



# LSM OSCILLATOR

30 kHz to 200 kHz

Low Power Surface Mount Crystal Oscillator

## DESCRIPTION

The LSM oscillator has the highest accuracy, stability and lowest current of all STATEK surface mount oscillators. The design consists of a hermetically-sealed CX-4 STATEK crystal, and a CMOS-compatible integrated circuit. The hybrid design is hermetically-sealed with a kovar lid in a surface mount ceramic package. Permanent precision tuning of the oscillator is accomplished by laser trimming the crystal.

## FEATURES

- Low power consumption
- Low aging
- CMOS compatible
- Double hermetically sealed package
- Full military testing available
- 3.3 Volt operation available
- Optional Tri-State
- Low harmonic noise

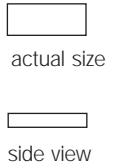
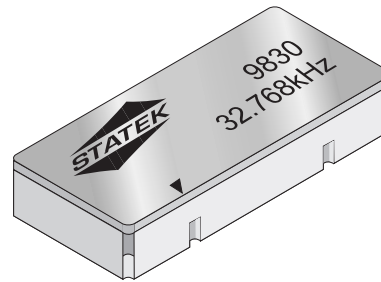
## APPLICATIONS

Industrial, Computer & Communications

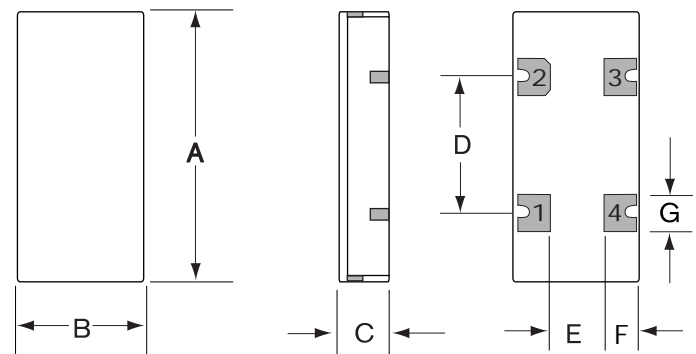
- General purpose clock oscillator
- Data logger
- Remote sensor
- Real Time Clock
- Medical test and diagnostics

Military

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



## PACKAGE DIMENSIONS

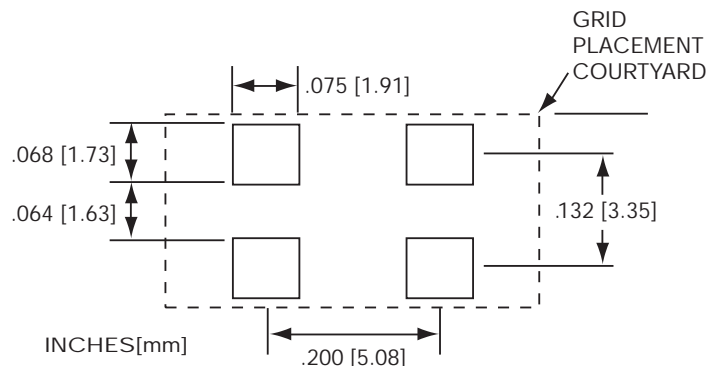


DIM	TYP.		MAX.	
	INCHES	mm	INCHES	mm
A	.400	10.16	.405	10.29
B	.180	4.57	.185	4.70
C*	.071	1.80	.079	2.00
D	.200	5.08	.205	5.21
E	.080	2.03	.085	2.16
F	.050	1.27	.058	1.47
G	.055	1.40	.063	1.60

Termination material is Au over Ni (SM1), solder dip (SM3) also available.

\*SM1 Termination; SM3 = .084 in. (2.13mm) Max.

