

Shoulder 好达

SHOULDER ELECTRONICS LIMITED

CRYSTAL RESONATOR Data Sheet

PRODUCT 产品: CRYSTAL RESONATOR

MODEL NO 型号: TF38

PREPARED 编制: Fengyu

CHECKED 审核: York

APPROVED 批准: Lijiating

DATE 日期: 2008-01-25

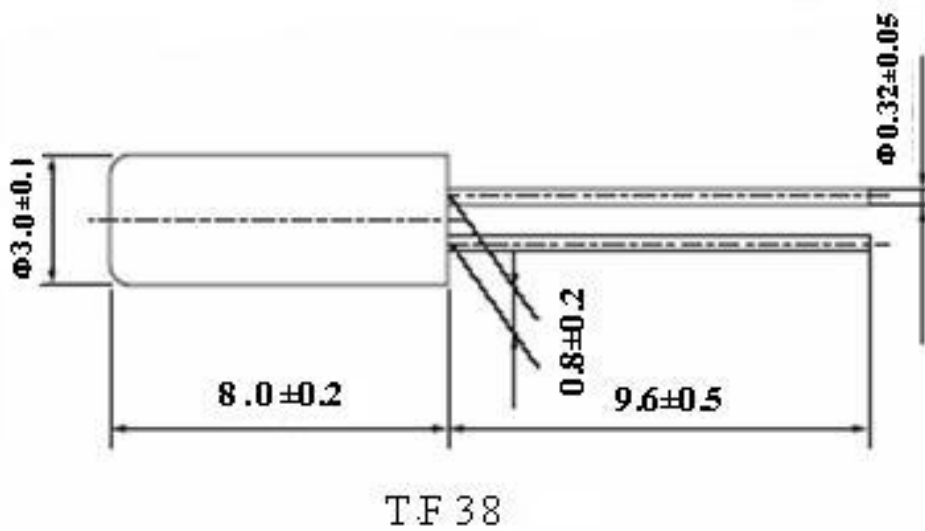
1. Feature

- RoHS Compliant(Lead Free)
- High precision characteristic covering up to high frequency range
- Higher frequency stability and reliability

