



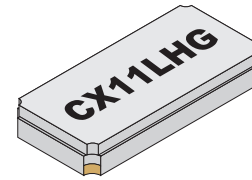
# CX11LHG AT CRYSTAL

16 MHz to 50 MHz

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

## DESCRIPTION

CX11LHG is a high performance quartz crystal designed to survive the most extreme shock and high vibration application environments. Low acceleration sensitivity and low aging performance meets the most demanding requirements. Available with tight calibration tolerances and high stability over temperature.



## FEATURES

- Mechanical shock survivability up to 75,000 g
- Ultra-low profile - typical height of 0.5 mm
- Low acceleration sensitivity available
- Hermetically sealed ceramic package
- Excellent aging characteristics
- Full military testing available
- Designed, manufactured and tested in the USA

## APPLICATIONS

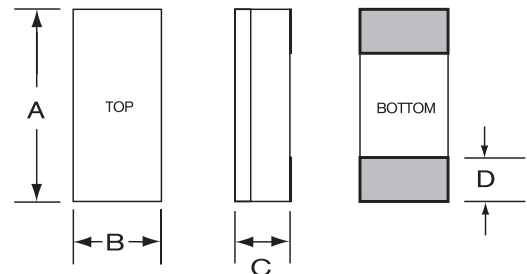
### Industrial & Communications

- 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

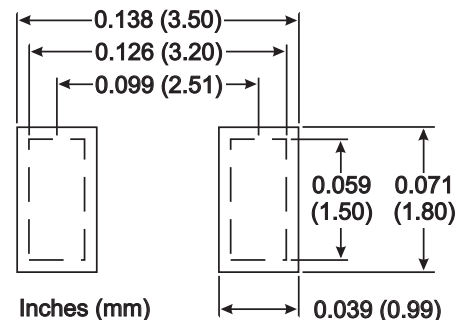


DIM	TYPICAL		MAXIMUM	
	inches	mm	inches	mm
A	0.127	3.20	0.135	3.43
B	0.060	1.50	0.068	1.73
C	see below			
D	0.028	0.71	0.037	0.94

## THICKNESS (DIM C)

Termination	Typical		Maximum	
	inches	mm	inches	mm
SM1	0.020	0.51	0.023	0.59
SM2/SM4	0.021	0.53	0.024	0.60
SM3/SM5	0.023	0.58	0.025	0.63

## SUGGESTED LAND PATTERN



## SPECIFICATIONS

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

Fundamental Frequency <sup>1</sup>	<u>16.0 MHz</u>	<u>24.0 MHz</u>	<u>32.0 MHz</u>
Motional Resistance $R_1$ ( $\Omega$ )	85	30	25
Motional Capacitance $C_1$ (fF)	1.5	1.6	1.9
Quality Factor Q (k)	80	150	110
Shunt Capacitance $C_0$ (pF)	0.7	0.7	0.9
Calibration Tolerance <sup>2</sup>	±100 to ±30 ppm, or tighter as required		
Load Capacitance	10 pF (unless specified otherwise)		
Drive Level	200 $\mu$ W MAX		
Frequency-Temperature Stability <sup>2,3</sup>	±50 ppm to ±10 ppm (Commercial) ±50 ppm to ±20 ppm (Industrial) ±100 ppm to ±30 ppm (Military)		
Aging, first year	5 ppm MAX		
Shock, survival	up to 75,000 g, 0.3 ms, 1/2 sine		
Vibration, survival <sup>4</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.		

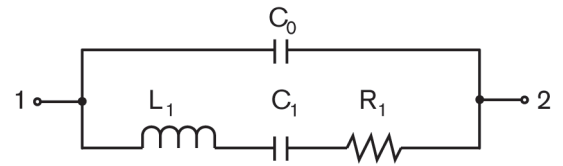
- For frequencies above 50 MHz contact factory.
- Other tolerances available. Contact factory.
- Does not include calibration tolerance. The characteristics of the frequency stability over temperature follow that of the AT thickness-shearmode.
- Per MIL-STD-202G, Method 204D, Condition D. Random vibration 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.

## 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 LOW PROFILE CX11LHG AT CRYSTALS

