



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

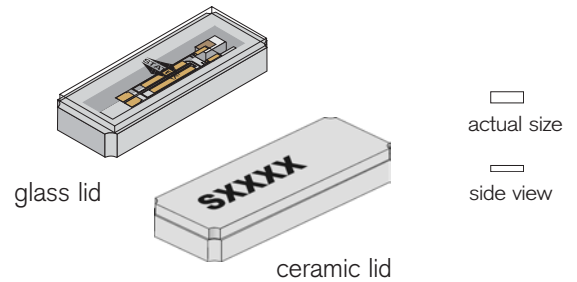
- Neurostimulators
- Medical Telemetry
- Chronic Pain Management
- Cochlear Implants
- Infusion Pumps

Military & Aerospace

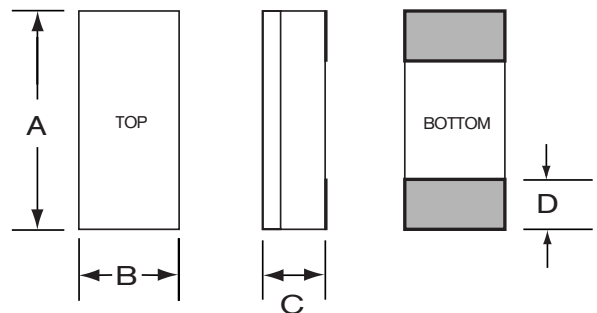
- Avionic Indicators and Instrumnts
- Cockpit Instrumentation Displays
- Data Communications
- Survival radio

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 ¹ | ± 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 ^{1,3} | ± 50 ppm to ± 10 ppm (Commercial) ± 100 ppm to ± 20 ppm (Industrial) ± 100 ppm to ± 30 ppm (Military) | | |
| Aging, first year ³ | 5 ppm MAX (better than 1 ppm available) | | |
| Shock, survival | 5,000 g, 0.3 ms, 1/2 sine | | |
| Vibration, survival ⁴ | 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. | | |

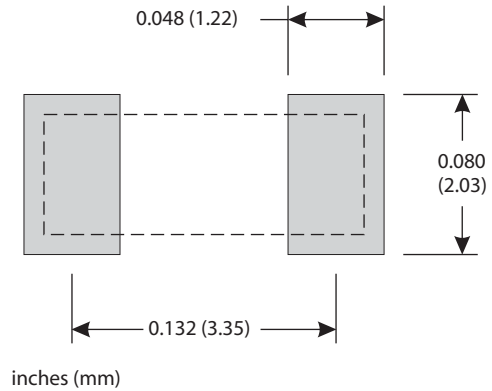
- Other tolerances available. Contact factory.
- Does not include calibration tolerance. The characteristics of the frequency stability over temperature follow that of the AT thickness-shear mode.
- 5 ppm MAX for frequencies below 40 MHz. For tighter tolerances and higher frequencies contact factory.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

TERMINATIONS

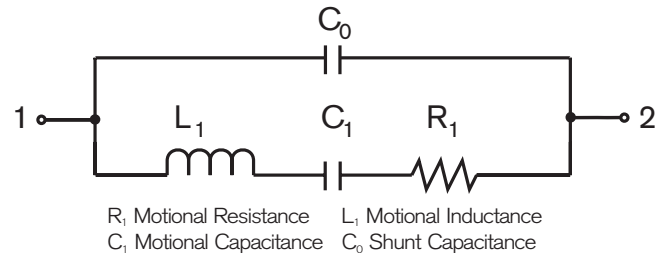
| Designation | Termination |
|-------------|---------------------------|
| SM1 | Gold Plated |
| SM2 | Solder Plated |
| SM3 | Solder Dipped |
| SM4 | Solder Plated (Lead Free) |
| SM5 | Solder Dipped (Lead Free) |

Max Process Temperature 260°C for 20 sec.

SUGGESTED LAND PATTERN



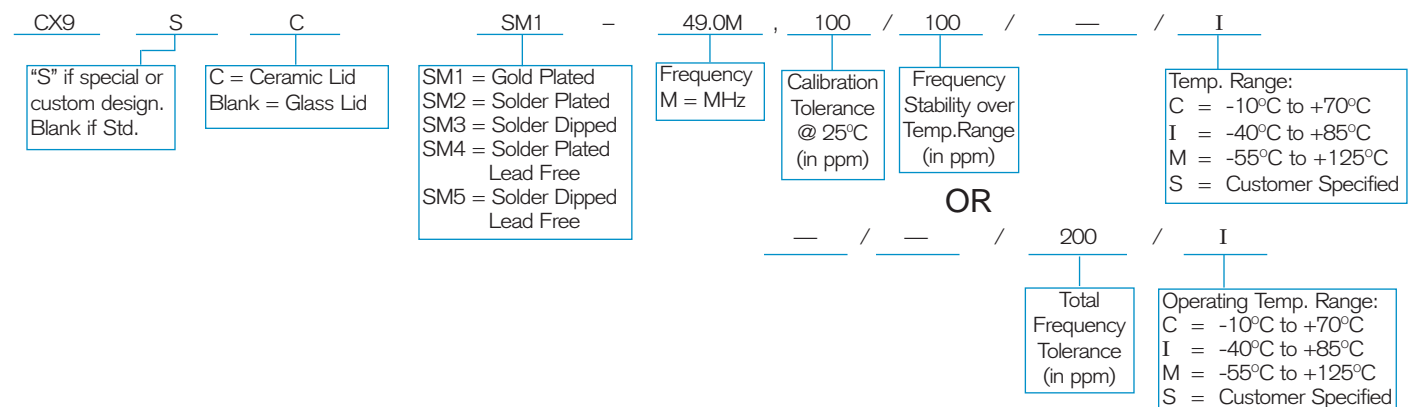
EQUIVALENT CIRCUIT



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