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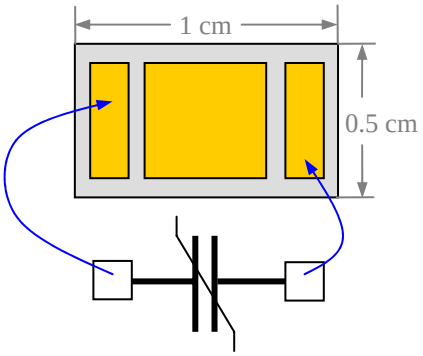
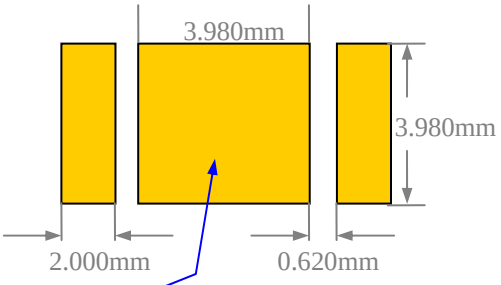
RC1-166A
4mm Sensor Die

Date: November 7, 2008

Summary:
The RC1-166A capacitor is a 4-millimeter by 4-millimeter 1-micron thick ferroelectric capacitor with no external package. It is configured so that it may be soldered directly onto PC boards or other mounts for use as a pressure, vibration, or temperature sensor.





The center metal contact is not an electrical contact. It is used to solder the top surface of the capacitor to the substrate if required for the application.
NOTE: It might be shorted to the top electrode. Do not use it as an electrical contact.

Temperature Range: -55°C to 125°C.

Device Designation:
"BC" => Die RC1-166A 10,000Å thick 4% niobium doped 20/80 PZT (4/20/80 PNZT) with CHROME/GOLD metallization.

Capacitor Size:
0.16cm^2

Total Lead Content per Die:
113 micrograms

Recovery: The platinum-electroded PNZT capacitors are prone to fatigue and imprint. They may be imprinted when received. They do imprint slowly at room temperature after use. There is a recovery procedure that will fully recover the capacitor from imprint. The recovery procedure will not recover fatigue loss. The recovery procedure may be executed multiple times on a capacitor without damage. To recover a 1-micron thick capacitor, execute a 20V or higher square wave at 1Hz for 100s on each capacitor at room temperature.

Poling: The domains of the PNZT capacitor on the die must be poled prior to use. The capacitor will not generate piezoelectric or pyroelectric signals if its domains are not oriented. Execute a single hysteresis loop on the capacitor with a ferroelectric tester. If you do not have a tester, apply 15V to 30V in either direction for a few seconds. The EDU and USB Sensor Boards have solder jumpers that allow you to disconnect the capacitor from the circuitry for poling. The capacitor may be poled using the HOBBYIST ferroelectric tester. The EDU does not have the voltage range to properly orient this capacitor.