HIGH TEMPERATURE CRYSTALS

High Temperature/High Shock/High Frequency

DESCRIPTION

An increasing number of applications require the use of high-temperature crystals. For these applications, Statek offers the CX1 **HT**, CX4 **HT**, and CX9 **HT** crystals. These crystals are designed to operate at temperatures up to and including 225°C. The frequency range offered is 6 MHz to 250 MHz for CX1**HT** and 14 MHz to 250 MHz for CX4**HT** and CX9**HT** crystals. The expected life at 200°C is in excess of 1,000 hours.

CX1HT	CX4HT	CX9HT
6 MHz - 250 MHz	14 MHz - 250 MHz	14 MHz - 250 MHz

FEATURES

- High temperature operation up to 225 °C
- High shock resistance
- Hermetically sealed ceramic package

APPLICATIONS

Industrial

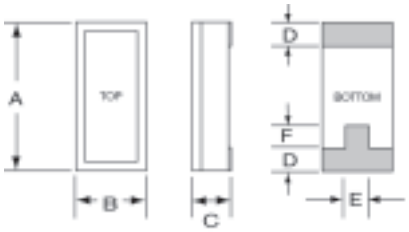
- Downhole instrumentation
- Rotary shaft sensors
- Underground boring tools

DIMENSIONS

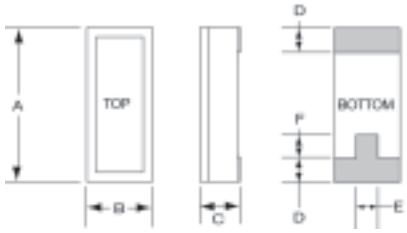
	CX1HT MAXIMUM		CX4HT MAXIMUM		CX9HT MAXIMUM	
DIM	inches	mm	inches	mm	inches	mm
A	0.330	8.38	0.210	5.33	0.170	4.32
B	0.155	3.94	0.085	2.16	0.068	1.73
C (SM1)	0.070	1.78	0.050	1.27	0.038	0.97
C (SM5)	0.075	1.90	0.053	1.35	0.040	1.02
D	0.055	1.40	0.046	1.16	0.038	0.97
E	0.070	1.78	0.020	0.51	———	
F	0.070	1.78	0.025	0.64	———	

PACKAGE DIMENSIONS

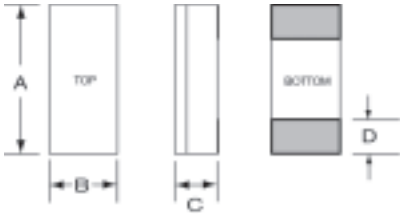
CX1HT



CX4HT

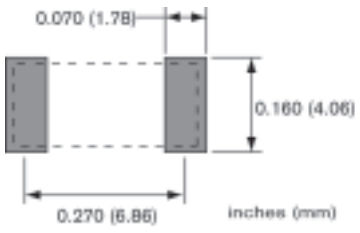


CX9HT

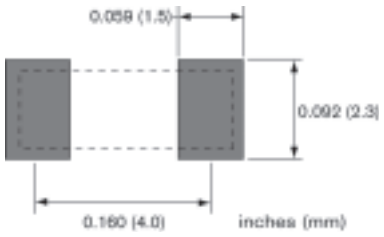


SUGGESTED LAND PATTERN

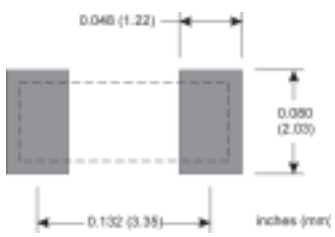
CX1HT



CX4HT



CX9HT



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SPECIFICATIONS

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

Frequency Range	See Specifications Table below
Calibration Tolerance[1]	± 100 ppm, or tighter, as required
Operating Temperature Range	-55°C up to +225°C
Frequency-Temperature Stability[2]	± 125 ppm for -55°C to +150°C ± 150 ppm for -55°C to +175°C ± 175 ppm for -55°C to +200°C ± 250 ppm for -55°C to +225°C
Total Tolerance[3]	± 200 ppm for +25°C to +200°C ± 300 ppm for +25°C to +225°C
Aging, first year	5 ppm at 25°C
Shock, survival	CX1HT: 1,000 g, 1 ms, ½ sine CX4HT: 5,000 g, 0.3 ms, ½ sine CX9HT: 5,000 g, 0.3 ms, ½ sine
Vibration, survival	20 g RMS, 10-2,000 Hz

1. Tighter frequency calibration available. Contact factory
2. Does not include calibration tolerance. The characteristics of the frequency stability over temperature follow that of the thickness-shear mode.
3. Includes calibration tolerance.
4. Higher shock and vibration available.

