



CX11SM CRYSTAL

16 MHz to 250 MHz

Ultra Miniature
Surface Mount Quartz Crystal

DESCRIPTION

When miniaturization is paramount, Statek's CX11SM AT quartz crystal is an excellent choice. Available in frequencies from 16 MHz to 250 MHz, this crystal has a 3.2 mm x 1.5 mm footprint and a height under 1.0 mm. The resonator is manufactured using Statek's photolithographic and chemical milling processes and then sealed within a ceramic package for high stability and low aging. Available with tight calibration tolerances and high stability over temperature, this crystal is well suited for many demanding applications.

FEATURES

- Ultra-miniature package
- Ultra-low profile
- Hermetically sealed package
- Excellent aging characteristics
- Full military testing available
- Designed and manufactured in the USA

APPLICATIONS

Medical

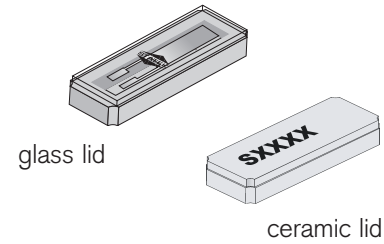
- Medical Telemetry
- Cardiac Rhythm Management
- Medical Telemetry
- Cochlear Implants
- Infusion Pumps

Military & Aerospace

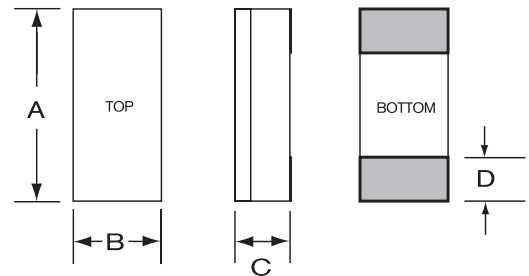
- Avionic Indicators and Instruments
- Cockpit Instrumentation Displays
- Data Communications
- Survival radio

Industrial, Computer & Communications

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



PACKAGE DIMENSIONS

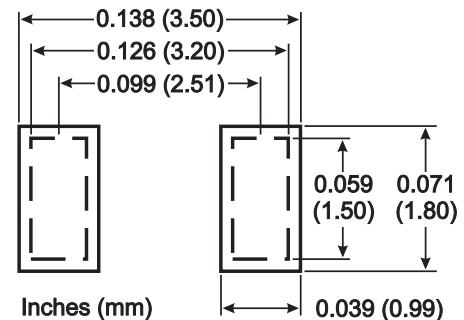


| DIM | TYPICAL | | MAXIMUM | |
|-----|---------|------|-----------|------|
| | inches | mm | inches | mm |
| A | 0.127 | 3.20 | 0.135 | 3.43 |
| B | 0.060 | 1.50 | 0.068 | 1.73 |
| C | - | - | see below | |
| D | 0.027 | 0.69 | 0.037 | 0.94 |

THICKNESS (DIM C)

| Lid | Termination | Typical | | Maximum | |
|------------|-------------|---------|------|---------|------|
| | | inches | mm | inches | mm |
| Ceramic | SM1 | 0.030 | 0.77 | 0.035 | 0.90 |
| | SM2/SM4 | 0.031 | 0.79 | 0.036 | 0.92 |
| | SM3/SM5 | 0.033 | 0.84 | 0.038 | 0.97 |
| Glass | SM1 | 0.029 | 0.74 | 0.034 | 0.87 |
| | SM2/SM4 | 0.030 | 0.77 | 0.035 | 0.89 |
| | SM3/SM5 | 0.032 | 0.81 | 0.037 | 0.94 |
| Thin Glass | SM1 | 0.025 | 0.64 | 0.030 | 0.77 |
| | SM2/SM4 | 0.026 | 0.66 | 0.031 | 0.79 |
| | SM3/SM5 | 0.028 | 0.71 | 0.033 | 0.84 |

