

FEATURES

- Frequency Range 16kHz to 600kHz
- High shock resistance
- Low ageing
- Designed for low power applications
- Full MIL testing available



DESCRIPTION

CX-2V crystals are high quality tuning fork crystals intended for use in Pierce (single inverter) oscillator circuits. The crystal is hermetically sealed and rugged.

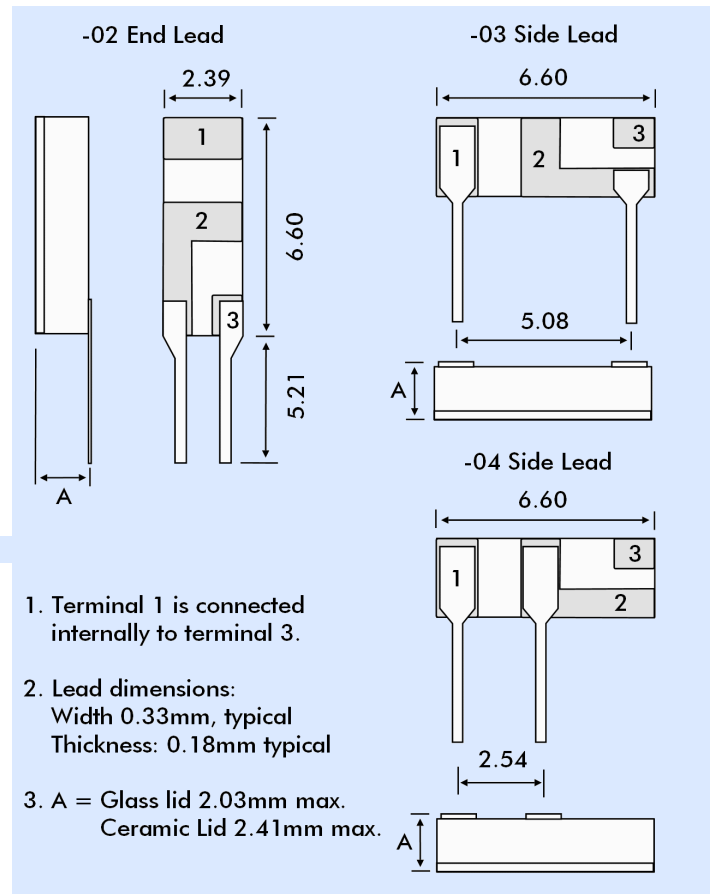
SPECIFICATION

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

Frequency Range:	16.0kHz to 600.0kHz
Functional Mode:	Tuning Fork (Flexure)
Standard Calibration Tolerance*:	A, B or C
Motional Resistance (R ₁):	Figure 1 Max = 16~24.9kHz, 2x typical 25~600kHz, 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	
	16~24.9kHz: 0.5μW max.
	25~600.0kHz: 1.0μW max.
Turning Point (T ₀ **):	Figure 4
Temperature Coefficient (k):	-0.035ppm/°C
Ageing, first year:	5ppm max.
Shock, survival***:	1,500g, 0.3ms, ½ sine
Vibration, survival***:	10g rms, 20~2000Hz
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 note

- * Tighter frequency calibration is available.
 ** Other turning point is available
 *** Higher shock and vibration survival is available

OUTLINE & DIMENSIONS



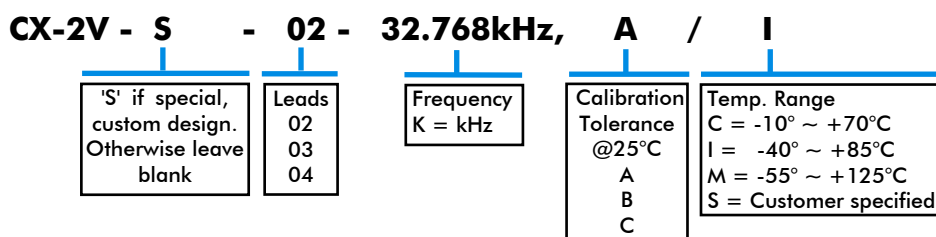
PACKAGING

CX-2V leaded crystals are supplied in tray pack (Standard)

