



# CX9SM AT CRYSTAL

14 MHz to 250 MHz

Low Profile, Ultra-Miniature  
Surface Mount AT Quartz Crystal

## DESCRIPTION

Designed and manufactured in the USA, Statek's CX9SM AT quartz crystal is the newest device available in frequencies ranging from 14 MHz to 250 MHz. This device has been specifically designed for applications requiring a very small foot print and low profile. It is 4.1 mm x 1.5 mm with a height under 1 mm. Using micro-machining processes, this surface-mountable crystal is hermetically sealed within an ultra-miniature ceramic package to ensure high stability and low aging. Tight calibration and excellent frequency/temperature stability make the CX9SM ideally suited for many high frequency applications.

## FEATURES

- Low profile (less than 1 mm)
- Ultra-miniature, surface mount design
- Available with glass or ceramic lid
- Hermetically sealed ceramic package
- High shock and vibration survival
- Excellent aging characteristics
- Designed for low power applications
- Full military testing available
- Designed and manufactured in the USA

## APPLICATIONS

### Medical

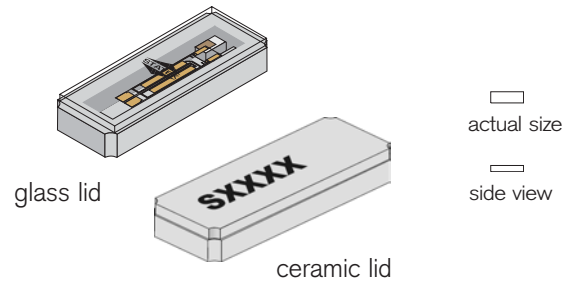
- Neurostimulators
- Medical Telemetry
- Chronic Pain Management
- Cochlear Implants
- Infusion Pumps

### Military & Aerospace

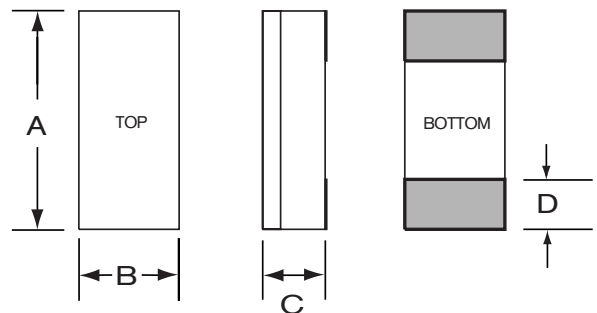
- Avionic Indicators and Instrumnts
- Cockpit Instrumentation Displays
- Data Communications
- Survival radio

### Industrial, Computer & Communications

- Communications
- Transmitters
- Pulse Generators
- Tracking Beacons
- Wildlife Telemetry



## PACKAGE DIMENSIONS



DIM	TYPICAL		MAXIMUM	
	inches	mm	inches	mm
A	0.160	4.10	0.170	4.32
B	0.060	1.50	0.068	1.73
C	-	-	see below	
D	0.031	0.79	0.038	0.97

## THICKNESS (DIM C) MAXIMUM

MAX	GLASS LID		CERAMIC LID	
	inches	mm	inches	mm
SM1	0.034	0.87	0.035	0.90
SM2/SM4	0.034	0.87	0.035	0.90
SM3/SM5	0.036	0.91	0.037	0.94



## SPECIFICATIONS

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

Fundamental Frequency	<u>25 MHz</u>	<u>49 MHz</u>	<u>155.52 MHz</u>
Motional Resistance $R_1(\Omega)$	30	30	25
Motional Capacitance $C_1$ (fF)	1.8	2.1	2.5
Quality Factor Q (k)	120	60	16
Shunt Capacitance $C_0$ (pF)	1.0	1.0	1.4
Calibration Tolerance <sup>1</sup>	± 100 ppm, or tighter as required		
Load Capacitance	10 pF (unless specified otherwise)		
Drive Level	200 µW MAX for $f \leq 50$ MHz 100 µW 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	5,000 g, 0.3 ms, 1/2 sine		
Vibration, survival <sup>4</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.		

