



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 μ A), 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

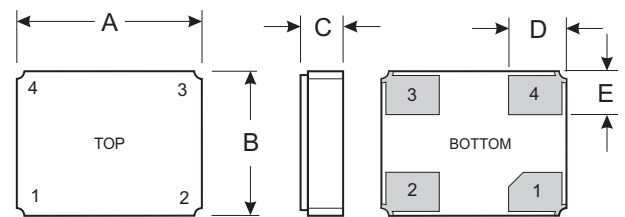
- High temperature operation up to +200°C
- Ultra-low current (typical 55 μ A)
- Fast start-up (typical 2 ms)
- High shock resistance up to 10,000 g
- Low aging
- CMOS output
- Optional Output Enable/Disable with Tri-State
- Low EMI emission
- Hermetically sealed ceramic package
- Full military testing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

APPLICATIONS

Industrial

- Downhole instrumentation
- Rotary shaft sensors
- Underground boring tools

DIMENSIONS

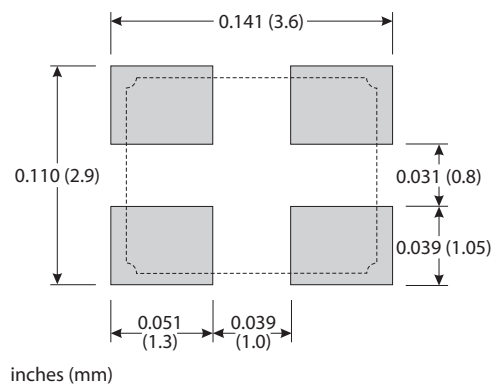


| DIM | TYPICAL | | MAXIMUM | |
|-------------|---------|------|---------|------|
| | inches | mm | inches | mm |
| A | 0.126 | 3.20 | 0.136 | 3.40 |
| B | 0.099 | 2.50 | 0.107 | 2.70 |
| C (SM1) | 0.039 | 1.00 | 0.043 | 1.09 |
| C (SM3/SM5) | 0.044 | 1.12 | 0.048 | 1.21 |
| D | 0.040 | 1.00 | 0.041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



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 | | |

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

