



# 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

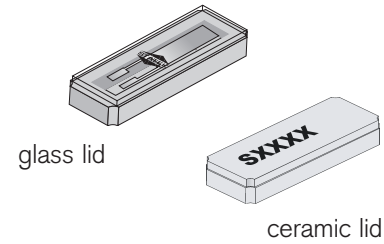
- Medical Telemetry
- Cardiac Rhythm Management
- Medical Telemetry
- Cochlear Implants
- Infusion Pumps

### Military & Aerospace

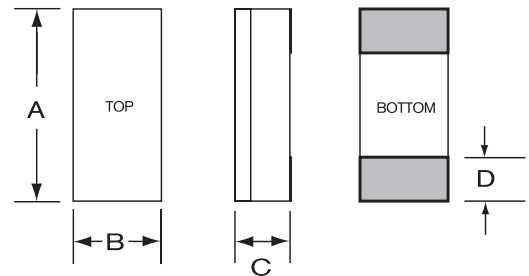
- Avionic Indicators and Instruments
- Cockpit Instrumentation Displays
- Data Communications
- Survival radio

### Industrial, Computer & Communications

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



## PACKAGE DIMENSIONS

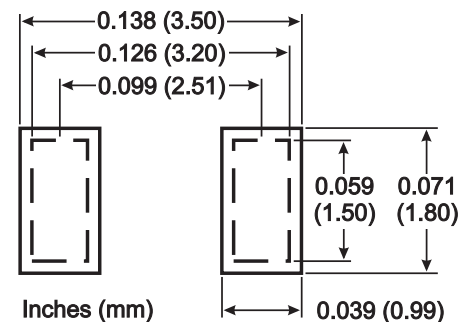


DIM	TYPICAL		MAXIMUM	
	inches	mm	inches	mm
A	0.127	3.20	0.135	3.43
B	0.060	1.50	0.068	1.73
C	-	-	see below	
D	0.027	0.69	0.037	0.94

## 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 $R_1$ ( $\Omega$ )	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 <sup>1</sup>	±100 to ±30 ppm, or tighter as required		
Load Capacitance	9 pF (unless specified otherwise)		
Drive Level	200 $\mu$ W MAX		
Frequency-Temperature Stability <sup>1,2</sup>	±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 <sup>3</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.		

1. Other tolerances available. Contact factory.

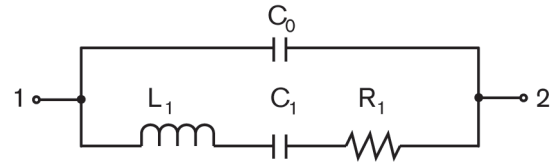
2. Does not include calibration tolerance. The characteristics of the frequency stability over temperature follow that of the AT thickness-shear mode.

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

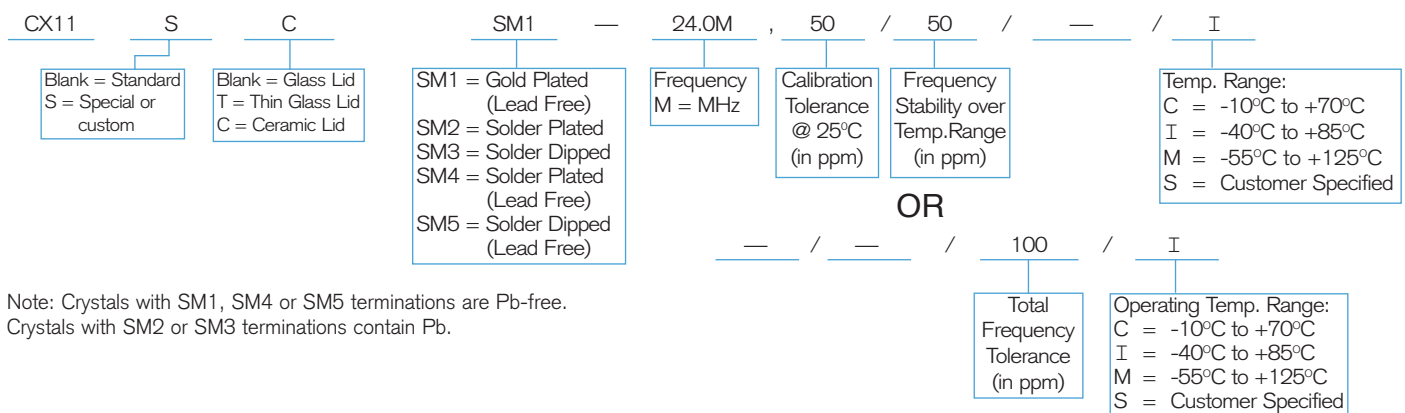


$R_1$  Motional Resistance     $L_1$  Motional Inductance  
 $C_1$  Motional Capacitance     $C_0$  Shunt Capacitance

## 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.