CX9SM AT CRYSTAL

13.5 MHz to 250 MHz

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 13.5 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)
- High shock and vibration survival
- Ultra-miniature, surface mount design
- Available with glass or ceramic lid
- Hermetically sealed ceramic package
- Excellent aging characteristics
- Designed for low power applications
- Full military testing available
- Designed, manufactured and tested in the USA

APPLICATIONS

Medical

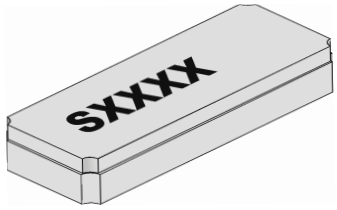
- Medical RF Telemetry
- Cardiac Rhythm Management
- Cochlear Implants
- Infusion Pump

Industrial & Communications

- Down-hole Data Recorder
- Process Control
- Environmental Control
- Telemetry
- Ruggedized Instrumentation

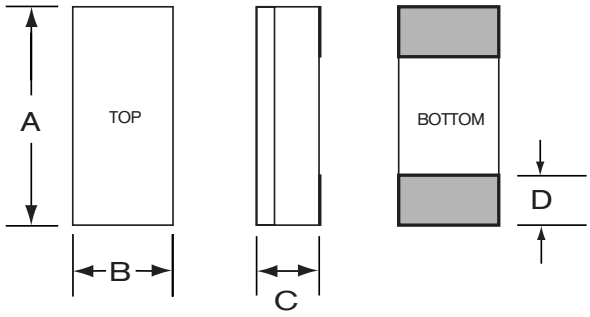
Military & Aerospace

- Smart Munitions
- Missile Telemetry
- Ruggedized Communications
- Aviation Equipment



ceramic lid

PACKAGE DIMENSIONS



	TYPICAL		MAXIMUM	
DIM	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

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

10158 - Rev C

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SPECIFICATIONS

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

Fundamental Frequency	14.7456 MHz	24 MHz	49 MHz
Motional Resistance R_1 (Ω)	65	30	30
Motional Capacitance C_1 (fF)	1.2	1.6	2.1
Quality Factor Q (k)	140	150	60
Shunt Capacitance C_0 (pF)	0.6	0.8	1.0

Calibration Tolerance[1]	± 100 ppm, or tighter as required
Load Capacitance	10 pF (unless specified otherwise)
Drive Level	200 μW MAX for f ≤ 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	100,000 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.

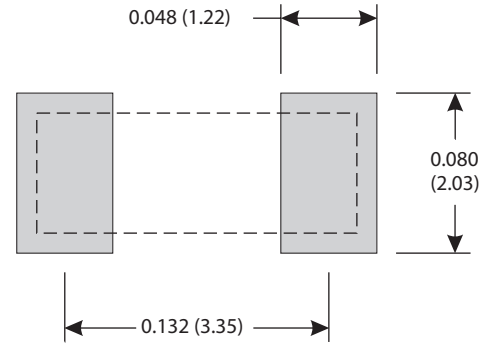
1. Other tolerances available. Contact factory.
2. Does not include calibration tolerance. The characteristics of the frequency stability over temperature follow that of the AT thickness-shear mode.
3. 5 ppm MAX for frequencies below 40 MHz. For tighter tolerances and higher frequencies contact factory.
4. 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)

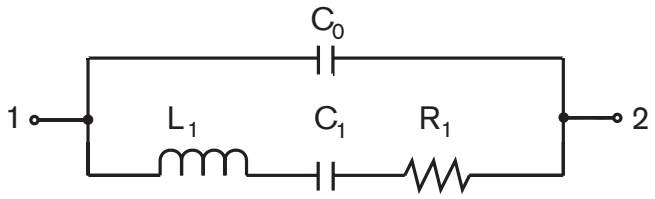
Max Process Temperature 260°C for 20 sec.

SUGGESTED LAND PATTERN



inches (mm)

EQUIVALENT CIRCUIT



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

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

CX9 S HG C SM1 – 49.0M , 100 / 100 / — / I

- S: "S" if special or custom design. Blank if Std.
- HG: HG = High Shock
- C: C = Ceramic Lid, Blank = Glass Lid
- SM1: SM1 = Gold Plated; SM2 = Solder Plated; SM3 = Solder Dipped; SM4 = Solder Plated Lead Free; SM5 = Solder Dipped Lead Free
- 49.0M: Frequency M = MHz
- 100: Calibration Tolerance @ 25°C (in ppm)
- 100: Frequency Stability over Temp.Range (in ppm)
- I: Temp. Range: C = -10°C to +70°C; I = -40°C to +85°C; M = -55°C to +125°C; S = Customer Specified

OR

— / — / 200 / I

- 200: Total Frequency Tolerance (in ppm)
- I: Operating Temp. Range: C = -10°C to +70°C; I = -40°C to +85°C; M = -55°C to +125°C; S = Customer Specified

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