



# LXO OSCILLATOR

10 kHz to 2.1 MHz

Low Power Crystal Oscillator

## DESCRIPTION

The LXO oscillator has the highest accuracy and stability of all STATEK oscillators. The design consists of a CMOS-compatible hybrid circuit, packaged in a hermetically-sealed metal DIP. Permanent, precision tuning of the oscillator is accomplished by laser trimming the crystal after it has been hermetically sealed in a ceramic package and connected to the oscillator circuit. This method of fine tuning allows for very tight calibration tolerance and eliminates the need for a trimming capacitor, a major source of long-term frequency drift. The specifications and characteristics of the LXO vary with frequency. The characteristics of the 32.768 kHz model are presented in this data sheet.



## FEATURES

- Low power consumption
- Low aging
- CMOS compatible
- Double hermetically sealed package
- Full military testing available
- 5V operation standard
- 2.5V to 15V operation also available

## APPLICATIONS

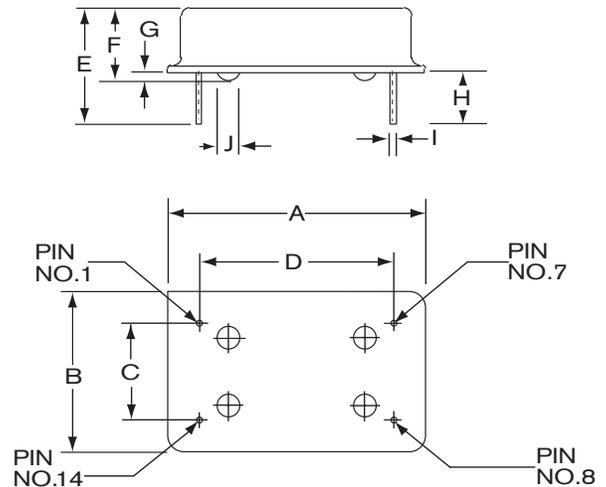
Industrial, Computer & Communications

- General purpose clock oscillator
- Data Logger
- Remote sensor
- Liquid level sensing
- Medical test and diagnostics

Military

- Portable field communication
- Military high speed modem
- Flight recorder

## PACKAGE DIMENSIONS



DIM	inches	mm
A	0.810 MAX.	20.57 MAX.
B	0.510 MAX.	12.95 MAX.
C	0.300 ± 0.005	7.62 ± 0.13
D	0.600 ± 0.005	15.24 ± 0.13
E	0.430 TYP.	10.92 TYP.
F	0.240 MAX.	6.10 MAX.
G	0.040 TYP.	1.02 TYP.
H	0.150 MIN.	3.81 MIN.
I	0.018 ± 0.002	0.46 ± 0.05
J	0.070 TYP.	1.78 TYP.

\* Position of bumps for reference only

10110 - Rev D



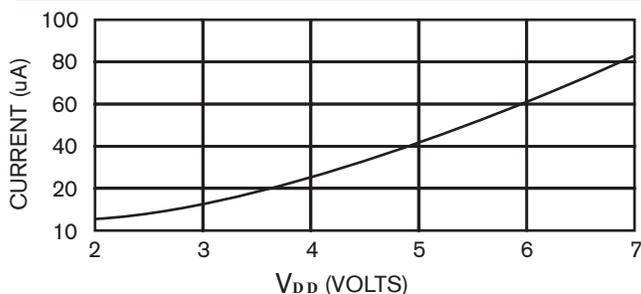
## SPECIFICATIONS: LXO 32.768 kHz

Specifications are typical at 25°C unless otherwise noted. Specifications are subject to change without notice.

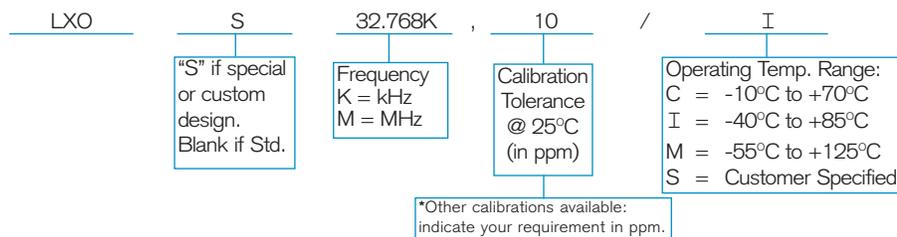
Supply Voltage ( $V_{DD}$ )	5V $\pm$ 10% (standard) (2.5V to 15V available)
Calibration Tolerance <sup>1</sup> (at 5V)	$\pm$ 10 ppm (0.001%) $\pm$ 25 ppm (0.0025%) $\pm$ 100 ppm (0.01%)
Frequency Stability <sup>2</sup>	
0°C to +50°C	$\pm$ 25 ppm Typ. (0.0025%) $\pm$ 40 ppm MAX. (0.004%)
-20°C to +70°C	$\pm$ 70 ppm Typ. (0.007%) $\pm$ 100 ppm MAX. (0.01%)
Voltage Coefficient	$\pm$ 1 ppm/V Typ. $\pm$ 3 ppm/V MAX.
Current Consumption	See below
Aging	$\pm$ 1 ppm/year Typ. $\pm$ 3 ppm/year MAX.
Shock, survival	1000 g peak, 1ms, 1/2 sine $\pm$ 3 ppm MAX.
Vibration, survival	10 g RMS, 10-2000 Hz $\pm$ 3 ppm MAX.
Frequency Change vs. 10% Output Load Change	$\pm$ 1 ppm MAX.
Operating Temperature	-10°C to +70°C (Commercial) -40°C to +85°C (Industrial) -55°C to +125°C (Military)

1. Tighter tolerances available
2. Does not include calibration tolerance.  
(Positive variations small compared to negative variations.)

## TYPICAL CURRENT CONSUMPTION, LXO-32.768 kHz



## HOW TO ORDER LXO CRYSTAL OSCILLATORS



## ABSOLUTE MAXIMUM RATINGS

Supply Voltage $V_{DD}$	-0.3V to 7V
Storage Temperature	-55°C to +125°C

## ELECTRICAL CHARACTERISTICS

### LXO-32.768 kHz

All parameters are measured at ambient temperature with a 10M $\Omega$  and 10pF load at 5V.

SYMBOL	PARAMETER	MIN.	TYP.	MAX.	UNIT
$V_{OH}$	Output Voltage Hi	4.8	4.95		V
$V_{OL}$	Output Voltage Lo		0.05	0.2	V
$t_r$	Rise Time		0.16	1	$\mu$ sec.
$t_f$	Fall Time		0.46	1	$\mu$ sec.
$I_{DD}$	Supply Current		45	60	$\mu$ A
	Duty Cycle	40	50	60	%

\* Models with faster rise and fall time available, contact factory.

## PIN CONNECTIONS

Pin	Connection
1	NC
7	Ground
8	Output
14	$V_{DD}$

## PACKAGING

LXO -Tube Pack

## OUTPUT WAVE FORM

