# CXOMK/CXOMKHG OSCILLATOR
# 32.768 kHz
**High Stability/High Shock** Crystal Oscillator

## DESCRIPTION

For those applications requiring a 32.768 kHz oscillator with high frequency stability over temperature or fast start-up, Statek offers the AT-crystal based 32.768 kHz CXOMK/CXOMKHG oscillator. A frequency stability of ±20 ppm over -40°C to +85°C is possible, compared to hundreds of parts-per-million for tuning-fork based 32.768 kHz oscillators. Whereas tuning-fork based oscillators start in hundreds of milliseconds, Statek's 32.768 kHz CXOMK/CXOMKHG oscillators start in 0.8 ms (typically).


Actual Size

Side View

## FEATURES

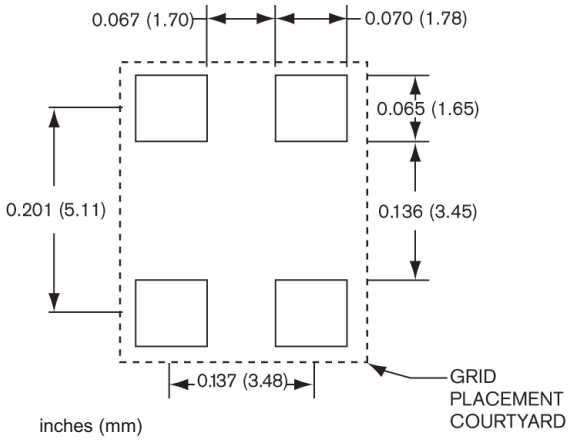
- High frequency stability over temperature
- Fast start-up
- High shock resistance
- Surface mount
- CMOS and TTL compatible
- Optional Output Enable/Disable with Tri-State
- Low EMI emission
- Hermetically sealed ceramic package
- Full military testing available

## APPLICATIONS

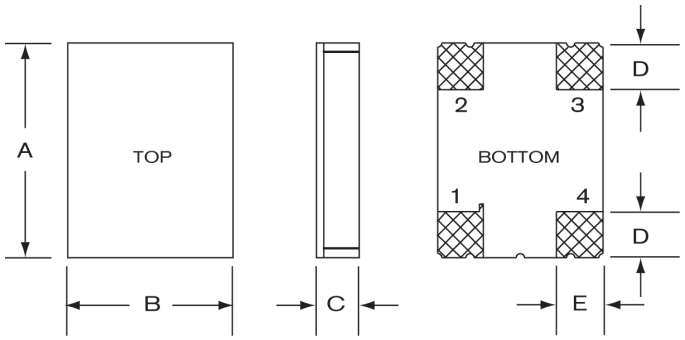
### Military / Avionics

- Aircraft landing gear
- Avionics
- Smart Munitions

## SUGGESTED LAND PATTERN




## DIMENSIONS




| | TYPICAL | | MAXIMUM | |
|---|---|---|---|---|
| DIM | inches | mm | inches | mm |
| A | 0.256 | 6.50 | 0.263 | 6.68 |
| B | 0.197 | 5.00 | 0.204 | 5.18 |
| C (SM1) | 0.055 | 1.34 | 0.060 | 1.52 |
| C (SM3/SM5) | 0.060 | 1.52 | 0.065 | 1.65 |
| D | 0.055 | 1.40 | 0.065 | 1.65 |
| E | 0.060 | 1.52 | 0.070 | 1.78 |

## PIN CONNECTIONS

1. Enable/Disable (E or T) or not connected (N)
2. Ground
3. Output
4. $V_{DD}$



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## 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] | 0.9 to 5.0 V ±10% |
| Calibration Tolerance[2] | ±100 ppm |
| Frequency Stability Over Temperature[3] | ±10 to ±50 ppm for Commercial<br>±20 to ±100 ppm for Industrial<br>±30 to ±100 ppm for Military |
| Output Load (CMOS) | 15 pF |
| Aging, first year | 10 ppm MAX |
| Shock | Std: 3,000 g, 0.3 ms, ½sine<br>HG: 10,000 g, 0.3 ms, ½sine |
| Vibration[4] | 20 g, 10-2,000 Hz swept sine |
| Operating Temp. Range | -10°C to 70°C (Commercial)<br>-40°C to 85°C (Industrial)<br>-55°C to 125°C (Military) |

| 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 | | 0.8 | | ms |
| $t_r$ | Rise Time (10%-90%) | | 85 | 1000 | ns |
| $t_f$ | Fall Time (10%-90%) | | 45 | 1000 | ns |
| | Duty Cycle | 45 | 50 | 55 | % |
| $I_{DD}$ | Supply Current | | 500µA | 1.0mA | |
| $I_{DD}$ | Static Current | | 3.2µA | 5.0µA | |

1. Other supply voltages available. Contact factory for ordering information.
2. Other tolerances available.
3. Does not include calibration tolerance. Other tolerances available.
4. Per MIL-STD-202G, Method 204D, Condition D. Random vibration testing also available.

Note: All parameters are measured at ambient temperature with a 10 MΩ, 15 pF load.

## 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 sec. |

## ENABLE/DISABLE OPTIONS (E/N)

For the 32.768 kHz CXOMK, 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 SUMMARY

| | Enable (Pin 1 High*) | Disable (Pin 1 Low) |
|---|---|---|
| Output | Frequency Output | High Z State |
| Oscillator | Oscillates | Stops |
| Current | 500 µA | 3.2 µA |

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

## PACKAGING OPTIONS

CXOMK - Tray Pack

- 16 mm tape, 7″ or 13″ reels
  Per EIA 481 (see Tape and Reel datasheet #10109)

## HOW TO ORDER 32.768 kHz CXOMK/CXOMKHG OSCILLATOR

CXOMK HG 4 S E SM3 – 32.768K , 30 / 30 / — / I

- HG: HG = High Shock, Blank=Standard
- 4: Supply Voltage: 1 = 1.8 V; 2 = 2.5 V; 3 = 3.0 V; 4 = 3.3 V; 5 = 5.0 V
- S: "S" if special or custom design. Blank if Std.
- E: Enable/Disable Option E or N
- SM3: Termination: Blank = SM1 = Gold Plated (Pb Free); SM3 = Solder Dipped; SM5 = Solder Dipped (Pb Free)
- 32.768K: Frequency K = kHz
- 30: Calibration Tolerance @ 25°C (in ppm)
- 30: Frequency Stability over Temp.Range (in ppm)
- I: Temperature Range: C = -10°C to +70°C; I = -40°C to +85°C; M = -55°C to +125°C; S = Customer Specified

OR

— / — / 50 / I

- 50: Total Frequency Tolerance (in ppm)
- I: Temperature 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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