

Piezo Ultrasonic Transducer, 20 kHz, 700 W



PKT40A

Description

The PKT40A piezoelectric ultrasonic transducer consists of four PA40ND5 chips that are bolted together in a metal housing. The electrode connected only to the chips should receive a positive bias while the electrode connected to the metal housing should be grounded.

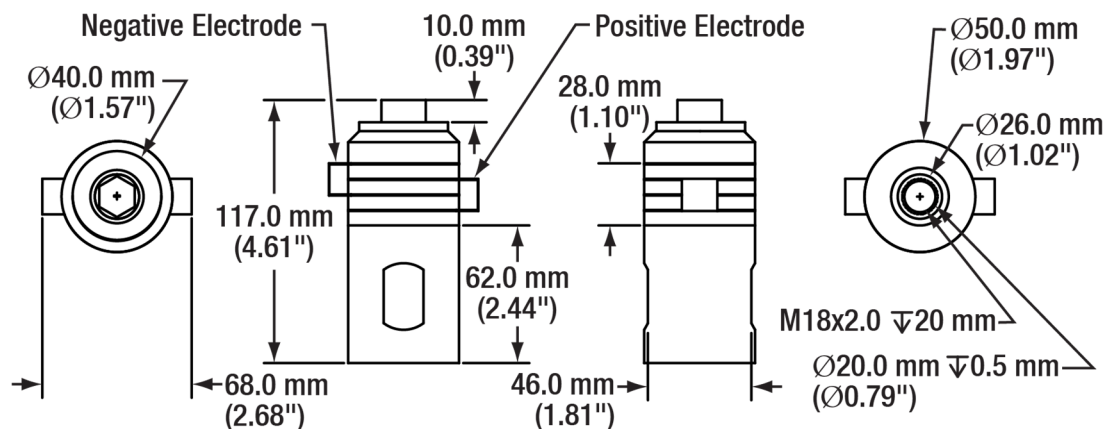
Specifications

PKT40A ^a	
Drive Voltage Range ^b	0 - 5 kV
Resonant Frequency	20 kHz (No Load)
Impedance at Resonant Frequency	$\leq 12 \Omega$
Dissipation Factor ^c	$< 0.3\%$
Capacitance ^c	$10.0 \text{ nF} \pm 15\%$
Bandwidth	$\Delta f \geq 1 \text{ kHz}$
Power (Typical, Instantaneous @ 3 kV)	700 W
Operating Temperature	-25 to 200 °C
Curie Temperature	320 °C
Joint Bolt	M18 x 2.0
Dimensions	Outer Diameter: 50.0 mm $\pm$ 1 mm Width: 68.0 mm $\pm$ 1 mm Height: 117.0 mm $\pm$ 1 mm

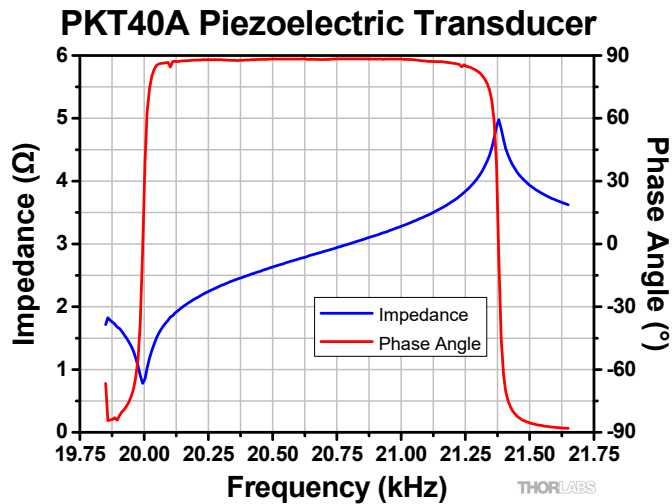


- All specifications are quoted at 25 °C, unless otherwise stated.
- The material can be driven at up to 5 kV, but operation above 3 kV may create an arc in the air. Protective measures such as silicone oil should be applied when the voltage is above 3 kV.
- Specified at 1 kHz, 1 V_{RMS}.

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 that is in contact with the metal housing should be grounded and the other electrode should be positively biased. 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 copper foil electrodes, use a soldering iron at a temperature no greater than 370 °C (700 °F) for a maximum of 2 seconds per spot, soldering to the middle of the electrode.

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 Transducer

- Loads should only be attached to the M18 x 2.0 tapped hole in the base of the metal housing. The metal housing of the transducer can be held or clamped.
- Caution: When operating at the resonant frequency, high voltages will be applied to the transducer which will generate high frequency forces as well as heat. Do not touch any part of the device to avoid risk of injury from electric discharge, vibration, or heat. When operated for extended periods, cooling the piezo chips and metal components by rapid air flow is recommended.

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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