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 (17 µA), fast start-up time (2 ms), and a tight frequency stability (±30 ppm to ±100 ppm) over a wide temperature range (-55°C to +125°C). These oscillators are also capable of withstanding significantly higher shock than a standard tuning fork design.

FEATURES

- **Ultra-low current (typical 17 µA)**
- **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

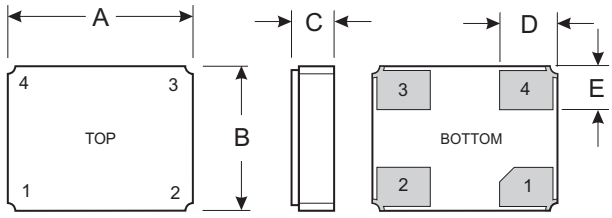
Industrial, Computer & Communications

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

Medical

- Test & diagnostic equipment
- Handheld devices

DIMENSIONS

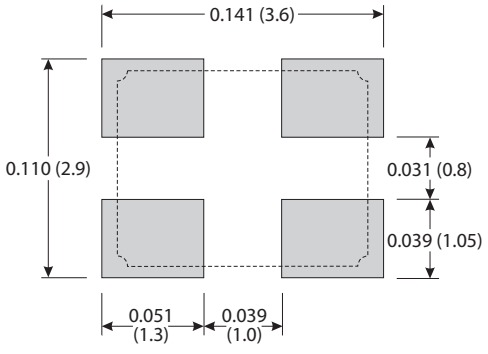


	TYPICAL		MAXIMUM	
DIM	inches	mm	inches	mm
A	0.126	3.20	0.136	3.40
B	0.099	2.50	0.107	2.70
C (SM1)	0.039	1.00	0.043	1.09
C (SM3/SM5)	0.044	1.12	0.048	1.21
D	0.040	1.00	0.041	1.10
E	0.030	0.75	0.031	0.85

PIN CONNECTIONS

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

SUGGESTED LAND PATTERN



inches (mm)

10216 Rev B

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]	3.3 V ±10%
Calibration Tolerance[2]	±25 ppm, ±50 ppm, ±100 ppm
Frequency Stability Over Temperature[3]	±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[4]	Std: 5,000 g, 0.3 ms, ½ sine HG: 10,000 g, 0.3 ms, ½ sine
Vibration[5]	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[6]:

SYMBOL	PARAMETER	MIN	TYP	MAX	UNIT
V_{OH}	Output Voltage High	0.9V_{DD}			V
V_{OL}	Output Voltage Low			0.1V_{DD}	V
$t_{startup}$	Start-up Time		2.0		ms
t_r	Rise Time (10%-90%)		2.6		ns
t_f	Fall Time (10%-90%)		2.4		ns
	Duty Cycle	45	50	55	%
I_{DD}	Input Current		17µA		

1. Other voltages available. Contact factory.
2. Other tolerances available.
3. Does not include calibration tolerance. Other tolerances available.
4. Higher shock available. Contact factory.
5. Per MIL-STD-202G, Method 204D, Condition D. Random vibration testing also available.
6. All parameters are measured at 25°C with a 10 MΩ and 15 pF load with V_{DD} = 3.3 V.

ABSOLUTE MAXIMUM RATINGS

Supply Voltage V_{DD}	-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

CXOXULP HG 4 S N SM3 , — 32.768k / 50 / 50 / — / I

- HG: HG = High Shock. Otherwise leave blank
- 4: Supply Voltage 1 = 1.8 V, 2 = 2.5 V, 3 = 3.0 V, 4 = 3.3 V
- S: "S" if special or custom design. Blank if Std.
- N: Enable/Disable Option E or N
- SM3: Terminations Blank = SM1 = Gold Plated (Lead Free), SM3 = Solder Dipped, SM5 = Solder Dipped (Lead Free)
- 32.768k: Frequency k = kHz
- 50: Calibration Tolerance @ 25°C (in ppm)
- 50: Frequency Stability over Temp. Range (in ppm)
- I: Temp. Range: C = -10°C to +70°C, I = -40°C to +85°C, M = -55°C to +125°C, S = Customer Specified

OR

— / — / 100 / I

- 100: Total Frequency Tolerance (in ppm)
- I: Temp. Range: C = -10°C to +70°C, I = -40°C to +85°C, M = -55°C to +125°C, S = Customer Specified

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