

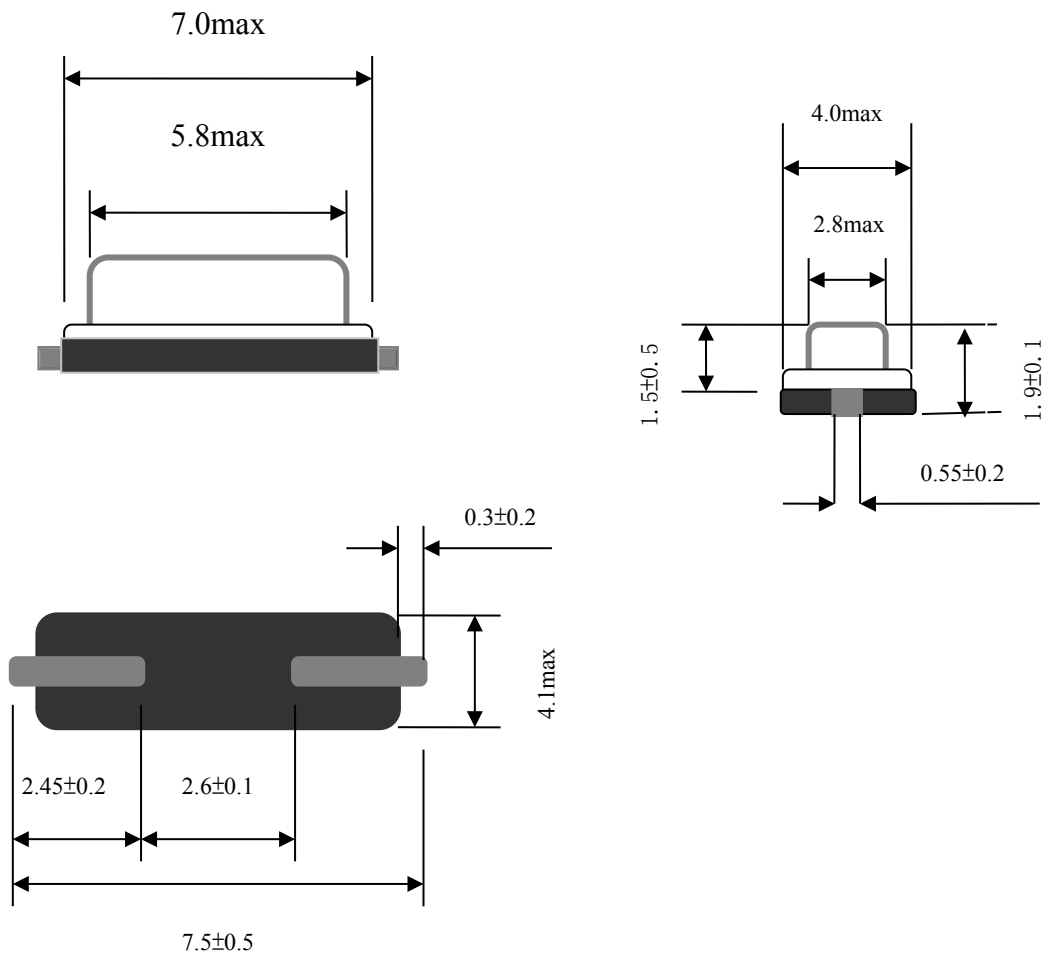
## Mini 49SMD Quartz Crystal SPECIFICATION

### ■ Specifications

1.Part No.	12M20P/Mini 49SMD
2.Nominal Frequency	12.000 MHz
3.Frequency Tolerance at 25°C	± 10 PPM
4.Frequency Stability (Ref. to 25°C)	± 30 PPM (-20°C ~ +70°C)
5.Mode of Oscillation	At Fund
6.Operating Temperature Range	-20°C +70°C
7.Storage Temperature Range	-40°C +85°C
8.Load Capacitance (C <sub>L</sub> )	20 pF
9.Shunt Capacitance (C <sub>O</sub> )	5 pF Max.
10.Equivalent Series Resistance (ESR)	40 Ω Max.
11.Drive Level	10 μW
12.Aging (at 25°C)	± 3 PPM / year Max.
13.Insulation Resistance	500 MΩ min. at DC 100 ± 10 V

