



# PRODUCT INFORMATION

	PART #	<b>CEC-116</b>	Revision	<b>6-2016</b>
	<b>Rugged Piezoelectric Transducer</b>			

DESCRIPTION	FEATURES
Challenge Electronics Piezoelectric Transducer; 30 mm diameter; B Style case (Round with standoffs and Top Sound Port); 14 mm high; PCB Mounted; 1 to 30 Vp-p; Resonant Frequency Primary 2,600 Hz. Secondary 2,400 Hz.; Typical 109 dB(A) at 10 cm, 12 Vp-p, 2,600 Hz.; 2 PC Pins 15.0 mm apart termination; RoHS Compliant	<ul style="list-style-type: none"> <li>◆ Reliable Piezoelectric Technology</li> <li>◆ Corrosion Resistant Stainless Steel Diaphragm</li> <li>◆ Flame Retardant Plastic</li> <li>◆ Hermetically Sealed</li> <li>◆ IP-68; Water Proof, NEMA 3R, 4X, or 12</li> <li>◆ RoHS, Lead Free and REACH Compliance</li> <li>◆ ISO 9001:2008 Certified</li> </ul>



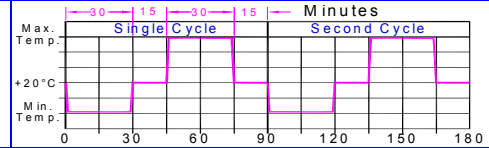
## REACH COMPLIANCE DECLARATION

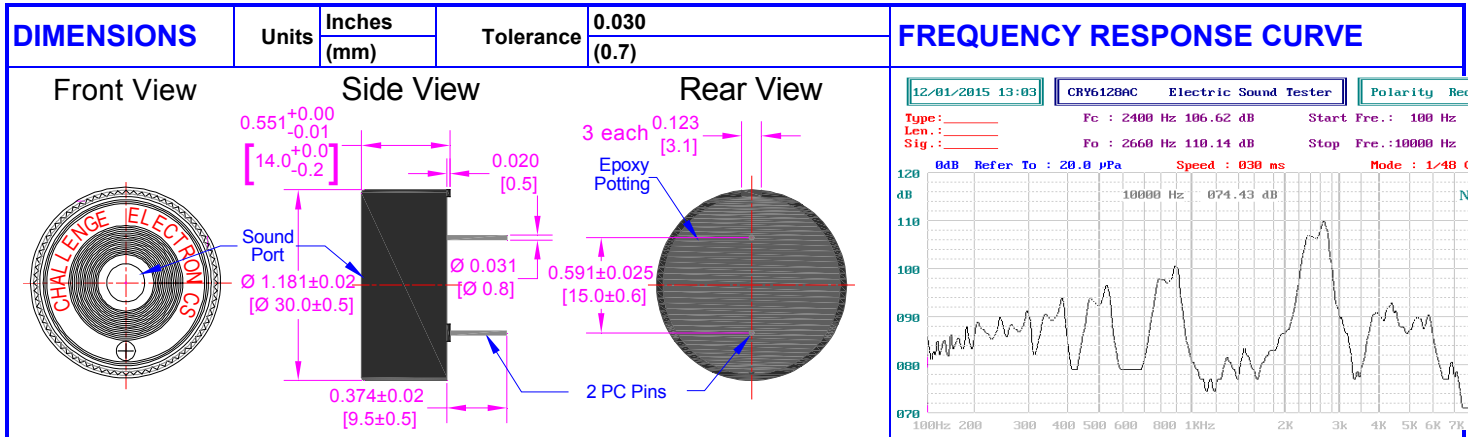
This product contains an article, Piezoelectric-Disc, which is exempted from the restriction in Article 4(1): 7(c)-I. The Article contains more than 0.1% (w/w) of REACH Candidate List SVHC Lead-Zirconium-Titanium-Oxide (CAS 12626-81-2), a key ingredient of the Piezoelectric-Disc in the Alarm operation. See section Substance Of Very High Concern and RoHS Lead Free Compliance, page # 3, for full details.

