

## Quartz Crystal Units

### 1. Specifications:

Nominal Frequency :32.768KHz  
 Oscillation Mode :Fundamental  
 CuttingMode :x+2° cut

#### Operation Conditions:

Item	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Operating Temperature Range	Topt	-40		85	°C	
Storage Temperature Range	Tstg	-55		125	°C	
Load Capacitance	CL		12.5		pF	
Drive Level	DL		0.1		uW	

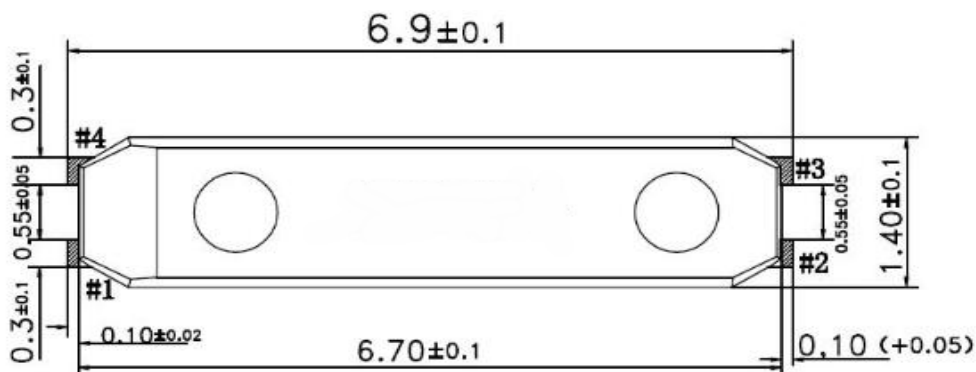
#### Frequency Stability:

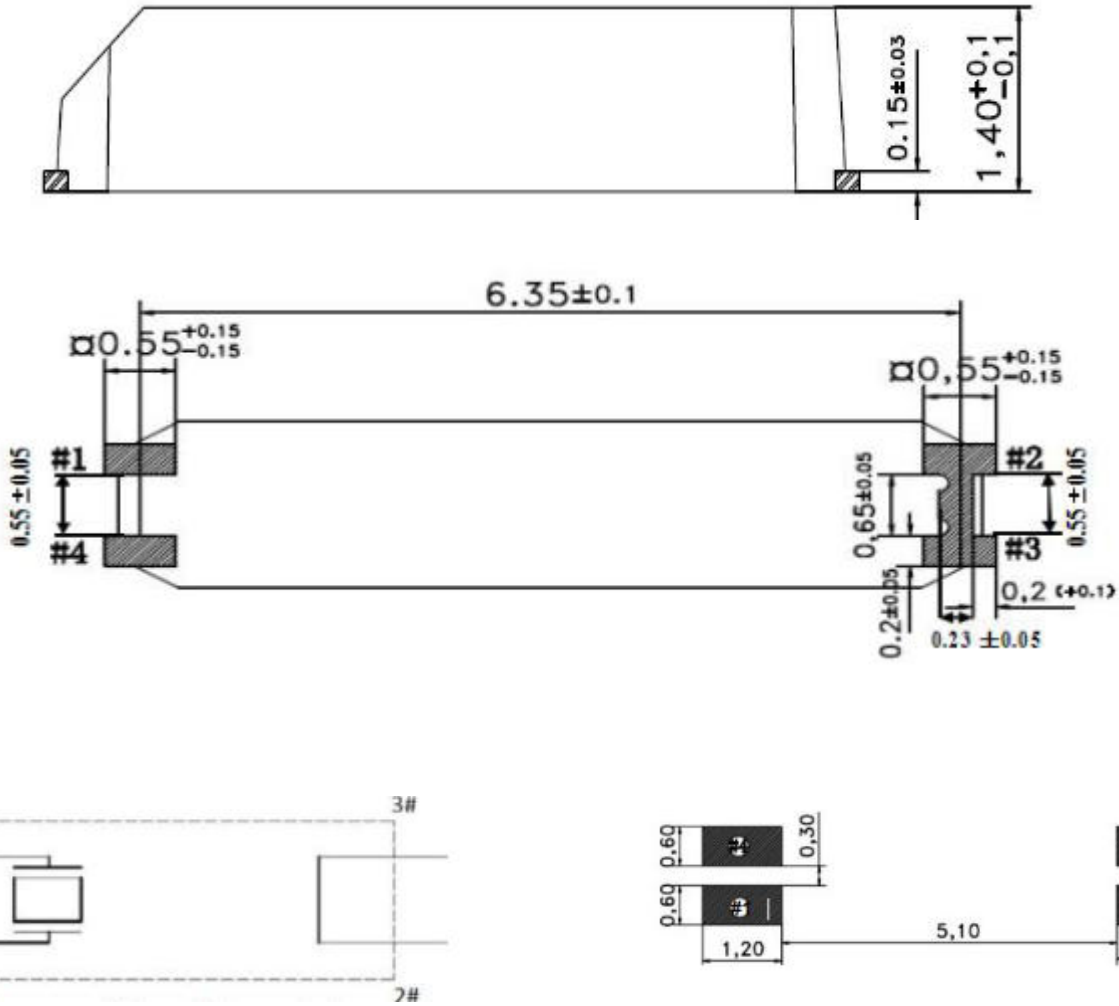
Item	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Tolerance	dF/Fo	-20		20	ppm	Refer to Center Frequency@25±3°C
Stability Over Temperature	dF/F25		-0.036		ppm/°C <sup>2</sup>	Refer to Operating Temperature
Aging	dF/F25	-5		5	ppm	Per Year