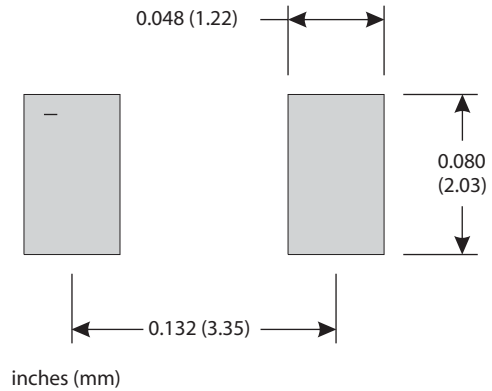
- Other tolerances available. Contact factory.
- Does not include calibration tolerance. The characteristics of the frequency stability over temperature follow that of the AT thickness-shear mode.
- 5 ppm MAX for frequencies below 40 MHz. For tighter tolerances and higher frequencies contact factory.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

## TERMINATIONS

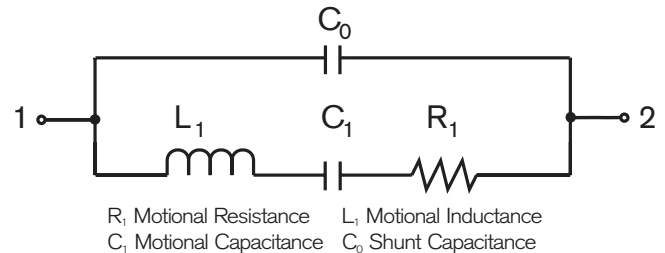
Designation	Termination
SM1	Gold Plated
SM2	Solder Plated
SM3	Solder Dipped
SM4	Solder Plated (Lead Free)
SM5	Solder Dipped (Lead Free)

Max Process Temperature 260°C for 20 sec.

## SUGGESTED LAND PATTERN



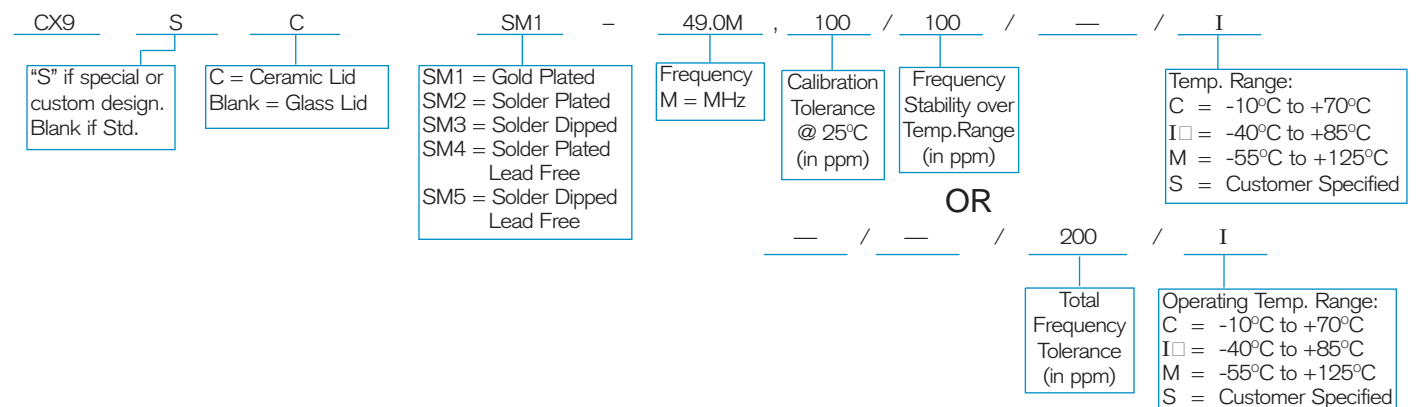
## EQUIVALENT CIRCUIT



## PACKAGING OPTIONS

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

## HOW TO ORDER CX9SM AT CRYSTALS



10158 - Rev B