CX-1V-SM

10kHz to 600kHz

MINIATURE SMD CRYSTAL
FOR PIERCE OSCILLATORS

EUROQUARTZ

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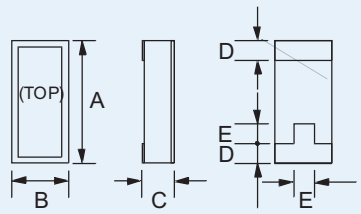
- Miniature tuning-fork design
- High shock resistance
- Designed for low-power applications
- Compatible with hybrid or PC board packaging
- Low ageing
- Full military environmental testing available
- Ideal for battery operated applications

General Description

The miniature CX-1V-SM quartz crystal is a high quality tuning-fork resonator for use in Pierce (single inverter) oscillators. The CX-1V-SM is hermetically sealed in a rugged, leadless ceramic package. The crystal has been designed for surface-mounting on printed circuit boards or hybrid circuits. The CX-1-SM crystal is manufactured using a photo-lithographic process, yielding consistently high quality production parts.



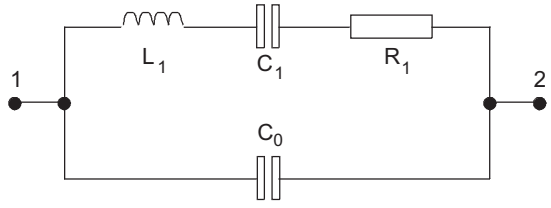
Outline

CX-1-SM Package Dimensions

Dimension	Typical (mm)	Maximum (mm)
A	8.00	8.38
B	3.56	3.94
C	-	see below
D	1.14	1.40
E	1.52	1.78

Dimension "C"	Glass Lid (mm max.)	Ceramic Lid (mm max.)
SM1	1.65	1.78
SM2	1.70	1.83
SM3	1.78	1.90

Equivalent Circuit



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

Specification

Frequency Range:	10kHz to 600kHz
Calibration Tolerance*:	A, B or C (see table)
Motional Resistance (R_1):	Figure 1 Max.: 10 ~ 169.9kHz, 2x typ. 170~600kHz, 2.5x typ.
Motional Capacitance (C_1):	Figure 2
Quality Factor (Q):	Figure 3 Min. is 0.25x typ.
Shunt Capacitance (C_0):	2.0pF max.
Drive Level:	10~24.98kHz 1.5µW max. 25~600kHz 1.0µW max.
Turning Point (T_0):**	Figure 4
Temperature Coefficient:	-0.035ppm/°C²
Ageing, first year:	±5ppm max.
Shock, survival*:**	1000g 1ms, ½ sine
Vibration, survival*:**	20g rms, 10-2,000Hz random
Operating Temperature:	-10°~+70°C (commercial) -40°~+85°C (industrial) -55°~+125°C (military)
Storage Temperature:	-55°C~+125°C
Process Temperature:	260°C for 20 seconds

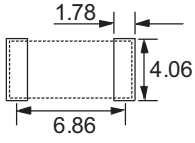
Specifications are typical at 25°C unless otherwise indicated.

* Tighter frequency calibration available
** Other turning point available
*** Higher shock and vibration version available

CX-1V-SM Crystal Calibration Tolerance at 25°C

Calibration	Frequency Range (kHz)			
	10~74.9	75~169.9	170~249.9	250~600
A	±0.003%	±0.005%	±0.01%	±0.02%
B	±0.01%	±0.01%	±0.02%	±0.05%
C	±0.1%	±0.1%	±0.2%	±0.5%

Solder Pad Layout



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Circuit Design

Conventional HCMOS Pierce Oscillator Circuit

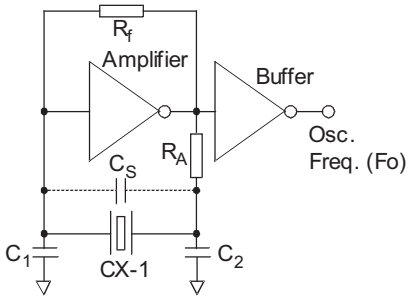


Figure 1 - CX-1V Typical Motional Resistance (R_1)

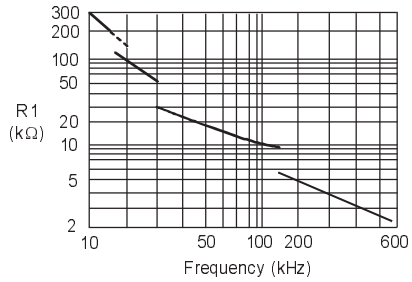


Figure 2 - CX-1V Typical Motional Capacitance (C_1)

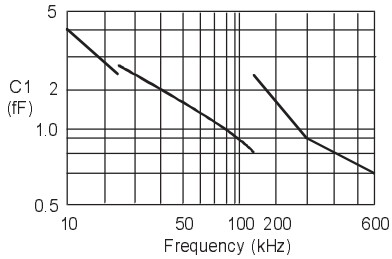


Figure 3 - CX-1V Typical Quality Factor (Q)

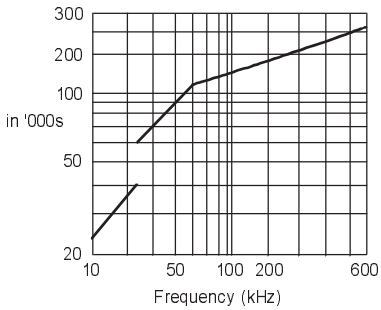
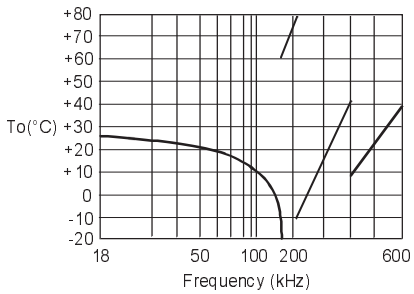


Figure 4 - CX-1V Typical Turning Point Temp. (°C)



Terminations

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

Packaging

CX-1V-SM - Bulk Pack (Standard)
- 16mm tape, 178mm or 330mm reels (Optional) per EIA 481
- Tray Pack (Optional)

Order Code

CX-1V [C = Ceramic Lid / Blank = Glass Lid] **-SM1** **32.768kHz** (**A** / **I**)

- [C = Ceramic Lid / Blank = Glass Lid]: "S" if special or custom design; Blank if standard
- -SM1: SM1, SM2, SM3
- 32.768kHz: Frequency
- (A / I): Calibration Tolerance* @ 25°C: A, B, C
- (A / I): Temperature Range: C = Commercial, I = Industrial, M = Military, S = Specify

*For other calibration tolerances enter figure in ppm