

Ultrasonic Piezo Chip, 35 kHz, 50 mm OD



PA40ND5

Description

The PA40ND5 piezoelectric chip is designed for ultrasonic transducers and has a resonant frequency of 35 kHz. It is made from a single layer of hard PZT material and exhibits negligible displacement. The bare electrode with the '+' should receive a positive bias and the other electrode should be grounded.

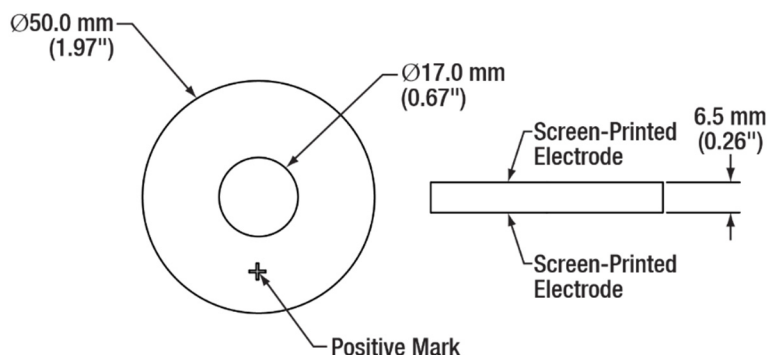
Specifications

PA40ND5 ^a	
Drive Voltage Range ^b	0 - 5 kV
Piezoelectric Constant	220 pC/N \pm 15%
Resonant Frequency	35 kHz (No Load)
Impedance at Resonant Frequency	$\leq 30 \Omega$
Operating Temperature	-25 to 200 °C
Dissipation Factor ^c	<0.4%
Capacitance ^c	2.3 nF \pm 15%
Curie Temperature	320 °C
Dimensions	Outer Diameter: 50.0 mm \pm 1 mm Inner Diameter: 17.0 mm \pm 0.5 mm Length: 6.5 mm \pm 0.2 mm

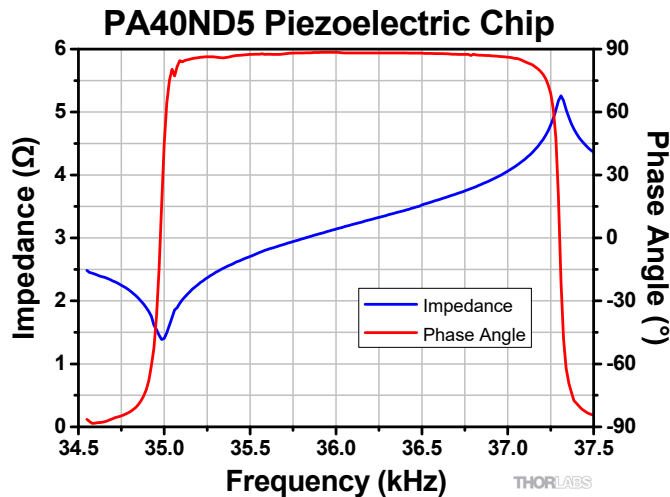
- a. All specifications are quoted at 25 °C, unless otherwise stated.
- b. The material can be driven at up to 5 kV, but operation above 3 kV may create an arc in the air. Protective measures such as silicone oil should be applied when the voltage is above 3 kV.
- c. Specified at 1 kHz, 1 V_{RMS}.



Drawings



Typical Performance Plots



This data was acquired under no load at 25 °C by an impedance analyzer with frequency sweeping.

Operation

Electrical Considerations

- The electrode with the engraved '+' should be positively biased and the other electrode should be grounded. The absolute maximum voltage is 5 kV. Exceeding 5 kV will decrease the device's lifespan and may cause mechanical failure. Reverse biasing the device may cause mechanical failure. Operating the device above 3 kV may create an arc in the air. Protective measures such as silicone oil should be applied when the voltage is above 3 kV.
- When soldering wires to the electrodes, use a soldering iron at a temperature no greater than 370 °C (700 °F) for a maximum of 2 seconds per spot. Solder to the middle of the electrode, keeping the spot as small as possible.

Electrical Shock and Discharge Caution

- During operation, high voltage is applied to the piezo and electrodes; do not touch the device by hand or with conductive materials to avoid injury or short circuit.
- After being driven, the piezo is fully charged. Directly connecting the positive and negative electrodes may result in a spark and/or device failure. It is recommended to discharge using a resistor (>1 kΩ) between the positive and negative electrodes.

Attaching Devices to the Piezo

- Any epoxy which cures at a temperature lower than 80 °C is safe to use. We recommend Thorlabs Item #s 353NDPK or TS10. Loctite Hysol 9340 is also usable.
- Loads should only be attached to the center of the flat faces since the edges do not translate. Attaching a load to the edges may lead to mechanical failure.

Storage Instructions

- Do not store the device at temperatures above 200 °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.

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