## SUGGESTED LAND PATTERN



10151 - Rev B



## SPECIFICATIONS: LSM 32.768 kHz\*\*\*\*

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

Supply Voltage*	5V ± 10% (3.3V available)		
Calibration Tolerance**	A:	± .001% (10ppm)	
	B:	± .0025%	
	C:	± .01%	
Frequency Stability***	0°C to +50°C	± 0.0025% Typ.	± 25ppm
		± 0.004% MAX.	± 40ppm
	-20°C to +70°C	± 0.007% Typ.	± 70ppm
		± 0.01% MAX.	± 100ppm
Voltage Coefficient	± 1 ppm/V Typ.		
	± 3 ppm/V MAX.		
Aging	± 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	

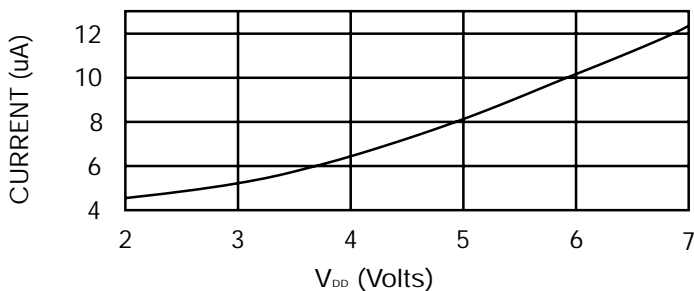
\* Contact the factory for lower voltage.

\*\* Tighter tolerances available.

\*\*\* Does not include calibration tolerance. Positive variations small compared to negative variations (See data sheet 10103).

\*\*\*\* Contact the factory for other frequencies.

## TYPICAL CURRENT CONSUMPTION, LSM-32.768 kHz



## ABSOLUTE MAXIMUM RATINGS

Supply Voltage V <sub>DD</sub>	-0.3V to 7V
Storage Temperature	-55°C to +125°C
Process Temperature	260°C 20 sec.

## ELECTRICAL CHARACTERISTICS

### LSM 32.768 kHz

All parameters are measured at ambient temperature with a 10MΩ and 10pF load at 5V.

SYMBOL	PARAMETER	MIN.	TYP.	MAX.	UNIT
V <sub>OH</sub>	Output Voltage Hi	4.8	4.95		V
V <sub>OL</sub>	Output Voltage Lo		0.05	0.2	V
t <sub>r</sub>	Rise Time (10%-90%)		12	25	nsec.
t <sub>f</sub>	Fall Time (10%-90%)		12	25	nsec.
SYM	Duty Cycle	40	50	60	%
I <sub>DD</sub>	Supply Current				
	V <sub>DD</sub> = 5V		8.3	15	µA
	V <sub>DD</sub> = 3.3V		5.5	10	µA

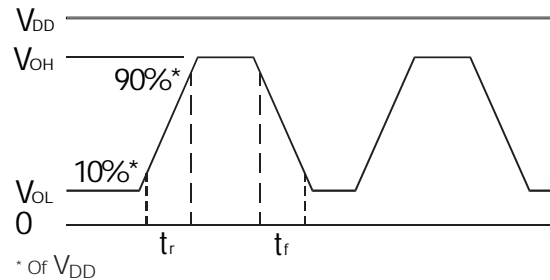
## PIN CONNECTIONS

Pin	Connection
1	Output Enable or NC
2	Ground
3	Output
4	V <sub>DD</sub>

## PACKAGING

LSM -Tray Pack (Standard)  
 -16mm tape, 7" or 13" reels (Optional)  
 Per EIA 481 (see data sheet 10109)

## OUTPUT WAVE FORM



## HOW TO ORDER LSM SURFACE MOUNT CRYSTAL OSCILLATORS

LSM	<u>3</u>	<u>S</u>	<u>T</u>	<u>SM3</u>	<u>32.768 kHz</u>	( <u>A</u> / <u>I</u> )
	3=3.3V Blank=5V (Std.)	"S" if special or custom design. Blank if Std.	*T = Tri-State Blank = Pin 1 no connection	Blank = SM1 (Std.) SM1 = Gold Plated SM3 = Solder Dipped	Frequency	**Calibration Tolerance @ 25°C (A) (B) (C)
						Temp. Range: C = Commercial I = Industrial M = Military S = Specify

\*Tri-state not available 100 kHz to 200 kHz  
 \*\*Other calibration fill in ppm

Frequencies other than 32.768 kHz  
 A: ± 0.01%  
 B: ± 0.03%  
 C: ± 0.1%

