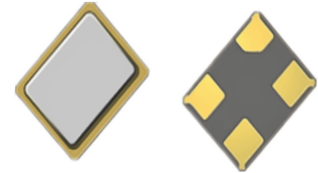


**SMD2016-4 Crystal Resonator**

**7D022118M01**

1. Scope:

- 1.1 This specification applies to the RoHS compliance quartz crystal unit with a frequency of 22.1184MHz which will be used in crystal oscillator applications.



2. Construction:

- 2.1 Type of Quartz Resonator: SMD2016-4pads

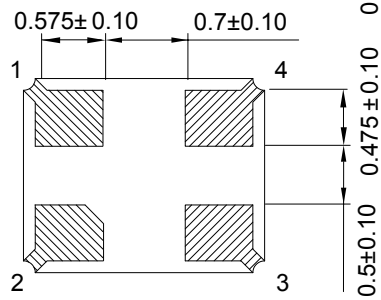
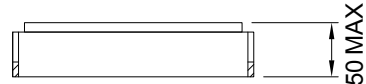
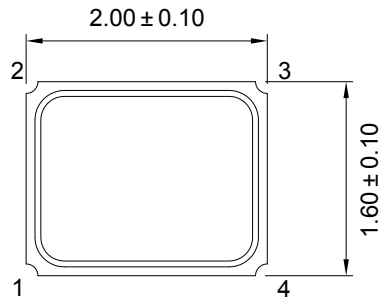
3. Electrical Characteristics

- |   |                      |
|---|----------------------|
| 3.1 Nominal Frequency(f):                     | 22.1184MHz           |
| 3.2 Load Capacitance( $C_L$ ):                | 12pF                 |
| 3.3 Frequency Tolerance( $\Delta f/f$ ):      | $\pm 10$ 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( $C_0$ ):               | 2pF Max              |
| 3.8 Drive Level( $D_L$ ):                     | 100 $\mu$ W Max      |
| 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( $\Delta f_A$ ):                   | $\pm 3$ ppm/Year Max |

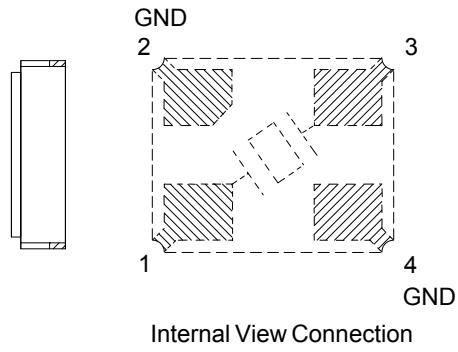
# Reliability Specification

|    | 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              | $-30 \pm 3^\circ\text{C}/30 \pm 3 \text{ min} \sim +85 \pm 2^\circ\text{C}/30 \pm 3\text{min}$ , 5 cycles  | Frequency change: $\leq \pm 5\text{ppm}$<br>Rr as specification |
| 8. | Refluence examination            |  <p style="text-align: center;">             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



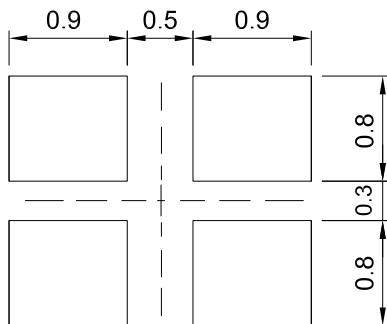
Bottom View



| 引脚 | 功能      |
|----|---------|
| #1 | CRYSTAL |
| #2 | GND     |
| #3 | CRYSTAL |
| #4 | GND     |

Units:mm

## Suggested Pad Layout



Units:mm

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## Packing Specification

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