DESCRIPTION

An increasing number of applications require the use of high-temperature crystals. For these applications, Statek offers the CX1HT, CX4HT, and CX9HT crystals. These crystals are designed to operate at temperatures up to and including 225°C. The frequency range offered is 6 MHz to 250 MHz for CX1HT and 14 MHz to 250 MHz for CX4HT and CX9HT crystals. The expected life at 200°C is in excess of 1,000 hours.

FEATURES

- High temperature operation up to 225°C
- High shock resistance
- Hermetically sealed ceramic package

APPLICATIONS

Industrial

- Downhole instrumentation
- Rotary shaft sensors
- Underground boring tools

PACKAGE DIMENSIONS

<table>
<thead>
<tr>
<th>DIM</th>
<th>CX1HT MAXIMUM</th>
<th>CX4HT MAXIMUM</th>
<th>CX9HT MAXIMUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0.330 8.38</td>
<td>0.210 5.33</td>
<td>0.170 4.32</td>
</tr>
<tr>
<td>B</td>
<td>0.155 3.94</td>
<td>0.085 2.16</td>
<td>0.068 1.73</td>
</tr>
<tr>
<td>C (SM1)</td>
<td>0.070 1.78</td>
<td>0.050 1.27</td>
<td>0.038 0.97</td>
</tr>
<tr>
<td>C (SM5)</td>
<td>0.075 1.90</td>
<td>0.053 1.35</td>
<td>0.040 1.02</td>
</tr>
<tr>
<td>D</td>
<td>0.055 1.40</td>
<td>0.046 1.16</td>
<td>0.038 0.97</td>
</tr>
<tr>
<td>E</td>
<td>0.070 1.78</td>
<td>0.020 0.51</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>0.070 1.78</td>
<td>0.025 0.64</td>
<td></td>
</tr>
</tbody>
</table>

SUGGESTED LAND PATTERN
SPECIFICATIONS

Specifications are typical at 25°C unless otherwise noted. Specifications are subject to change without notice.

Frequency Range
See Specifications Table below

Calibration Tolerance¹
± 100 ppm, or tighter, as required

Operating Temperature Range
-55°C up to +225°C

Frequency-Temperature Stability²
± 125 ppm for -55°C to +150°C
± 150 ppm for -55°C to +175°C
± 175 ppm for -55°C to +200°C
± 250 ppm for -55°C to +225°C

Total Tolerance³
± 200 ppm for +25°C to +200°C
± 300 ppm for +25°C to +225°C

Aging, first year
5 ppm at 25°C

Shock, survival⁴
CX1HT: 1,000 g, 1 ms, ½ sine
CX4HT: 5,000 g, 0.3 ms, ½ sine
CX9HT: 5,000 g, 0.3 ms, ½ sine

Vibration, survival⁴
20 g RMS, 10-2,000 Hz

1. Tighter frequency calibration available. Contact factory.
2. Does not include calibration tolerance. The characteristics of the frequency stability over temperature follow that of the thickness-shear mode.
3. Includes calibration tolerance.
4. Higher shock and vibration available.

SPECIFICATIONS TABLE¹ (Specifications shown are typical unless otherwise noted.)

<table>
<thead>
<tr>
<th>Frequency Range</th>
<th>Motional Resistance R1 @ 25°C</th>
<th>Motional Capacitance C1 @ 25°C</th>
<th>Shunt Capacitance C0 @ 25°C</th>
<th>Quality Factor Q @ 25°C</th>
<th>Load Capacitance CL</th>
<th>Drive Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>CX1HT 6 MHz to 250 MHz</td>
<td>30 Ω @ 10 MHz</td>
<td>5.5 F @ 10 MHz</td>
<td>2.2 pF @ 10 MHz</td>
<td>100 K @ 10 MHz</td>
<td>10 pF</td>
<td>500 µW MAX. for f &lt; 50 MHz</td>
</tr>
<tr>
<td></td>
<td>25 Ω @ 32 MHz</td>
<td>6.2 F @ 32 MHz</td>
<td>2.3 pF @ 32 MHz</td>
<td>30 K @ 32 MHz</td>
<td>10 pF</td>
<td>200 µW MAX. for f &gt; 50 MHz</td>
</tr>
<tr>
<td>CX4HT 14 MHz to 250 MHz</td>
<td>75 Ω @ 16 MHz</td>
<td>1.5 F @ 16 MHz</td>
<td>0.9 pF @ 16 MHz</td>
<td>90 K @ 16 MHz</td>
<td>10 pF</td>
<td>200 µW MAX. for f &lt; 50 MHz</td>
</tr>
<tr>
<td></td>
<td>30 Ω @ 32 MHz</td>
<td>2.5 F @ 32 MHz</td>
<td>1.1 pF @ 32 MHz</td>
<td>70 K @ 32 MHz</td>
<td>10 pF</td>
<td>100 µW MAX. for f &gt; 50 MHz</td>
</tr>
<tr>
<td>CX9HT 14 MHz to 250 MHz</td>
<td>30 Ω @ 25 MHz</td>
<td>1.8 F @ 25 MHz</td>
<td>1.0 pF @ 25 MHz</td>
<td>120 K @ 25 MHz</td>
<td>10 pF</td>
<td>200 µW MAX. for f &lt; 50 MHz</td>
</tr>
<tr>
<td></td>
<td>30 Ω @ 49 MHz</td>
<td>2.1 F @ 49 MHz</td>
<td>1.0 pF @ 49 MHz</td>
<td>60 K @ 49 MHz</td>
<td>10 pF</td>
<td>100 µW MAX. for f &gt; 50 MHz</td>
</tr>
</tbody>
</table>

1. For more detailed specifications on high frequency crystals, refer to standard high frequency crystal datasheets (CX1SM, CX4SM and CX9SM.)

CONVENTIONAL CMOS PIERCE OSCILLATOR CIRCUIT

HOW TO ORDER CX1HT, CX4HT and CX9HT CRYSTALS

CX4HT
S              HG        C               SM1
CX1HT          CX4HT      CX9HT
          "S" if special or custom design. Blank if Std. |
          HG = High Shock otherwise leave blank |
          C = Ceramic Lid |
          terminations
SM1 = Gold Plated
SM4 = Solder Plated (Lead Free)
SM5 = Solder Dipped (Lead Free)

Frequency M = MHz
Calibration Tolerance @ 25°C (in ppm)
Frequency Stability over Temp. Range (in ppm)
Total Frequency Tolerance (in ppm)
Temp. Range: H = 25°C to 200°C
S = Customer Specified Temp. Range

OR

Calibration Tolerance @ 25°C (in ppm)
Frequency Stability over Temp. Range (in ppm)
Total Frequency Tolerance (in ppm)
Temp. Range: H = 25°C to 200°C
S = Customer Specified Temp. Range

STATEK CORPORATION  512 N. MAIN ST., ORANGE, CA 92868  714-639-7810  FAX: 714-997-1256  www.statek.com