

CX-1V-03

10kHz to 600kHz

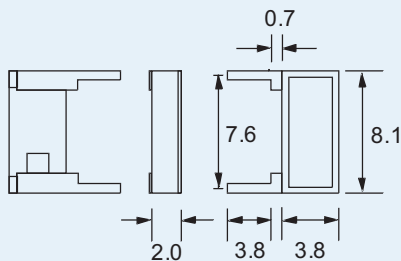
MINIATURE QUARTZ CRYSTAL
FOR PIERCE OSCILLATORS

Page
1 of 2

Telephone: +44(0)1460 230000
Fax: +44(0)1460 230001
Email: sales@euroquartz.co.uk
Web: www.euroquartz.co.uk

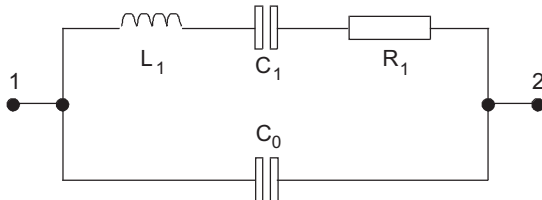
General Description

The CX-1V quartz crystal is a high quality tuning fork resonator designed for use in Pierce (single inverter) oscillators. The CX-1V is hermetically sealed in a rugged, miniature ceramic package, a quarter the size of an eight pin dual-in-line package. The crystal is manufactured utilizing a photo-lithographic process, ensuring consistency and repeatability of electrical characteristics.



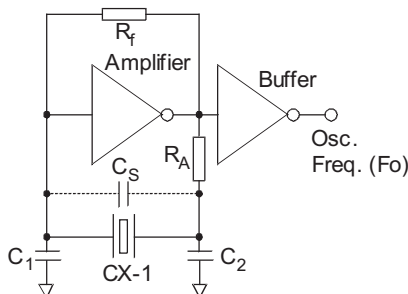
Outline and Dimensions

Equivalent Circuit



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

Conventional HCMOS Pierce Oscillator Circuit



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

Specification

Frequency Range:	10kHz to 600kHz
Calibration Tolerance*:	A, B, or C (see table below)
Motional Resistance (R_1):	Figure 1 2x Typ. @ 10~169.9kHz 2.5x Typ. @ 170~600kHz
Motional Capacitance (C_1):	Figure 2
Quality Factor (Q):	Figure 3 (Minimum is 0.25x Typ.)
Shunt Capacitance (C_0):	2.0pF max.
Drive Level:	0.5 μ W max. @ 10~24.9kHz 1.0 μ W max. @ 25~600kHz
Turning Point (T_0)**:	Figure 4
Temperature Coefficient (k):	-0.035ppm/ $^{\circ}$ C ²
Ageing, first year:	\pm 5ppm max.
Shock, survival***:	1,000g 1ms, 1/2 sine
Vibration, survival***:	20g rms 10 - 2,000Hz
Operating Temperature:	-10 $^{\circ}$ ~+70 $^{\circ}$ C (commercial) -40 $^{\circ}$ ~+85 $^{\circ}$ C (industrial) -55 $^{\circ}$ ~+125 $^{\circ}$ C (military)
Storage Temperature:	-55 $^{\circ}$ C~+125 $^{\circ}$ C
Process Temperature:	Lead to Package temp. not to exceed 175 $^{\circ}$ C Glass lid to package seal rim temp. not to exceed 210 $^{\circ}$ C

Specifications are typical at 25 $^{\circ}$ C unless otherwise indicated.

- * Closer calibration available
- ** Other turning point available
- *** Higher shock and vibration available

CX-1V Crystal Calibration Tolerance at 25 $^{\circ}$ C

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

Load Capacitance (C_L) Used to Calibrate CX-1V)

Frequency Range (kHz)	Load Cap. (pF)	Frequency Range (kHz)	Load Cap. (pF)
10~15.9	11	55~99.9	8
16~24.9	10	100~179.9	5
25~54.9	9	180~600	4

(Other C_L available)

CX-1V-03

10kHz to 600kHz

MINIATURE QUARTZ CRYSTAL
FOR PIERCE OSCILLATORS

Page
2 of 2

Telephone: +44(0)1460 230000
 Fax: +44(0)1460 230001
 Email: sales@euroquartz.co.uk
 Web: www.euroquartz.co.uk

Circuit Design

Conventional HCMOS Pierce Oscillator Circuit

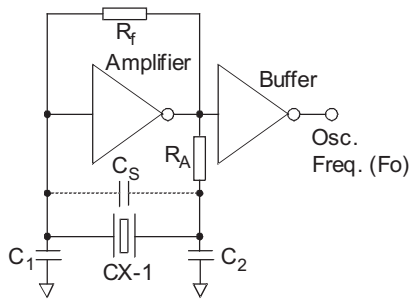


Figure 1 - CX-1V Typical Motional Resistance (R₁)

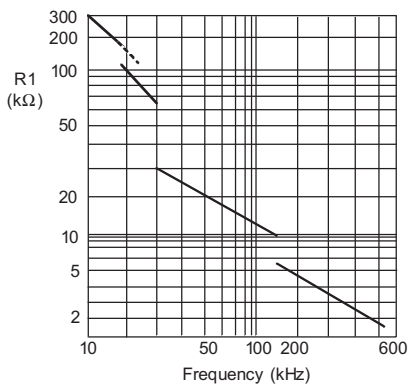


Figure 2 - CX-1V Typical Motional Capacitance (C₁)

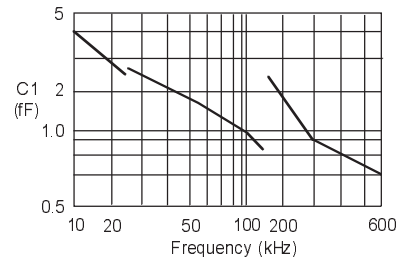


Figure 3 - CX-1V Typical Quality Factor (Q)

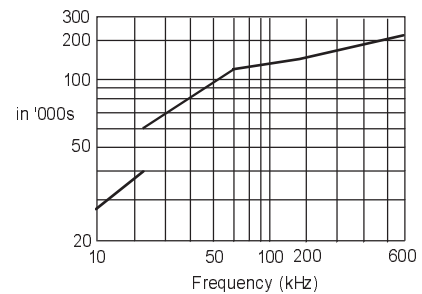
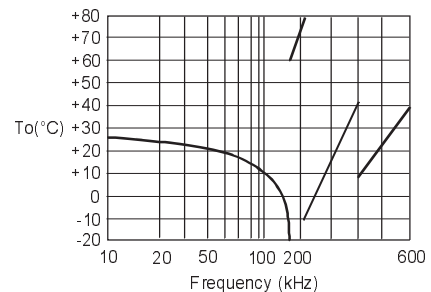


Figure 4 - CX-1V Typical Turning Point Temp. (°C)



Note: Frequency (f) deviation from frequency (f₀) @ turning point

$$\frac{f-f_0}{f_0} = k(T-T_0)^2$$

Packaging

CX-1V-03 - Bulk Pack (Standard)
 Tray Pack (Optional)

Order Code

CX-1V Side leads **-03** Frequency **32.768kHz** **(A / I)**

"S" if special or custom design
 Blank if standard

*For other calibrations insert value in ppm

Calibration Tolerance* @ 25°C
 (A)
 (B)
 (C)

Temperature Range:
 C = Commercial
 I = Industrial
 M = Military
 S = Specify