**DESCRIPTION**

Statek’s HGXOHT crystal oscillator is a high temperature, surface-mount oscillator that can survive extremely high shocks – up to 100,000 g. The design consists of a hermetically-sealed high-shock crystal and a CMOS compatible integrated circuit housed in a 5.0 mm x 7.5 mm surface-mount ceramic package.

**FEATURES**

- Mechanical shock survivability up to 100,000 g
- High temperature operation up to 200°C
- Excellent stability over temperature
- Fast start-up
- High shock resistance
- Designed for surface mount applications
- CMOS and TTL compatible
- Optional output Enable/Disable
- Low EMI emission
- Hermetically sealed ceramic package

**APPLICATIONS**

- Industrial
- Downhole instrumentation
- Rotary shaft sensors
- Underground boring tools
- Avionics applications

**PACKAGE DIMENSIONS**

*SM1 (Termination material is Au over Ni over W). Solder dip (SM3 and SM5) also available.*

**TYPICAL**

<table>
<thead>
<tr>
<th>DIM</th>
<th>inches</th>
<th>mm</th>
<th>inches</th>
<th>mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0.295</td>
<td>7.50</td>
<td>0.302</td>
<td>7.68</td>
</tr>
<tr>
<td>B</td>
<td>0.197</td>
<td>5.00</td>
<td>0.204</td>
<td>5.18</td>
</tr>
<tr>
<td>C</td>
<td>0.089</td>
<td>2.25</td>
<td>0.098</td>
<td>2.50</td>
</tr>
<tr>
<td>D</td>
<td>0.055</td>
<td>1.40</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>E</td>
<td>0.040</td>
<td>1.02</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>F</td>
<td>0.240</td>
<td>6.10</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>G</td>
<td>0.100</td>
<td>2.54</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**SUGGESTED LAND PATTERN**

**PIN CONNECTIONS**

1. Enable/Disable (E) or not connected (N)
2. Ground
3. Output
4. \( V_{DD} \)
**SPECIFICATIONS**

Specifications are typical at 25°C unless otherwise noted. Specifications are subject to change without notice. Tighter specifications available, please contact factory.

- **Supply Voltage**
  - 3.3 V ±10%
  - 5.0 V ±10%
- **Calibration Tolerance** ± 50 ppm, or tighter as required
- **Frequency Stability** ± 100 ppm for 25°C to 150°C
- **Over Temperature**
  - ± 150 ppm for 25°C to 175°C
  - ± 175 ppm for 25°C to 200°C
- **Total Tolerance** ± 200 ppm for 25°C to 200°C
- **Output Load** (CMOS) 15 pF
- **Start-up Time** 5 ms MAX
- **Rise/Fall Time** 10 ns MAX
- **Duty Cycle** 40% MIN, 60% MAX
- **Shock survival**
  - Up to 100,000 g, 0.5 ms, ½ sine
- **Vibration, survival**
  - 20 g, 10-2000 Hz, swept sine
- **Operating Temp Range** -55°C up to 200°C

1. Does not include calibration tolerance.
2. Frequency over temperature relative to nominal frequency.
3. Higher CMOS loads available. Contact factory.
4. Shock survival applies at -55°C to +125°C.
6. Expected life at 200°C is in excess of 1,500 hours.

**PACKAGING OPTIONS**

HGXOHT
- Tray Pack
- Tape and Reel
- 16 mm tape, 7” or 13” reels

Per EIA 481 (see Tape and Reel data sheet # 10109)

**ABSOLUTE MAXIMUM RATINGS**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Voltage V&lt;sub&gt;DD&lt;/sub&gt;</td>
<td>-0.5 V to 4.0 V (3.3V V&lt;sub&gt;DD&lt;/sub&gt;)</td>
</tr>
<tr>
<td></td>
<td>-0.5 V to 7.0 V (5V V&lt;sub&gt;DD&lt;/sub&gt;)</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-55°C to +125°C</td>
</tr>
<tr>
<td>Maximum Process Temperature</td>
<td>260°C for 20 s</td>
</tr>
</tbody>
</table>

**ENABLE/DISABLE OPTIONS (E/N)**

Statek offers two enable/disable options: E and N. The E-version has a Tri-State output and stops oscillating internally when the output is put into the high Z state. The N-version does not have PIN 1 connected internally and has no enable/disable capability. The following table describes the Enable/Disable option E.

**COMPARISON OF ENABLE/DISABLE OPTIONS E AND N**

<table>
<thead>
<tr>
<th></th>
<th>E</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>When enabled (PIN 1 is high)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output Frequency</td>
<td>Freq. output</td>
<td>Freq. output</td>
</tr>
<tr>
<td>Oscillator</td>
<td>Oscillates</td>
<td>Oscillates</td>
</tr>
<tr>
<td>Current consumption</td>
<td>Normal</td>
<td>Normal</td>
</tr>
<tr>
<td><strong>When disabled (PIN 1 is low)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output Frequency</td>
<td>High Z state</td>
<td>N/C</td>
</tr>
<tr>
<td>Oscillator</td>
<td>Stops</td>
<td>N/C</td>
</tr>
<tr>
<td>Current consumption</td>
<td>Very low</td>
<td>N/C</td>
</tr>
</tbody>
</table>

*When PIN 1 is allowed to float, it is held high by an internal pull-up resistor.
N/C Pin 1 not connected, output frequency.

**HOW TO ORDER HGXOHT SURFACE MOUNT CRYSTAL OSCILLATORS**

```
HGXOHT H G X O H T
D 4 S N
S 20.0M
SM3

Supply Voltage 4 = 3.3V 5 = 5.0V
Shock Level
A = 5,000 g
B = 10,000 g
C = 20,000 g
D = 30,000 g
F = 50,000 g
G = 75,000 g
H = 100,000 g
Blank = Standard
S = Special or custom
Enable/Disable Option E or N
Termination Blank = SM1
= Gold Plated (Pb Free)
SM3 = Solder Dipped (Pb Free)
SM5 = Solder Dipped (Pb Free)
Frequency K = kHz
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

Note: The HGXOHT oscillator with SM1 or SM5 termination is Pb free. The HGXOHT oscillator with SM3 termination contains Pb.
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