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# Technology & Design Notice of Piezo-Ceramics

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## ▶ Technology & Design Notice

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#### Design Notice

##### Operating Temperature Ranges

The Piezo Resonators should not be operated beyond the Operating Temperature Range specified in the catalog.

##### Changes/Drifts in Oscillating Frequency

Oscillating frequency may drift depending upon the controlling IC and/or external capacitors C1 and C2 used in the circuit design.

Token standard resonator is adjusted with our standard measuring circuit. There could be slight shift in frequency other types of IC are used. When you require exact oscillation frequency in your application, we can adjust it with your specified circuit on request.

##### Fail-Safe Design for Equipment

When using The Piezo Resonators, it is recommended that you build a protective failsafe circuit into your design to prevent equipment damage in the event that the resonator malfunctions or fails.

##### Abnormal Oscillation

The Piezo Resonators are always accompanied by spurious resonances. Spurious oscillations or stoppage of oscillation may occur depending on the circuit design (IC used, frequency characteristics of the IC, supply voltage etc.) and/or environmental conditions. These factors should be taken into consideration when designing the circuit.

##### Stray Capacitance

Stray capacitances and insulation resistances on printed circuit boards may cause abnormal oscillation or stoppage of oscillation. These factors should be taken into consideration when designing the circuit.

##### Overvoltage Spikes & Electrostatic Discharges

Voltage spikes and electrostatic discharges may cause damage/malfunction or failures of the resonators.

##### Abnormal Mechanical Stresses

Abnormal or excess mechanical stresses such as vibration or shock should be avoided when handling or storing resonators to prevent damage and cracking.

##### Surface Mounting Consideration

In automated mounting of The Piezo Resonators on printed circuit boards, any bending, expanding and pulling forces or shocks to the resonator should be kept to a minimum to prevent electrical failures and/or mechanical damage to the devices.

##### Prohibited Applications

- Flow Soldering should not be used to solder piezo resonators.
- Please do not apply excess mechanical stress to the component and lead terminals at soldering.
- Ultrasonic Cleaning and Ultrasonic Welding should not be used on piezo resonators to avoid possible damage.
- Avoid washing in water because it could deteriorate the resonator's performance characteristics.
- Avoid resin coating or potting for humidity protection because it could deteriorate the resonator's performance characteristics.

