



Ceramic Resonators and Filters

PIEZO DIELECTRIC MICROWAVE DEVICES - PRECAUTION USAGE

▶ GENERAL INFORMATION

Piezo dielectric microwave device that is used with the clock circuit of an IC to set the speed of the IC. The piezo by itself is not a clock, so it must be used with circuitry built into the IC to create the clock signal. Quartz crystals have been used in this manner for many years, but TOKEN offers lower cost and more rugged piezo products in piezo dielectric microwave, ceramic resonators, ceramic filters, and . The clock circuit consists of the passive resonator, quartz or ceramic piezo, and an active amplifier that is built into the IC.

▶ PIEZO DEVICES CHARACTERISTICS PRECAUTIONS FOR SAFETY

In application of the piezo devices, it is recommended that equipment shall be protected by adding a protective and/or retardant design circuit against deteriorations and failures of the ceramic piezo.

▶ OPERATION TEMPERATURE RANGES

The ceramic piezo devices shall not be operated beyond the specified “Operating Temperature Range” in the Specifications.

▶ CHANGES / DRIFTS IN OSCILLATING

It shall be noted that oscillating frequencies of the ceramic piezo devices may drift depending on different IC manufacturer applied and capacitance values of external capacitors and the circuit design.

▶ ABNORMAL OSCILLATION

The ceramic piezo device is always accompanied by spurious resonances. Hence in the circuit, spurious oscillations or stop of oscillation may occur depending on the circuit design (IC applied, frequency characteristics of the IC, supply voltage etc.) and/or environmental conditions Attention shall be paid to those abnormalities above mentioned in circuit design.

▶ STRAY CAPACITANCE

Stray capacitance and insulation resistances on printed circuit board may cause abnormalities of the ceramic piezo device such as “higher harmonic oscillations”.or “stop of oscillations”. Attention shall be paid to those abnormalities above mentioned in circuit design.

▶ OVERVOLTAGE SPIKES AND ELECTROSTATIC DISCHARGES

Abnormal/excess electrical stresses such as over voltage spikes and electrostatic discharges may cause electrical deteriorations and failures of the ceramic piezo and affect reliability of the devices.

▶ ABNORMAL MECHANICAL STRESS

Abnormal/excess mechanical stresses such as falling shocks shall not be applied to the ceramic piezo devices in handling, to prevent them from being damaged or cracked. Dropped devices shall not be used.

▶ SURFACE MOUNTING CONSIDERATION

In automated mounting of the chip ceramic piezo device on printed circuit boards, any bending, expanding and pulling forces or shocks against the chip ceramic piezo devices shall be kept minimum to prevent them from electrical failures and mechanical damages of the devices.

▶ SOLDERING FLUX

1. Rosin-based and non-activated soldering flux is recommended.
2. The content of halogen in the flux shall be 0.1 wt. % or less.

Note: In case of water-soluble type or activated type soldering flux being applied, the flux residues on the surface of PC boards, may have influences on the reliability of the ceramic piezo device, and cause deteriorations and failures of the devices.

▶ POST SOLDERING CLEANING

Application of ultrasonic cleaning is prohibited. Cleaning conditions such as kinds of cleaning solvents, immersion time and temperatures etc. shall be checked by experiments before production.



Ceramic Filters

► SOLDERING (REFLOW)

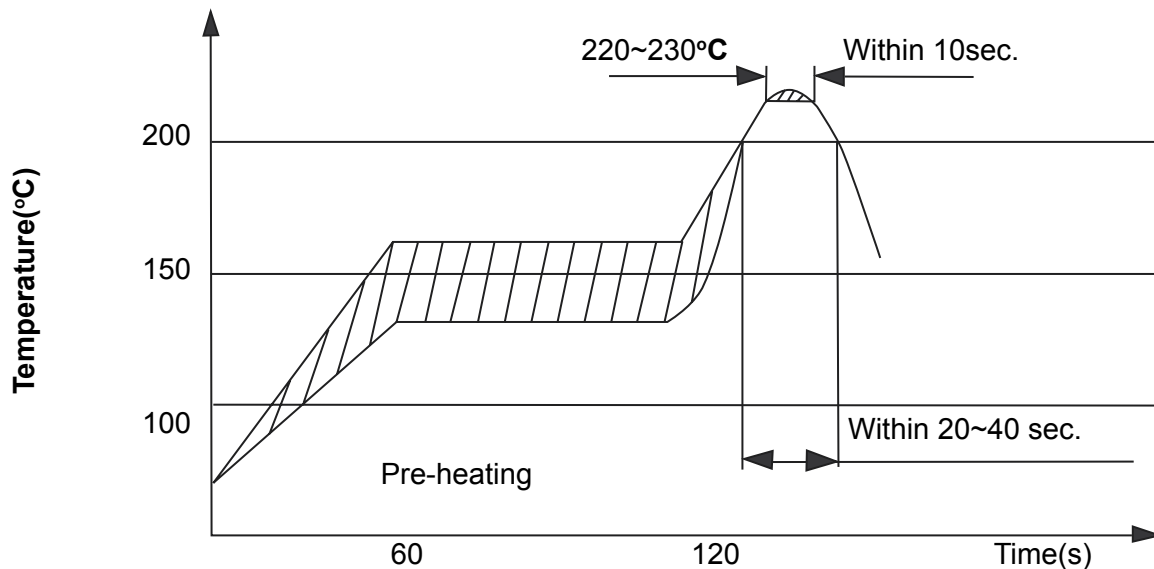
Solderings of the chip ceramic piezo devices shall conform to the soldering conditions in the individual specifications. The chip ceramic piezo devices are designed for “Reflow Solderings” in the reflow solderings, too high Soldering temperatures and too large temperature gradient such as rapid heating or cooling may cause electrical failures and mechanical damages of the devices.

Following soldering conditions are recommended;

Preheating: 150 degree C for 60 sec to 120 sec.

Soldering Temperature: 220 degree C for 10 seconds max.

Peak Soldering Temperature: 240 degree C max.



► OPERATION AND STORAGE CONDITIONS

The ceramic piezo devices shall not be operated and/or stored under following environmental conditions:

To be exposed directly to water or salt water.

To be exposed directly to sunlight.

Under conditions of dew formation.

Under conditions of corrosive atmosphere such as hydrogen sulfide, sulfurous acid, chlorine and ammonia.