



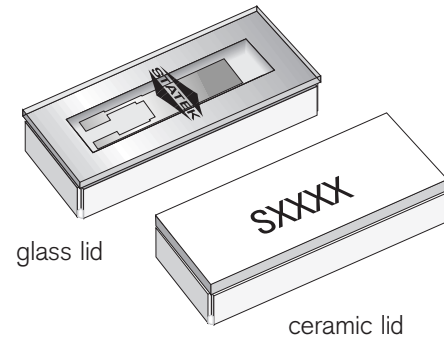
# CX1SM AT CRYSTAL

6 MHz to 250 MHz  
Miniature Surface Mount AT Quartz Crystal

Fundamental Mode: 6 MHz - 250 MHz

## DESCRIPTION

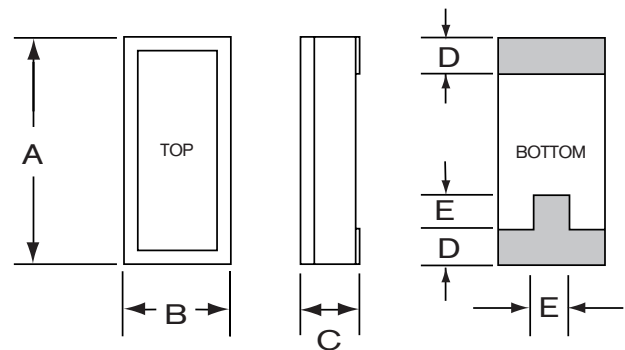
STATEK's miniature CX1SM AT crystals in leadless ceramic packages are designed for surface mounting on printed circuit boards or hybrid substrates. Due to its robust design, this product has gained wide acceptance in the industry.



## FEATURES

- Designed for surface mount applications using infrared, vapor phase, or epoxy mount techniques
- Low profile 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

## PACKAGE DIMENSIONS



## APPLICATIONS

### Medical

- Infusion Pumps
- Monitoring Equipment

### Industrial, Computer & Communications

- Instrumentation
- Process Control
- Environmental Control
- Telemetry

### Military & Aerospace

- Communications
- Satellite Command and Control
- Cockpit Electronics
- Smart Munitions
- Timing Devices (Fuzes)

DIM	TYPICAL		MAXIMUM	
	inches	mm	inches	mm
A	0.315	8.00	0.330	8.38
B	0.140	3.56	0.155	3.94
C	-	-	see below	
D	0.045	1.14	0.055	1.40
E	0.060	1.52	0.070	1.78

### THICKNESS (DIM C) MAXIMUM

	GLASS LID		CERAMIC LID	
	inches	mm	inches	mm
SM1	0.065	1.65	0.070	1.78
SM2/SM4	0.067	1.70	0.072	1.83
SM3/SM5	0.070	1.78	0.075	1.90

## SPECIFICATIONS

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

Fundamental Frequency	10 MHz	32 MHz	155.52 MHz
Motional Resistance $R_1$ ( $\Omega$ )	30	25	15
Motional Capacitance $C_1$ (fF)	5.5	6.2	4.0
Quality Factor Q (k)	100	30	30
Shunt Capacitance $C_0$ (pF)	2.2	2.3	2.3

Calibration Tolerance <sup>1</sup>	$\pm 100$ ppm, or tighter as required
Load Capacitance <sup>2</sup>	20 pF for $f \leq 50$ MHz 10 pF for $f > 50$ MHz
Drive Level	500 $\mu$ W MAX for $f \leq 50$ MHz 200 $\mu$ W MAX for $f > 50$ MHz
Frequency-Temperature Stability <sup>1,3</sup>	$\pm 50$ ppm to $\pm 10$ ppm (Commercial) $\pm 100$ ppm to $\pm 20$ ppm (Industrial) $\pm 100$ ppm to $\pm 30$ ppm (Military)

Aging, first year<sup>4</sup> 5 ppm MAX (better than 1ppm available)