## SPECIFICATIONS

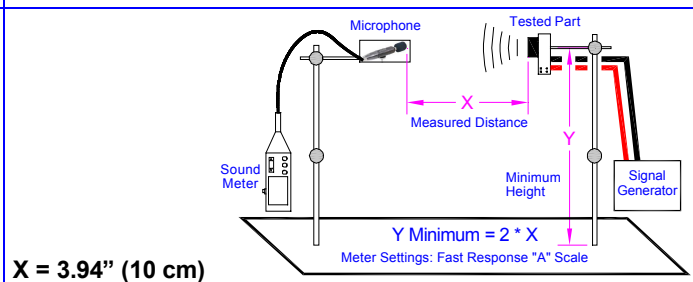
Operating Voltage	<b>1 to 30 Vp-p</b>	Nominal Operating Voltage	<b>12 Vp-p</b>	Capacitance	<b>26,000 ± 30% pF</b> , at 100 Hz. 1 V <sub>RMS</sub>			
Resonant Frequency	Primary Resonant Frequency (Fo)	<b>2,600 ± 500 Hz.</b>	Secondary Resonant Frequency (Fo)	<b>2,400 ± 250 Hz.</b>				
Sound Pressure Level	<b>109 ± 5 dB(A)</b>	In production, SPL is measured at 2,600 Hz.; AQL test at 2,600 Hz. & 2,400 Hz.; SPL is measured at: 10 cm, Rated Voltage, Resonant Frequency only, Square Wave, 50% Duty Cycle, 25°C, Sound Level meter # 2240, Type 2, Fast Response, A-Weighted; per SJ/T10382-1993						
Maximum Current	<b>10 mA</b> , at: Rated Voltage, Resonant Frequency, Square Wave, 50% Duty Cycle							
Operating Temperature	<b>-40°C to +70°C</b>	Storage Temperature	<b>-40°C to +95°C</b>					
Materials	Alarm Case	<b>Plastic, "B" Case, NORYL™ PX9406 or equal, flame retardant UL 94-V0, Black</b>						
	Diaphragm	<b>Stainless Steel 304</b>	Sound Port Direction	<b>Top</b>				
	Encapsulation	<b>Two parts epoxy resign or silicone potting, Black</b>						
	Termination	<b>Two (2) PC Pins, 0.8 mm diameter, Brass, Electro-Tin plated</b>						
Physical Dimensions	Diameter (D)	<b>30.0 mm Ø</b>	Height (H)	<b>14.0 mm</b>	PC Pins Spacing	<b>15.0 mm</b>	PC Pins Length	<b>9.5 mm</b>
Approximate Weight	<b>7 grams</b>	Removable Washing Label	<b>No</b>	Compliance	<b>RoHS, Lead Free and REACH</b>			
Options								

