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, 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 find 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:
Crystal can be cleaned with conventional cleaning methods. Ultrasonic cleaning is acceptable up to 20KHz. Higher
frequencies can destroy the crystal blank. The ultra sonic conditions can change according to different pc-boards sizes
and weights. Cleaning tests from the customer side will then avoid any further damages.

Storage conditions:
Standard Storage Temperature: 25±5°C humidity:
60±15%RH

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

Shock Conditions:
1.500G/0.5 ms, half sine, three axis

Insulation Resistance:
All our MHz-Crystals are 500M Ohm 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 become wider.

(Approximation formula of frequency temperature characteristics)

\[ F_{\text{tem}} = B \cdot (T - Ti)^2 \]

B: Parabolic coefficient  
T: Given temperature  
Ti: Turnover temperature