

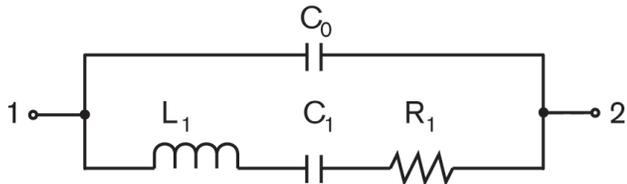
DESCRIPTION

High performance tuning fork quartz crystal designed and manufactured for high-reliability applications.

FEATURES

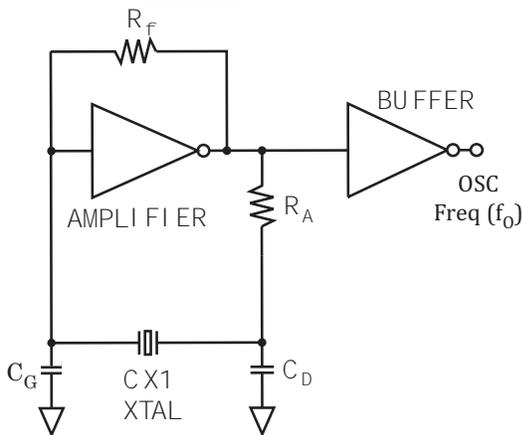
- Designed for low power applications
- Compatible with hybrid or PC board packaging
- Low aging
- Full military testing available
- Ideal for battery operated applications
- Designed and manufactured in the USA

EQUIVALENT CIRCUIT



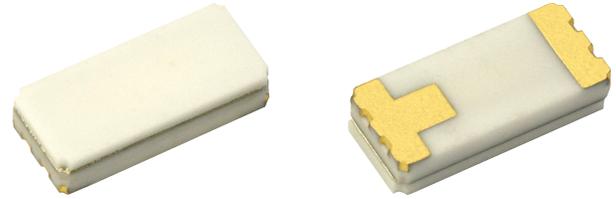
R_1 Motional Resistance L_1 Motional Inductance
 C_1 Motional Capacitance C_0 Shunt Capacitance

CONVENTIONAL CMOS PIERCE OSCILLATOR CIRCUIT

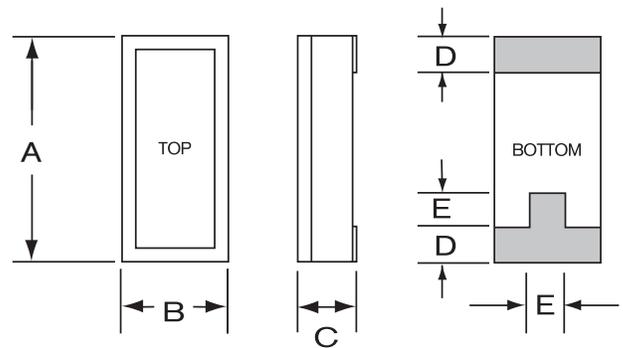


PACKAGING OPTIONS

- CX1VSM - Tray Pack
- 16mm tape, 7" or 13" reels
(Reference tape and reel data sheet 10109)

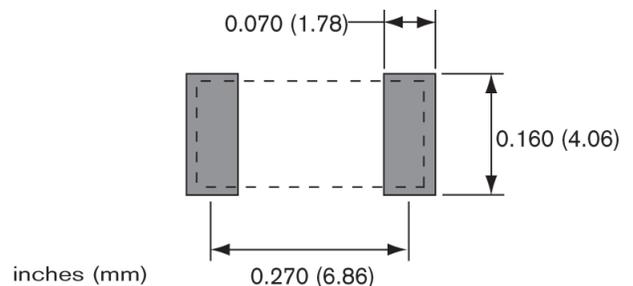


PACKAGE DIMENSIONS



DIM	Termination	TYPICAL		MAXIMUM	
		inches	mm	inches	mm
A		0.315	8.00	0.330	8.38
B		0.140	3.56	0.155	3.94
C	SM1	—	—	0.070	1.78
C	SM2/SM4	—	—	0.072	1.83
C	SM3/SM5	—	—	0.075	1.90
D		0.045	1.14	0.055	1.40
E		0.060	1.52	0.070	1.78

SUGGESTED LAND PATTERN



SPECIFICATIONS

Specifications are typical at 25°C unless otherwise noted.
Specifications are subject to change without notice.

