

1. QUARTZ CRYSTAL UNIT SPECIFICATION

Parameter	Sign	Specification
1.1 Frequency:	F0	10.000MHz
1.2 Mode of Oscillation		AT Fundamental
1.3 Holder type :		HC-49/SMD
1.4 Frequency tolerance:	ΔF	$\pm 30\text{ppm}$ at 25°C
1.5 Equivalent series resistance :	Rr	80Ω max.
1.6 Operating temperature range:	T _{OPR}	-20°C To +70°C
1.7 Storage temperature range:	T _{STG}	-40°C To +85°C
1.8 Frequency stability:	TC	$\pm 30\text{ppm}$ at -20°C To +70°C
1.9 Loading capacitance :	CL	18pF
1.10 Drive level :	DL	100 uW Typical ,500uW max.
1.11 Shunt Capacitance :	C0	7.0pF max.
1.12 Insulation resistance (IR):	IR	More than 500M ohms at DC 100V
1.13 Circuit:		Measured in S&A 250B
1.14 Aging:		$\pm 5\text{ ppm max.}$ (+25°C 1 st Year)
1.15 Dimensions and marking		Refer to page.4
1.16 Emboss carrier tape & reel		Refer to page.5 ~page.6

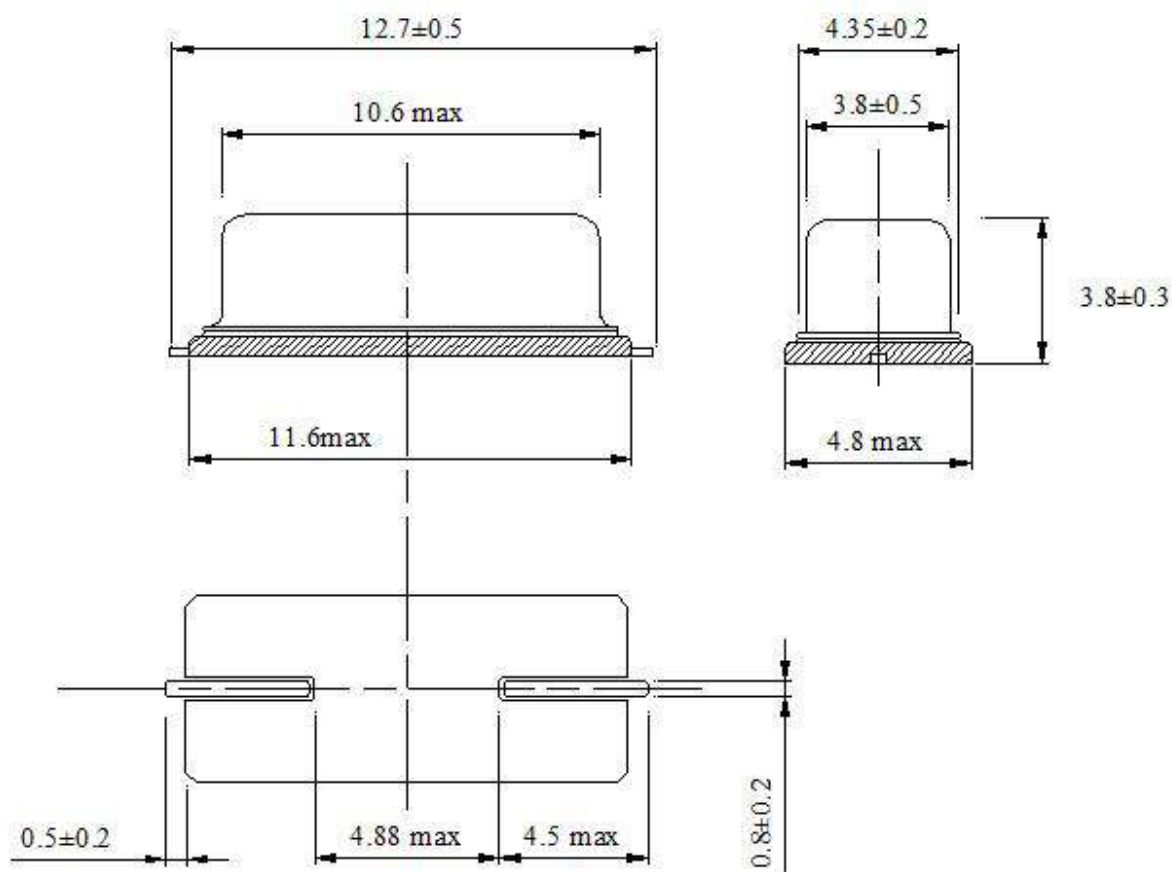
Standard atmospheric conditions

Unless otherwise specified, the standard range of atmospheric conditions for making measurement and tests are as follow:

Ambient temperature : 25±3°C

Relative humidity : 40%~70%

2. MARKING & DIMENSIONS



*Marking should be printed as following:

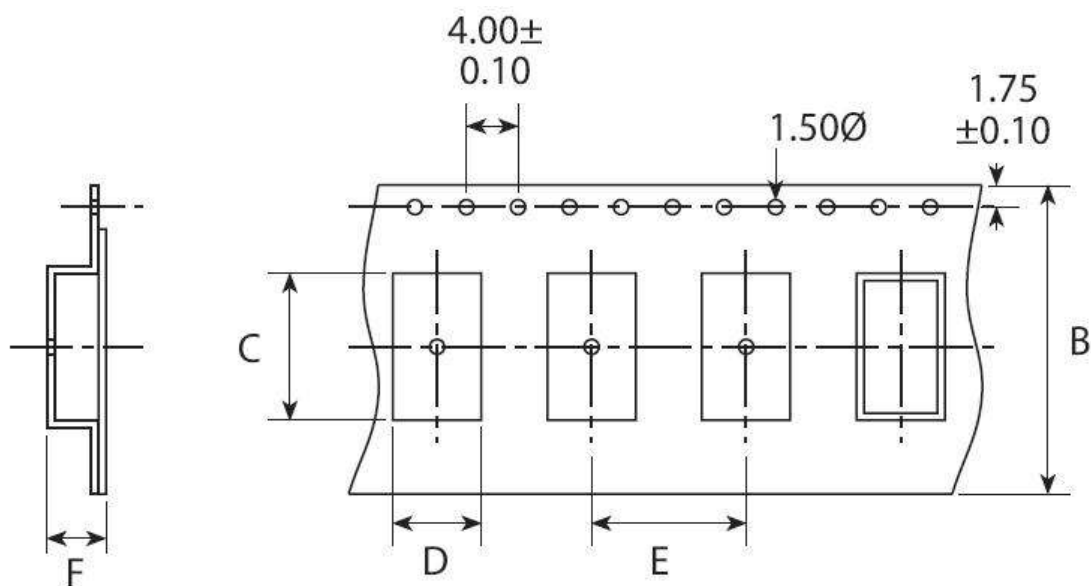
Logo, Nominal Frequency

Nominal Frequency: (ex. 8.000 MHz $\vee$ 8.000)