STANDARD CALIBRATION TOLERANCE

	Frequency Range (kHz)			
	16 ~ 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%

HOW TO ORDER CX-2V CRYSTALS

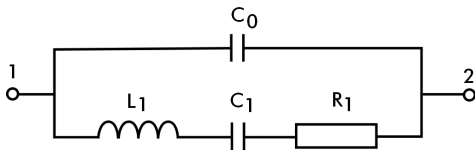


LOAD CAPACITANCE (CL)*

Frequency Range (kHz)	Load Capacitance	Frequency Range (kHz)	Load Capacitance
16~24.9	10pF	100.0~179.9	5pF
25~54.9	9pF	180~600	4pF
55~100.0	8pF		

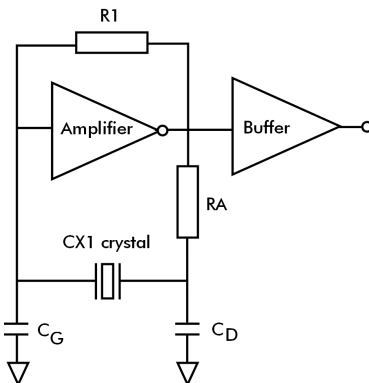
* The load capacitance we use to calibrate CX2VSM.
(Other CL is available.)

CRYSTAL EQUIVALENT CIRCUIT



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

CONVENTIONAL CMOS PIERCE OSCILLATOR CIRCUIT



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.

Turning Point Temperature

Note: Frequency f at temperature T is related to frequency F_0 at turning point temperature T_0 by:

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

FIGURE 1
CX2V Typical Motional Resistance R1

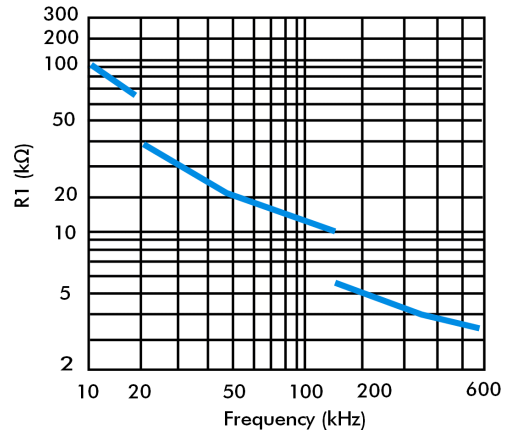


FIGURE 2
CX2V Typical Motional Capacitance C1

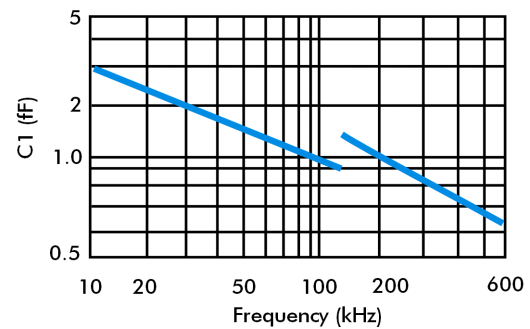


FIGURE 3
CX2V Typical Quality Factor (Q)

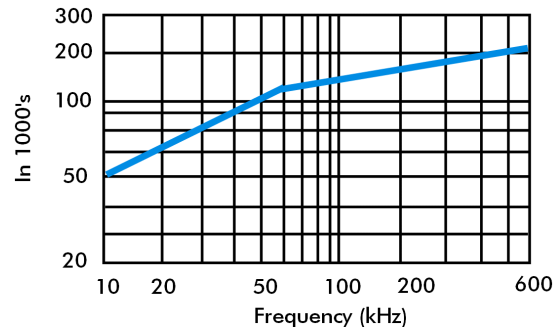


FIGURE 4
CX2V Typical Turning Point Temperature (T₀)