<b>RELIABILITY</b>	<b>1. Reliability Tests done per Buzzer test method SJ-258-10382</b> <b>2. * Parts should conform to original performance within ±3dB, after 3 hours of recovery and dry period</b>	
Peak Operation		
Thermal Operating Temperature Test	<b>96 hours</b> continuous operation at <b>Nominal Voltage</b> , at <b>Maximum Operating Temperature</b> , per GB/T2423.2-1989 * <b>96 hours</b> continuous operation at <b>Nominal Voltage</b> , at <b>Minimum Operating Temperature</b> ; per GB/T2423.1-1989 *	
Thermal Storage Temperature Test	<b>96 hours</b> storage at <b>Maximum Storage Temperatures</b> , per GB/T2423.2-1989 * <b>96 hours</b> storage at <b>Minimum Storage Temperatures</b> ; per GB/T2423.1-1989 *	
Thermal Shock Test	<b>5 cycles of Minimum and Maximum Operating Temperature</b> Each cycle shall be set per diagram below and is three (3) hours long. Make sure to limit temperature range to specifications listed above, per GB/T2423.3-1993 *	
Humidity Test	<b>120 Hours</b> at +60°C±2°C, 90-95% RH, per EIA/JESD22 – A101 & GB2423.3-93 *	
Salt Spray	Withstand exposure to salt spray for a period of <b>300 hours</b> , per ASTM B117 & GJB150.11A-2009 *	
Environmental Exposure	Withstands water submergence and dust exposure when mounted with Gasket) per <b>IP-68</b> *	
Vibration Test	<b>2 Hours</b> at 1.5 mm with 10 to 55 Hz. of vibration frequency to each of 3 perpendicular direction *	
Drop Test	Dropped naturally from 1 meter height onto the surface of 10 mm wooden board, 2 directions upper and side of the part are applied, per GB2423.8-81 *	
Termination Strength	Maximum of 9.8 N load pull test, applied to each terminal in axial direction for <b>10 second</b>	
Solderability	Terminal leads are immersed in rosin for 5 seconds and then immersed in solder-bath of +270°C for 3±1 seconds	
Life Test	Intermittent	<b>1,000 hours</b> of a 1 minute on 4 minutes off cycle at room temperature and <b>maximum Voltage</b>
	Continuous	<b>250 hours</b> continuous operation at room temperature and <b>maximum Voltage</b>
Warranty	For a period of <b>Two (2) years</b> 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	

