Hermetically Sealed Piezoelectric Actuator, 150 V, 17.0 µm

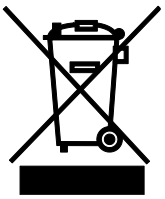
PH24SRW

Description

The PH24SRW hermetically sealed piezoelectric actuator consists of a metal bellows and internal discrete piezo stack. It offers a maximum displacement of 17.0 µm ± 15%. A red wire is attached to the electrode that should receive positive bias and a black wire is attached to the electrode that should be grounded.

Specifications

PH24SRW[a]	
Drive Voltage Range	0 - 150 V
Displacement (Free Stroke) at 150 V	17.0 µm ± 15%
Hysteresis	<15% (See Graph on Next Page)
Load (Recommended) [b]	200 N (45 lbs)
Blocking Force at 150 V	900 N (203 lbs)
Resonant Frequency	22 kHz (No Load)
Maximum Operating Frequency [c]	900 Hz
Impedance at Resonant Frequency	2 Ω
Dissipation Factor [d]	<2.0%
Capacitance [d]	1600 nF ± 15%
Operating Temperature	-25 to 130 °C
Curie Temperature	230 °C
Vacuum Compatibility [e]	10^{-8} Torr
Outer Dimensions	OD: 12.0 ± 0.1 mm Length: 24.2 ± 0.1 mm



a. All specifications are quoted at 25 °C, unless otherwise stated.

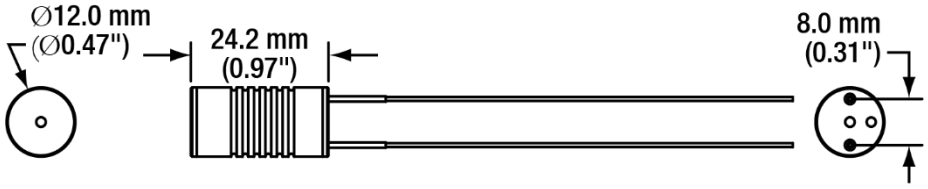
b. The displacement may vary slightly for different loads, and the maximum displacement occurs when used with the recommended load.

c. Operating above this frequency may cause high temperature heating to the piezo and lead to depolarization and even failure.

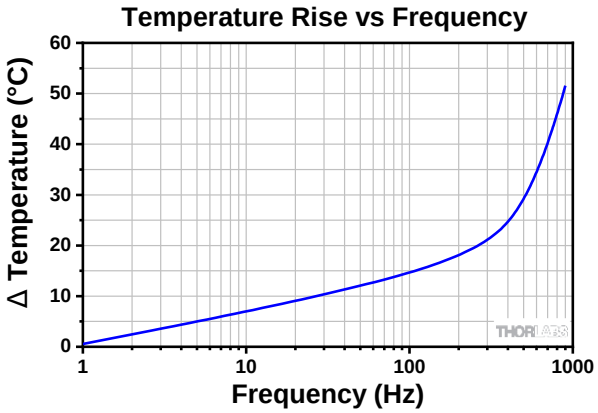
d. Specified at 1 kHz, 1 V_{RMS}.

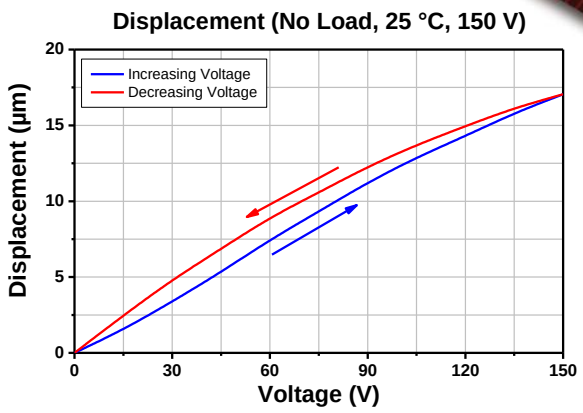
e. It is recommended to clean the part with isopropyl alcohol (IPA) in an ultrasonic immersion tank and then bake it at 60 °C for two hours. If using a custom baking process, the maximum baking temperature should be less than 150 °C and the baking time should be less than 2 hours.

Drawing



Typical Performance Plots





These temperature increases were measured after applying a sine-wave drive voltage ranging from 0 to 150 V at the specified frequency for 10 minutes.

Operation

Electrical Considerations

- The electrode attached to the red wire should be positively biased and the electrode attached to the black wire should be grounded. The recommended maximum drive voltage is 150 V and the absolute maximum voltage is 150 V. Exceeding 150 V will decrease the device's lifespan and may cause mechanical failure. Reverse biasing the device may cause mechanical failure.
- **Caution:** After driving, the piezo is fully charged. Directly connecting the red and black wires has the risk of electricity discharging, spark, and even failure. We recommend using a resistor (>1 kΩ) between the wires to release the charge.

Mounting Options

- Loads should only be attached to the top and bottom surfaces of the cap and we recommend mounting/clamping the actuator via the two cone-shaped grooves using end hemispheres with <6 mm diameter (such as Item #s PKCESP, PKDESP, PKJESP and PKFESP), as shown in the image to the right.
- The wire exits can be bent nearly 90° to let the end hemispheres contact the groove on the bottom cap. The base of the wire exit is a short copper pin that is difficult to bend. It may be bent once or twice, but bending it 10 times or more will destroy the soldering joints.

Storage Instructions

- Do not store the device at temperatures above 80 °C.
- Do not store the device in humid environments. The relative humidity (RH) should be less than 40%.
- Do not immerse the device in organic solvents.
- Do not use the device around combustible gases or liquids.