DESCRIPTION

For high temperature, high stability and fast start-up applications, Statek offers the AT crystal-based 32.768 kHz HGXOHT oscillator. This oscillator is designed to operate at temperatures up to 200°C. A high-shock version is also offered that features 100,000 g shock survivability. Other features include fast start-up time (0.8 ms typical) and low current operation (500 µA at 25°C.)

FEATURES

- Mechanical shock survivability up to 100,000 g
- High temperature operation up to 200°C
- Overall 5 times improvement in total frequency stability when compared to a typical tuning fork design
- Excellent stability over temperature
- Fast start-up
- CMOS output
- Optional output enable/disable
- Low current
- Hermetically sealed ceramic crystal package (Double Hermetic Seal)

APPLICATIONS

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

SUGGESTED LAND PATTERN

| PIN CONNECTIONS |
|-----------------|-----------------|-----------------|-----------------|
| 1. Enable/Disable (E) or not connected (N) |
| 2. Ground |
| 3. Output |
| 4. V_DD |

*SM1 (Termination material is Au over Ni over W). Solder dip (SM5) also available.
**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%
Calibration Tolerance ±50 ppm, or tighter as required

Frequency Stability ±100 ppm for 25°C to 150°C
over Temperature¹
±150 ppm for 25°C to 175°C
±175 ppm for 25°C to 200°C

Total Tolerance² ±200 ppm for 25°C to 200°C

Supply Current (Typical) 500 µA
Output Load (CMOS) 15 pF
Start-up Time 0.8 ms typical
Rise/Fall Time 85 ns / 45 ns
Duty Cycle 40% MIN, 60% MAX
Aging, first year 10 ppm MAX at 25°C
Aging, 1,000 Hrs 100 ppm MAX at 200°C

Shock survival³ Up to 100,000 g, 0.5 ms, ½ sine
Vibration, survival³ 20 g, 10-2000 Hz, swept sine

Operating Temp Range⁵ -55°C up to 200°C

¹. Does not include calibration tolerance.
². Frequency over temperature relative to nominal frequency.
³. Shock survival applies at -55ºC to +125ºC.
⁴. Per MIL-STD-202G, Method 204D, Condition D, Random vibration testing also available.
⁵. Expected life at 200°C is in excess of 1,500 hours.

**ABSOLUTE MAXIMUM RATINGS**

Supply Voltage V_DD -0.5 V to 4.0 V
Storage Temperature -55°C to +125°C
Maximum Process Temperature 260°C for 20 s

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

For the 32.768 kHz HGXOHT, 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 so has no enable/disable capability. The following table describes the Enable/Disable option E.

**ENABLE/DISABLE OPTION E FUNCTION TABLE**

<table>
<thead>
<tr>
<th>Function</th>
<th>Enable (Pin 1 High*)</th>
<th>Disable (Pin 1 Low)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output</td>
<td>Frequency output</td>
<td>High Z State</td>
</tr>
<tr>
<td>Oscillator</td>
<td>Oscillates</td>
<td>Stops</td>
</tr>
<tr>
<td>Current</td>
<td>500 µA at 25°C</td>
<td>3.2 µA at 25°C</td>
</tr>
</tbody>
</table>

*When Pin 1 is allowed to float, it is held by an internal pull-up resistor.

**PACKAGING OPTIONS**

- HGXOHT - Tray Pack
  - 16 mm tape, 7" or 13" reels
  Per EIA 481 (see Tape and Reel data sheet # 10109)

**HOW TO ORDER 32.768 kHz HGXOHT SURFACE MOUNT CRYSTAL OSCILLATORS**

<table>
<thead>
<tr>
<th>HGXOHT</th>
<th>Supply Voltage 4 = 3.3V</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>D</td>
<td>S</td>
</tr>
<tr>
<td>S</td>
<td>N</td>
</tr>
<tr>
<td>N</td>
<td>SM1</td>
</tr>
<tr>
<td>SM1</td>
<td>32.768 K</td>
</tr>
<tr>
<td></td>
<td>/ / 200 / 200 / H</td>
</tr>
</tbody>
</table>

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