



## LXO-1 OSCILLATOR

10 kHz to 2.1 MHz

Low Power Crystal Oscillator

### DESCRIPTION

The LXO-1 oscillator has the highest accuracy, stability and lowest current 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-1 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
- 1.7V to 7V operation available
- Optional Tri-State

### APPLICATIONS

Industrial, Computer & Communications

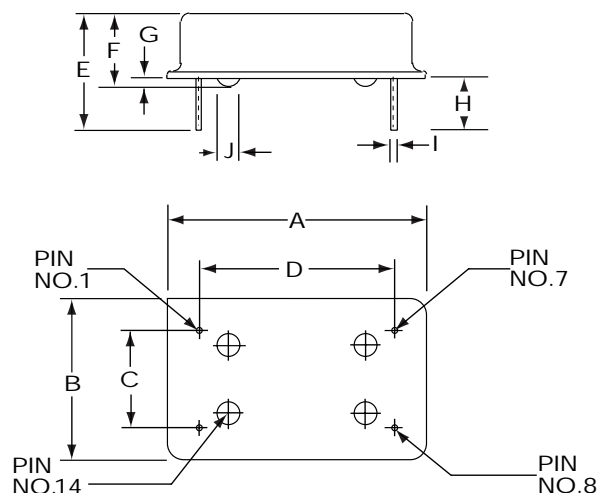
- General purpose clock oscillator
- Data Logger
- Remote sensor
- Liquid level sensing
- Medical test and diagnostics

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

10112- Rev C

## SPECIFICATIONS: LXO-1 32.768 kHz

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

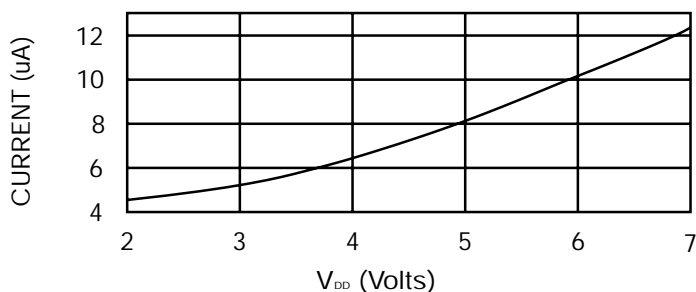
Supply Voltage ( $V_{DD}$ )	5V $\pm$ 10% (3.3V available)
Calibration Tolerance* (at 5V)	A: $\pm$ .001% ( $\pm$ 10ppm) B: $\pm$ .0025% C: $\pm$ .01%
Frequency Stability**	
0°C to +50°C	-0.0025% Typ. $\pm$ 25ppm -0.004% MAX. $\pm$ 40ppm
-20°C to +70°C	-0.007% Typ. $\pm$ 70ppm -0.01% MAX. $\pm$ 100ppm
Voltage Coefficient	1 ppm/V Typ. 3 ppm/V MAX.
Aging, first year	1 ppm/year Typ. 3 ppm/year MAX.
Shock	1000g, 1msec., 1/2 sine 3 ppm MAX.
Vibration	10g rms, 10-2000 Hz 3 ppm MAX.
Frequency Change vs. 10% Output Load Change	1 ppm MAX.
Operating Temperature	-10°C to +70°C Commercial -40°C to +85°C Industrial -55°C to +125°C Military

\* Tighter tolerances available

\*\* Does not include calibration tolerance. Positive variations small compared to negative variations.

## TYPICAL CURRENT CONSUMPTION

LXO-1 32.768 kHz



## ABSOLUTE MAXIMUM RATINGS

Supply Voltage	-0.3V to 7V
Storage Temperature	-55°C to +125°C

## ELECTRICAL CHARACTERISTICS

LXO-1 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 (10%-90%)		12	25	nsec.
$t_f$	Fall Time (10%-90%)		12	25	nsec.
SYM	Duty Cycle	40	50	60	%
Supply Current					
$I_{DD}$	$V_{DD}=5V$		7	15	$\mu A$
	$V_{DD}=3V$		5	10	$\mu A$

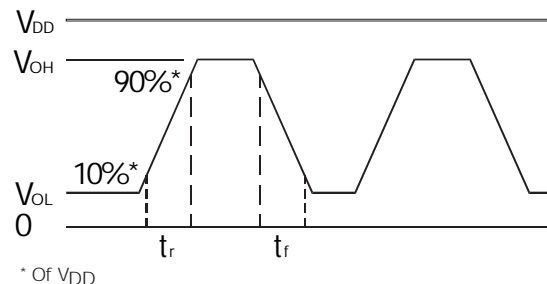
## PIN CONNECTIONS

Pin	Connection
1	INH (Tri-State) or NC
7	$V_{SS}$ (Gnd)
8	Output
14	$V_{DD}$

## PACKAGING

LXO-1 Tube Pack (Standard)

## OUTPUT WAVE FORM



## HOW TO ORDER LXO-1 CRYSTAL OSCILLATORS

LXO-1	S	T	32.768 kHz	(	A	/	I	)
	"S" if special or custom design. Blank if Std.	T=Tri-State Blank=Pin 1 no connection	Frequency		*Calibration Tolerance @25°C (A) (B) (C)		Temp. Range: C = Commercial I = Industrial M = Military S = Specify	

\*Other calibration fill in ppm  
Frequencies other than 32.768 kHz  
A:  $\pm$  0.01%  
B:  $\pm$  0.03%  
C:  $\pm$  0.1%

10112 - Rev C