



CX2SM AT CRYSTAL

9.6 MHz to 250 MHz

Low Profile, Miniature Surface Mount AT Quartz Crystal

Fundamental Mode: 9.6 MHz - 250 MHz
Third Overtone: 48 MHz - 160 MHz

DESCRIPTION

STATEK's miniature CX2SM 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 small footprint. The CX2SM crystal is manufactured using the STATEK-developed photolithographic process, and was designed utilizing the experience acquired by producing millions of crystals for industrial, commercial, military and medical applications.

FEATURES

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

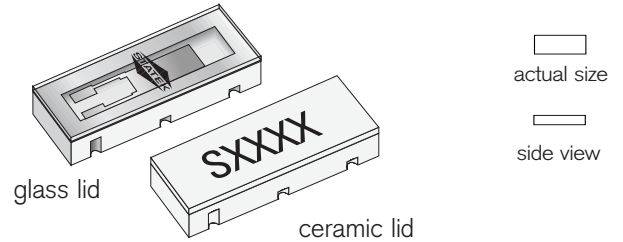
- Infusion Pumps

Industrial, Computer & Communications

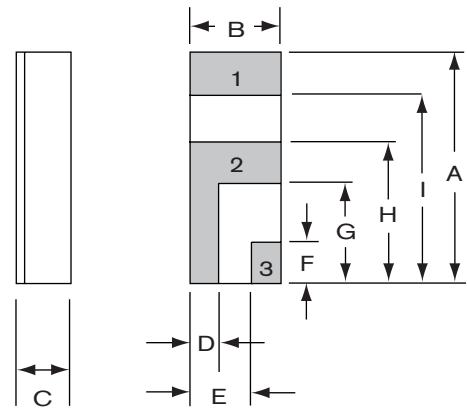
- Engine Control
- Down-hole Data Recorder

Military & Aerospace

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



PACKAGE DIMENSIONS



DIM	TYPICAL		MAXIMUM	
	inches	mm	inches	mm
A	0.260	6.60	0.275	6.99
B	0.094	2.39	0.108	2.74
C	-	-	see below	
D	0.035	0.89	0.045	1.14
E	0.059	1.50	0.069	1.75
F	0.050	1.27	0.060	1.52
G	0.105	2.67	0.115	2.92
H	0.155	3.94	0.165	4.19
I	0.210	5.33	0.220	5.59

THICKNESS (DIM C) MAXIMUM

	GLASS LID		CERAMIC LID	
	inches	mm	inches	mm
SM1	0.065	1.65	0.075	1.91
SM2/SM4	0.067	1.70	0.077	1.96
SM3/SM5	0.070	1.78	0.080	2.03

Note: Terminal 1 is electrically connected internally to terminal 3

10136 - Rev B



SPECIFICATIONS

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

	10 MHz	32 MHz	155.52 MHz
Fundamental Frequency	10 MHz	32 MHz	155.52 MHz
Motional Resistance (R_1)	60	25	10
Motional Capacitance C_1 (fF)	2.8	6.2	4.0
Quality Factor Q (k)	95	30	30
Shunt Capacitance C_0 (pF)	1.4	2.3	2.3

Calibration Tolerance¹ ± 100 ppm, or tighter as required

Load Capacitance² 20 pF for $f \leq 50$ MHz

10 pF for $f > 50$ MHz

Drive Level 500 μ W MAX for $f \leq 50$ MHz

200 μ W MAX for $f > 50$ MHz

Frequency-Temperature Stability^{1,3} ± 50 ppm to ± 10 ppm (Commercial)
± 100 ppm to ± 20 ppm (Industrial)

± 100 ppm to ± 30 ppm (Military)

Aging, first year⁴ 5 ppm MAX (better than 1 ppm available)

Shock, survival⁵ 3,000 g, 0.3 ms, 1/2 sine

Vibration, survival⁶ 20 g, 10-2,000 Hz swept sine

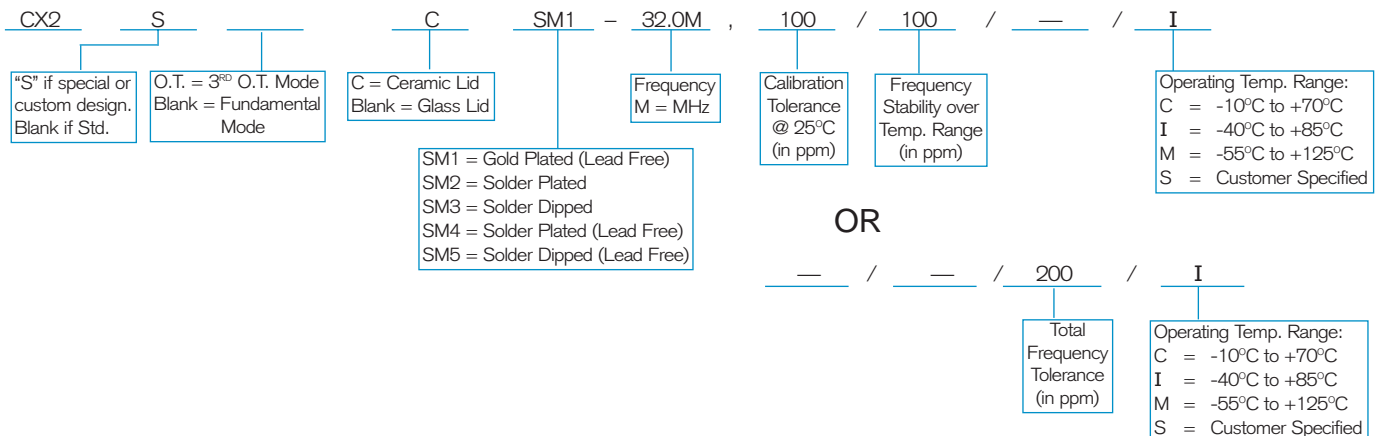
Operating Temp. Range -10°C to +70°C (Commercial)
-40°C to +85°C (Industrial)
-55°C to +125°C (Military)

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.
- Per MIL-STD-202G, Method 204D, Condition D. Random vibration testing also available.

HOW TO ORDER CX2SM AT CRYSTALS



TERMINATIONS

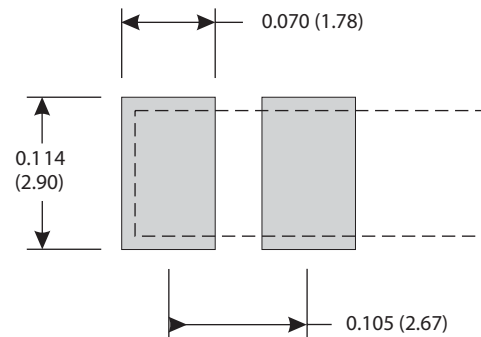
Designation	Termination
SM1	Gold Plated (Lead Free)
SM2	Solder Plated
SM3	Solder Dipped
SM4	Solder Plated (Lead Free)
SM5	Solder Dipped (Lead Free)

Max Process Temperature 260°C for 20 sec.

PACKAGING OPTIONS

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

SUGGESTED LAND PATTERN



EQUIVALENT CIRCUIT

