LSM OSCILLATOR

30 kHz to 400 kHz

Low Power Surface Mount Crystal Oscillator

DESCRIPTION

The LSM oscillator is an ultra-low current quartz crystal oscillator with a typical start-up time of 500ms. The design consists of a 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

- Ultra-low power consumption
- Typical start-up time of 500ms
- Typical rise and fall times of 25ns
- Hermetically sealed ceramic package
- Optional output enable/disable with Tri-State
- Full military testing per MIL-PRF-55310 available
- Designed, manufactured, and tested in the USA
- 3.3 volt operation available

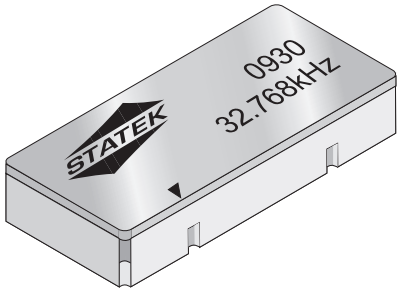
APPLICATIONS

Industrial, Computer & Communications

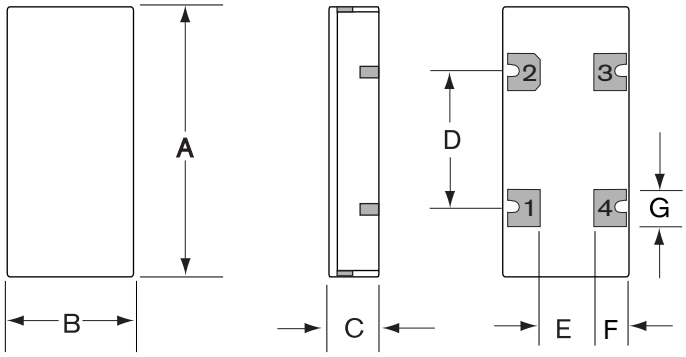
- General purpose clock oscillator
- Data logger
- Remote sensor
- Real time clock
- Medical test and diagnostics

Military

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



PACKAGE DIMENSIONS

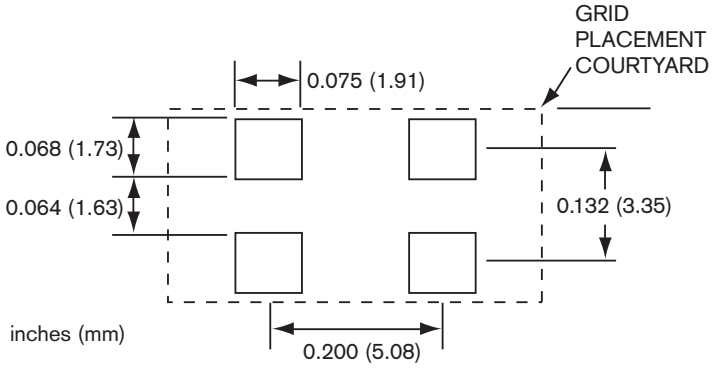


	TYPICAL		MAXIMUM	
DIM	inches	mm	inches	mm
A	0.400	10.16	0.405	10.29
B	0.180	4.57	0.185	4.70
C*	0.071	1.80	0.079	2.00
D	0.200	5.08	0.205	5.21
E	0.080	2.03	0.085	2.16
F	0.050	1.27	0.058	1.47
G	0.055	1.40	0.063	1.60

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

*SM1 Termination; SM3 = 0.084 in. (2.13mm) Max.

SUGGESTED LAND PATTERN



10151 - Rev D

SPECIFICATIONS: LSM 30 kHz to 400 kHz

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

Supply Voltage[1]	5 V ± 10%
	3.3 V ± 10%
Calibration Tolerance	± 10 ppm (0.001%)
	± 25 ppm (0.0025%)
	± 100 ppm (0.01%)

Frequency Stability Over Temperature[2]

0°C to +50°C	± 25 ppm	Typ.	(0.0025%)
	± 40 ppm	MAX.	(0.004%)
-10°C to+70°C	± 70 ppm	Typ.	(0.007%)
	± 100 ppm	MAX.	(0.01%)

Voltage Coefficient	± 1 ppm/V
Aging, first year	± 2 ppm
Shock	5000 g, 0.3 ms, 1/2 sine
Vibration	20 g RMS, 10 - 2000 Hz
Operating Temp. Range	-10°C to +70°C (Commercial)
	-40°C to +85°C (Industrial)
	-55°C to +125°C (Military)

1. Contact the factory for lower voltage.
2. Does not include calibration tolerance. Positive variations small compared to negative variations.

Current Consumption*	2.8 µA (32.768 kHz)
* V_{DD} = 3.3 V and 10pF load.	8.0 µA (100.0 kHz)

TRISTATE/DISABLE OPTIONS (T/N)

Statek offers two enable/disable options: T and N. The T-version has a Tri-State output and continues 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 Tri-State/Disable capability. The following table describes the Tri-State/Disable option T.

ABSOLUTE MAXIMUM RATINGS

Supply Voltage V_{DD}	-0.5 V to 7 V
Storage Temperature	-55°C to +125°C
Process Temperature	260°C 20 sec.

ELECTRICAL CHARACTERISTICS

LSM 32.768 kHz

All parameters are measured at 25°C with a 10MΩ and 10pF load with V_{DD} 3.3 V.

SYMBOL	PARAMETER	MIN.	TYP.	MAX.	UNIT
V_{OH}	Output Voltage Hi	V_{DD}-0.4	V_{DD}		V
V_{OL}	Output Voltage Lo		0	0.4	V
SYM	Duty Cycle	45	50	55	%
t_r	Rise Time (10%-90%)			50	nsec.
t_f	Fall Time (10%-90%)			50	nsec.

PIN CONNECTIONS

Pin	Connection
1	Output Enable or NC
2	Ground
3	Output
4	V_{DD}

PACKAGING OPTIONS

LSM -Tray Pack

-16mm tape, 7" or 13" reels
(Reference tape and reel data sheet 10109)

TRISTATE/DISABLE OPTION T FUNCTION TABLE

	Tri-State (Pin 1 High*)	Disable (Pin 1 Low)
Output	Frequency Output	High Z State
Internal Osc.	Oscillates	Oscillates
Current	Normal	Lower than Normal

*When PIN 1 is allowed to float, it is held high by an internal pull-up resistor.

HOW TO ORDER LSM SURFACE MOUNT CRYSTAL OSCILLATORS

LSM | 3 | S | T | SM3 | — | 32.768K | , | 100 | / | I

- 3: 3 = 3.3 V; Blank = 5 V (Std.)
- S: "S" if special or custom design. Blank if Std.
- T: *T = Tri-State; Blank = Pin 1 no connection
- SM3: Blank = SM1; = Gold Plated (Lead Free); SM3 = Solder Dipped; SM5 = Solder Dipped (Lead Free)
- 32.768K: Frequency K = kHz
- 100: Calibration Tolerance @ 25°C (in ppm)
- I: Temp. Range: C = -10°C to +70°C; I = -40°C to +85°C; M = -55°C to +125°C; S = Customer Specified

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