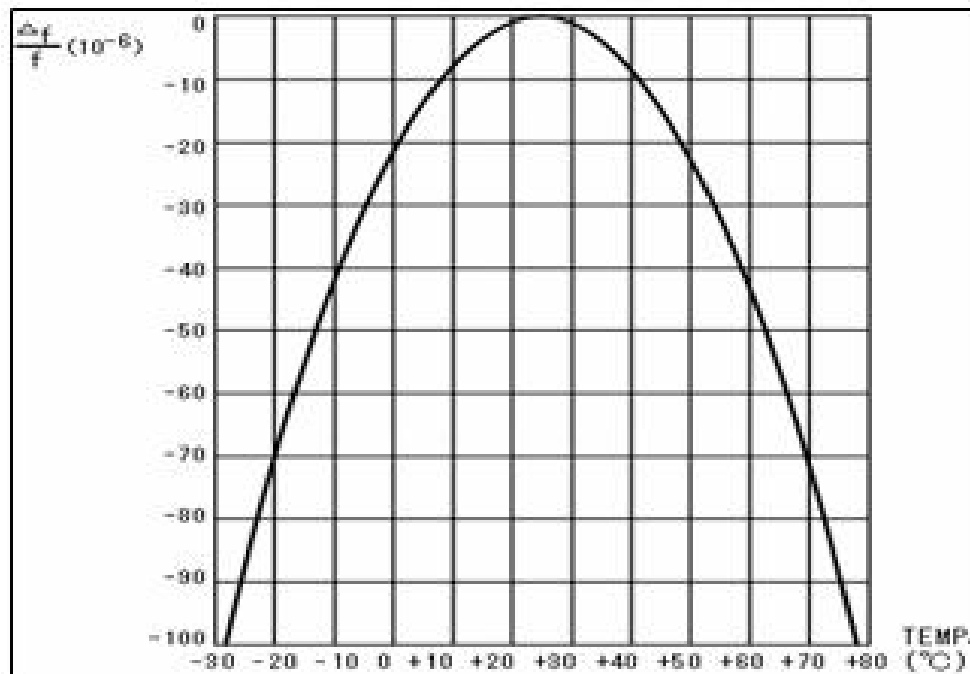
2. SPECIFICATION

FREQUENCY RANGE	25.000-150.000KHz
LOAD CAPACITANCE	12.5PF
FREQUENCY TOLERANCE AT 25°C	-/+30PPM MAXIMUM
TURNOVER TEMPERATURE	25±5°C
TEMPERATURE COEFFICIENT	[-0.035±0.01] ppm /°C
OPERATING TEMPERATURE RANGE	-10 TO +60°C
STORAGE TEMPERATURE RANGE	-40 TO +85°C
EQUIVALENT SERIES RESISTANCE (ESR) 25°C	40KΩ MAXIMUM
DRIVE LEVEL	1.0μW MAXIMUM
MOTIONAL CAPACITANCE	0.0035pF TYPICAL
SHUNT CAPACITANCE	1.75pF TYPICAL
CAPACITANCE RATIO CO/C1	500 TYPICAL
AGING [first year] AT 25°C ±3°C	-/+5PPM MAXIMUM
QUALITY FACTOR(DEPEND ON FREQUENCY)	60000 TYPICAL
INSULATION RESISTANCE (DC100V±15V)	500 MOhm MINIMUM

3. DIMENSIONS



4. FREQUENCY VS. TEMPERATURE CURVE



5. MECHANICAL AND ENVIRONMENTAL SPECIFICATION

1) Vibration

Conditions : Vibration Frequency 10 to 55Hz
Vibration Amplitude 1.5mm

Cycle Time 1-2min (10-55-10Hz)

Direction X.Y.Z

Duration 2h/each direction

Results: Frequency Change: ± 10 ppm Max.

Resistance Change: $\pm 15\%$ or 5kohm Max.

2) Shock

Conditions: 3 Times free drop from 75cm height to hard wooden board of thickness more than 30mm

Results: Frequency Change: ± 10 ppm Max.

Resistance Change: $\pm 15\%$ or 5kohm Max.

3) Leakage

Conditions: Put crystal units into a hermetic container and Helium for 0.5-0.6Mpa, and keep it for 1h; Check the leakage by a Helium leak detector

Results: Leakage: 1×10^{-8} mbar.l/s Max.

4) Solderability

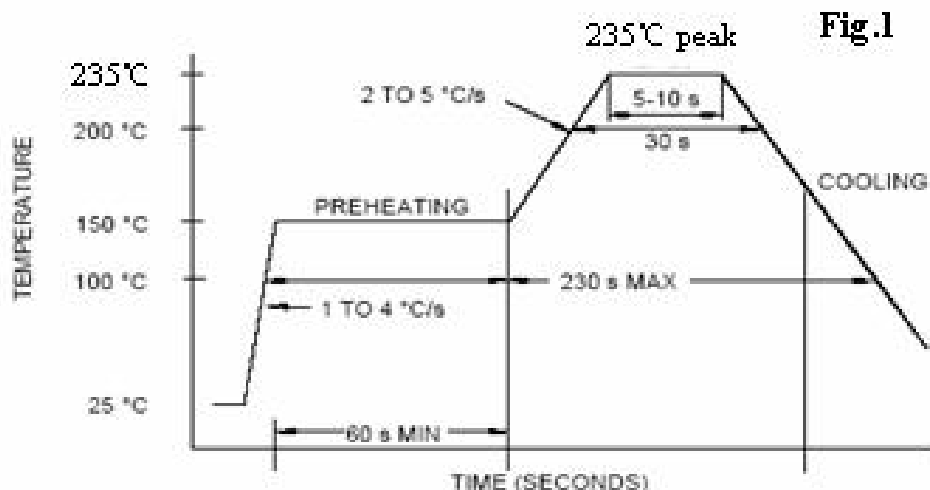
Conditions: Put the leads of crystal units into solder melted tank for 3 to 5s
Temperature of solder melted tank is $245^{\circ}\text{C} \pm 5^{\circ}\text{C}$

Results: The dipped surface of the leads should be at least 95% covered with continuous new solder coating

5) Reflow soldering

Temperature cycling test

Conditions: Next Fig.1 for TF38 families.



Results: Resistance Change: $\pm 25\%$ or 10kohm Max.

