

FEATURES

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



DESCRIPTION

CX1H crystals consist of a high quality tuning fork resonator in a rugged, hermetically sealed ceramic package. CX1H is intended for use in Series (two cascaded inverters) oscillator circuits.

SPECIFICATION

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

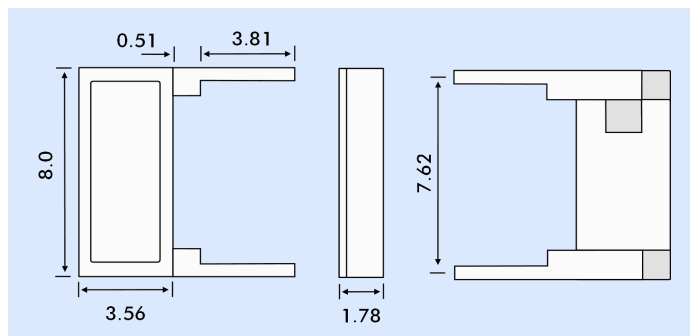
Frequency Range:	10.0kHz to 600.0kHz
Standard Calibration Tolerance*:	see table
Motional Resistance (R ₁):	Figure 1 Max = 10~169.9kHz, 2x typical 170~600kHz, 2.5x typical
Motional Capacitance (C ₁):	Figure 2
Quality Factor (Q):	Figure 3 Min. is 0.25x typical
Shunt Capacitance (C ₀):	2.0pF max.
Drive Level	
10~24.9kHz:	1.5μW max.
25~600.0kHz:	3.0μW max.
Turning Point (T ₀)**:	Figure 4
Temperature Coefficient (k):	-0.035ppm/°C ²
Ageing, first year:	5ppm max.
Shock, survival***:	1,000g, 1ms, ½ 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

OUTLINE & DIMENSIONS



STANDARD CALIBRATION TOLERANCE

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

PACKAGING

CX1Hcrystals are Tray Packed as standard.

HOW TO ORDER CX1H LEADED CRYSTALS

CX1H - S - 03 - 32.768K, 30 / I

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

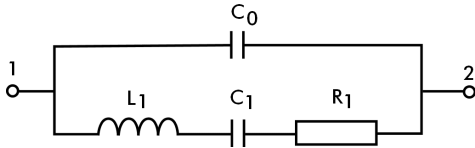
Side Leads
03 = Non RoHS Compliant
05 = RoHS Compliant

Frequency
K = kHz

Calibration Tolerance
@25°C
(in ppm)

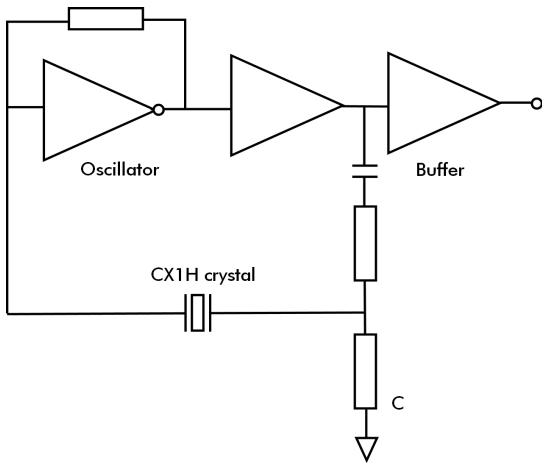
Temp. Range
C = -10° ~ +70°C
I = -40° ~ +85°C
M = -55° ~ +125°C
S = Customer specified

CRYSTAL EQUIVALENT CIRCUIT



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

CONVENTIONAL SERIES OSCILLATOR CIRCUIT



Turning Point Temperature

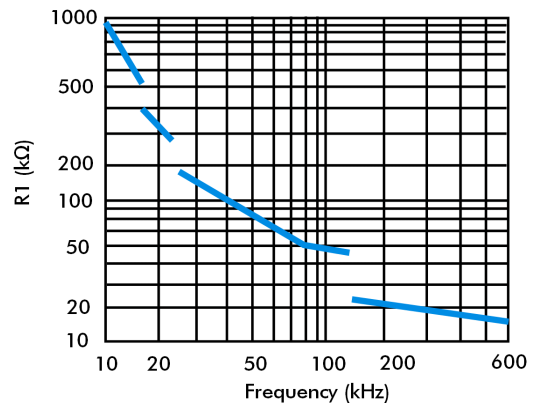
Note: Frequency *f* at temperature *T* is related to frequency *f*₀ at turning point temperature *T*₀ by:

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

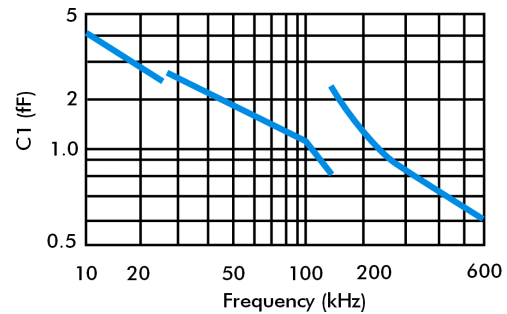
PACKAGE HANDLING

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.

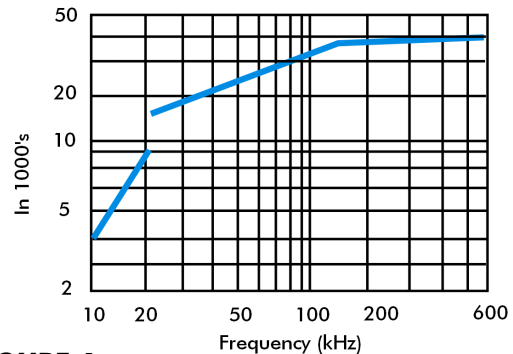
**FIGURE 1
 CX1H Typical Motional Resistance R1**



**FIGURE 2
 CX1H Typical Motional Capacitance C1**



**FIGURE 3
 CX1H Typical Quality Factor (Q)**



**FIGURE 4
 CX1H Typical Turning Point Temperature (T₀)**

