

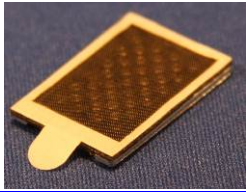


# PRODUCT INFORMATION

<b>PART #</b>	<b>CES22P15H14-100U</b>	<b>Revision: 1-2012</b>
	<b>PIEZOELECTRIC MINI SPEAKER</b>	

**DESCRIPTION:** Challenge Electronics Speaker, 22 mm Long, Dynamic Piezo, 15mm Wide, Height 1.4 mm, 1,000 Hz. (Fo) Resonant Frequency, U Contact or Solder Points Termination, RoHS Compliant

- Low Power
- Small Size
- RoHS Compliant
- ISO/TS 16949, ISO 13485



## SPECIFICATIONS

Shape	Square	Capacitance	0.85 µFD at 1,000 Hz.			
Rated Operating Voltage	7.0 V <sub>RMS</sub>	Maximum Input Voltage	9.0 V <sub>RMS</sub>			
Resonant Frequency (Fo)	1,000 ± 150 Hz.	Frequency Range	850 Hz. to 12,000 Hz. SPL between 90 ~ 100 dB			
Sound Pressure Level	92 ± 3.0 dB (A), at 5.0 V <sub>RMS</sub> , 5 cm, Average 1.0, 1.5, 1.8, 2.0, 3.0, 3.5, 4.0 K Hz.					
Operating Temperature	-20°C to +70°C		Storage Temperature	-30°C to +85°C		
Distortion	Less than 5% at 1,000 Hz. at 5 V <sub>RMS</sub> sine wave					
Buzz & Rattle	Less than 5% at 5.0 V <sub>RMS</sub> sine wave between 850 Hz. and 12,000 Hz.					
Physical Dimensions	Length (L)	21.8 mm	Width (W)	14.8 mm	Height (H)	1.4 mm
Material	Stainless Steel Frame, Piezoelectric, PZT (Lead Zirconate Titanate), with Kapton membrane					
Termination	Tinned Copper on Kapton material, dimension 13 mm X 3 mm, bonding pad dimension 1 mm X 1.5 mm					
Mounting Gasket	Poron Foam Material, Double Sided Adhesive Tape, 0.7 mm Thickness					
Approximate Weight	2 grams		Compliance	RoHS		
Options						

## RELIABILITY

Thermal Operating Temperature Test	240 hours continuous operation at Rated Voltage, at Maximum Rated Operating Temperature *
	240 hours continuous operation at Rated Voltage, at Minimum Rated Operating Temperature *
Thermal Storage Temperature Test	240 hours storage at Maximum Rated Storage Temperatures *
	240 hours storage at Minimum Rated Storage Temperatures *
Thermal Shock Test	10 cycles of Minimum and Maximum Operating Temperature, Transfer time between temperature <10 seconds, with dwell time at each temperature of 30 minutes, (per IEC 68-2-14) *
Humidity Test	240 Hours at +40°C ± 2°C, 90-95% RH, (per IEC 68-2-67) *
Drop Test	Part mounted in a 100 grams fixture and dropped naturally from 75 cm height onto the surface of concrete or steel, 3 axes (X, Y, Z) directions, 3 times (9 times total) *
Termination Strength	Maximum of 22 N (2.24 K <sub>F</sub> ) load pull test, applied to each terminal in axial direction for 10 seconds
* Reliability Test Performance	Parts should conform to original performance after 3 hours of recovery period Sound Pressure Level: within ±3 dB tested with Rated Voltage Resonant Frequency (Fo): with maximum Deviation of ±20% Hz.

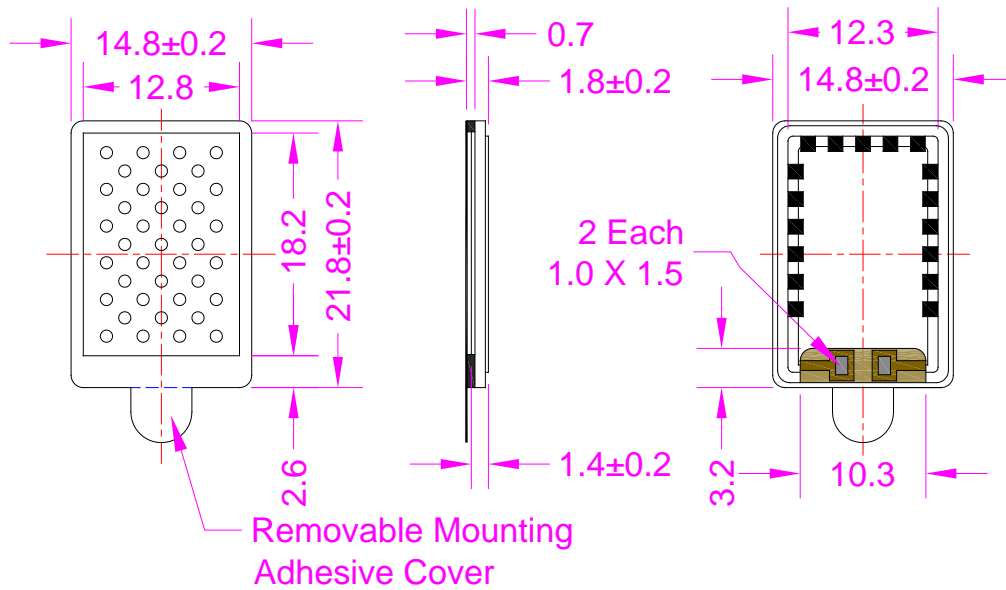
Life Test	240 hours continuous operation at Rated Voltage, with Sine Wave 1,000 Hz.
Warranty	For a period of one (1) year from date of shipping under normal operations conditions This warranty does not apply to products damaged through misuse, abuse, improper installation, alteration, rework, or attempt to repair

