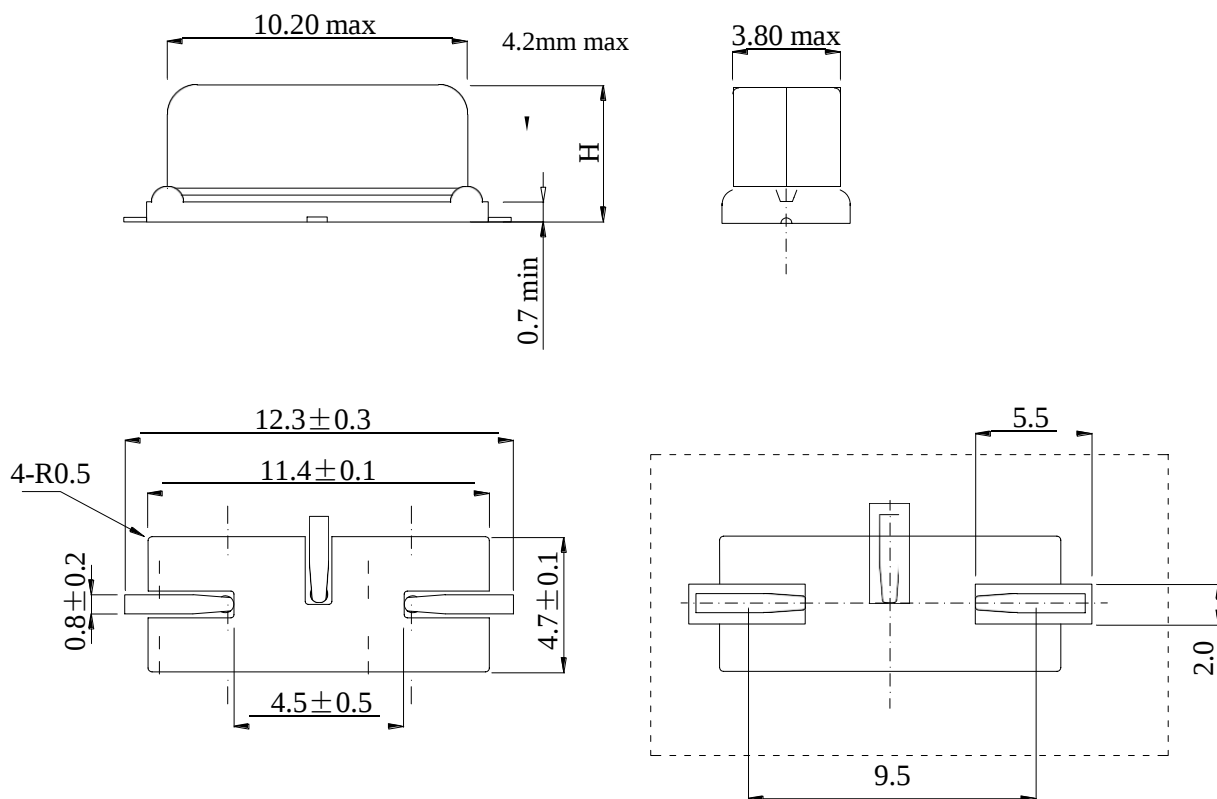


1. QUARTZ CRYSTAL UNIT SPECIFICATION

1.1 Frequency:	8.000MHz
1.2 Mode of Oscillation	AT Fundamental
1.3 Holder type :	HC-49/SMD-3PIN
1.4 Frequency tolerance:	$\pm 30\text{ppm}$ at 25°C
1.5 Equivalent resistance (R_r):	60Ω Max.
1.6 Operating temperature range:	-40°C To $+85^{\circ}\text{C}$
1.7 Storage temperature range:	-55°C To $+105^{\circ}\text{C}$
1.8 Frequency stability:	$\pm 50\text{ppm}$ at -40°C To $+85^{\circ}\text{C}$
1.9 Loading capacitance (CL) :	20pF
1.10 Drive level (DL):	100 μW Typical
1.11 Shunt Capacitance (C0):	7.0pF MAX
1.12 Insulation resistance (IR):	More than 500M ohms at DC 100V
1.13 Circuit:	Measured in S&A 250B
1.14 Aging:	$\pm 3\text{ ppm Max}$ ($+25^{\circ}\text{C}$ 1 st Year)
1.15 Dimensions and marking	Refer to page.3
1.16 Emboss carrier tape & reel	Refer to page.4
1.17 Other	RoHS Compliant (Pb free)

2. MARKING & DIMENSIONS



Recommended Solder Pad Layout:

*Marking should be printed as following:

