DESCRIPTION
The CXOLHG is a low frequency (16 kHz to 32.768 kHz) crystal oscillator that combines the fast start-up, tight stability over temperature, and high shock survivability of AT-cut oscillators with the low current consumption of tuning-fork based oscillators. The CXOLHG is housed in a 1.5 mm x 3.2 mm ceramic package and operates from 1.8 V to 3.3 V.

FEATURES
- Ultra-low power
  (less than 1 μA; \( V_{DD} = 3.3 \text{V}, \text{OE “Low”} \))
- Fast start-up (typically 3 ms)
- Tight frequency tolerance
- High shock resistance (up to 100,000 g)
- Low acceleration sensitivity (typically 0.5 ppb/g)
- Low aging
- CMOS output
- Optional output enable/disable with tri-state
- Hermetically sealed ceramic package
- Full military testing available
- Designed and manufactured in the USA

APPLICATIONS
- Military, Aerospace & Avionics
  - Communications
  - Navigation
  - GPS
- Industrial, Computer & Communications
  - Handheld instrumentation
  - Transponder/Animal migration

SUGGESTED LAND PATTERN

PACKAGE DIMENSIONS

<table>
<thead>
<tr>
<th>DIM</th>
<th>TYPICAL</th>
<th>MAXIMUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0.126</td>
<td>0.130</td>
</tr>
<tr>
<td>B</td>
<td>0.059</td>
<td>0.063</td>
</tr>
<tr>
<td>C</td>
<td>0.037</td>
<td>0.039</td>
</tr>
<tr>
<td>D</td>
<td>0.029</td>
<td>0.030</td>
</tr>
<tr>
<td>E</td>
<td>0.020</td>
<td>0.021</td>
</tr>
</tbody>
</table>

PIN CONNECTIONS
1. Output
2. Ground
3. Output Enable/Disable (E) or no connection (N)
4. \( V_{DD} \)
SPECIFICATIONS

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

- Supply Voltage: 1.8 V to 3.3 V ± 10%
- Calibration Tolerance: ± 25 ppm
- Frequency Stability: ± 10 to ± 50 ppm for Commercial
  Over Temperature: ± 20 to ± 50 ppm for Industrial
  ± 35 to ± 50 ppm for Military
- Output Load (CMOS): 15 pF
- Aging, first year: 3 ppm

Shock Options:
- D = 30,000 g, 0.3 ms, ½ sine
- F = 50,000 g, 0.3 ms, ½ sine
- G = 75,000 g, 0.3 ms, ½ sine
- H = 100,000 g, 0.3 ms, ½ sine

Vibration:
- 20 g, 10-2,000 Hz swept sine

Operating Temp. Range:
- C = -10°C to 70°C (Commercial)
- I = -40°C to 85°C (Industrial)
- M = -55°C to 125°C (Military)

Moisture Sensitivity Level (MSL): This product is hermetically sealed and not moisture sensitive.

1. Other tolerances available.
2. Does not include calibration tolerance. Other tolerances available.

ENABLE/DISABLE OPTIONS (E/N)

For the CXOLHG, 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 3 connected internally and so has no enable/disable capability. The following table summarizes the Enable/Disable option E.

<table>
<thead>
<tr>
<th>Option</th>
<th>Function Table</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>Enable (Pin 3 High*)</td>
</tr>
<tr>
<td>N</td>
<td>Disable (Pin 3 Low)</td>
</tr>
</tbody>
</table>

Output Frequency Output High Z State Stays Stops

Current 10µA Less than 1µA at 25°C

ELECTRICAL CHARACTERISTICS

All parameters are measured at 25°C with a 10 MΩ and 15 pF load with VDD = 3.3 V.

<table>
<thead>
<tr>
<th>Symbol Parameter</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>VOH</td>
<td></td>
<td></td>
<td>0.9VDD</td>
<td>V</td>
</tr>
<tr>
<td>VDL</td>
<td></td>
<td></td>
<td>0.1VDD</td>
<td>V</td>
</tr>
<tr>
<td>tstart</td>
<td>3</td>
<td>5</td>
<td>ms</td>
<td></td>
</tr>
<tr>
<td>tRise</td>
<td>7</td>
<td>10</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>tFall</td>
<td>5</td>
<td>10</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>Duty Cycle</td>
<td>45</td>
<td>50</td>
<td>55</td>
<td>%</td>
</tr>
</tbody>
</table>

HOW TO ORDER CXOLHG SURFACE MOUNT CRYSTAL OSCILLATORS

- Supply Voltage
  1 = 1.8 V
  2 = 2.5 V
  3 = 3.0 V
  4 = 3.3 V

- Shock Level Code
  D = 30,000 g
  F = 50,000 g
  G = 75,000 g
  H = 100,000 g

- Termination
  Blank = Gold Plated (Lead Free)
  SM2 = Solder Plated
  SM3 = Solder Dipped (60/40 Sn-Pb)
  SM5 = Solder Dipped (Lead Free)

- Frequency
  K = kHz
  Calibration Tolerance @ 25°C (in ppm)
  Frequency Stability over Temp. Range (in ppm)

- Temp. Range:
  C = -10°C to +70°C
  I = -40°C to +85°C
  M = -55°C to +125°C

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