Shock, survival<sup>5</sup> 3,000 g, 0.3 ms, 1/2 sine

Vibration, survival<sup>6</sup> 20 g, 10-2,000 Hz swept sine

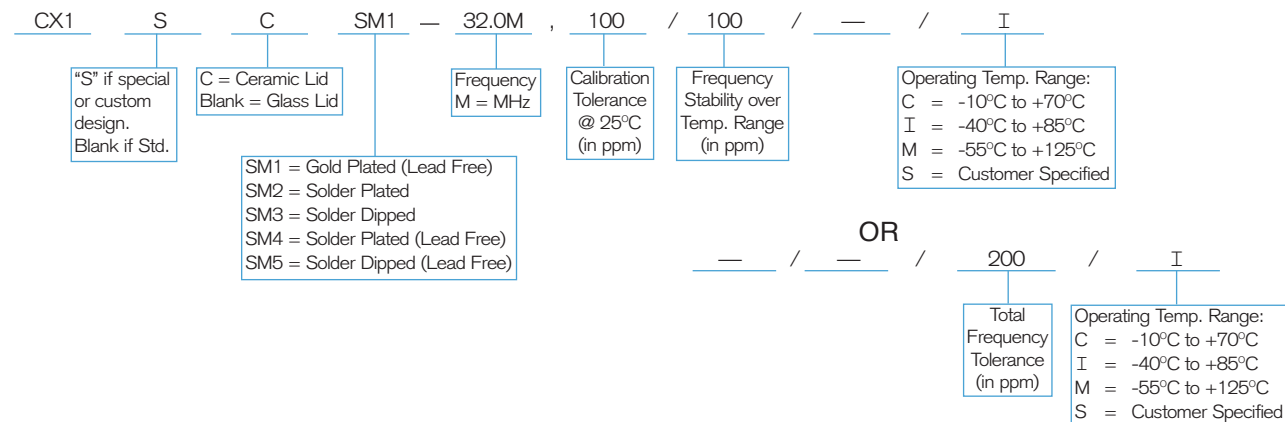
Operating Temp. Range  
-10°C to +70°C (Commercial)  
-40°C to +85°C (Industrial)  
-55°C to +125°C (Military)

Storage Temp. Range -55°C to +125°C

Max Process Temperature 260°C for 20 sec.

- Other tolerances available. Contact factory.
- Unless specified otherwise.
- Does not include calibration tolerance. The characteristics of the frequency stability over temperature follow that of the AT thickness-shear mode.
- 5 ppm MAX for frequencies below 40 MHz. For tighter tolerances and higher frequencies contact factory.
- Higher shock version available. Refer to data sheet model CX1HGSM AT (10108).
- Per MIL-STD-202G, Method 204D, Condition D. Random vibration testing also available.

## HOW TO ORDER CX1SM AT CRYSTALS

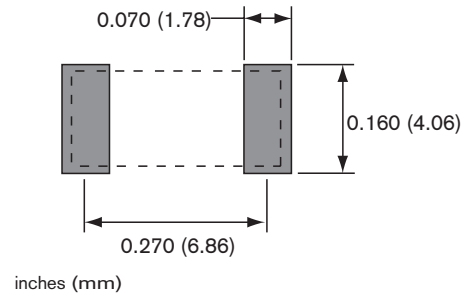


## TERMINATIONS

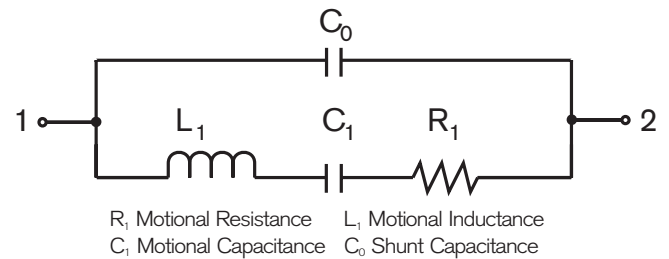
Designation	Termination
SM1	Gold Plated (Lead Free)
SM2	Solder Plated
SM3	Solder Dipped
SM4	Solder Plated (Lead Free)
SM5	Solder Dipped (Lead Free)

Max Process Temperature 260°C for 20 sec.

## SUGGESTED LAND PATTERN



## EQUIVALENT CIRCUIT



## PACKAGING OPTIONS

- Tray Pack
- 16mm tape, 7" or 13" reels  
Per EIA 481 (see Tape and Reel data sheet 10109)