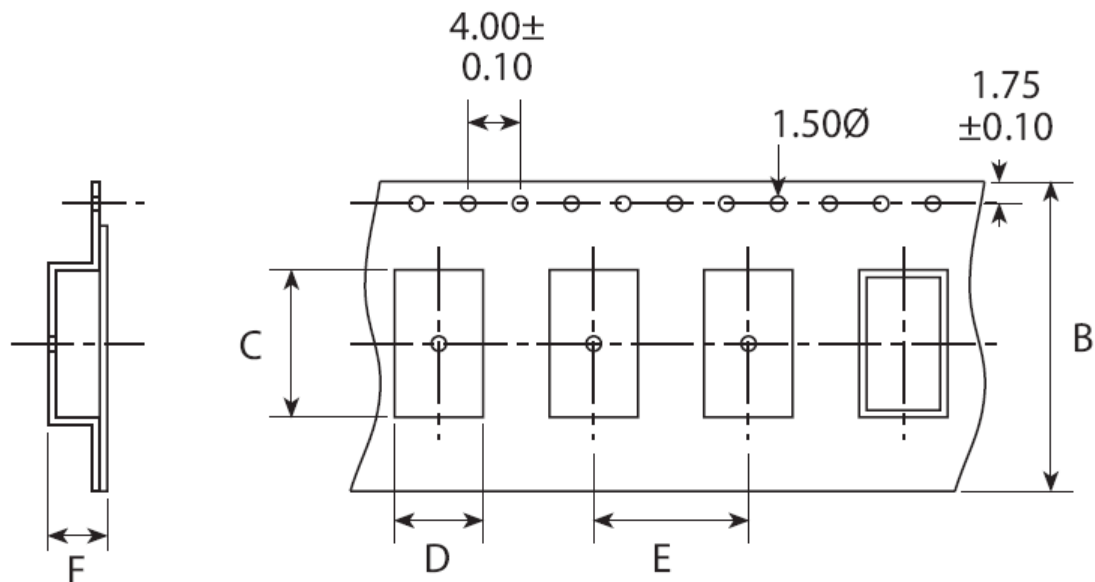
Logo, Nominal Frequency

Nominal Frequency: (ex. 8.000 MHz → 8.000)