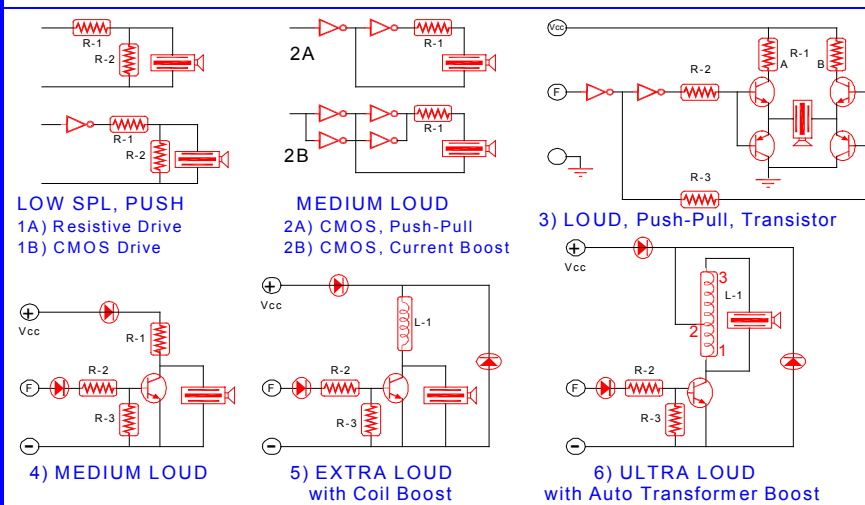




**Standard SPL Measurement Process**



**DRIVING CIRCUIT APPLICATIONS**

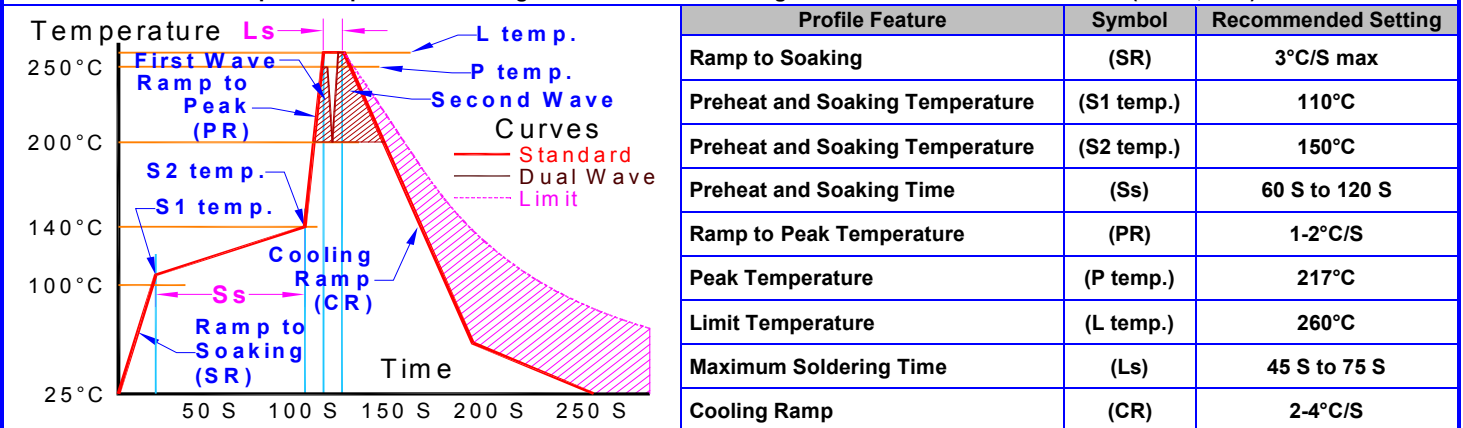


**PIEZOELECTRIC PRECAUTION**

1. Do not maintain Vdc (Direct Current) on the Piezoelectric Assembly. Direct Voltage may depolarize the Piezoelectric Ceramic Disc resulting in Lower Sound Pressure Levels
2. a non-polarize Capacitor can be used in series with the Piezoelectric Sound Transducer to block constant Vdc

**RECOMMENDED SOLDER-WAVE TEMPERATURE PROFILE**

Below is a standard temperature profile for Through Hole Devices according to JESD22-B106 and IEC668 2-20 (260°C, 10 s)





## SUBSTANCE OF VERY HIGH CONCERN and RoHS COMPLIANCE DECLARATION

**This product does NOT contain any of the REACH Substances of Very High Concern (SVHC), and complies with European Union REACH Regulation No.1907/2006 regarding chemical substances that must be registered and disclosed with one (1) Exemption**

Lead (Pb) / Lead Compounds	≤1,000 ppm	≤ 10,000 ppm (1)	Poly Brominated Diphenyl Ethers (PBDE)	≤1,000 ppm	In compliance
Mercury (Hg) / Mercury Compounds	≤1,000 ppm	In compliance	Bis (2-Ethylhexyl) Phthalate (DEHP)	≤1,000 ppm	In compliance
Cadmium (Cd) / Cadmium Compounds	≤ 100 ppm	In compliance	Butyl Benzyl Phthalate (BBP)	≤1,000 ppm	In compliance
Hexavalent Chromium (Cr vi)	≤1,000 ppm	In compliance	Dibutyl Phthalate (DBP)	≤1,000 ppm	In compliance

(1) European Union Directive 2011/65/EU (RoHS Directive) of the European Parliament. And of the Council of 8 June 2011 and all subsequent amendments, The ANNEX III of the Directive Applications exempted from the restriction in Article 4(1): 7(c)-I, Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. Piezoelectric devices, or in a glass or ceramic matrix compound Piezoelectric is also known as Lead Zirconate Titanate (PZT) ceramics. Piezoelectric Ceramic disc, (PZT), lead as high covalent compound in the ceramic matrix to achieve good ferroelectric properties in a wide temperature range. The best-known performances can be reached with PZT ceramics, which are a mixture of PbTiO<sub>3</sub> and PbZrO<sub>3</sub>. The lead content, homogeneous material compound is between 58% and 68% by weight depending on the proportion of zirconium (Zr) and titanium (Ti)

