



# CXOXULP OSCILLATOR 32.768 kHz

Ultra-Low Power/Fast Start-Up/High Shock

## 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 (12  $\mu$ A) and fast start-up time (5 ms), these oscillators offer tight frequency stability over a wide temperature range (-55°C to +125°C) and high shock survivability.



## FEATURES

- Ultra-low current (typical 12  $\mu$ A)
- Fast start-up (typical 5 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

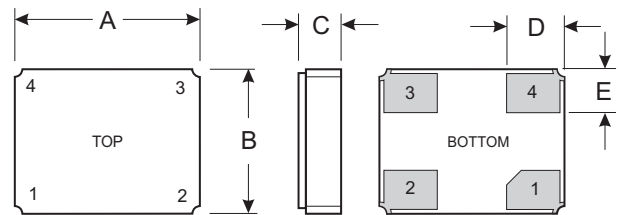
### Industrial, Computer & Communications

- Handheld instrumentation
- Transponder/Animal migration

### Medical

- Test & diagnostic equipment
- Handheld devices

## DIMENSIONS

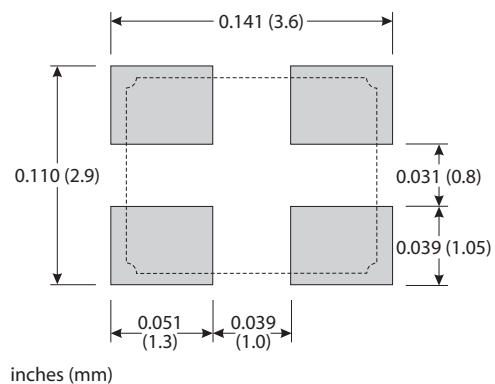


DIM	TYPICAL		MAXIMUM	
	inches	mm	inches	mm
A	0.126	3.20	0.136	3.40
B	0.099	2.50	0.107	2.70
C (SM1)	0.039	1.00	0.043	1.09
C (SM3/SM5)	0.044	1.12	0.048	1.21
D	0.040	1.00	0.041	1.10
E	0.030	0.75	0.031	0.85

## PIN CONNECTIONS

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

## SUGGESTED LAND PATTERN



10216 Rev C



## 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
Calibration Tolerance <sup>1</sup>	±25 ppm, ±50 ppm, ±100 ppm
Frequency Stability Over Temperature <sup>2</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	Std: 5,000 g, 0.3 ms, ½ sine HG: 50,000 g, 0.5 ms, ½ sine
Vibration <sup>3</sup>	20 g, 10-2,000 Hz swept sine
Operating Temp. Ranges	-10°C to 70°C (Commercial) -40°C to 85°C (Industrial) -55°C to 125°C (Military)

## Electrical characteristics<sup>4</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		5.0		ms
t <sub>r</sub>	Rise Time (10%-90%)		2.5	5.0	ns
t <sub>f</sub>	Fall Time (10%-90%)		2.1	5.0	ns
	Duty Cycle	45	50	55	%
I <sub>DD</sub>	Input Current		12		µA
	Period Jitter (rms)		30		ps

- Other tolerances available.
- Does not include calibration tolerance. Other tolerances available.
- Per MIL-STD-202G, Method 204D, Condition D. Random vibration testing also available.
- All parameters are measured at 25°C with a 10 MΩ / 15 pF load and 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

	Enabled (Pin 1 High*)	Disabled (Pin 1 Low)
Output	Frequency Output	High Z State
Oscillator	Oscillates	Stops
Current	12µA	Less than 1µA at 25°C

\*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