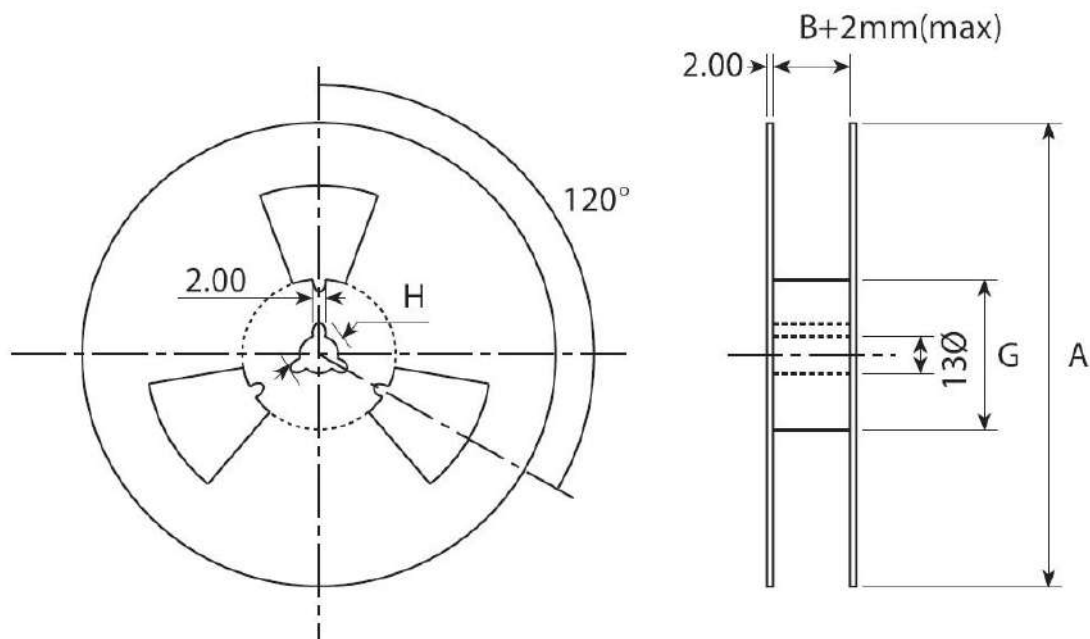
Marking: Laser marking

3.CARRIER TAPE & REEL

a.) Dimensions of Carrier Tape



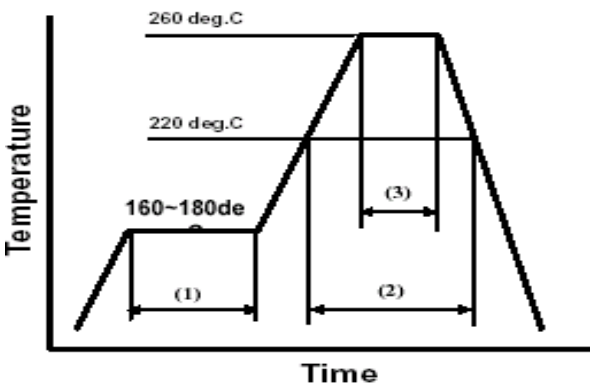
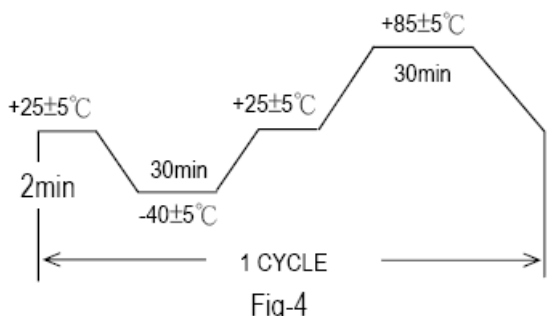
b.) Dimensions of Reel



	A	B	C	D	E	F	G
49SMD-3PIN	330±2.0	24±0.2	13.9	5.6	12.0	4.8	100
1000 pieces of crystal unit per reel							

4.MECHANICAL/ENVIRONMENTAL CHARACTERISTICS

NO.	ITEM	CONDITIONS	SPECIFICATIONS
4.1	Leaking Test	Fully immersed into hot water at $90^{\circ}\text{C} \pm 3^{\circ}\text{C}$ for 3 minutes.	no air bubble are visible.
		Take measurements with a helium leakage detector, or measure insulation resistance under pressure.	$1 \times 10^{-8} \text{ Pa.m}^3/\text{s}$ Max or $\text{IR} \geq 500\text{M}\Omega$
4.2	Drop Test	Dropping 6 times from the height of 75 cm onto hard wooden board of thickness more than 30mm.	The crystal must meet: $ \Delta f \leq \pm 5\text{ppm}$ $ \Delta R \leq 15\%$
4.3	Vibration Test	Vibration Frequency: 10~55Hz Cycle: 1.5 Min. Amplitude: 1.5mm P-P. Direction: X.Y.Z Time: 2 Hours / Each Direction	The crystal must meet: $ \Delta f \leq \pm 5\text{ppm}$ $ \Delta R \leq 15\%$
4.4	Solderability Test	The terminal lead wire is to be soaked in a $230^{\circ}\text{C} \pm 5^{\circ}\text{C}$ tin trough for 5 ± 0.5 seconds.	Tin over the wire $\geq 90\%$ The crystal must meet: $ \Delta f \leq \pm 5\text{ppm}$ $ \Delta R \leq 15\%$
4.5	Low Temperature Enduring	The samples crystal is to be tested after being placed in the environment of $-40 \pm 3^{\circ}\text{C}$ for 96 hours, and recovered to room temperature for 2 hours.	The crystal must meet: $ \Delta f \leq \pm 5\text{ppm}$ $ \Delta R \leq 15\%$
4.6	High Temperature Enduring	The samples crystal is to be tested after being heated at $+85 \pm 3^{\circ}\text{C}$ for 96 hours, and cooled to room temperature for 2 hours.	The crystal must meet: $ \Delta f \leq \pm 5\text{ppm}$ $ \Delta R \leq 15\%$

4.7	Humidity	The temperature is at $40 \pm 3^{\circ}\text{C}$, and at 93% $\pm 2\%$ RH after 96 hours, and cooled to room temperature for 2 hours.	The crystal must meet: $ \Delta f \leq \pm 5\text{ppm}$ $ \Delta R \leq 15\%$												
4.8	Resistance to Solder Heat 1) Reflow solder	After resonator is soldered for 1 time in following temperature conditions, and then be placed in natural condition for 24-25 hours. Resonator shall be measured.  <table border="1"> <tbody> <tr> <td>(1)</td><td>Preheat</td><td>160~180 deg.C</td><td>120sec.</td></tr> <tr> <td>(2)</td><td>Primary heat</td><td>220 deg.C</td><td>60sec.</td></tr> <tr> <td>(3)</td><td>Peak</td><td>260 deg.C</td><td>10sec. Max.</td></tr> </tbody> </table>	(1)	Preheat	160~180 deg.C	120sec.	(2)	Primary heat	220 deg.C	60sec.	(3)	Peak	260 deg.C	10sec. Max.	The crystal must meet: $ \Delta f \leq \pm 5\text{ppm}$ $ \Delta R \leq 15\%$
(1)	Preheat	160~180 deg.C	120sec.												
(2)	Primary heat	220 deg.C	60sec.												
(3)	Peak	260 deg.C	10sec. Max.												
4.9	Thermal shock	Should be satisfied after supplying the following temperature cycle (10 cycles). (Refer to Fig-4). Temperature shift from low to high, high to low shall be done in $1^{\circ}\text{C}/\text{min}$.  Fig-4	The crystal must meet: $ \Delta f \leq \pm 5\text{ppm}$ $ \Delta R \leq 15\%$												