



CX4HGSM AT CRYSTAL

14 MHz to 50 MHz

High Shock, Ultra-Miniature, Low Profile
Surface Mount AT Quartz Crystal

DESCRIPTION

Intended for applications requiring shock survivability up to 100,000 g, Statek's surface-mount CX4HGSM crystals are high-shock versions of the CX4SM crystals.

FEATURES

- High shock and vibration resistance
- Designed for surface mount applications using infrared, vapor phase, or epoxy mount techniques.
- Low profile (less than 1.2 mm) hermetically sealed ceramic package
- Available with glass or ceramic lid
- Custom designs available
- Full military testing available
- Designed and manufactured in the USA

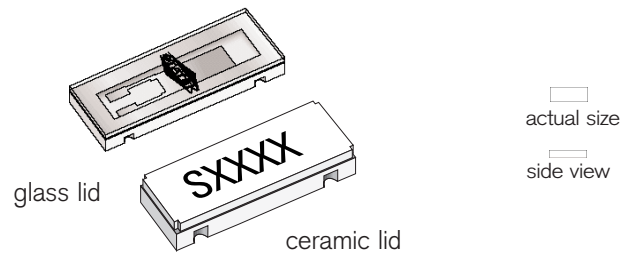
APPLICATIONS

Industrial & Communications

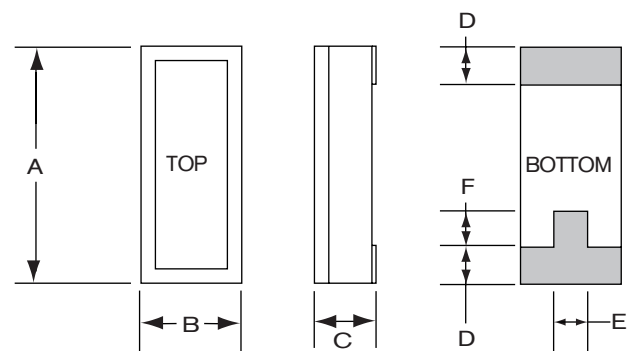
- Down-hole Data Recorder
- Process Control
- Environmental Control
- Engine Control
- Telemetry
- Ruggedized Instrumentation
- Automotive Control

Military & Aerospace

- Smart Munitions
- Timing Devices (Fuzes)
- Surveillance Devices
- Missile Telemetry
- Ruggedized Communications
- Aviation Equipment



PACKAGE DIMENSIONS



DIM	TYPICAL		MAXIMUM	
	inches	mm	inches	mm
A	0.197	5.00	0.210	5.33
B	0.072	1.83	0.085	2.16
C	—	—	see below	
D	0.036	0.91	0.046	1.16
E	0.020	0.51	—	—
F	0.025	0.64	—	—

THICKNESS (DIM C) MAXIMUM

	GLASS LID		CERAMIC LID	
	inches	mm	inches	mm
SM1	0.045	1.14	0.050	1.27
SM2/SM4	0.046	1.17	0.051	1.30
SM3/SM5	0.048	1.22	0.053	1.35



SPECIFICATIONS

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

Fundamental Frequency	14.7456 MHz	16MHz	20 MHz	32 MHz	40 MHz
Motional Resistance R_1 (Ω)	60	75	50	30	30
Motional Capacitance C_1 (ff)	1.4	1.5	1.4	2.5	1.5
Quality Factor Q (k)	120	90	110	70	90
Shunt Capacitance C_0 (pF)	0.8	0.9	0.9	1.1	1.0

Frequency Range ¹	14 MHz to 50 MHz
Calibration Tolerance ²	± 100 ppm, or tighter as required
Load Capacitance	10 pF (unless specified otherwise)
Drive Level	200 μ W MAX
Frequency-Temperature Stability ^{2,3}	± 50 ppm to ± 10 ppm (Commercial) ± 100 ppm to ± 20 ppm (Industrial) ± 100 ppm to ± 30 ppm (Military)
Aging, first year ⁴	10 ppm MAX
Shock, survival	Up to 100,000 g, 0.5 ms, 1/2 sine
Vibration, survival ⁵	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

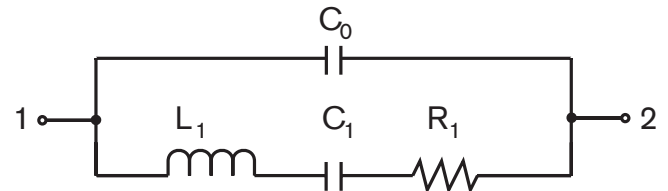
- Other frequencies available. Contact factory.
- Other tolerances available. Contact factory.
- Does not include calibration tolerance. The characteristics of the frequency stability over temperature follow that of the AT thickness-shear mode.
- Lower aging available at low shock levels.
- Per MIL-STD-202G, 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)

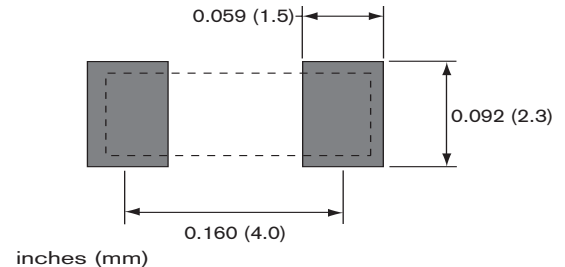
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EQUIVALENT CIRCUIT



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

SUGGESTED LAND PATTERN



PACKAGING OPTIONS

- Tray Pack
- Tape and Reel
Per EIA 481 (see Tape and Reel data sheet 10109)

HOW TO ORDER CX4HGSMT AT CRYSTALS

CX4	S	HG1	C	SM1	-	32.0M	,	100	/	100	/	-	/	I
	"S" if special or custom design. Blank if standard	Shock Level HG1 = 10,000 g HG2 = 20,000 g HG3 = 30,000 g HG4 = 50,000 g HG5 = 75,000 g HG6 = 100,000 g	C = Ceramic Lid Blank = Glass Lid	Termination SM1 = Gold Plated SM2 = Solder Plated SM3 = Solder Dipped SM4 = Solder Plated (Lead Free) SM5 = Solder Dipped (Lead Free)		Frequency M = MHz		Calibration Tolerance @25°C (in ppm)		Frequency Stability over Temp. Range				Operating 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
										Total Frequency Tolerance (in ppm)				Operating Temp. Range: C = -10°C to +70°C I = -40°C to +85°C M = -55°C to +125°C S = Customer Specified

10165 Rev B