#### Electrical Performance:

Item	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Equivalent Series Resistance	ESR			65	KΩ	@Series
Shunt Capacitance	C0			3	pF	
Insulation Resistance	IR	500			MΩ	@DC 100 Volt

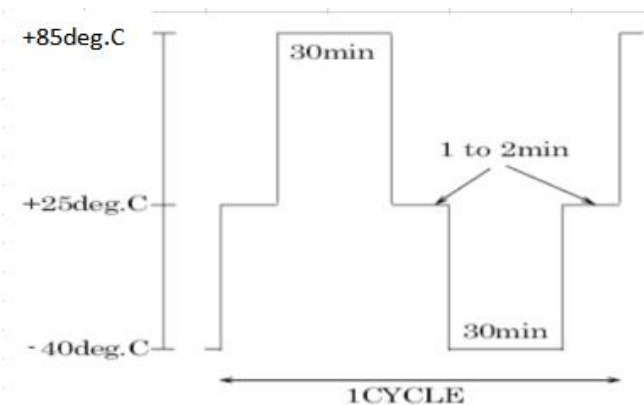
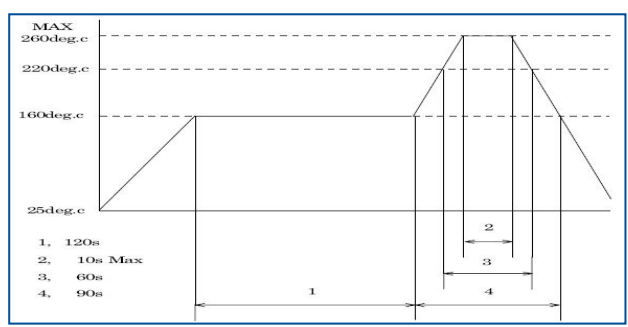
### 2. Dimensions:



