



# LF XO OSCILLATOR

32.768 kHz

Fast Start-up/High Precision  
Miniature Surface Mount Crystal Oscillator

## DESCRIPTION

Statek's 32.768 kHz, surface mount LF XO oscillators, designed especially for applications requiring fast start-up and high precision, consist of a Statek miniature AT quartz crystal and a CMOS/TTL compatible hybrid circuit in a ceramic package. Each crystal is pre-qualified before assembly into the oscillator through electrical tests and characterization over temperature.

For harsh environment applications, Statek provides a high shock version of the LF XO crystal oscillator.

## FEATURES

- High precision ( $\pm 10$  ppm)
- Fast start-up (0.8ms typ.)
- High shock resistance
- Tight frequency-temperature stability
- Low acceleration sensitivity (HG version)
- CMOS output
- Optional Output Enable/Disable with Tri-State
- Low EMI emission
- Full military testing per MIL-PRF-55310
- Low jitter

## APPLICATIONS

### Military & Aerospace

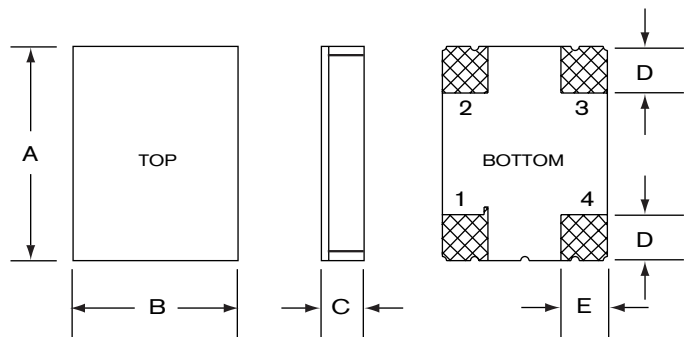
- Smart Munitions
- Cockpit Systems
- Navigation

### Industrial, Computer & Communications

- Industrial Controls
- Instrumentation
- Down-hole Drilling

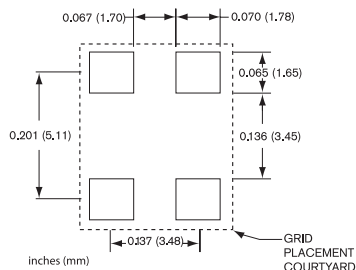


## DIMENSIONS



DIM	TYPICAL		MAXIMUM	
	inches	mm	inches	mm
A	0.256	6.50	0.263	6.68
B	0.197	5.00	0.204	5.18
C (SM1)	0.063	1.60	0.065	1.65
C (SM3/SM5)	0.067	1.70	0.073	1.85
D	0.055	1.40	0.065	1.65
E	0.060	1.52	0.070	1.78

## SUGGESTED LAND PATTERN



## PIN CONNECTIONS

1. Not connected (N) or Enable (E)
2. Ground
3. Output
4.  $V_{DD}$

10191 Rev A



## SPECIFICATIONS

Specifications are typical at 25°C unless otherwise noted. Specifications are subject to change without notice. Tighter specifications available (contact factory).

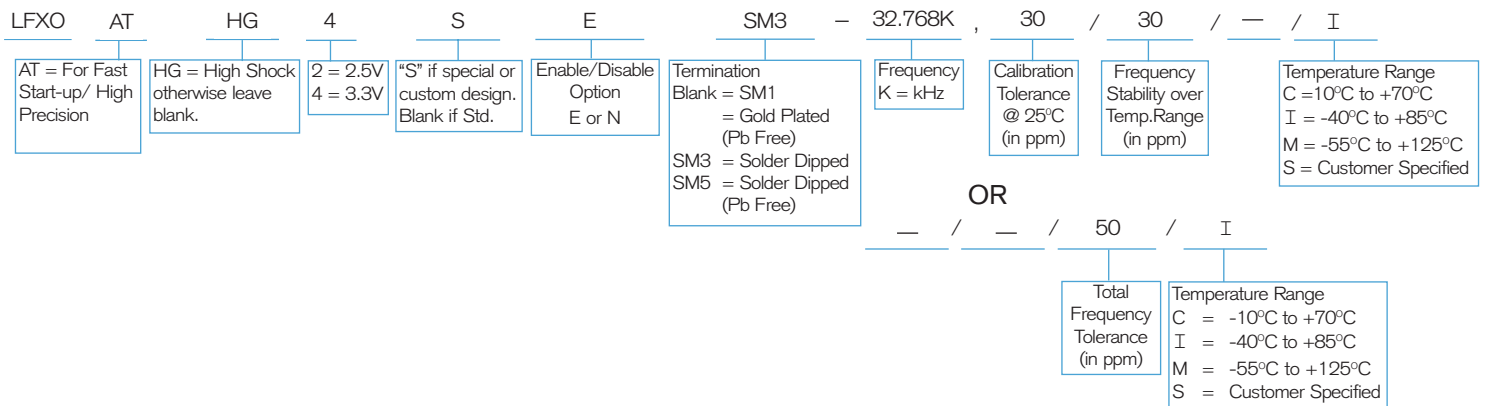
Supply Voltage <sup>1</sup>	3.3 V ±10% (2.5 V also available)
Calibration Tolerance <sup>2</sup>	±10 ppm and up
Frequency Stability	±10 to ±50 ppm for Commercial
Over Temperature <sup>3</sup>	±20 to ±100 ppm for Industrial ±30 to ±100 ppm for Military
Output Load (CMOS)	15 pF
Aging, first year	3 ppm MAX
Shock <sup>4</sup>	Std: 5,000 g, 0.3 ms, ½ sine HG: 20,000 g, 0.3 ms, ½ sine
Vibration <sup>5</sup>	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<sup>6</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		0.8		ms
t <sub>r</sub>	Rise Time (10%-90%)		85	1000	ns
t <sub>f</sub>	Fall Time (10%-90%)		45	1000	ns
	Duty Cycle	45	50	55	%
I <sub>DD</sub>	Supply Current		500		µA

- Other supply voltages available. Contact factory for ordering information.
  - Other tolerances available.
  - Does not include calibration tolerance. Tighter tolerances available.
  - Higher shock available. Contact factory.
  - Per MIL-STD-202G, Method 204D, Condition D. Random vibration testing also available.
  - Measurements done at V<sub>DD</sub> = 3.3V
- Note: All parameters are measured at ambient temperature with a 10 MΩ, 15 pF load.

## HOW TO ORDER 32.768 kHz LFXO OSCILLATORS/ FAST START-UP



## 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 sec.

## ENABLE/DISABLE OPTIONS (E/N)

For the 32.768 kHz fast start-up LFXO, 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

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