## TEST PROCESS

<p>Standard test condition of speaker</p> <p>Standard Baffle Board Recommended In IEC 268-5 Where 1650mmx1350mm</p>	<p><b>Test Condition</b></p> <p><b>STANDARD</b></p> <p>Temperature: 15 ~ 35°C Relative humidity: 45% ~ 85% Atmospheric pressure: 860 mbar to 1060mbar</p> <p><b>JUDGEMENT</b></p> <p>Temperature: 20±3°C Relative humidity: 60% ~ 70% Atmospheric pressure: 860 mbar to 1060 mbar</p>	<p><b>Standard Test Fixture</b></p> <p>Zero Level: -dB Mode: TSR potentiometer Range: 50 dB Sweep Time: 0.5 sec</p>
	<p><b>Input Voltage: 5 V<sub>RMS</sub></b> <b>Distance: X = 5 cm</b></p>	



**DIMENSIONS** Units in: mm, Tolerance:  $\pm 0.5$  mm unless specified otherwise.



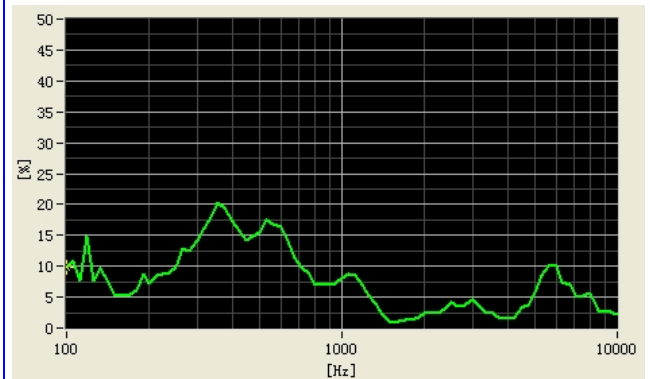
**SPL vs. FREQUENCY RESPONSE**

(only for reference)



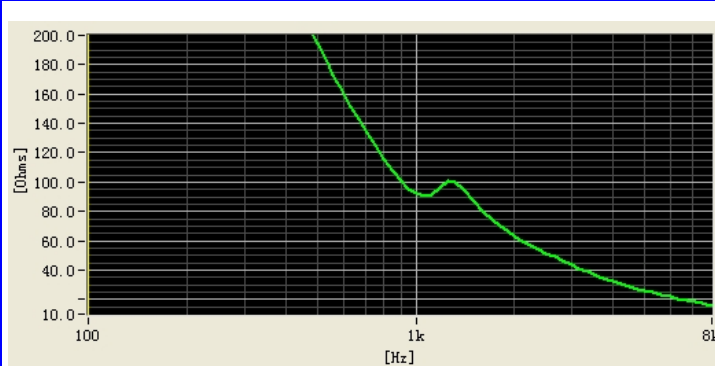
**TOTAL HARMONIC DISTORTION**

(only for reference)



