

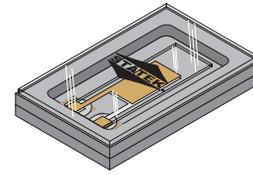


# CX17SM AT CRYSTAL

12 MHz to 200 MHz  
Ultra-Miniature, Ultra-Low Profile  
Surface Mount AT Quartz Crystal

## DESCRIPTION

The CX17SM is a miniature, low profile, surface-mount AT quartz crystal that is ideal for many applications.



## FEATURES

- Small footprint (4.8 mm x 3.0 mm typical)
- Low profile (0.90 mm typical)
- Designed for surface-mount applications
- High shock and vibration resistance
- Custom designs available
- Full military testing available
- Designed and manufactured in the USA

## APPLICATIONS

### Medical

- Medical telemetry

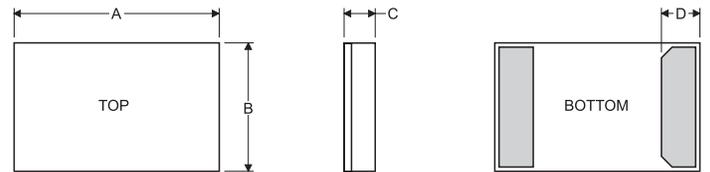
### Industrial, Computer, & Communications

- Instrumentation
- Handheld devices

### Military & Aerospace

- Communications
- Smart munitions
- Surveillance devices
- Projectile telemetry

## PACKAGE DIMENSIONS



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Dimension	Minimum mm	Typical mm	Maximum mm
A	4.70	4.80	4.90
B	2.90	3.00	3.10
C	See below		
D	0.80	0.90	1.00

## THICKNESS (DIM C)

Lid	Termination	Minimum mm	Typical mm	Maximum mm
Glass	SM1	0.80	0.90	1.00
	SM2/SM4	0.82	0.92	1.02
	SM3/SM5	0.83	0.94	1.05

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## SPECIFICATIONS

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

Fundamental Frequency	12 MHz	20 MHz	32 MHz
Motional Resistance $R_1$ ( $\Omega$ )	35	15	10
Motional Capacitance $C_1$ (fF)	2.8	4.2	5.4
Quality Factor Q (k)	130	120	90
Shunt Capacitance $C_0$ (pF)	1.1	1.2	1.5

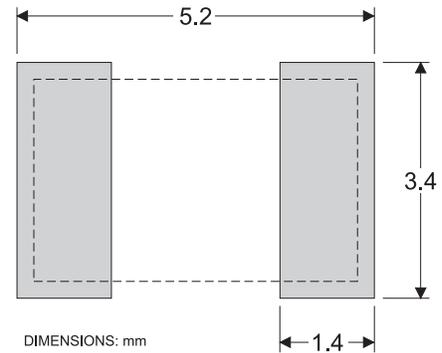
Calibration Tolerance <sup>1</sup>	±100 ppm, or tighter as required
Load Capacitance <sup>2</sup>	10 pF
Drive Level <sup>3</sup>	50 $\mu$ W nominal, 500 $\mu$ W MAX
Frequency-Temperature Stability <sup>1,4</sup>	±50 ppm to ±10 ppm (Commercial) ±100 ppm to ±20 ppm (Industrial) ±100 ppm to ±30 ppm (Military)
Aging, first year <sup>5</sup>	5 ppm MAX (better than 1 ppm available)
Shock, survival <sup>6</sup>	5,000 g, 0.3 ms, 1/2 sine
Vibration, survival <sup>7</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 s

1. Other tolerances available. Contact factory.
2. Unless specified otherwise.
3. Crystals are characterized and tested at 50  $\mu$ W, unless specified otherwise. Operation at higher drive levels can result in sub-optimal behavior.
4. Does not include calibration tolerance. The characteristics of the frequency stability over temperature follow that of the AT thickness-shear mode.
5. 5 ppm MAX for frequencies 50 MHz and lower. For tighter tolerances and higher frequencies contact factory.
6. Higher shock version available.
7. Per MIL-STD-202G, Method 204D, Condition D. Random vibration testing also available.

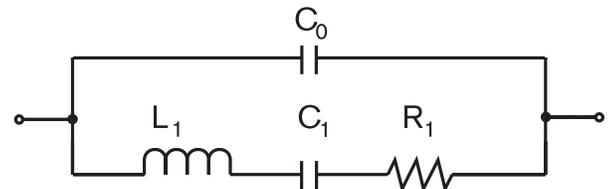
## TERMINATIONS

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

## SUGGESTED LAND PATTERN



## EQUIVALENT CIRCUIT



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

## PACKAGING OPTIONS

- Tray Pack

## HOW TO ORDER CX17SM AT CRYSTALS

CX17	S	SM1	-	20.0M	,	100	/	100	/	-	/	I
Blank = Standard S = Special or custom	Blank = Glass Lid	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

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