Challenge Electronics
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ISO 9001:2008 Certified

PRODUCT INFORMATION

PART #: CEPT110K017-5-120-41NR

Revision: 2-2016

SMD Piezoelectric Sound Transducer

DESCRIPTION

Challenge Electronics Piezoelectric Transducer, 11.0 mm Long. Square, **K** Style case (Square, Top Sound Port), **1.7** mm High, **5** Vpp Rated Voltage, **1** to **20** Vpp Operating Voltage, **4,1**00 Hz. Resonant Frequency, Typical output of 73 dB(A) at 10 cm at Rated Voltage, **N** Type SMD Termination, **R**oHS Compliance

FEATURES

- **RoHS, SVHC, and REACH**
- **ISO 9001 Certified**

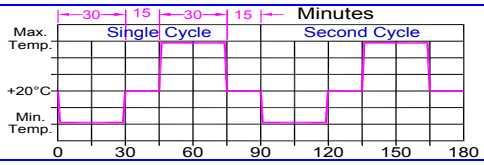
REACH DECLARATION COMPLIANCE

The Piezoelectric-Ceramic-Disc article 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 section Substance Of Very High Concern and RoHS Compliance, pages # 2 &3, for full details.

SPECIFICATIONS

Operating Voltage		1- 20 Vp-p		**Nominal Rated Voltage**	5 Vp-p		**Resonant Frequency**	4,100 ± 500 Hz.	
Sound Pressure Level		73 dB(A), at: 10 cm, Rated Voltage, Resonant Frequency, Square Wave, 50% Duty Cycle, 25°C, Sound Level meter # 2240, Type 2, Fast Response, A-Weighted							
Operating Current		2 mA, at: Nominal rated Voltage, Resonant Frequency, Square Wave, 50% Duty Cycle							
Operating Temperature		-40ºC to + 105ºC		**Storage Temperature**	-40ºC to +120ºC		**Capacitance**	10,000 pF ± 30% 100 Hz. 1 Vrms	
Material	**Housing**	Plastic, LCP Vectra E130i or equal					**Sound Port Direction**	Top	
	Diaphragm	Ni Alloy Disc N42 or equal					**Encapsulation**	Plastic Plate	
	Termination	SMD, 2 soldering pads, Sn plated Brass							
Physical Dimensions		**Length (L)**	11.0 mm	**Width (W)**	9.0 mm	**Height (H)**	1.7 mm	**Pins Spacing**	
Approximate Weight		0.9 grams		**Removable Washing Label**	No	**Compliance**	RoHS, SVHC, and REACH		
Options									

RELIABILITY * After Reliability Test Performance, parts should conform to original performance within ±3dB, after 3 hours of recovery period

Thermal Operating Temperature Test	**96 hours** continuous operation **at Rated Voltage**, at **Maximum Rated Operating Temperature** *	
	96 hours continuous operation **at Rated Voltage**, at **Minimum Rated Operating Temperature** *	
Thermal Storage Temperature Test	**96 hours** storage at **Maximum Rated Storage Temperatures** *	
	96 hours storage at **Minimum Rated Storage Temperatures** *	
Thermal Shock Test	**5 cycles** of **Minimum and Maximum Operating Temperature** Each cycle shell be set per diagram and is 3 hours long *	
Humidity Test	**140 Hours** at +40°C±2°C, 90-95% RH *	
Insulation Test	A minimum of 10 MΩ, measured with 100 Vdc Insulation Resistance Meter, between the Electrical Terminals and the Transducer Case	
Vibration Test	**2 Hours** of at 1.5 mm with 10 to 55 Hz. vibration frequency to each of 3 perpendicular directions *	
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	Dropped naturally from 750 mm height onto the surface of 40 mm wooden board, 3 axes (X,Y,Z) directions, 3 times (9 times total) *	
Solderability	Terminal leads are immersed in rosin for 5 seconds and then immersed in solder-bath of +270°C for 3±1 seconds	
Soldering Heat Resistance	Terminal leads are immersed, up to 1.5 mm from part case, in rosin for 5 seconds and then immersed in solder-bath of +350±5°C for 3±0.5 seconds or +260±5°C for 10±1 seconds	
Operation Life Test — **Continuous**	Two hundred fifty (250) hours of continuous operation, at **Rated Voltage**, each **at Minimum & Maximum Rated Operating Temperatures**	
Operation Life Test — **Intermittent**	One thousand (1,000) hours of: 1 minute ON 4 minutes OFF cycle, at **Room Temperature**, and **Maximum Rated Voltage**	
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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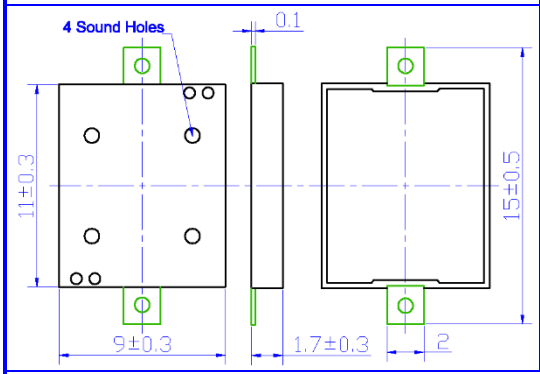
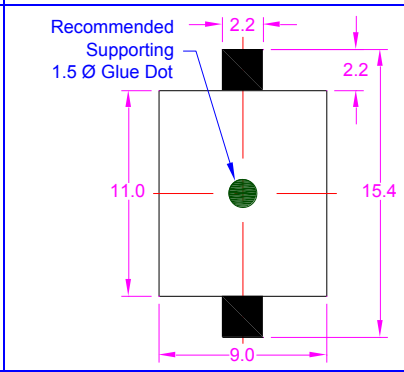
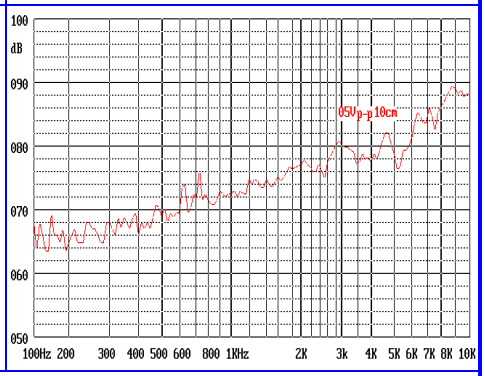
DIMENSIONS Units in: mm Tolerance: ±0.2 mm



