

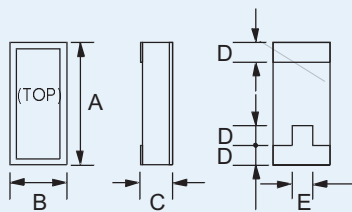
**CX-3-SM**  
**9.6MHz to 160MHz**  
 LOW-PROFILE  
 MINIATURE AT-CUT  
 SMD CRYSTAL

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## General Description

CX-3-SM AT-cut crystals are leadless devices designed for surface-mounting on printed circuit boards or hybrid circuits. The crystals are low profile with a very small land area.



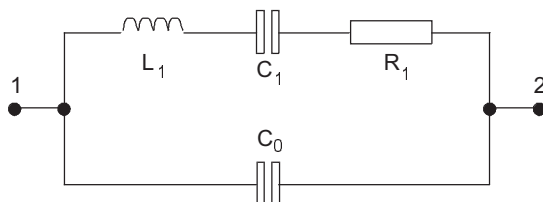
Outline

### CX-3-SM Package Dimensions

Dimension	Typical (mm)	Maximum (mm)
A	6.73	7.11
B	2.62	2.90
C	-	see below
D	1.27	1.52
E	1.32	1.57

Dimension "C"	Glass Lid (mm max.)	Ceramic Lid (mm max.)
SM1	1.47	1.75
SM2	1.52	1.80
SM3	1.60	1.88

### Equivalent Circuit



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

- Designed for surface-mount applications using infrared, vapour phase, wave solder or epoxy mount techniques
- Ideal for use with microprocessors
- Designed for low power applications
- Compatible with hybrid or PCB mounting
- Low ageing
- Full military environmental testing available
- Custom designs available

## Specification

<b>Frequency Range:</b>	9.6MHz to 160MHz
<b>Calibration Tolerance*:</b>	A: ±0.01% (±100ppm) B: ±0.1% C: ±1.0%
<b>Load Capacitance:</b>	20pF (unless other specified)
<b>Motional Resistance (<math>R_1</math>):</b>	see table below
<b>Motional Capacitance (<math>C_1</math>):</b>	see table below
<b>Quality Factor (Q):</b>	see table below
<b>Shunt Capacitance (<math>C_0</math>):</b>	see table below
<b>Drive Level:</b>	500µW max.
<b>Frequency Stability Temp**:</b>	-10° to +70°C from ±10ppm -40° to +85°C from ±20ppm -55° to +125°C from ±30ppm
<b>Ageing, first year:</b>	±5ppm max.
<b>Shock, survival***:</b>	3,000g peak, 0.3ms, 1/2 sine
<b>Vibration, survival:</b>	20g rms 10-2,000Hz random
<b>Operating Temperature:</b>	-10°~+70°C (commercial) -40°~+85°C (industrial) -55°~+125°C (military)
<b>Storage Temperature:</b>	-55°C~+125°C
<b>Max. Process Temperature:</b>	260°C for 20 seconds

Note: temperature stability characteristics follow those of AT-cut thickness-shear mode.

Specifications are typical at 25°C unless otherwise indicated.

\* Closer frequency calibration available

\*\* Other turning point available

\*\*\* Higher shock version available

### CX-3-SM Motional Parameters, Q and $C_0$

Frequency	Motional Resistance $R_1$ ( $\Omega$ )	Motional Capacitance $C_1$ (fF)	Quality Factor '000s	Shunt Capacitance $C_0$ (pF)
10.0MHz	60	2.8	95	1.4
32MHz	20	7.8	36	2.4
155MHz	50	0.5	41	3.2

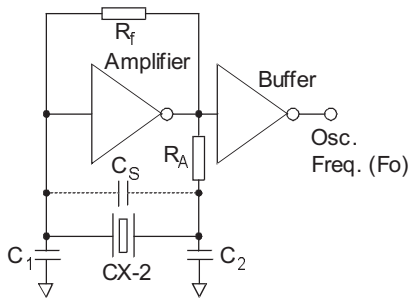
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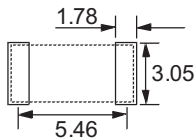
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## Circuit Design

### Conventional HCMOS Pierce Oscillator Circuit



## Solder Pad Layout



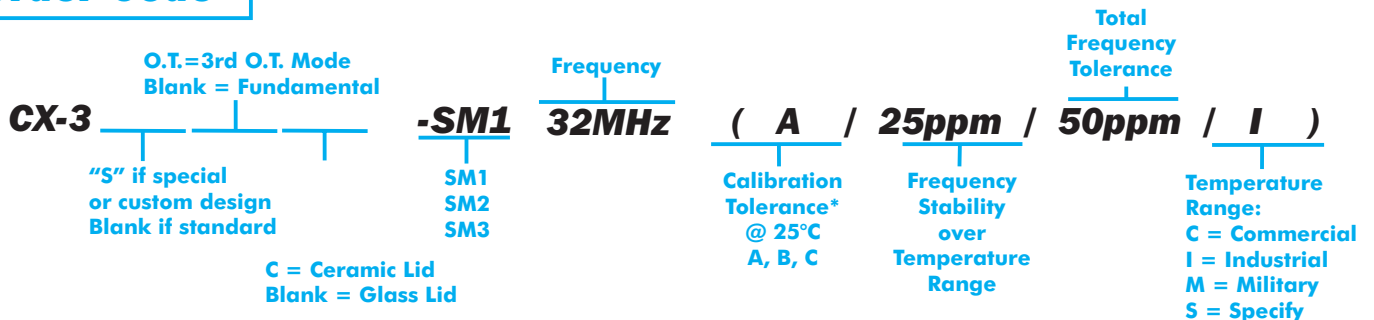
## Packaging

- CX-3H-SM- Bulk Pack (Standard)
- 16mm tape, 178mm or 330mm reels (Optional) per EIA 481
  - Tray Pack (Optional)

## Terminations

Designation	Termination
SM1	Gold Plated
SM2	Nickel, Silver Plated
SM3	Nickel, Solder Plated and Solder Dipped

## Order Code



\*For other calibration tolerances enter figure in ppm