

## CX4SM AT CRYSTAL

14 MHz to 250 MHz

Ultra-Miniature, Low Profile  
Surface Mount AT Quartz Crystal

### DESCRIPTION

STATEK's ultra-miniature CX4SM AT crystals in leadless ceramic packages are designed for surface mounting on printed circuit boards or hybrid substrates. These crystals are low profile and have a very small land pattern.

### FEATURES

- Designed for surface mount applications using infrared, vapor phase, wave solder or epoxy mount techniques.
- Low profile (less than 1.2 mm) hermetically sealed ceramic package
- Excellent aging characteristics
- Available with glass or ceramic lid
- High shock and vibration resistance
- Custom designs available
- Full military testing available
- Designed and manufactured in the USA

### APPLICATIONS

#### Medical

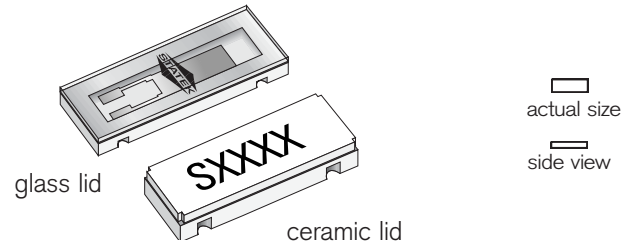
- Neurostimulators
- Cochlear Implants
- Implantable CRM
- Infusion Pumps
- Glucose Monitors

#### Industrial, Computer & Communications

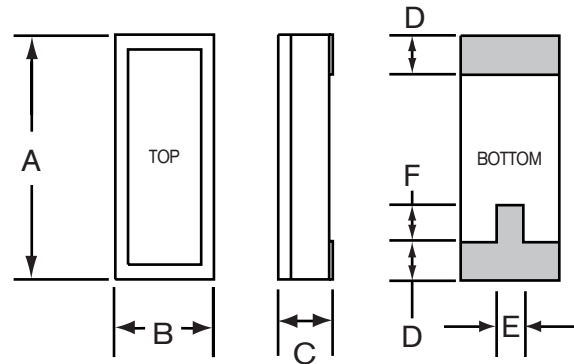
- Instrumentation
- Process Control
- Environmental Control
- Engine Control
- Handheld Inventory Control
- Down-hole Data Recorder
- Telemetry

#### Military & Aerospace

- Communications Radio
- Smart Munitions
- Timing Devices (Fuzes)
- Surveillance Devices



### PACKAGE DIMENSIONS



DIM	TYPICAL		MAXIMUM	
	inches	mm	inches	mm
A	0.197	5.00	0.210	5.33
B	0.072	1.83	0.085	2.16
C	-	-	see below	
D	0.036	0.91	0.046	1.16
E	0.020	0.51	-	-
F	0.025	0.64	-	-

### THICKNESS (DIM C) MAXIMUM

	GLASS LID		CERAMIC LID	
	inches	mm	inches	mm
SM1	0.045	1.14	0.050	1.27
SM2/SM4	0.046	1.17	0.051	1.30
SM3/SM5	0.048	1.22	0.053	1.35

## SPECIFICATIONS

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

Fundamental Frequency	14.7456 MHz	16MHz	20 MHz	32 MHz	40 MHz	80 MHz	160 MHz	200 MHz
Motional Resistance $R_1$ ( $\Omega$ )	60	75	50	30	30	30	30	40
Motional Capacitance $C_1$ (fF)	1.4	1.5	1.4	2.5	1.5	1.8	2.5	2.0
Quality Factor Q (k)	120	90	110	70	90	40	20	15
Shunt Capacitance $C_0$ (pF)	0.8	0.9	0.9	1.1	1.0	1.0	1.5	1.5

Calibration Tolerances <sup>1</sup>	± 100 ppm, or tighter as required
Load Capacitance	10 pF (unless specified otherwise)
Drive Level	200 $\mu$ W MAX for $f \leq 50$ MHz 100 $\mu$ W MAX for $f > 50$ MHz
Frequency-Temperature Stability <sup>1,3</sup>	± 50 ppm to ± 10 ppm (Commercial) ± 100 ppm to ± 20 ppm (Industrial) ± 100 ppm to ± 30 ppm (Military)
Aging, first year <sup>3</sup>	5 ppm MAX (better than 1 ppm available)
Shock, survival <sup>4</sup>	5,000 g, 0.3 ms, 1/2 sine
Vibration, survival <sup>5</sup>	20 g, 10-2,000 Hz swept sine
Operating Temp. Range	-10°C to +70°C (Commercial) -40°C to +85°C (Industrial) -55°C to +125°C (Military)
Storage Temp. Range	-55°C to +125°C
Max Process Temperature	260°C for 20 sec.

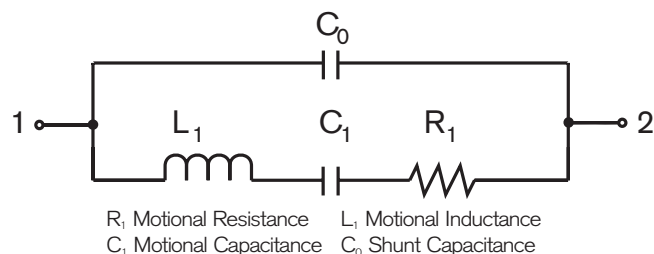
- 1) Other tolerances available. Contact factory.
- 2) Does not include calibration tolerance. The characteristics of the frequency stability over temperature follow that of the AT thickness-shear mode.
- 3) 5 ppm MAX for frequencies below 40 MHz. For tighter tolerances and higher frequencies contact factory.
- 4) Higher shock version available.
- 5) Per MIL-STD-202G, Method 204D, Condition D. Random vibration testing also available.

## TERMINATIONS

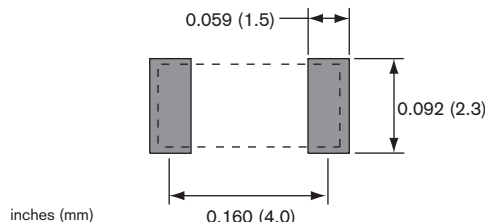
Designation	Termination
SM1	Gold Plated (Lead Free)
SM2	Solder Plated
SM3	Solder Dipped
SM4	Solder Plated (Lead Free)
SM5	Solder Dipped (Lead Free)

Max Process Temperature 260°C for 20 sec.

## EQUIVALENT CIRCUIT



## SUGGESTED LAND PATTERN



## PACKAGING OPTIONS

- Tray Pack
- Tape and Reel  
Per EIA 481 (see Tape and Reel data sheet 10109)

## HOW TO ORDER CX4SM AT CRYSTALS

