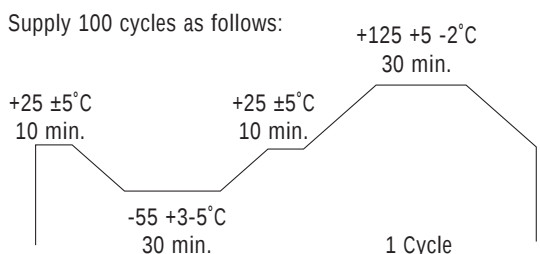


RELIABILITY TEST PROCEDURES FOR QUARTZ CRYSTALS

NO.	TEST NAME	TEST PROCEDURES	REQUIREMENTS
1	SHOCK	Drop 3 times from the height of 100 cm onto hard wooden board.	Frequency Drift ± 5 PPM Max. Resistance Drift $\pm 15\%$ Max.
2	VIBRATION	Vibration Frequency: 10 to 55 Hz, 1.5 mm, full wave Cycle: 2 min. Direction: X.Y.Z. Time: 2 hours in each direction	Frequency Drift ± 5 PPM Max. Resistance Drift $\pm 15\%$ Max.
3	SOLDERABILITY	After applying ROSIN flux, dip in solder Dipping Time: 3 ± 0.5 sec. Soldering Temperature: $+230 \pm 5^\circ\text{C}$ Dipping Depth: 2 mm from the edge of terminals/lead-wires of specimen.	Over 90% of terminals/lead-wires dipped is covered by solder.
4	RESISTANCE TO SOLDERING HEAT	Dipping in solder Dipping Time: 10 ± 1 sec. Soldering Temperature: $+260 \pm 5^\circ\text{C}$ Dipping Depth: 2 mm from the edge of terminals/lead-wires of specimen.	Frequency Drift ± 5 PPM Max. Resistance Drift $\pm 15\%$ Max.
5	STORAGE IN HIGH TEMPERATURE	$+85 \pm 2^\circ\text{C}$ for 500 hours.	Frequency Drift ± 5 PPM Max. Resistance Drift $\pm 15\%$ Max.
6	STORAGE IN LOW TEMPERATURE	$-40 \pm 2^\circ\text{C}$ for 500 hours.	Frequency Drift ± 5 PPM Max. Resistance Drift $\pm 15\%$ Max.
7	HUMIDITY	$+60 \pm 2^\circ\text{C}$ in humidity 95% for 500 hours.	Frequency Drift ± 5 PPM Max. Resistance Drift $\pm 15\%$ Max.
8	THERMAL SHOCK	Supply 500 cycles as follows: Temperature shift shall be done within 30 sec. $-55 \pm 2^\circ\text{C}$ (30 min) $\longleftrightarrow$ $+125 \pm 2^\circ\text{C}$ (30 min)	Frequency Drift ± 5 PPM Max. Resistance Drift $\pm 15\%$ Max.
9	TEMPERATURE CYCLE	Supply 100 cycles as follows:  1 Cycle	Frequency Drift ± 5 PPM Max. Resistance Drift $\pm 15\%$ Max.

RELIABILITY TEST PROCEDURES FOR QUARTZ CRYSTALS

NO.	TEST NAME	TEST PROCEDURES	REQUIREMENTS
10	STRENGTH OF TERMINALS/ LEAD WIRES	1) Lead Pull Weight: 1 kg Time: 30 sec.	There are no visual abnormalities.
		2) Lead Bend Weight: 225 g Bending Angle: 90 degrees Bending Count: 2 times	There are no visual abnormalities.
11	SEALING TIGHTNESS MIL-STD 202F METHOD 112D TEST C AND D	1) Dipping in Florinert at: +125 ±5°C for 5 min. (Gross Leak)	There are no gas bubbles.
		2) Leak rate shall be measured by using: Helium Leak Detector (Fine Leak)	Leak rate: 1x10 ⁻⁶ atm°CC/sec. Max.