

DESCRIPTION

The CX9SM AT quartz crystal is 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 ageing. Tight calibration and excellent frequency/temperature stability make the CX9SM AT 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 ageing characteristics
- Designed for low power applications
- Full military testing available

APPLICATIONS

Medical

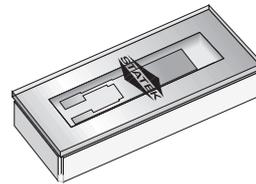
- Neurostimulators
- Medical Telemetry
- Chronic Pain Management
- Cochlear Implants
- Infusion Pumps

Military & Aerospace

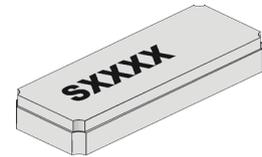
- Avionic Indicators & Instrumnts
- Cockpit Instrumentation Displays
- Data Communications
- Survival Radio

Industrial, Computer & Communications

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

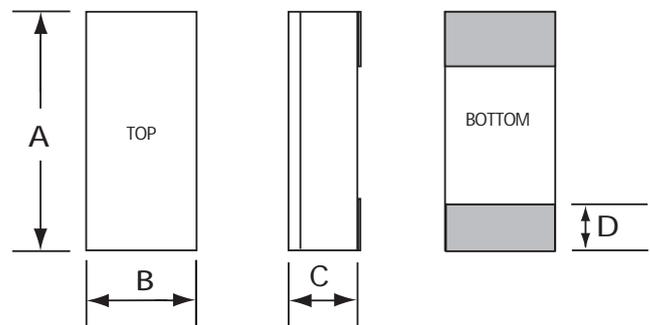


glass lid



ceramic lid

PACKAGE DIMENSIONS



DIM	Typical mm	Maximum mm
A	4.10	4.32
B	1.50	1.73
C	-	see below
D	0.79	0.97

Thickness (Dim C) maximum

	Glass Lid mm	Ceramic Lid mm
Max		
SM1	0.87	0.90
SM2/SM4	0.87	0.90
SM3/SM5	0.91	0.94

SPECIFICATIONS

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

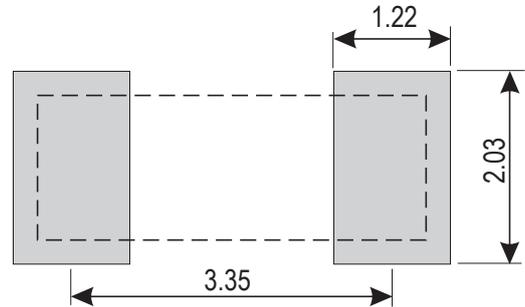
Fundamental Frequency	25 MHz	49 MHz	155.52 MHz
Motional Resistance $R_1(\Omega)$	30	30	25
Motional Capacitance C_1 (fF)	1.8	2.1	2.5
Quality Factor Q (k)	120	60	16
Shunt Capacitance C_0 (pF)	1.0	1.0	1.4
Calibration Tolerance ¹	±100 ppm or tighter as required		
Load Capacitance	10 pF (unless specified otherwise)		
Drive Level	200 µW MAX for $f \leq 50$ MHz 100 µW MAX for $f > 50$ MHz		
Frequency-Temperature Stability ^{1,2}	±50 ppm to ±10 ppm (Commercial) ±100 ppm to ±20 ppm (Industrial) ±100 ppm to ±30 ppm (Military)		
Ageing, 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 sales offices.
- 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 sales offices.
- Per MIL-STD-202G, Method 204D, Condition D. Random vibration testing also available.

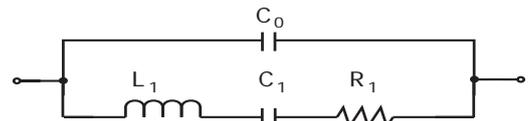
Termination Variants

- SM1 = Gold Plated (RoHS compliant)
- SM2 = Solder Plated (non RoHS compliant)
- SM3 = Solder Dipped (non RoHS compliant)
- SM4 = Solder Plated (RoHS compliant)
- SM5 = Solder Dipped (RoHS compliant)

SUGGESTED LAND PATTERN



EQUIVALENT CIRCUIT



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

PACKAGING OPTIONS

- Tray Pack
- Tape and reel in accordance with EIA-481-D, 1kpcs per reel (please see Application Notes)

ORDERING INFORMATION (*minimum required)

- Frequency*
- Model*
- Lid*
- Termination Variant*
- Frequency Tolerance (@25°C)*
- Frequency Stability over Operating Temperature Range*
- Operating Temperature Range*
- Load Capacitance*
- Overtone

Example

- 20.0MHz CX9 SM AT C SM1
100/100/-55 to 125C/10 FUND