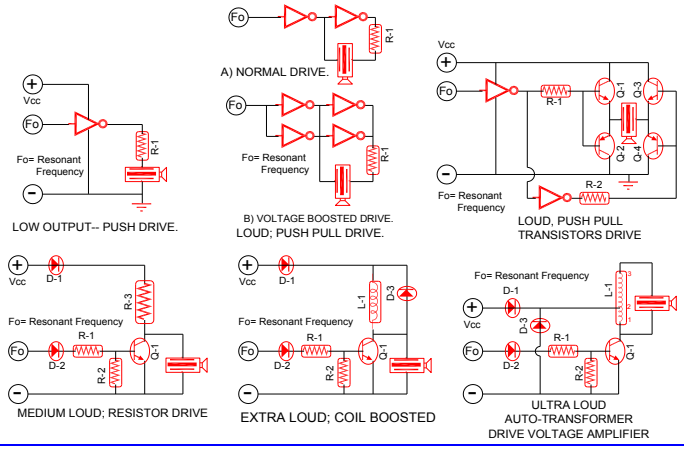
RECOMMENDED LAND PATTERN



FREQUENCY RESPONSE CURVE

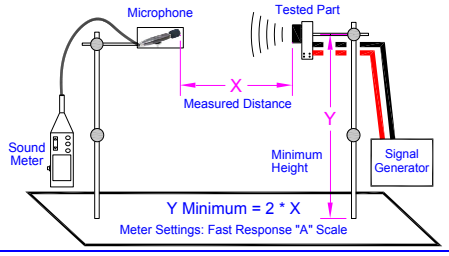


RECOMMENDED CIRCUIT DRIVE



TESTING PROCESS

X = 10 cm

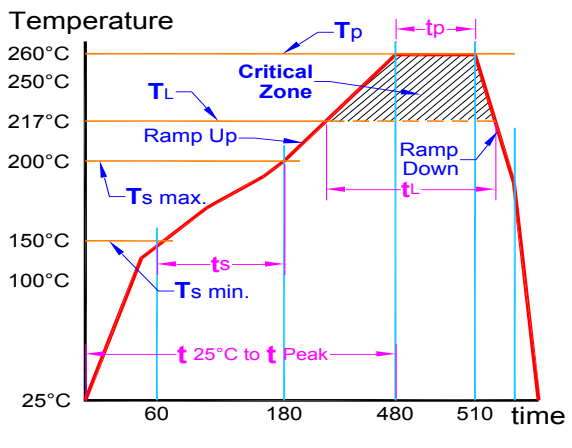


STORAGE

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 2

RECOMMENDED REFLOW OVEN TEMPERATURE PROFILE

Below is the recommended standard temperature profile for SMD moisture sensitivity characterization according to IPC/JEDEC joint industry standard: J-STD-020D-01. Pb-free assembly data on base of SnAg3.8Cu0.7 (SAC).



