

FEATURES

- Frequency Range 10kHz to 600kHz
- High shock resistance
- Low ageing
- Designed for low power applications
- Full MIL testing available

DESCRIPTION

CX1V crystals consist of a high quality tuning fork resonator in a rugged, hermetically sealed ceramic package. CX1V is intended for use in Pierce (single inverter) oscillator circuits.

SPECIFICATION

Specifications stated are typical at 25°C unless otherwise indicated. Specifications may change without notice.

Frequency Range:	10.0kHz to 600.0kHz
Standard Calibration Tolerance*:	see table
Motional Resistance (R ₁):	Figure 1 Max = 10~169.9kHz, 2x typical 170~600kHz, 2.5x typical
Motional Capacitance (C ₁):	Figure 2
Quality Factor (Q):	Figure 3 Min. is 0.25x typical
Shunt Capacitance (C ₀):	2.0pF max.
Drive Level	
10~24.9kHz:	0.5μW max.
25~600.0kHz:	1.0μW max.
Turning Point (T ₀)**:	Figure 4
Temperature Coefficient (k):	-0.035ppm/°C ²
Ageing, first year:	5ppm max.
Shock, survival***:	1,000g peak, 1ms, 1/2 sine
Vibration, survival***:	20g rms, 10~2000Hz
Operating Temperature Range	
Commercial:	-10° to +70°C
Industrial:	-40° to +85°C
Military:	-55 to +125°C
Storage Temperature Range:	-55° to +125°C
Maximum Process Temperature:	See package handling notes

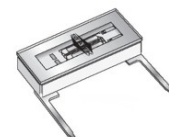
* Tighter frequency calibration is available.

** Other turning point is available

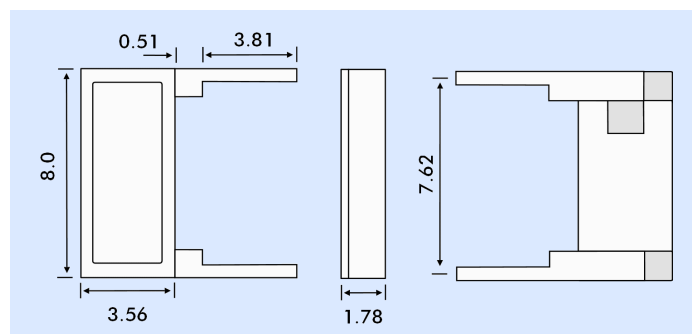
*** Higher shock and vibration survival is available

PACKAGING

CX1V crystals are Tray Packed as standard



OUTLINE & DIMENSIONS



STANDARD CALIBRATION TOLERANCE

Frequency Range (kHz)			
16~74.9	75~169.9	170~249	250~600
±30ppm	±50ppm	±100ppm	±200ppm

LOAD CAPACITANCE (CL)*

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

* The load capacitance we use to calibrate CX1V. (Other CL is available.)

HOW TO ORDER CX1V LEADED CRYSTALS

CX1V - S - 03 - 32.768K, 30 / I

'S' if special, custom design. Otherwise leave blank

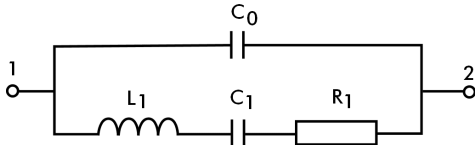
Side Leads
03 = Non RoHS Compliant
05 = RoHS Compliant

Frequency
K = kHz

Calibration Tolerance
@25°C
(in ppm)

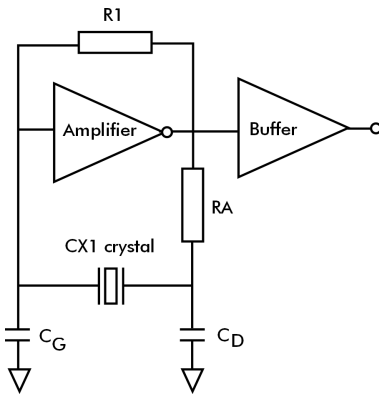
Temp. Range
C = -10° ~ +70°C
I = -40° ~ +85°C
M = -55° ~ +125°C
S = Customer specified

CRYSTAL EQUIVALENT CIRCUIT



R1 Motional Resistance L1 Motional Inductance
 C1 Motional Capacitance C0 Shunt Capacitance

CONVENTIONAL CMOS PIERCE OSCILLATOR CIRCUIT



Turning Point Temperature

Note: Frequency *f* at temperature *T* is related to frequency *F0* at turning point temperature *To* by:

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

PACKAGE HANDLING

The CX crystal is hermetically sealed in a ceramic package. Normal handling and soldering precautions for small, low thermal mass parts are adequate when installing or testing CX crystals. CX crystals may be wave soldered with proper precaution taken to avoid desoldering the leads. A slow machine rate or too high a pre-heat temperature or solder bath temperature may damage the crystals. **Lead to package solder interface temperature should not exceed 175°C, glass lid to package seal rim temperature should not exceed 210°C.** If the seal rim reaches temperatures above the maximum specified, the package may lose its hermeticity. Loss of hermeticity results in a frequency decrease and motional resistance increase.

FIGURE 1
CX1V Typical Motional Resistance R1

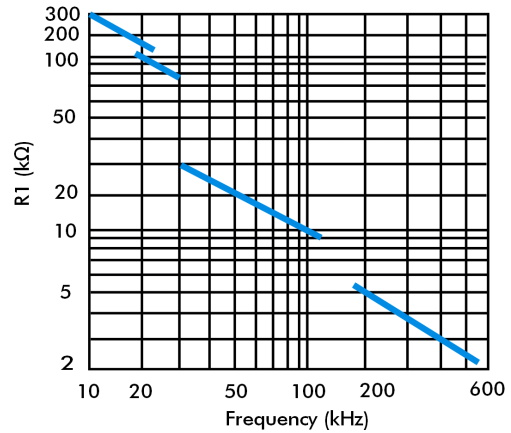


FIGURE 2
CX1V Typical Motional Capacitance C1

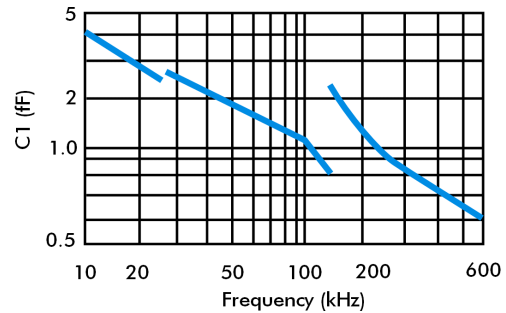


FIGURE 3
CX1V Typical Quality Factor (Q)

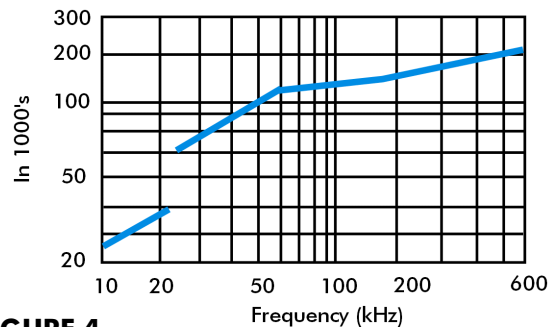


FIGURE 4
CX1V Typical Turning Point Temperature (To)