## ■ Dimensions

Unit : mm

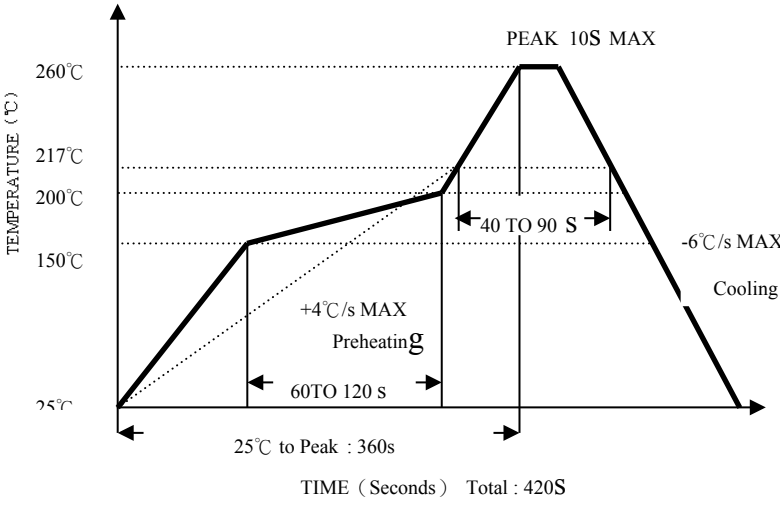


## Reliability Specifications

Test Item	Condition of Test	Performance Requirements
Leakage	The sample crystal is to be soaked in the alcohol and enforced with the pressure of 5km/cm <sup>3</sup> for 30 minutes. Next, the sample shall be tested after being taken out and dried with a dryer ◦	≥500MΩ
Vibration	Endurance condition by a frequency sweep shall be made. the entire frequency range from 10HZ to 55HZ and return to 10HZ. Amplitude (total excursion): 1.5mm This motion shall be applied for a period of 2h each of 3 mutually perpendicular axes.	After the test, the parameters of table must be satisfied
Drop	From 750mm height 3 times on 30mm hard wooden floor	
Lead Wire Strength	The terminal lead is to be pulled with a force of 10±0.5N for 30seconds at a distance of 2.5±0.5mm from the crystal's main body and then be twisted with 250g force second times.	
Solderability	The terminal lead wire is to be soaked in a 230±10 deg C tin trough for 2 seconds, as to make the tin over the wire not smaller than 80%.	
Cold	The unit shall be stored at a temperature of -30±3°C for 2h , then it shall be subjected to standard atmospheric conditions for 1h after which measurement shall be made.	
Dry heat	The unit shall be stored at a temperature of 85±3°C for 16h , then it shall be subjected to standard atmospheric conditions for 1h after which measurement shall be made.	
Aging	The unit shall be stored at a temperature of 100±2°C for 30d , then it shall be subjected to standard atmospheric conditions for 1h after which measurement shall be made.	

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<p><b>Temperature Cycling</b></p>	<p>The unit shall be subjected to 10 successive change of temperature cycles, each as shown in table below, then it shall be subjected to standard atmospheric conditions for 1h after which measurement shall be made.</p> <table border="1" data-bbox="435 627 1189 1019"> <thead> <tr> <th></th> <th>Temperature</th> <th>Duration</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-40°C±3°C</td> <td>30min</td> </tr> <tr> <td>2</td> <td>standard atmospheric conditions</td> <td>Within 30S</td> </tr> <tr> <td>3</td> <td>85°C±3°C</td> <td>30min</td> </tr> <tr> <td>4</td> <td>standard atmospheric conditions</td> <td>Within 30S</td> </tr> </tbody> </table>		Temperature	Duration	1	-40°C±3°C	30min	2	standard atmospheric conditions	Within 30S	3	85°C±3°C	30min	4	standard atmospheric conditions	Within 30S	<p>After the test, the parameters of table must be satisfied</p>
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<p><b>Resistance to soldering heat</b></p>	 <p>Reflow soldering cure see the chart.</p> <p>Soldering iron method:</p> <p>Bit temperature : 350°C±10°C</p> <p>°CApplication time of soldering iron</p>	<p>The change of the unit frequency is within ±5ppm</p>
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