



CX1SM AT-CUT CRYSTAL

6 MHz to 250 MHz
Surface Mount Quartz Crystal

DESCRIPTION

High performance, fundamental mode, AT-Cut quartz crystals designed and manufactured for high-reliability applications.

FEATURES

- Hermetically sealed ceramic package
- Excellent aging characteristics
- High shock and vibration resistance
- Custom designs available
- Full military testing available
- Designed and manufactured in the USA

APPLICATIONS

Medical

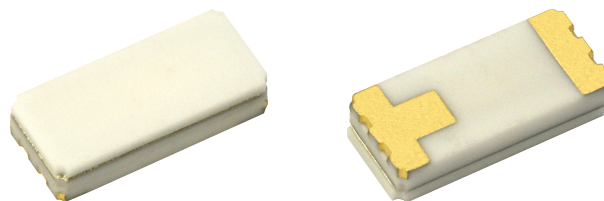
- Infusion Pumps
- Monitoring Equipment

Industrial, Computer & Communications

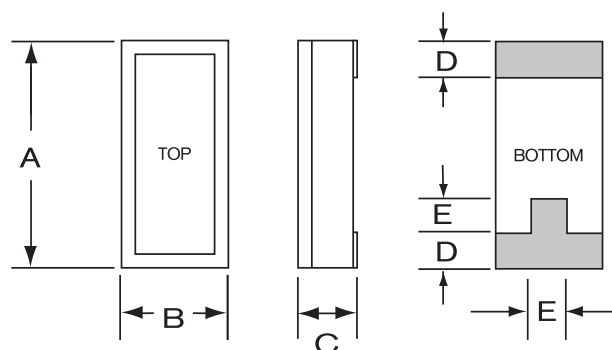
- Instrumentation
- Process Control
- Environmental Control
- Telemetry

Military & Aerospace

- Communications
- Satellite Command and Control
- Cockpit Electronics
- Smart Munitions
- Timing Devices (Fuzes)

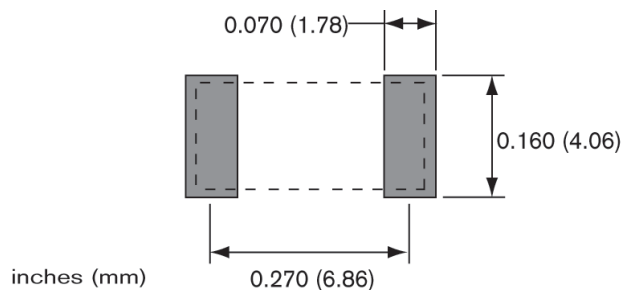


PACKAGE DIMENSIONS



DIM	Termination	TYPICAL		MAXIMUM	
		inches	mm	inches	mm
A		0.315	8.00	0.330	8.38
B		0.140	3.56	0.155	3.94
C	SM1	—	—	0.070	1.78
C	SM2/SM4	—	—	0.072	1.83
C	SM3/SM5	—	—	0.075	1.90
D		0.045	1.14	0.055	1.40
E		0.060	1.52	0.070	1.78

SUGGESTED LAND PATTERN



SPECIFICATIONS

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

Fundamental Frequency	10 MHz	32 MHz	155.52 MHz
Motional Resistance R_1 (Ω)	30	25	15
Motional Capacitance C_1 (fF)	5.5	6.2	4.0
Quality Factor Q (k)	100	30	30
Shunt Capacitance C_0 (pF)	2.2	2.3	2.3
Calibration Tolerance ¹	± 100 ppm, or tighter as required		
Load Capacitance ²	20 pF for $f \leq 50$ MHz 10 pF for $f > 50$ MHz		
Drive Level	500 μ W MAX for $f \leq 50$ MHz 200 μ W 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 ⁴	5 ppm MAX (better than 1 ppm available)		
Shock, survival ⁵	3,000 g, 0.3 ms, $\frac{1}{2}$ sine		
Vibration, survival ⁶	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. Unless specified otherwise.
3. Does not include calibration tolerance. The characteristics of the frequency stability over temperature follow that of the AT thickness-shear mode.
4. 5 ppm MAX for frequencies below 40 MHz. For tighter tolerances and higher frequencies contact factory.
5. Higher shock version available. Refer to data sheet model CX1HGSM AT (10108).
6. Per MIL-STD-202G, Method 204D, Condition D. Random vibration testing also available.

HOW TO ORDER CX1SM AT CRYSTALS

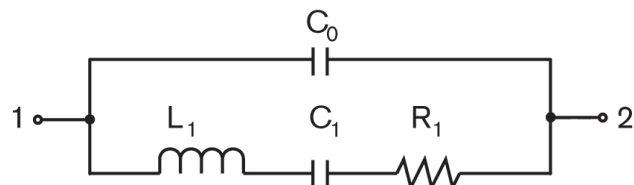
CX1	S	C	SM1	—	32.0M	,	100	/	100	/	—	/	I	
Special Blank = Standard S = Special or Custom		Lid C = Ceramic Lid	Terminations SM1 = Gold Plated (Lead Free) SM2 = Solder Plated SM3 = Solder Dipped SM4 = Solder Plated (Lead Free) SM5 = Solder Dipped(Lead Free)		Frequency M = MHz		Calibration Tolerance @ 25°C (in ppm)		Frequency Stability over Temp. Range (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			
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		

TERMINATIONS

Designation	Termination
SM1	Gold Plated (Lead Free)
SM2	Solder Plated
SM3	Solder Dipped
SM4	Solder Plated (Lead Free)
SM5	Solder Dipped (Lead Free)

Max Process Temperature 260°C for 20 sec.

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)