ABSOLUTE MAXIMUM RATINGS

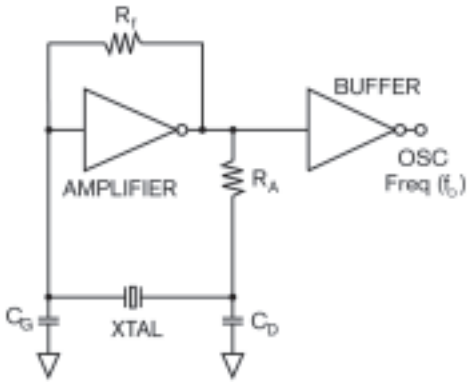
Storage Temperature	-55°C to 125°C
Maximum Process Temperature	260°C for 20 seconds

PACKAGING OPTIONS

- Tray Pack
- 16 mm tape, 7" or 13" reels

Per EIA 481 (see Tape and Reel data sheet # 10109)

CONVENTIONAL CMOS PIERCE OSCILLATOR CIRCUIT



SPECIFICATIONS TABLE[1] (Specifications shown are typical unless otherwise noted.)

	Frequency Range	Motional Resistance R1 @ 25°C	Motional Capacitance C1 @ 25°C	Shunt Capacitance C0 @ 25°C	Quality Factor Q @ 25°C	Load Capacitance CL Load	Drive Level
CX1HT	6 MHz to 250 MHz	30 Ω @ 10 MHz 25 Ω @ 32 MHz	5.5 fF @ 10 MHz 6.2 fF @ 32 MHz	2.2 pF @ 10 MHz 2.3 pF @ 32 MHz	100 K @ 10 MHz 30 K @ 32 MHz	10 pF	500 µW MAX. for f < 50 MHz 200 µW MAX. for f > 50 MHz
CX4HT	14 MHz to 250 MHz	75 Ω @ 16 MHz 30 Ω @ 32 MHz	1.5 fF @ 16 MHz 2.5 fF @ 32 MHz	0.9 pF @ 16 MHz 1.1 pF @ 32 MHz	90 K @ 16 MHz 70 K @ 32 MHz	10 pF	200 µW MAX. for f < 50 MHz 100 µW MAX. for f > 50 MHz
CX9HT	14 MHz to 250 MHz	30 Ω @ 25 MHz 30 Ω @ 49 MHz	1.8 fF @ 25 MHz 2.1 fF @ 49 MHz	1.0 pF @ 25 MHz 1.0 pF @ 49 MHz	120K @ 25 MHz 60 K @ 49 MHz	10 pF	200 µW MAX. for f < 50 MHz 100 µW MAX. for f > 50 MHz

1. For more detailed specifications on high frequency crystals, refer to standard high frequency crystal datasheets (CX1SM, CX4 SM and CX9SM.)

HOW TO ORDER CX1HT, CX4HT and CX9HT CRYSTALS

CX4HT	S	HG	C	SM1	20.0M	,	—	/	—	/	200	/	H
CX1HT CX4HT CX9HT	"S" if special or custom design. Blank if Std.	HG = High Shock otherwise leave blank	C = Ceramic Lid	Terminations* SM1 = Gold Plated 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)		Total Frequency Tolerance (in ppm)		Temp. Range: H = 25°C to 200°C S = Customer Specified Temp. Range

OR

100	/	175	/	—	/	H
Calibration Tolerance @ 25°C (in ppm)		Frequency Stability over Temp. Range (in ppm)		Total Frequency Tolerance (in ppm)		Temp. Range: H = 25°C to 200°C S = Customer Specified Temp. Range

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