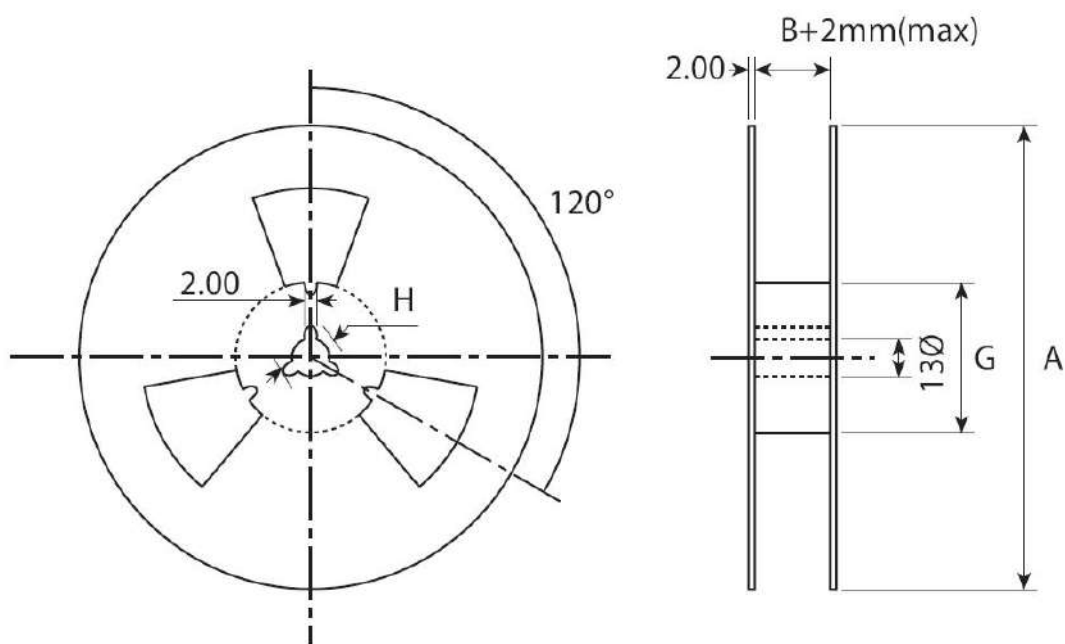
Marking: Laser marking

3.CARRIER TAPE & REEL

a.) Dimensions of Carrier Tape

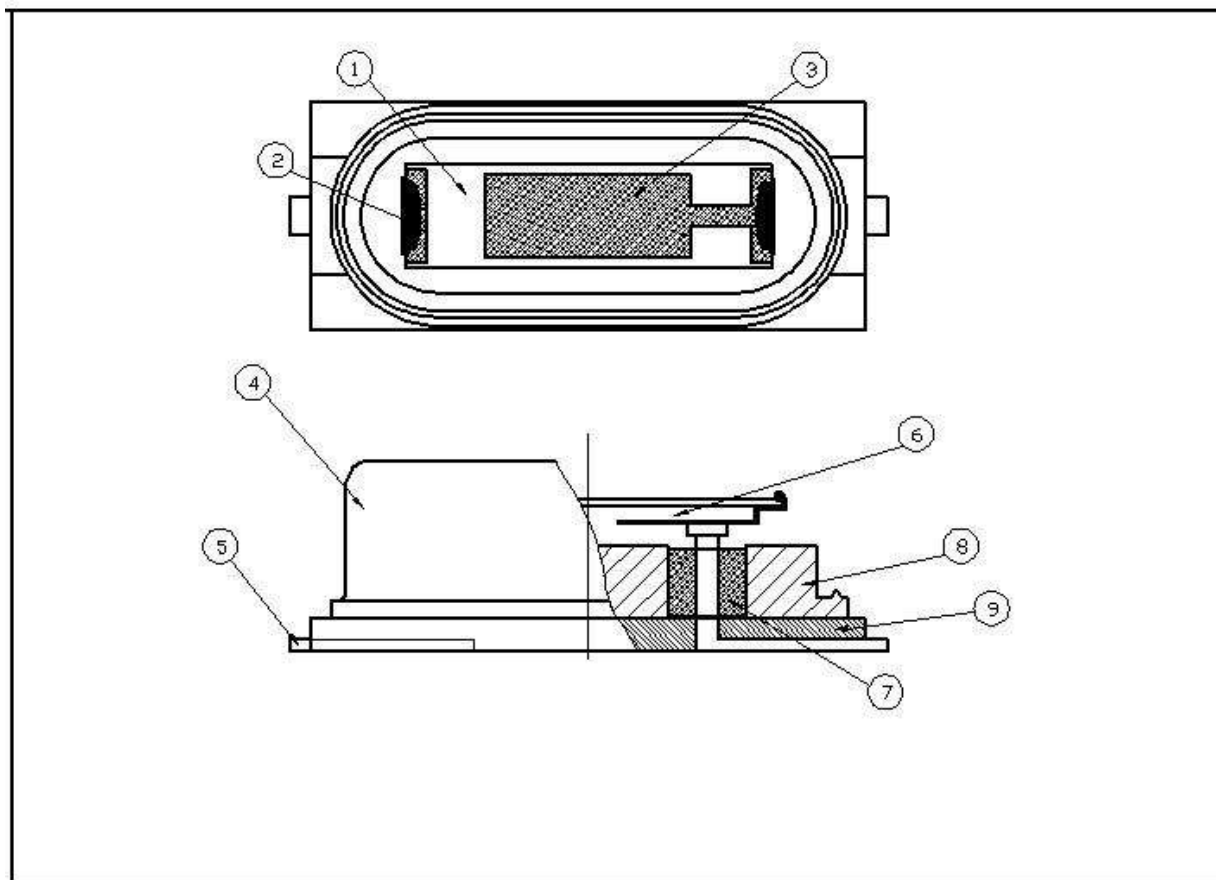


b.) Dimensions of Reel



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

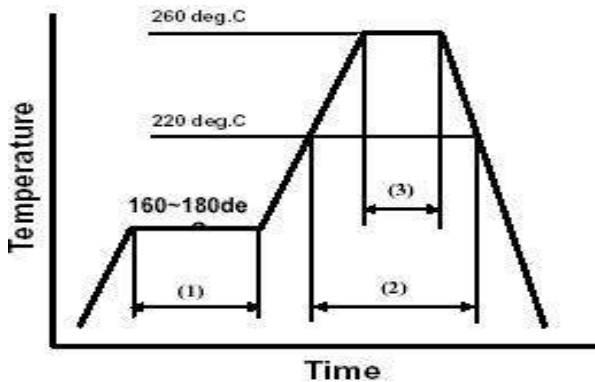
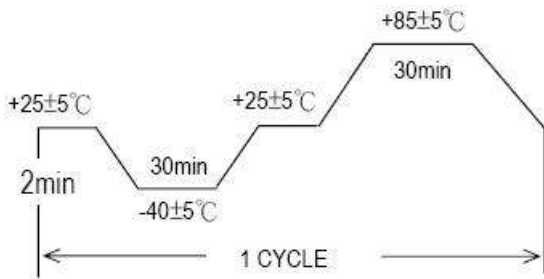
4. INSIDE STRUCTURE



NO.	Product name	MATERIALS	QTY
1	Blank	SIO2	1
2	Silver paste	3301F	2
3	Silver	Ag	2
4	Cover	Au	1
5	Lead	Kovar	2
6	Pin	C7701	2
7	GLASS	GLASS	2
8	Base	SPCC-SD	1
9	Insulation	PPA	1

5.MECHANICAL/ENVIRONMENTAL CHARACTERISTICS

NO.	ITEM	CONDITIONS	SPECIFICATIONS
5.1	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 $\text{IR} \geq 500 \text{ M}\Omega$
5.2	Drop Test	Dropping 6 times from the height of 75 cm onto hard wooden board of thickness more than 30mm.	The crystal must meet: $\Delta f \leq 5 \text{ ppm}$ $\Delta R \leq 15\%$
5.3	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: $\Delta f \leq 5 \text{ ppm}$ $\Delta R \leq 15\%$
5.4	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: $\Delta f \leq 5 \text{ ppm}$ $\Delta R \leq 15\%$
5.5	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: $\Delta f \leq 5 \text{ ppm}$ $\Delta R \leq 15\%$
5.6	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: $\Delta f \leq 5 \text{ ppm}$ $\Delta R \leq 15\%$

5.7	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: $\Delta f \leq 5\text{ppm}$ $\Delta R \leq 15\%$												
5.8	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: $\Delta f \leq 5\text{ppm}$ $\Delta R \leq 15\%$
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5.9	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: $\Delta f \leq 5\text{ppm}$ $\Delta R \leq 15\%$												