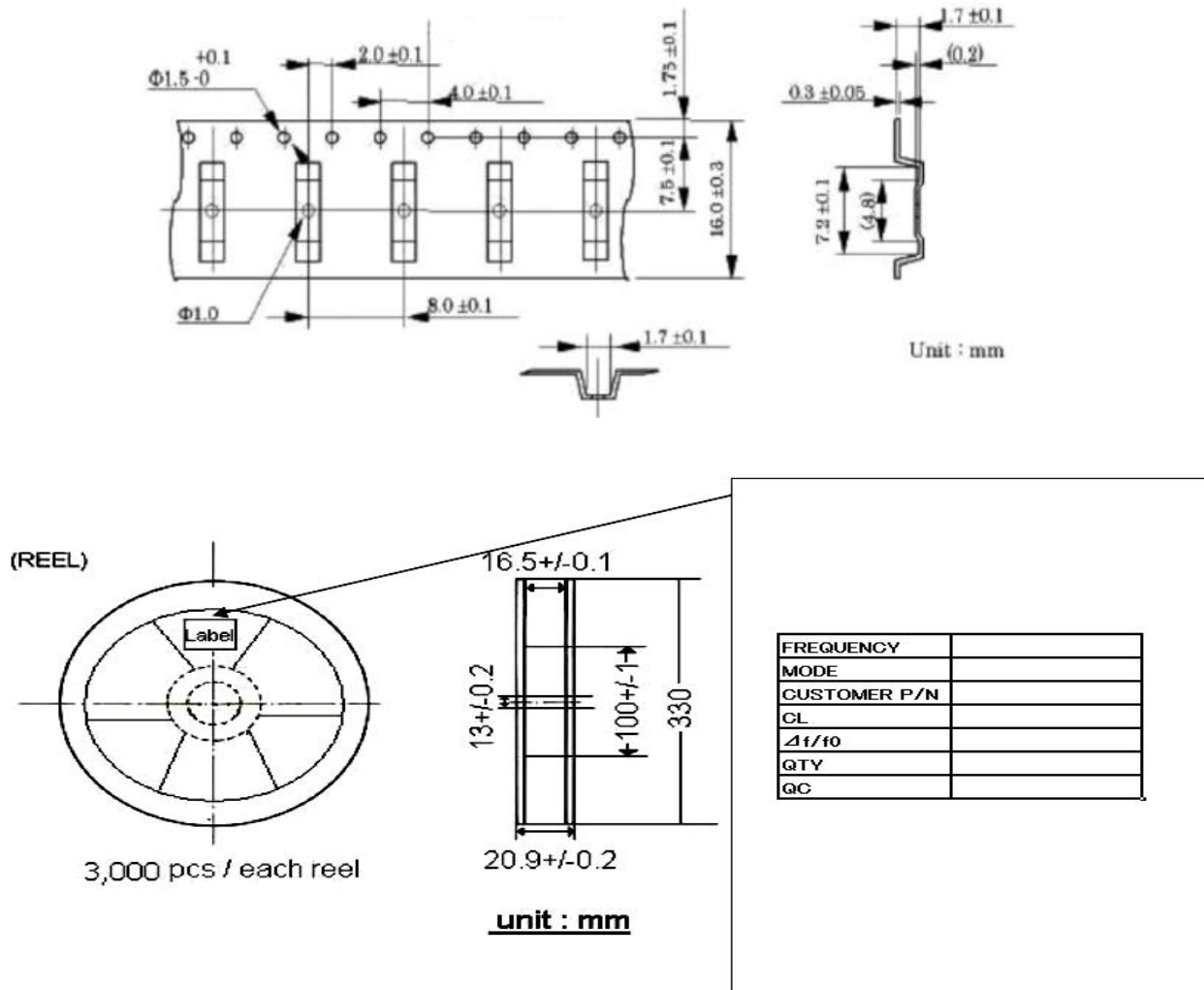


### 3. Reliability characteristic:

Test Items	Test Method and Condition	Requirements
Vibration	(1)Vibration Frequency 10 to 55Hz (2)Vibration Amplitude 1.5mm (3) Cycle Time 1-2min(10-55-10Hz) (4)Direction X. Y. Z (5)Duration 2h/each direction	Frequency Change : $\pm 10$ ppm Max. Resistance Change: $\pm 15\%$ or 5kohm Max.
Shock	3 Times free drop from 75cm height to hard wooden board of thickness more than 30mm	Frequency Change : $\pm 10$ ppm Max. Resistance Change: $\pm 15\%$ or 5kohm Max.
Hermetic seal	Helium leak detector Checked: before the molded crystal units	less than $1 \times 10^{-7}$ mbar.l/sec.

<p><b>Weldability</b></p>	<p>Dip the leads of crystal units into the solution (7-10%) of rosin 3±1s, then dip into tank 5~10S s. Temperature of solder melted tank is 245°C±5°C</p>	<p>The dipped surface of the leads should be at least 95% covered with continuous new solder coating</p>
<p><b>High temperature</b></p>	<p>96 hours at 125°C±2°C After being left at room temperature for 2 hours, the test is carried out.</p>	<p>Frequency Change : ±10ppm Max. Resistance Change : ±25% or 10kohm Max.</p>
<p><b>Low temperature</b></p>	<p>96 hours at -40°C±2°C After being left at room temperature for 2 hours, the test is carried out.</p>	<p>Frequency Change : ±10ppm Max. Resistance Change : ±15% or 5kohm Max.</p>
<p><b>High temperature and humidity</b></p>	<p>96 hours at 60°C±2°C, relative humidity 90-100% After being left at room temperature for 2 hours, the test is carried out.</p>	<p>Frequency Change : ±10ppm Max. Resistance Change : ±25% or 10kohm Max.</p>
<p><b>Temperature cycle</b></p>	<p>After supplying the following temperature cycle (100 time)</p> 	<p>Frequency Change : ±10ppm Max. Resistance Change : ±25% or 10kohm Max.</p>
<p><b>Reflow soldering</b></p>		<p>After 24h past from frequency test, Frequency Change: ±10ppm Max. Resistance Change: ±25% or 10kohm Max. Notice: 1、Using the infrared lamp at soldering process may cause uneven temperature rise on plastic surface of the parts, so that please keep the package temperature within left conditions. 2、DO NOT dip the plastic part into solder</p>

### 4. Packing



### 5. Disclaimer

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