

### DESCRIPTION

The CXOXULP 32.768 kHz oscillator achieves the low power comparable with a tuning fork design and the fast start-up and tight frequency stability attained by an AT cut crystal design. Designed for applications requiring ultra-low current (17  $\mu$ A), fast start-up time (2 ms), and a tight frequency stability ( $\pm 30$  ppm to  $\pm 100$  ppm) over a wide temperature range ( $-55^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$ ). These oscillators are also capable of withstanding significantly higher shock than a standard tuning fork design.



### FEATURES

- Ultra-low current (typical 17  $\mu$ A)
- Fast start-up (typical 2 ms)
- Tight tolerance
- High shock resistance
- Low aging
- CMOS output
- Optional Output Enable/Disable with Tri-State
- Low EMI emission
- Hermetically sealed ceramic package
- Full military testing available
- Designed and manufactured in the USA

### APPLICATIONS

#### Military, Aerospace & Avionics

- Communications
- Navigation
- GPS

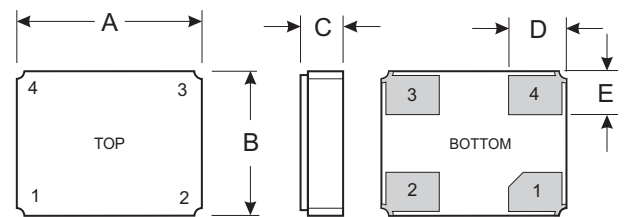
#### Industrial, Computer & Communications

- Miniature clock oscillator
- Handheld instrumentation
- Transponder/Animal migration

#### Medical

- Test & diagnostic equipment
- Handheld devices

### DIMENSIONS

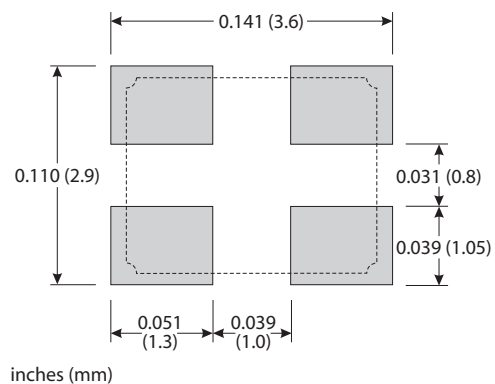


DIM	TYPICAL		MAXIMUM	
	inches	mm	inches	mm
A	0.126	3.20	0.136	3.40
B	0.099	2.50	0.107	2.70
C (SM1)	0.039	1.00	0.043	1.09
C (SM3/SM5)	0.044	1.12	0.048	1.21
D	0.040	1.00	0.041	1.10
E	0.030	0.75	0.031	0.85

### PIN CONNECTIONS

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

### SUGGESTED LAND PATTERN



## SPECIFICATIONS

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

Supply Voltage <sup>1</sup>	3.3 V ±10%
Calibration Tolerance <sup>2</sup>	±25 ppm, ±50 ppm, ±100 ppm
Frequency Stability Over Temperature <sup>3</sup>	±10 to ±50 ppm for Commercial ±20 to ±100 ppm for Industrial ±50 to ±100 ppm for Military
Output Load (CMOS)	15 pF
Aging, first year	5 ppm
Shock <sup>4</sup>	Std: 5,000 g, 0.3 ms, ½ sine HG: 10,000 g, 0.3 ms, ½ sine
Vibration <sup>5</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)

### Electrical characteristics:<sup>6</sup>

SYMBOL	PARAMETER	MIN	TYP	MAX	UNIT
V <sub>OH</sub>	Output Voltage High	0.9V <sub>DD</sub>			V
V <sub>OL</sub>	Output Voltage Low			0.1V <sub>DD</sub>	V
t <sub>startup</sub>	Start-up Time		2.0		ms
t <sub>r</sub>	Rise Time (10%-90%)		2.6		ns
t <sub>f</sub>	Fall Time (10%-90%)		2.4		ns
	Duty Cycle	45	50	55	%
I <sub>DD</sub>	Input Current		17		µA

- Other voltages available. Contact factory.
- Other tolerances available.
- Does not include calibration tolerance. Other tolerances available.
- Higher shock available. Contact factory.
- Per MIL-STD-202G, Method 204D, Condition D. Random vibration testing also available.
- All parameters are measured at 25°C with a 10 MΩ and 15 pF load with V<sub>DD</sub> = 3.3 V.

## ABSOLUTE MAXIMUM RATINGS

Supply Voltage V <sub>DD</sub>	-0.3 V to 5.0 V
Storage Temperature	-55°C to 125°C
Maximum Process Temperature	260°C for 20 seconds

## ENABLE/DISABLE OPTIONS (E/N)

For the 32.768 kHz CXOXULP, 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 summarizes the Enable/Disable option E.

### ENABLE/DISABLE OPTION E FUNCTION TABLE

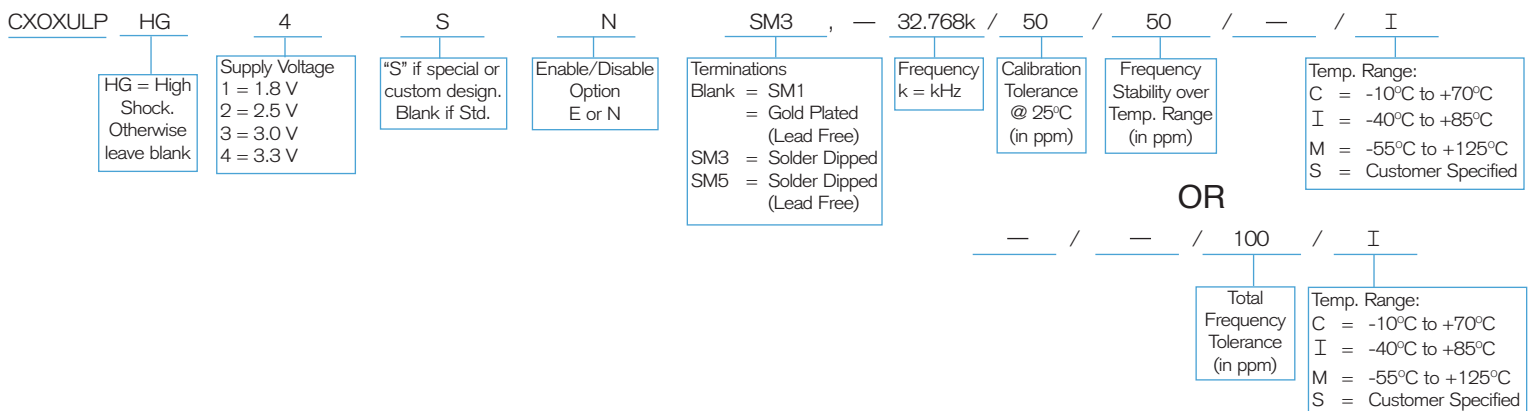
	Enable (Pin 1 High*)	Disable (Pin 1 Low)
Output	Frequency Output	High Z State
Oscillator	Oscillates	Stops

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

## PACKAGING OPTIONS

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

## HOW TO ORDER CXOXULP 32.768 kHz SURFACE MOUNT CRYSTAL OSCILLATORS



10216 Rev B