6) Lead Strength (DIP)

Conditions: The crystal lead with the 0.9kg(9N)power(keep it for 30s \pm 5s)

and bend the crystal lead 90° with 0.45kg power and two times (which you want to bend should be more than 1.5mm from the case)

Results: The crystal lead is not abnormality

7) High Temperature Endurance

Conditions: The crystal units shall be put in somewhere for 2 hours at temperature of $85^{\circ}\text{C} \pm 2^{\circ}\text{C}$, then keep it for 1 to 2 hours under room temperature

Results: Frequency Change: $\pm 10\text{ppm}$ Max.
Resistance Change: $\pm 15\%$ or 5kohm Max.

8) Low Temperature Endurance

Conditions: The crystal units shall be put in somewhere for 2 hours at temperature of -25°C , then keep it for 1 to 2 hours under room temperature

Results: Frequency Change: $\pm 10\text{ppm}$ Max.
Resistance Change: $\pm 15\%$ or 5kohm Max.

9) Low Temperature Endurance

Conditions: somewhere at 40°C in relative humidity of 90-95% for 48 hours, then keep it for one or two hours under room temperature

Results: Frequency Change: $\pm 10\text{ppm}$ Max.
Resistance Change: $\pm 15\%$ or 5kohm Max.

10) Temperature Cycle

Conditions: Temperature shift from low (-40°C) to high (100°C , keep 30 minutes), satisfy high (100°C) to low (-40°C , keep 30 minutes), then go up to room temperature for 5 cycles

Results: Frequency Change: $\pm 10\text{ppm}$ Max.
Resistance Change: $\pm 15\%$ or 5kohm Max.

11) Salt Spray Test

Conditions: Put the crystal units in the salt spray room (salt density: 5%) at the temperature of 35°C for 96 hours. Then clean it with water and dry its surface.

Results: The appearance shall have no abnormality and soldering is good.
Frequency Change: $\pm 10\text{ppm}$ Max.
Resistance Change: $\pm 10\%$ or 5kohm Max.

6. PACKAGE

1000pcs/bag

5000pcs/box (175*120*65)

100000pcs/big box (300*180*600)

7. PROCESSING INSTRUCTIONS

The following instructions and information are provided for the purpose of having the user understand the proper way to process our crystal products to prevent problems prior to use and enhance the reliability of the equipment to which they are applied.

1) When dropped by mistake

The crystal units are designed and manufactured to resist physical shocks. However, when the crystal units are subjected to excessive impact such as being dropped onto the floor or giving shocks during processing, need to make sure its satisfactory performance before using it.

2) Soldering

Lead wires should be soldered within 3 seconds with the soldering iron heated to a temperature no higher than 300°C

In solder-dip processing, the leads should be soldered within 10 seconds with a temperature no higher than 260°C. Mounting in upright is recommendable to prevent the heat conduction directly to the body of the crystal unit.

3) TO BEND THE LEAD of cylinder type products

When the lead of cylinder type crystal units need to be bent, leave more than 1.5mm (3.0mm is recommendable) of lead from the case in order to prevent from any cracks of the hermetic sealing glass at the root of the lead, and use a jig to bend if possible.

When bending the lead of cylinder type crystal units, do not scrape off the soldering plating from the lead surface.

4) Mounting :

A: "Mounting" of cylinder type products

Soldering the body of the cylinder type crystal units with PCB must be avoided due to deteriorate the characteristics or damage the products. Rubber adhesive is recommended

B: When the lead needs to be bent by hand, please follow the instruction as below:

Hold the body of the cylinder type crystal unit in fingers; Pick at the part with tweezers, which you want to bend. There should be more than 1.5mm(3.0mm is recommended) from the body case; Bend the lead 90° by tweezers without pulling the lead strongly. If pulling the lead strongly may cause any cracks of hermetic sealing glass at the root of the lead and may cause the leakage and the characteristics to deteriorate.

5) Cleaning

Crystal units may be affected and destroyed at worst by supersonic cleaning or supersonic welding. Please be sure to check if your cleaning and welding process affects any damage to crystal units before using.

Some kinds of cleaning fluid may cause any damage to crystal units. Please be sure to check suitability of the cleaning fluid in advance.

6) Storage

Storage of crystal units under higher temperature or high humidity for a long term may affect frequency stability or solderability. Please store the crystal units under the normal temperature and humidity without exposing to direct sunlight and dew

condensation , and avoid the storage of crystal units for more than 6 months, and mount them as soon as possible after unpacking

Shoulder 好达