

## **HC-49SMD     Quartz Crystal**

### **72008000RW1**

#### **1.     Scope:**

- 1.1 This specification applies to the RoHS compliance quartz crystal unit with a frequency of 8.000MHz which will be used in crystal oscillator applications.



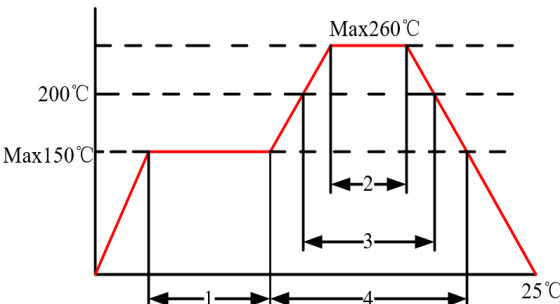
#### **2.     Construction:**

- 2.1 Type of Quartz Resonator: HC-49SMD

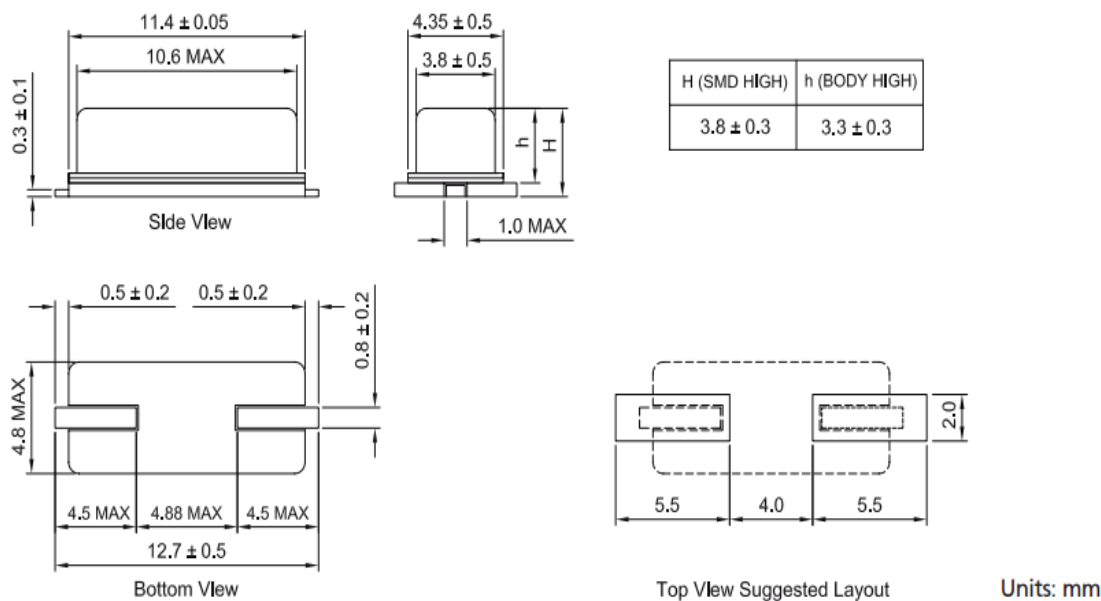
#### **3.     Electrical Characteristics**

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|-----------------------------------------------|----------------------|
| 3.1 Nominal Frequency(f):                     | 8.000 MHz            |
| 3.2 Load Capacitance( $C_L$ ):                | 20pF                 |
| 3.3 Frequency Tolerance( $\Delta f/f$ ):      | $\pm 20$ ppm         |
| 3.4 Frequency Temperature Stability:          | $\pm 20$ ppm         |
| 3.5 Resonance Resistance(ohm):                | 80 ohms Max          |
| 3.6 Osc mode:                                 | Fundamental mode     |
| 3.7 Shunt Capacitance( $C_0$ ):               | 7pF Max              |
| 3.8 Drive Level( $D_L$ ):                     | 100 $\mu$ W typical  |
| 3.9 Operating Temperature Range( $T_{OPR}$ ): | -20 to + 70°C        |
| 3.10 Storage Temperature Range( $T_{STG}$ ):  | -55 to + 125°C       |
| 3.11 Insulation Resistance(IR):               | > 500M ohms          |
| 3.12 Aging( $\Delta f_A$ ):                   | $\pm 5$ ppm/Year Max |

## Reliability Specification

|    | Item                             | Condition                                                                                                                                                    | Standard                                                        |
|----|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
| 1. | Drop characteristics             | Free drop from 75cm height on a hard wooden board for 3 times. (Board is thickness more than 30 mm.)                                                         | Frequency change: $\leq \pm 5\text{ppm}$<br>Rr as specification |
| 2  | Mechanical shock                 | Device are shocked to half sine wave (1000g) three mutually perpendicular axes each 3 times                                                                  | Frequency change: $\leq \pm 5\text{ppm}$<br>Rr as specification |
| 3. | Shake characteristics            | Shake frequency 10~55Hz, cyc1~2 minutes, swing 1.5mm, direction x/y/z, all 30 minutes, test after 1 hours.                                                   | Frequency change: $\leq \pm 5\text{ppm}$<br>Rr as specification |
| 4. | Humidity characteristics         | +40 $\pm$ 2 $^{\circ}\text{C}$ & 90%~95% R.H. 250 hours                                                                                                      | Frequency change: $\leq \pm 5\text{ppm}$<br>Rr as specification |
| 5. | Low temperature characteristics  | -40 $\pm$ 2 $^{\circ}\text{C}$ , 250 hours, put in room temperature, test after 1 hours.                                                                     | Frequency change: $\leq \pm 5\text{ppm}$<br>Rr as specification |
| 6. | High temperature characteristics | +85 $\pm$ 2 $^{\circ}\text{C}$ , 250 hours, put in room temperature, test after 1 hours.                                                                     | Frequency change: $\leq \pm 5\text{ppm}$<br>Rr as specification |
| 7. | Temperature cycling              | -30 $\pm$ 3 $^{\circ}\text{C}$ /30 $\pm$ 3 min~+85 $\pm$ 2 $^{\circ}\text{C}$ /30 $\pm$ 3min, 5 cycles                                                       | Frequency change: $\leq \pm 5\text{ppm}$<br>Rr as specification |
| 8. | Refluence examination            |  <p>1.Max 180sec<br/>2. Max 10 sec<br/>3.Max 80 sec<br/>4.Max 90 sec</p> | Frequency change: $\leq \pm 5\text{ppm}$<br>Rr as specification |

# Package Outline Dimensions



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## Packing Specificatio

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