Profile Feature	Symbol	Recommended Setting
Assembly Average Ramp-Up rate	**(Tsmax to Tp)**	**3°C/S max**
Preheat **Temperature min.** **Temperature max.** **Time**	**(Tsmin)** **(Tsmax)** (tsmin to **tsmax)**	**150°C** **200°C** **60 S to 180 S**
Time maintained above **Temperature** **Time**	**(TL)** **(tL)**	**217°C** **60 S to 150 S**
Peak/classification temperature	**(Tp)**	**260°C**
Number of allowed reflow cycles		**3**
Time within 5°C of actual peak temperature	**(tp)**	**20 S to 40 S**
Ramp-down rate		**6°C/S max**
Time 25 °C to peak temperature		**8 minutes max.**
Assembly Average Ramp-Up rate	**(Tsmax to Tp)**	**3°C/S max**

SUBSTANCE OF VERY HIGH CONCERN (REACH) and RoHS LEAD FREE COMLIANCE

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

Lead (Pb) / Lead Compounds	≤1,000 ppm	**≤ 10,000 ppm (*)**	**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**

(*) 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 PbTiO3 and PbZrO3. The lead content, homogeneous material compound is between 58% and 68% by weight depending on the proportion of zirconium (Zr) and titanium (Ti)

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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)
4) In all cases, the lead substance is chemically combined in Capacitors and presents no hazard to humans or the environment under normal handling and use. In addition, Challenge Electronics complies with the restrictions stated in Annex XVII of REACH

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)

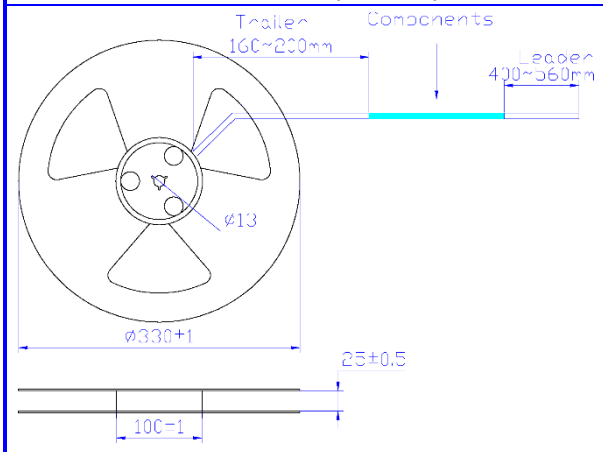
Lead Zirconium Titanium Oxide Information Basic information

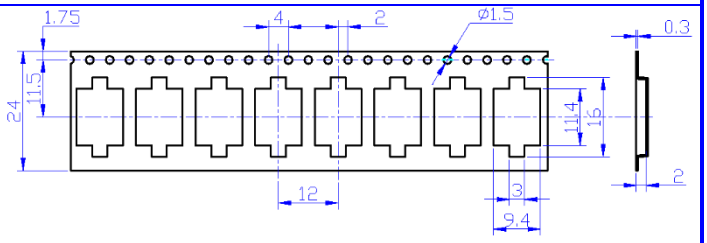
Density:	7.7 g/cm^3	CAS #:	12626-81-2	EC #:	235-727-4	Inclusion Date:	12/19/2012	DN:	ED/169/2012	Product Categories:	Inorganics
Safety Information:		RIDADR:	UN1993	TSCA:	Yes	Hazard Class:	3	Packing Group:	III		

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

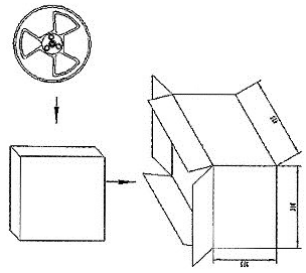
PACKAGING

TAPE & REEL DIMENSIONS (Unit: mm)





1. 110 sprocket holes pitch cumulative tolerance ± 0.20 mm
2. Carrier camber not to exceed 1 mm in 100 mm
3. Ao & Bo measured on a place 0.3mm 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. Component loaded 4.8meters per 13" reel: 2,000 parts



Shipping Box Marking	SHIPPING BOX		
Part Number	Dimensions	X	**41.5 cm**
Other PN if required		Y	**39 cm**
Quantity		Z	**37.5 cm**
Lot and/or Date Code	Quantity		**10,000**
PO Number	Approximate Weight		**Kg**
Gross Weight	Volume		**m^3**
Box Number of Boxes	Made in		**China**
RoHS Lead Free Compliance			

Revision:	Description:	By:	Date:
1-2011	Modified format	E. Zofan	6/23/2011
2-2016	Added Substance of Very High Concern (REACH) and RoHS Lead Free Compliance	E. Zofan	9/8/2016