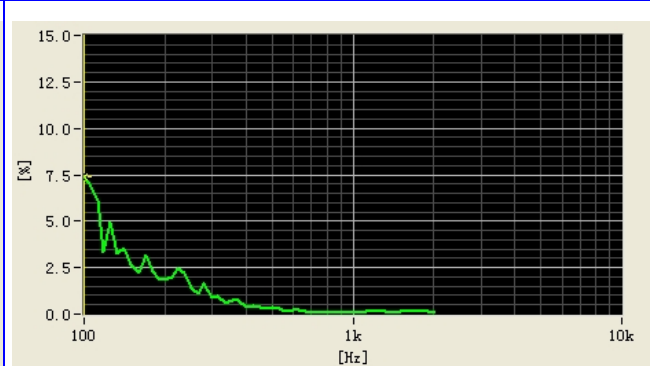
**IMPEDANCE RESPONSE**

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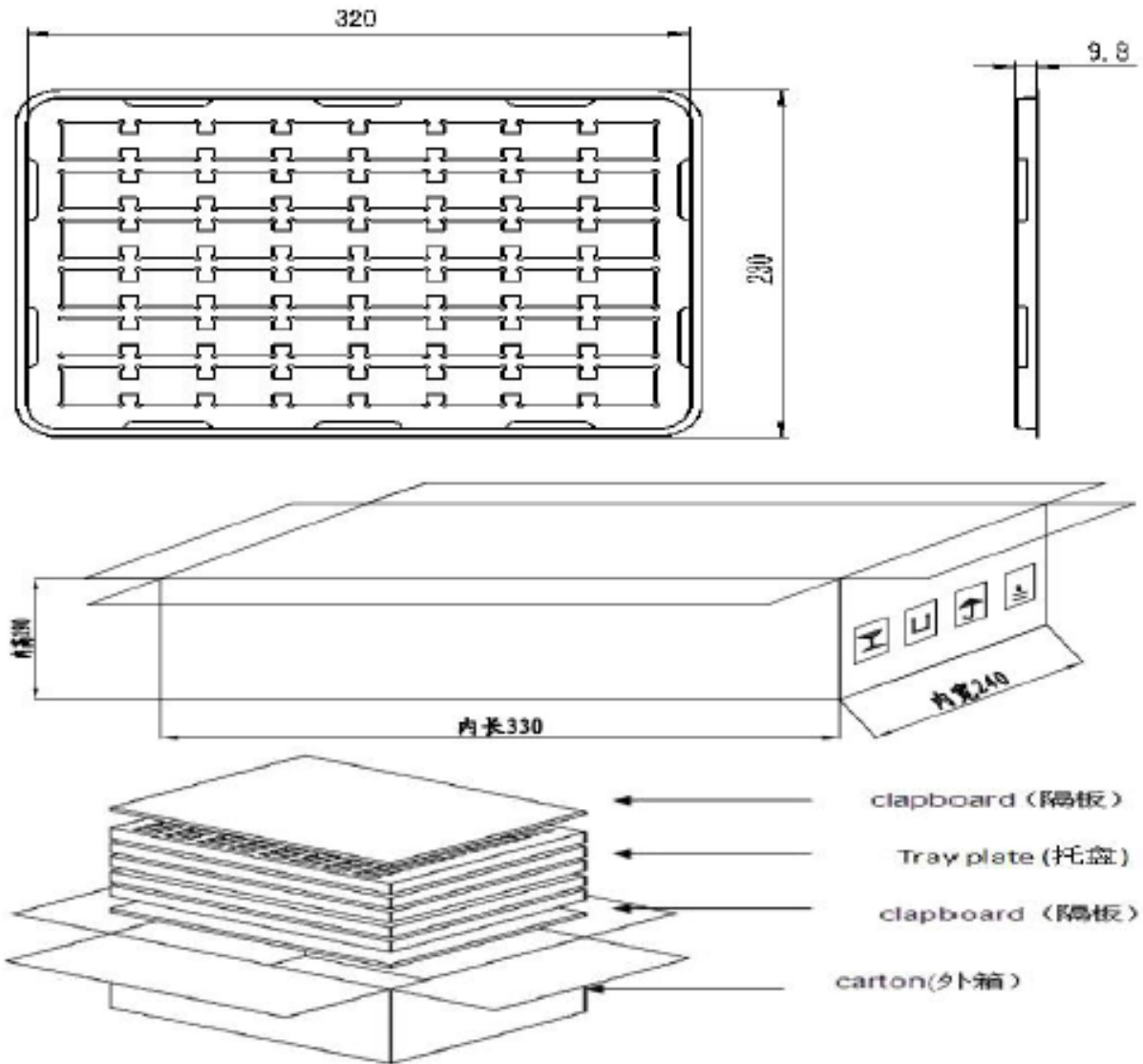
**BUZZES and RATTLES**

(only for reference)





**PACKAGING**



MARKING		TRAY			SHIPPING BOX		
<b>Bundle</b>	<b>Shipping Box</b>	Dimensions	X1	<b>32 cm</b>	Dimensions	X3	<b>33 cm</b>
Customer PN	Customer Part Number		Y1	<b>25 cm</b>		Y3	<b>24 cm</b>
Other PN if required	Other PN (if required)		Z1	<b>1 cm</b>		Z3	<b>19 cm</b>
Quantity	Quantity	Quantity	<b>48 Parts</b>		Number of Trays	<b>45</b>	
Lot and/or Date Code	Lot and/or Date Code	<b>BUNDLE</b>			Quantity	<b>2,160 Parts</b>	
Bundle Number	PO Number	Dimensions	X2	<b>32 cm</b>	Approximate Weight	<b>5 kg</b>	
	Net Weight		Y2	<b>25 cm</b>	Approximate Net Weight	<b>4.5 kg</b>	
	Gross Weighjt		Z2	<b>9 cm</b>			
	Box Number	Quantity	<b>1,080 Parts</b>				
	Total Number of Boxes						
	Manufacturing Country						