

# CXOLHG OSCILLATOR

16.000 kHz - 32.768 kHz  
Ultra-Low Power/High Shock/Fast Start-Up

## 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  $\mu$ A;  $V_{DD}=3.3V$ , 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

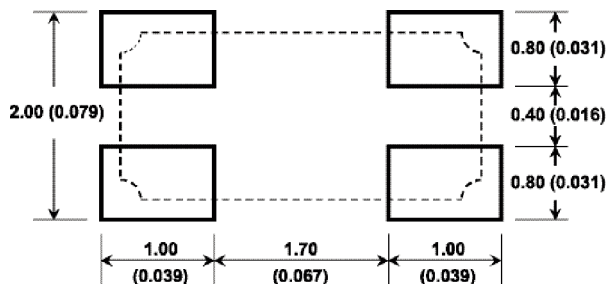
### Military, Aerospace & Avionics

- Communications
- Navigation
- GPS

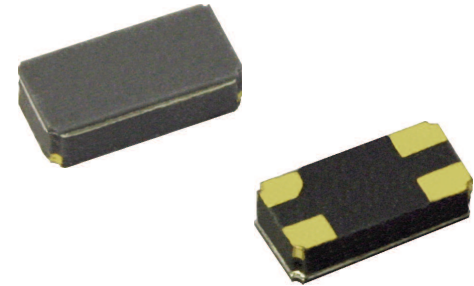
### Industrial, Computer & Communications

- Handheld instrumentation
- Transponder/Animal migration

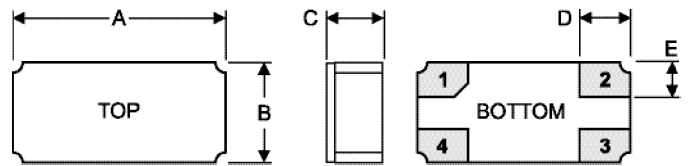
## SUGGESTED LAND PATTERN



mm (inches)



## PACKAGE DIMENSIONS



DIM	TYPICAL		MAXIMUM	
	inches	mm	inches	mm
A	0.126	3.20	0.130	3.30
B	0.059	1.50	0.063	1.60
C (SM1)	0.037	0.95	0.039	1.00
D	0.029	0.75	0.030	0.77
E	0.020	0.50	0.021	0.52

## PIN CONNECTIONS

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



10228 Rev G



## 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 <sup>1</sup>	±25 ppm
Frequency Stability	±10 to ±50 ppm for Commercial
Over Temperature <sup>2</sup>	±20 to ±50 ppm for Industrial ±35 to ±50 ppm for Military
Output Load (CMOS)	15 pF
Aging, first year	3 ppm

Shock	<u>Options</u>
	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 <sup>3</sup>	20 g, 10-2,000 Hz swept sine
Operating Temp. Range	-10°C to 70°C (Commercial) -40°C to 85°C (Industrial) -55°C to 125°C (Military)

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

- Other tolerances available.
- Does not include calibration tolerance. Other tolerances available.
- Per MIL-STD-202G, Method 204D, Condition D. Random vibration testing also available.

## PACKAGING OPTIONS

CXOLHG - Tray Pack  
- 12 mm tape, 7" or 13" reels  
(Per EIA 481)

## ABSOLUTE MAXIMUM RATINGS

Supply Voltage $V_{DD}$	-0.5 V to 5.0V
Storage Temperature	-55°C to 125°C
Maximum Process Temperature	260°C for 20 seconds

## 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.

### ENABLE/DISABLE OPTION E FUNCTION TABLE

	Enable (Pin 3 High*)	Disable (Pin 3 Low)
Output	Frequency Output	High Z State
Oscillator	Oscillates	Stops
Current	10µA	Less than 1µA at 25°C

\*When PIN 3 is allowed to float, it is held high by an internal pull-up resistor.

## ELECTRICAL CHARACTERISTICS

All parameters are measured at 25°C with a 10 MΩ and 15 pF load with  $V_{DD} = 3.3$  V.

SYMBOL	PARAMETER	MIN	TYP	MAX	UNIT
$V_{OH}$	Output Voltage High	0.9 $V_{DD}$			V
$V_{OL}$	Output Voltage Low			0.1 $V_{DD}$	V
$t_{startup}$	Start-up Time		3	5	ms
$t_r$	Rise Time (10%-90%)		7	10	ns
$t_f$	Fall Time (10%-90%)		5	10	ns
	Duty Cycle	45	50	55	%

## HOW TO ORDER CXOLHG SURFACE MOUNT CRYSTAL OSCILLATORS

