

■ **SCOPE**

This shall cover the characteristics of all the FTX HC-49U SERIES, which can be used in AV equipment OA Equipment, communication equipment and Measuring instruments.

■ **DIMENSIONS:**

See fig.1

■ **ELECTRICAL CHARACTERISTICS**

Item		Requirement	Note
Holder Type		HC- 49U	
Nominal frequency	Fo	4.000 MHz	
Operation Mode	Mn	fund	
Operating temperature	To	-20 to 70 °C	
Store temperature	ST	-55 to 125 °C	
Shunt capacitance	Co	< 7pf	
Freq. Tolerance		±50 ppm	@ 25°C
Freq. Vs temp.		±30 ppm	
Load capacitance	CL	20 pf std.	
Motional resistance	Rs	30Ω	
Drive level	DL	0.01 mW	
Insulation resistance	Ir	500MΩ	(DC500±10V)min
Aging rate		± 3 ppm/y	

■ **MEASUREMENT**

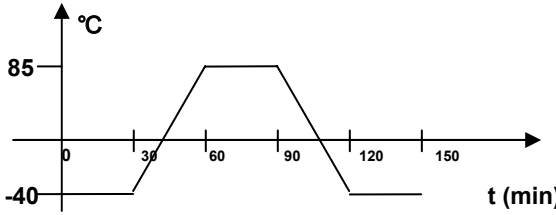
item	REQUIREMENT
Test instrument	It shall be measured by S&A 150D
Measurement	Standard condition: (1) Temperature 25 ±3°C (2) Relative humidity 60± 10% R.H
Condition	The measurement shall be in the temperature range of 5°C to 35°C and relative humidity range of 45% to 85% when there are no faults

This standard is defined in accordance with IEC1178-1: 1993.OC6800000 and GB/T12273-1996.

■ PHYSICAL CHARACTERISTICS

Test Item	Condition of test	Performance Requirements
Shock (Destructive)	Resonator shall be tested after 3 times random drops from the height of 50 cm onto hard wooden board of thickness more than 30 mm.	No visible damage, and measured Values shall meet Table 1.
Vibration (Destructive)	Subject resonator to following vibration Frequency: 10-55Hz Amplitude: 1.5mm Cycle time: 1~2min(10-55-10Hz) Duration: 3 mutually perpendicular Planes in each 2 hours Direction: X, Y, Z	No visible damage, and measured Values shall meet Table 1.
Terminal Strength (Destructive)	Pulling: body of resonator shall be fixed, and 1kg of tension weight shall be supplied gradually to axial direction of lead terminals for 30 seconds	The lead shall not be broken , Frequency value shall meet Table1 and $C.I < 2 \Omega$
	Bending: body of resonator shall be fixed, And 90° bending at a distance of 2.5 ± 0.5 mm from crystal main body shall be given being supplied 450g tension weight. after that, lead terminals shall be straightened gradually. Then, the same bending and straightening shall be supplied to the opposite direction in the same axial.	
Solder Heating (Destructive)	Each lead terminals shall be dipped into the solder melted tank at $350 \pm 10^\circ\text{C}$ for 3 ± 1 seconds to 2mm from the root of the resonator ,and at $260 \pm 10^\circ\text{C}$ for 10 ± 1 seconds by the same way.	No visible damage, and measured Values shall meet Table 1.
Solder DIP. (Destructive)	Dip the lead in liquid solder for 5 seconds, At $230 \pm 5^\circ\text{C}$ and 2.0mm from the root , after this dipping , 90% min of dipped parts shall be covered with solder.	No visible damage, and measured Values shall meet Table 1.
Leakage (non-destructive)	The resonator is to be soaked in the alcohol and enforced with the pressure of 25N/cm ² for 5 minutes Next , the resonator shall be tested after being taken out and dried with a dryer.	The Ir between the wire and the shell must be more than 500M Ω .

