

Handling Notes for Quartz Crystals

Lead cutting for through hole versions:

One sensitive part in through hole crystals is the glass isolator section. Mechanical stress during lead bending or lead cutting can create micro cracks in the glass. The wire must be mechanically fixed between the bending or cutting point and the glass area. Do not cut or bend the wire at less than 3.0 mm distance from the base plate. Do not solder the crystal housing, use rubber glue or SMD clips to fix the housing.

Soldering:

All through hole crystals are suitable for the standard wave soldering lines, according to JEDEC J-STD-020E/2014, not higher than 260°C for 10 seconds. SMD versions can be used for reflow soldering versions according to our soldering conditions which will be found on our relevant datasheets. If soldering processes are used with higher temperatures (lead free soldering) or other soldering methods please contact us. The crystal frequency can change by a few ppm after the soldering process. The change will recover after a few hours or days without any damages.

Cleaning conditions:

Crystals can be cleaned with conventional cleaning methods, using:

- Cleaning solvent: HCFC, Isopropanol, demineralized water
- Temperature difference: component temp. - solvent temp. < 30°C
- Immersion Wash: 5 minutes max. in above solvent at +60°C max
- Drying process: 1-2 hours at 80°C

To avoid insulation resistance problems, it is necessary to dry after the cleaning process

General Storage conditions:

Standard storage temperature: 25±5°C humidity: 60±15%RH

Standard storage temperature range (if not otherwise specified): -40°C to +85°C

Moisture sensitivity level (MSL)= 1

Shock Conditions:

1.500G/0.5 ms, half sine, three axis

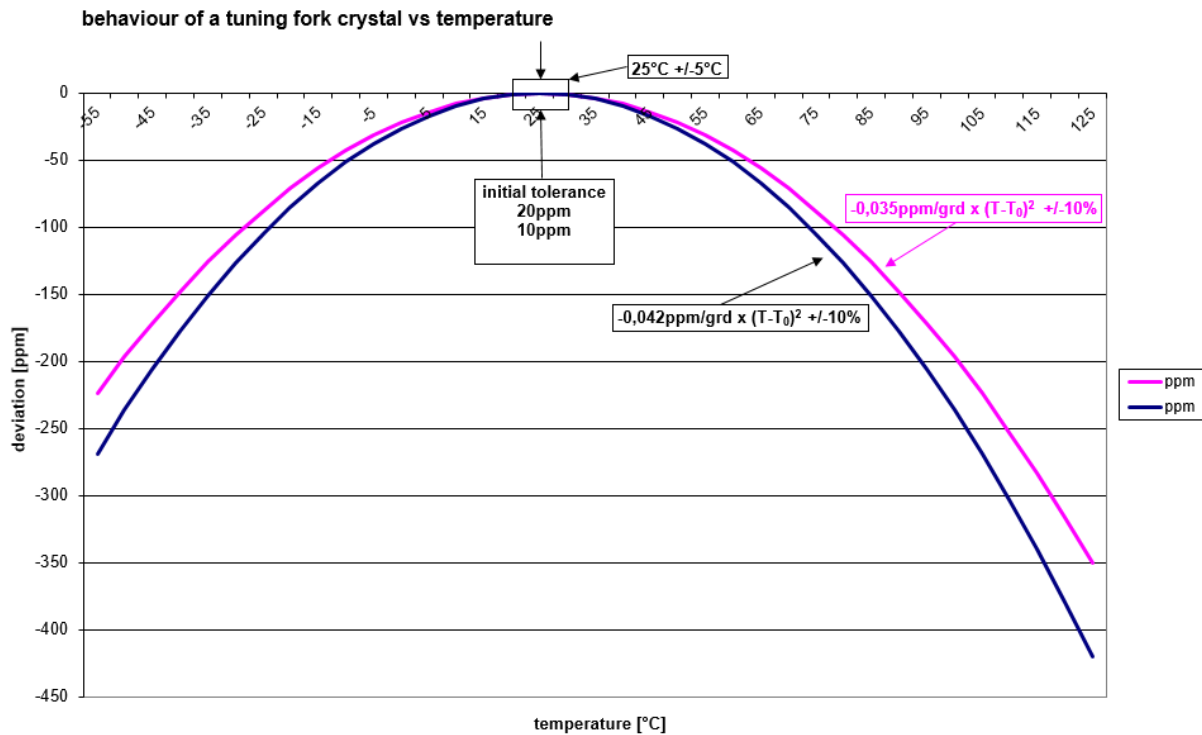
Insulation Resistance:

All our MHz and tuning fork crystals have a 500M Ohm resistance at 100V DC.

Oscillation Circuit Design Precautions:

Parabolic Coefficient

Frequency Temperature Curve



Frequency Temperature Characteristics

Frequency temperature characteristics of tuning fork crystals is shown by negative quadratic curve which has a peak at 25°C as per left graph.

Please make sure to consider the temperature range and frequency accuracy you need since magnitude of frequency variation becomes larger and larger as the temperature range becomes wider.

(Approximation formula of frequency temperature characteristics)

$$f_{\text{tem}} = B (T - T_i)^2$$

B: Parabolic coefficient

T: Given temperature

T_i: Turnover temperature

For more information regarding the temperature behavior, please check also the WP on our Geyer Homepage: Tuning Fork Crystals in the extended temperature range