- 1) According to the REACH terminology, Challenge Electronics acknowledge being Producers, Importers and Marketer of Sound Devices Articles, which do not contain Substances of Very High Concern (SVHC's) to be intentionally released
- 2) Challenge Electronics hereby declares, to the best of our knowledge and based on our China Manufacturers and Fabricators information, that, all Challenge Electronics Sound Devices Articles are chemically safe, and should not harm any human, animals, or the environment
- 3) It should be noted that SVHC items are not banned from inclusion, but are Reportable per current REACH regulations
  - a) With the exception of The Piezoelectric-Ceramic-Disc article that CONTAINS more than 0.1% (w/w) of REACH Candidate List SVHC Lead-Zirconium-Titanium-Oxide (CAS 12626-81-2), which is a key ingredient of the Piezoelectric-Ceramic-Disc in the Alarm operation. See also the RoHS Compliance ANNEX III of the Directive Applications exempted from the restriction in Article 4(1)
  - b) Some SMD and Dip type Capacitors CONTAINS one of the following Lead Oxides published in the ECHA SVHC Candidate List at or greater than 0.1% of total weight: Lead monoxide (CAS 1317-36-8), Lead titanium zirconium oxide (CAS 12626-81-2)

IMDS Guide for Piezoelectric

Automotive Industry Interpretation Guide for ELV Annex II (2016/774/EU) with IMDS Information added by the IMDS Steering Committee

• Interpretation Guide for ELV Annex II (2016/774/EC) Version 3.0

• Definition/interpretation of -Exemption (10a)

### Examples for components covered by (10a)

#### a) Piezoceramics

Piezoceramics are characterized through their ability to transform mechanical energy in electrical energy and reciprocal. They fulfil technical functions as actuators, sensors, generators and motors. They are used for instance in Actuators for diesel and gasoline injection valves, knock sensors, resonator and filter, actuators, bending actuators for pneumatic valves, tire Pressure Sensors, ceramic sensors (like ABS, air bag, pressure, car navigation sensors), **Piezoelectric Alarms, Piezoelectric buzzers, Piezoelectric Sound Transducers, Ultrasonic Sensor and Transmitter.** The lead content in the Piezoceramics ceramics is around 50 to 70% by weight, depending on the content of dopants, required functional properties and on the proportion of Zirconium (Zr) and Titanium (Ti)

### Lead Zirconium Titanium Oxide Information Basic information

Density: 7.7 g/cm <sup>3</sup>	CAS #: 12626-81-2	EC #: 235-727-4	Inclusion Date: 12/19/2012	DN: ED/169/2012	Product Categories: Inorganics
Safety Information:	RIDADR: UN1993	TSCA: Yes	Hazard Class: 3	Packing Group: III	

In Challenge Electronics role as Supplier, we have taken the necessary steps towards our China Manufacturing in order to get a written confirmation about their knowledge of the Regulation and their analysis of the impact on their company

## PACKAGING

MARKING Shipping Box		TRAY	
Part Number	Dimensions	X	cm
Customer PN (if required)		Y	cm
Quantity		Z	cm
Lot and / or Date Code	Quantity	50	
PO Number	<b>SHIPPING BOX</b>		
Net Weight	Dimensions	X	cm
Gross Weighjt		Y	cm
Box Number _ of _ Boxes		Z	cm
RoHS	Quantity		
	Approximate Weight		
	Volume	m <sup>3</sup>	
	Made in	China	

Revision	Description	By	Date
1-2013	Revised SPL Level and Frequency Response Curve	Ely Zofan	1/30/2013
2-2015	Added SubstanceE of Very High Concern & RoHS Compliance, and Extended the waranty period	Ely Zofan	12/10/2015
3-2016	Modified Resonant Frequency,	Ely Zofan	2/5/2016
4-2016	Modified Dimensions Drawing	Ely Zofan	2/16/2016
5-2016	Added Soldering information	Ely Zofan	3/10/2016
6-2016	Corrected PC Pins Length and added REACH COMPLIANCE DECLARATION	Ely Zofan	11/14/2016