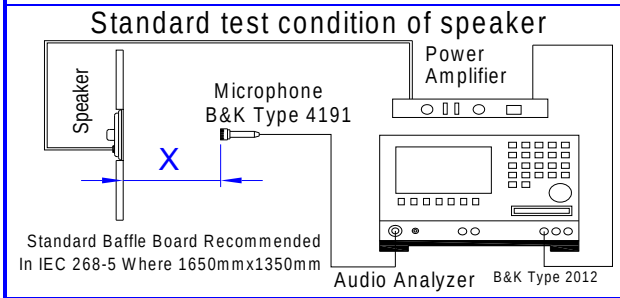
Units in: mm, Tolerance: ± 0.5 mm unless specified otherwise



SPL vs. FREQUENCY RESPONSE



TEST PROCESS



Test Condition

STANDARD
Temperature: 15 ~ 35°C
Relative humidity: 45% ~ 85% Atmospheric pressure: 860 mbar to 1060mbar

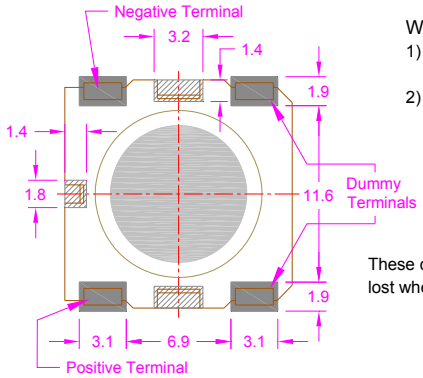
JUDGEMENT
Temperature : 20±3°C
Relative humidity: 60% ~ 70%
Atmospheric pressure: 860mbar to 1060mbar

Standard Test Fixture

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

Input Power:
0.5 W
Microphone Distance:
X = 10 cm

RECOMMENDED LAND PATTERN



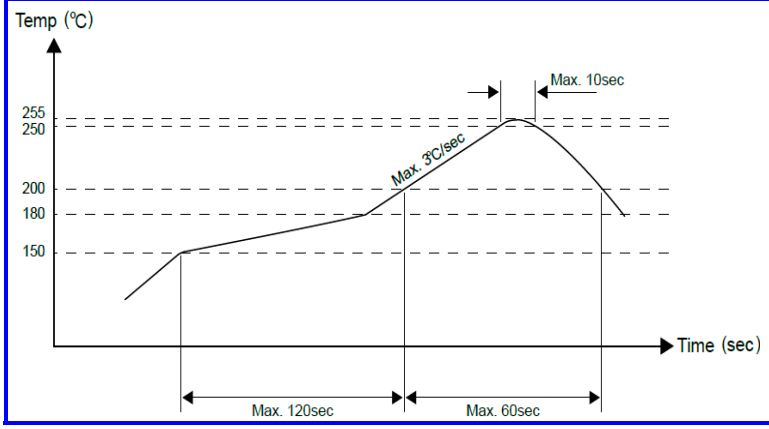
We recommend that:
1) You provide 3 venting holes in PCB, as shown in slotted
2) Apply a GLUE DOT between PCB and Speaker to relieve the Sound Vibrations from weakening Solder Joints

These can minimize the Sound lost when mounting Speaker on PCB.

STORAGE

1. **Shelf life:** Twelve (12) months when devices are to be stored in factory supplied unopened ESD moisture sensitive bag under maximum environmental conditions of 30°C, 70% R.H.
2. **Exposure:** Devices should not be exposed to high humidity high temperature environment. MSL (moisture sensitivity level) Class 1

SOLDER REFLOW PROFILE



Stage	Temperature Profile	Maximum Time
Pre-heat	**150~200°C**	**120 sec**
Solder Melt	**Above 230°C**	**60 sec**
Peak	**255°C Max**	**10 sec**
Cool Down		**100 sec**
Total Period		**6 Minutes**

