

### DESCRIPTION

The LXO-AT consists of a TTL and CMOS-compatible hybrid circuit and a miniature quartz crystal packaged in a hermetically-sealed metal DIP. Permanent, precision tuning and a hermetically sealed AT quartz crystal allows for very tight calibration tolerance and eliminates the need for a tuning capacitor, a major source of long-term frequency drift.

### FEATURES

- Low aging
- CMOS and TTL compatible
- Double hermetically sealed package
- Full military testing available
- 3 Volt model also available
- Optional Tri-State or Output Enable

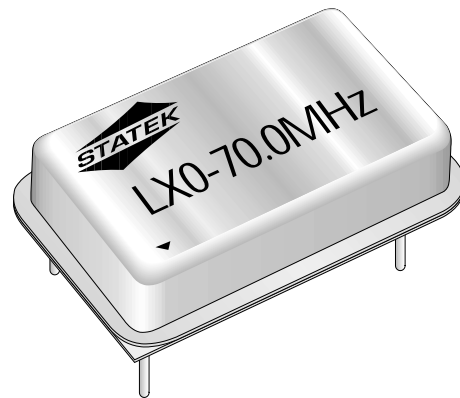
### APPLICATIONS

Industrial, Computer & Communications

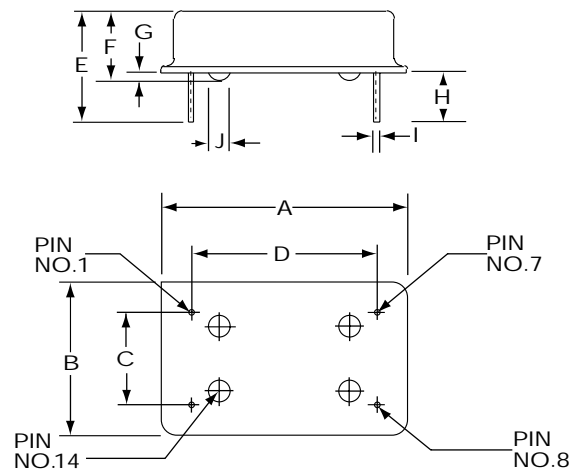
- General purpose clock oscillator

Military

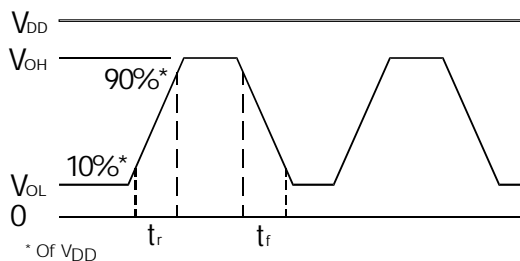
- Flight recorder
- Airborne hybrid computers



### PACKAGE DIMENSIONS



### OUTPUT WAVE FORM



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

## SPECIFICATIONS

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	A:	$\pm$ 0.01% (100ppm)
Tolerance (at 5V)*	B:	$\pm$ 0.03%
	C :	$\pm$ 0.10%
Frequency	0° C to +50°C from $\pm$ 5 to $\pm$ 30ppm	
Stability**	-10°C to +70°C from $\pm$ 10 to $\pm$ 50ppm	
	-40°C to +85°C from $\pm$ 20 to $\pm$ 100ppm	
	-55°C to +125°C from $\pm$ 30 to $\pm$ 100ppm	
Supply Current	4 mA to 60 mA (Depending on freq.)	
Output Levels	$V_{OL}$	$V_{OH}$
TTL	0.4V MAX.	2.4V MIN.
CMOS	0.5V MAX.	4.5V MIN.
Start-up Time	5 msec. MAX.	
Rise/Fall Time	6 nsec. Typ., 10 nsec. MAX.	
Duty Cycle	40% Min., 60% MAX.	
Aging, first year	10 ppm MAX.	
Shock, survival***	1,000g peak 1 msec., 1/2 sine	
Vibration survival	10g rms 10-2000 Hz	
Operating Temperature	-10°C to +70°C	Commercial
	-40°C to +85°C	Industrial
	-55°C to +125°C	Military
Storage Temperature	-55°C to +125°C	

\* Tighter tolerances available for calibration and stability.

\*\* Does not include calibration tolerance

\*\*\* High shock version available

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

## ABSOLUTE MAXIMUM RATINGS

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

## TRUTH TABLE

	PIN 1*	PIN 3
LXO-AT-8E	Low (0)	High (1)
	High (1)	Freq. Output
LXO-AT-2E	Low (0)	Low (0)
	High (1)	Freq. Output
LXO-AT-10T	Low (0)	High (Z)
	High (1)	Freq. Output

\* Normally high (internal pull-up resistor)

## ENABLE VS. TRI-STATE

Enable: When pin 1 is low (0), the oscillator stops oscillation.

Tri-state: When pin 1 is low, the oscillator is running. However, the output buffer amplifier stops functioning and output is in high impedance (Z) state.

	Enable	Tri-state
Current consumption when pin 1 is low	Low	High
Output recovery delay when pin 1 changes from low (0) to high (1)	Delayed	Immediate

## PIN CONNECTIONS

- Output Enable,  $\overline{INH}$  (Tri-State) or NC
- Ground
- Output
- $V_{DD}$

## PACKAGING

LXO-AT- Tube Pack (Standard)

## HOW TO ORDER LXO-AT CRYSTAL OSCILLATORS

LXO-AT	S	10	T	32 MHz	(	100ppm	/	100ppm	/	200ppm	/	I	)
"S" if special or custom design. Blank if Std.	2 = 2 LS 8 = 8 10 = 10	TTL Load TTL Load TTL Load	E = Enable T = Tri-State N = Neither	Frequency	Calibration Tolerance* @ 25°C (A) (B) (C)	Frequency Stability over Temp. Range	Total Frequency Tolerance	Temp. Range: C = Commercial I = Industrial M = Military S = Specify					

\* Other calibration fill in ppm

10111 - Rev D