■ **ENVIRONMENT ENDURANCE:**

Test Item	Condition of test	Performance Requirements
Heat Resistance (non-destructive)	Subject resonator to 85±5°C for 16 hours, then place the resonator in natural condition for 1 hour.	No visible damage, measured Values shall meet Table1.
Cold Resistance (non-destructive)	Subject resonator to -40±5°C for 2 hours, then, place the resonator in natural condition for 1 hour.	No visible damage, measured Values shall meet Table 1.
Humidity	Keep the resonator at 40±2°C and 90-95% R.H. for 96 hours. Then place it in natural condition for 1 hour.	The freq. meet $ \Delta f \leq 5\text{ppm}$ and C.I. $\leq 5\Omega$
Temperature shock	Temperature shaft from low to high, high to low For 3 times. And then put the resonator in natural Condition for 1 hour. 	No visible damage, measured Values shall meet Table 1..

■ **CHARGE OF CHARACTERISTICS**

Table 1

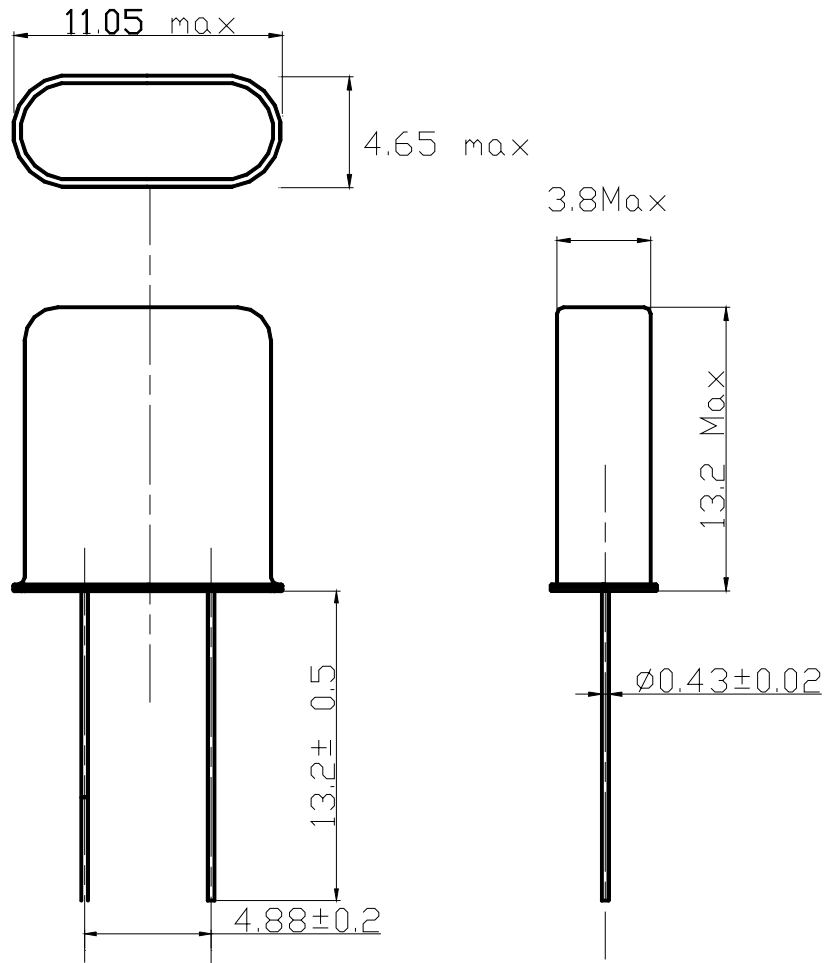
Test Item	Specification	Note
Frequency change ($ \Delta f/f_0 $)	No more than 10ppm	
C.I. (R)	No more than 15%	Reference to the initial value

■ **REVIEW OF SPECIFICATIONS**

When something gets doubtful with these specifications, we shall jointly work to get an agreement.

- DIMENSIONS: (UNIT: mm)

FIG.1



HC-49U

V:1.0

Date: 04/12/2002

APPORVAL SHEET

Customer: _____
Description: HC-49U XTAL 4MHz
Part No.: FTX4M20U
Application: _____

Approved by:	Checked by :	Issued by :
--------------	--------------	-------------

Date: Sep 30, 02

FRONTER ELECTRONICS CO., LTD

ADD: Rm.906 9/F.,Chuangzhan Center,NO.6007
Shennan Rd., Shenzhen, China, 518040.
FAX: 86-755-83867976
TEL: 86-755-83867990
HTTP: www.chinafronter.com