CXOXULPHT OSCILLATOR 32.768 kHz

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

DESCRIPTION

The CXOXULPHT 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 (55 µA), fast start-up time (2 ms), and a tight frequency stability (200 ppm) for high temperature operation up to +200°C. These oscillators are also capable of withstanding significantly higher shock than a standard tuning fork design.

FEATURES

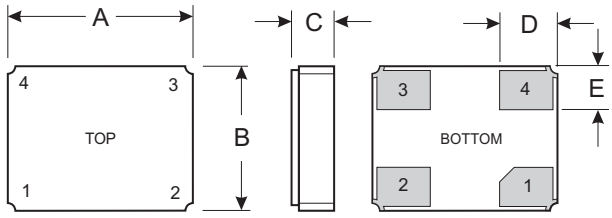
- **High temperature operation up to +200°C**
- **Ultra-low current (typical 55 µA)**
- **Fast start-up (typical 2 ms)**
- **High shock resistance up to 10,000 g**
- Low aging
- CMOS output
- Optional Output Enable/Disable with Tri-State
- Low EMI emission
- Hermetically sealed ceramic package
- Full military testing available
- Designed and manufactured in the USA

APPLICATIONS

Industrial

- Downhole instrumentation
- Rotary shaft sensors
- Underground boring tools

DIMENSIONS

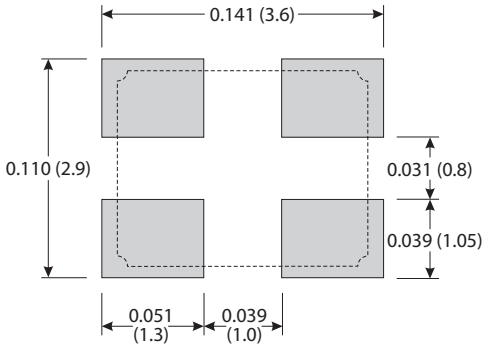


	TYPICAL		MAXIMUM	
DIM	inches	mm	inches	mm
A	0.126	3.20	0.136	3.40
B	0.099	2.50	0.107	2.70
C (SM1)	0.039	1.00	0.043	1.09
C (SM3/SM5)	0.044	1.12	0.048	1.21
D	0.040	1.00	0.041	1.10
E	0.030	0.75	0.031	0.85

PIN CONNECTIONS

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

SUGGESTED LAND PATTERN



inches (mm)

10218 Rev A

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]	±100 ppm
Frequency Stability Over Temperature[3]	±100 ppm for 25°C to 150°C ±150 ppm for 25°C to 175°C ±175 ppm for 25°C to 200°C
Total Tolerance	±200 ppm for 25°C to 200°C
Output Load (CMOS)	15 pF
Aging, first year	10 ppm max at +25°C
Aging, 1,000 hours	100 ppm max at +200°C
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[6]	-55°C up to 200°C

Electrical characteristics:[7]

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%)		4.0		ns
t_f	Fall Time (10%-90%)		5.0		ns
	Duty Cycle	45	50	55	%
I_{DD}	Input Current		55µA		

1. Other voltages available. Contact factory.
2. Other tolerances available.
3. Does not include calibration tolerance. Other tolerances available.
4. Shock at room temperature. Contact factory for requirements above 10,000 g.
5. Per MIL-STD-202G, Method 204D, Condition D at room temperature. Random vibration testing also available.
6. Expected life at 200°C is in excess of 1,500 hours.
7. 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 CXOXULPHT, 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/N 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

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

HOW TO ORDER CXOXULPHT 32.768 kHz SURFACE MOUNT CRYSTAL OSCILLATORS

CXOXULPHT — HG — 4 — S — N — SM3 — 32.768K, / — / — / 200 / H

- HG: HG = High Shock. Otherwise leave blank
- 4: Supply Voltage 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); SM5 = Solder Dipped (Lead Free)
- 32.768K: Frequency k = kHz
- 200: Total Frequency Tolerance (in ppm)
- H: Temp. Range: H = +25°C to +200°C; S = Customer Specified

OR

100 / 175 / — / H

- 100: Calibration Tolerance @ 25°C (in ppm)
- 175: Frequency Stability over Temp. Range (in ppm)
- H: Temp. Range: H = +25°C to +200°C; S = Customer Specified

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