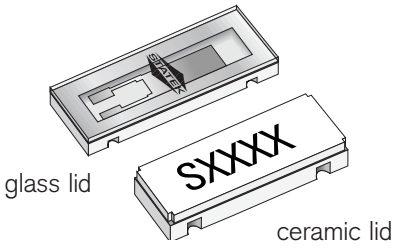
CX4SM AT CRYSTAL

14 MHz to 250 MHz

Ultra-Miniature, Low Profile
Surface Mount AT Quartz Crystal

DESCRIPTION

STATEK's ultra-miniature CX4SM AT crystals in leadless ceramic packages are designed for surface mounting on printed circuit boards or hybrid substrates. These crystals are low profile and have a very small land pattern.



FEATURES

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

APPLICATIONS

Medical

- Neurostimulators
- Cochlear Implants
- Implantable CRM
- Infusion Pumps
- Glucose Monitors

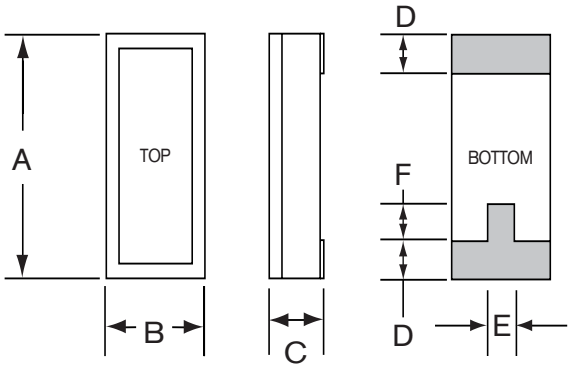
Industrial, Computer & Communications

- Instrumentation
- Process Control
- Environmental Control
- Engine Control
- Handheld Inventory Control
- Down-hole Data Recorder
- Telemetry

Military & Aerospace

- Communications Radio
- Smart Munitions
- Timing Devices (Fuzes)
- Surveillance Devices

PACKAGE DIMENSIONS



	TYPICAL		MAXIMUM	
DIM	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

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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	16MHz	20 MHz	32 MHz	40 MHz	80 MHz	160 MHz	200 MHz
Motional Resistance R_1 (Ω)	60	75	50	30	30	30	30	40
Motional Capacitance C_1 (fF)	1.4	1.5	1.4	2.5	1.5	1.8	2.5	2.0
Quality Factor Q (k)	120	90	110	70	90	40	20	15
Shunt Capacitance C_0 (pF)	0.8	0.9	0.9	1.1	1.0	1.0	1.5	1.5

Calibration Tolerances[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[4]	5,000 g, 0.3 ms, ½ 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.

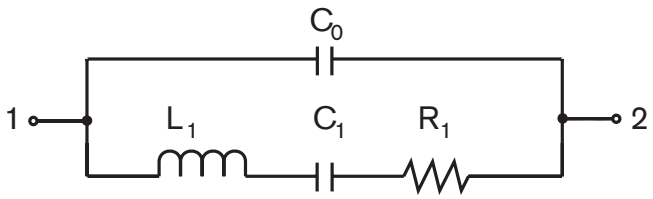
1) Other tolerances available. Contact factory.
2) Does not include calibration tolerance. The characteristics of the frequency stability over temperature follow that of the AT thickness-shear mode.
3) 5 ppm MAX for frequencies below 40 MHz. For tighter tolerances and higher frequencies contact factory.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

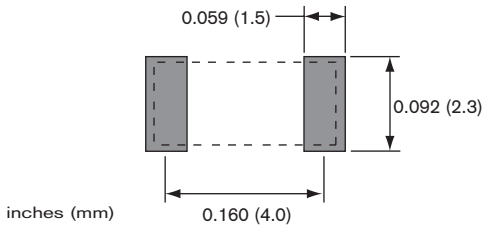
Max Process Temperature 260°C for 20 sec.

EQUIVALENT CIRCUIT



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

SUGGESTED LAND PATTERN



PACKAGING OPTIONS

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

HOW TO ORDER CX4SM AT CRYSTALS

CX4 S C SM1 – 32.0M , 100 / 100 / — / I

- S: "S" if special or custom design. Blank if standard
- C: C = Ceramic Lid, Blank = Glass Lid
- SM1: SM1 = Gold Plated (Lead Free); SM2 = Solder Plated; SM3 = Solder Dipped; SM4 = Solder Plated (Lead Free); SM5 = Solder Dipped (Lead Free)
- 32.0M: Frequency M = MHz
- 100: Calibration Tolerance @25°C (in ppm)
- 100: Frequency Stability over Temp. Range
- 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

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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