SUGGESTED LAND PATTERN



10179 Rev B



SPECIFICATIONS

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

| | | | |
|--|--|-----------------|---------------|
| Fundamental Frequency | <u>16.0 MHz</u> | <u>24.0 MHz</u> | <u>155.52</u> |
| <u>MHz</u> | | | |
| Motional Resistance R_1 (Ω) | 90 | 30 | 25 |
| Motional Capacitance C_1 (fF) | 1.5 | 1.6 | 2.8 |
| Quality Factor Q (k) | 70 | 150 | 16 |
| Shunt Capacitance C_0 (pF) | 0.7 | 0.7 | 1.4 |
| Calibration Tolerance ¹ | ±100 to ±30 ppm, or tighter as required | | |
| Load Capacitance | 9 pF (unless specified otherwise) | | |
| Drive Level | 200 μ W MAX | | |
| Frequency-Temperature Stability ^{1,2} | ±50 ppm to ±10 ppm (Commercial) ±50 ppm to ±20 ppm (Industrial) ±100 ppm to ±30 ppm (Military) | | |
| Aging, first year | 3 ppm MAX (better than 1 ppm available) | | |
| Shock, survival | 5,000 g, 0.3 ms, 1/2 sine | | |
| Vibration, survival ³ | 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.

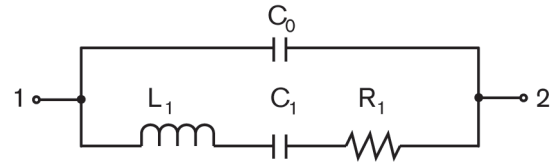
2. Does not include calibration tolerance. The characteristics of the frequency stability over temperature follow that of the AT thickness-shear mode.

3. 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) |

EQUIVALENT CIRCUIT

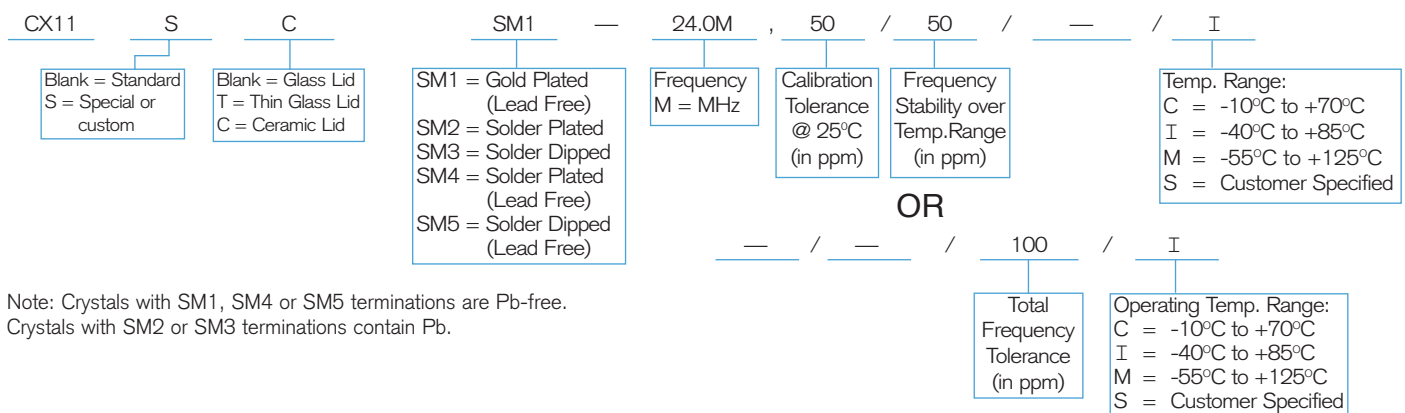


R_1 Motional Resistance L_1 Motional Inductance
 C_1 Motional Capacitance C_0 Shunt Capacitance

PACKAGING OPTIONS

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

HOW TO ORDER CX11 AT CRYSTALS



Note: Crystals with SM1, SM4 or SM5 terminations are Pb-free.
Crystals with SM2 or SM3 terminations contain Pb.