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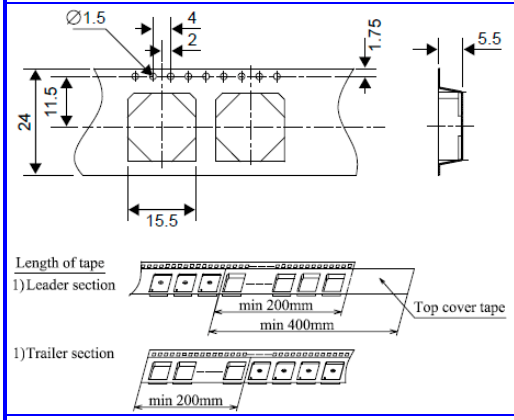
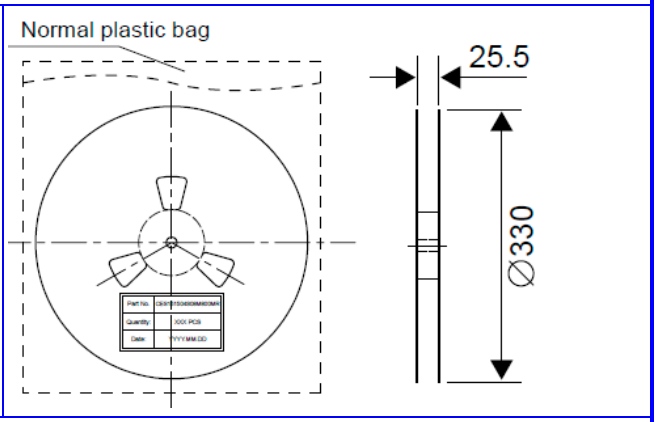
RoHS CONTROLLED SUBSTANCE REQUIREMENTS

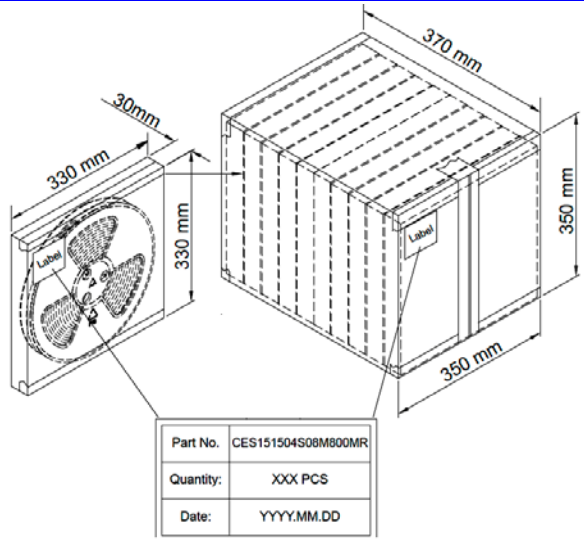
Controlled Substance	Measured	Limits	Controlled Substance	Measured	Limits
Cadmium (Cd) / Cadmium Compounds	≤ 5 ppm	≤ 5 ppm	Mercury (Hg) / Mercury Compounds	≤ 5 ppm	≤ 1,000 ppm
Lead (Pb) / Lead Compounds	≤ 5 ppm	≤ 100 ppm	PBB / PBDE	≤ 2 ppm	≤ 1,000 ppm
Tin Solder	Not used	≤ 1,000 ppm			
Chromium VI (Cr6+) Compounds	≤ 13 ppm	≤ 1,000 ppm	Packing Materials Cr+Pb+Hg+Cr6+ Total	≤ 34 ppm	≤ 100 ppm

TAPE & REEL





SHIPPING & PACKAGING



MARKING	REEL		
Bundle	Dimensions	**R1**	**33.0 cm**
Customer PN			
Other PN if required		**Z1**	**2.5 cm**
Quantity	Quantity		**500**
Lot and/or Date Code	**BUNDLE**		
Bundle Number	Dimensions	**X2**	**33 cm**
Shipping Box		**Y2**	**3 cm**
Customer Part Number		**Z2**	**33 cm**
Other PN (if required)	Quantity		**500**
Quantity	**SHIPPING BOX**		
Lot and/or Date Code	Dimensions	**X3**	**35 cm**
PO Number		**Y3**	**37 cm**
Net Weight		**Z3**	**35 cm**
Gross Weight	Number of Bundles		**10**
Box Number	Quantity		**5,000**
of Number of Boxes	Approximate Weight		**15 Kgs**
Made in China			

Revision	Description	By	Date
2-2013	Updated specifications for PCB Layout	ESZ	2/14/2013
3-2017	Updated: SPL, resonant frequency, weight, operating + storage temps, frequency response chart, mechanical dwg, load test, soldering profile shipping & packaging details. Specified housing and cone materials. Add product photo.	WS	2017-08-03
4-2017	Updated Moisture Sensitivity Level from Class 2 to Class 1.	JL	2017-10-09