Frequency Range	10 kHz to 600 kHz
Standard Calibration Tolerance ¹ (see table below)	
Motional Resistance (R_1)	Figure 1 MAX: 10-169.9 kHz, 2x Typ. 170-600 kHz, 2.5x Typ.
Motional Capacitance (C_1)	Figure 2
Quality Factor (Q)	Figure 3
Min. is 0.25x Typ.	
Shunt Capacitance (C_0)	2.0 pF MAX.
Drive Level	10-24.9 kHz 0.5 μ W MAX. 25-600 kHz 1.0 μ W MAX.
Turning Point (T_0) ²	Figure 4
Temperature Coefficient (k)	-0.035 ppm/°C ²
Aging, first year	5 ppm MAX.
Shock, survival ³	1,000 g, 1ms, 1/2 sine
Vibration, survival ³	20 g RMS, 10-2,000 Hz
Operating Temp. Range	-10°C to +70°C (Commercial) -40°C to +85°C (Industrial) -55°C to +125°C (Military)
Storage Temp. Range	-55°C to +125°C
Max Process Temperature	260°C for 20 sec.

1. Tighter frequency calibration available.
2. Other turning point available.
3. Higher shock and vibration available.

CX1VSM Standard Calibration Tolerance at 25°C

Frequency Range (kHz)			
10-74.9	75-169.9	170-249.9	250-600
± 30 ppm (0.003%)	± 50 ppm (0.005%)	± 100 ppm (0.01%)	± 200 ppm (0.02%)
± 100 ppm (0.01%)	± 100 ppm (0.01%)	± 200 ppm (0.02%)	± 500 ppm (0.05%)
± 1000 ppm (0.1%)	± 1000 ppm (0.1%)	± 2000 ppm (0.2%)	± 5000 ppm (0.5%)

Load Capacitance (C_L), Used to Calibrate CX1VSM (other C_L available)

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

HOW TO ORDER CX1VSM CRYSTALS

CX1V	S	C	SM1	-	32.768K	,	30	/	I		
Special Blank = Standard S = Special or Custom		Lid C = Ceramic Lid		Terminations SM1 = Gold Plated (Lead Free) SM2 = Solder Plated SM3 = Solder Dipped SM4 = Solder Plated (Lead Free) SM5 = Solder Dipped (Lead Free)		Frequency K = kHz		Calibration Tolerance @ 25°C (in ppm)		Operating Temp. Range C = -10°C to +70°C I = -40°C to +85°C M = -55°C to +125°C S = Customer Specified	

FIGURE 1
CX1V TYPICAL MOTIONAL RESISTANCE (R_1)

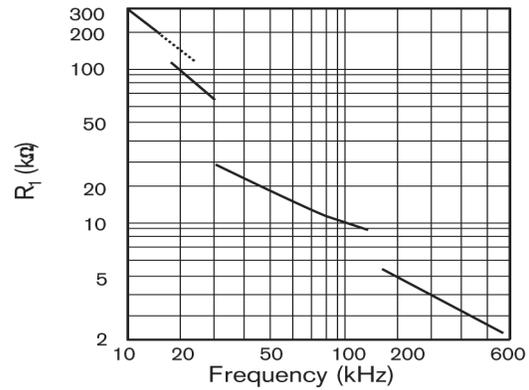


FIGURE 2
CX1V TYPICAL MOTIONAL CAPACITANCE (C_1)

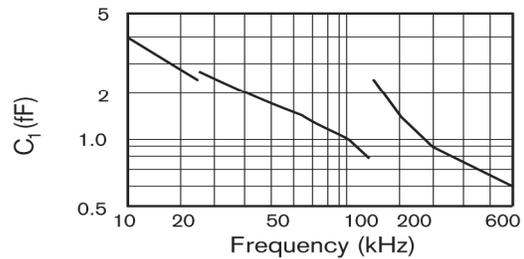


FIGURE 3
CX1V TYPICAL QUALITY FACTOR (Q)

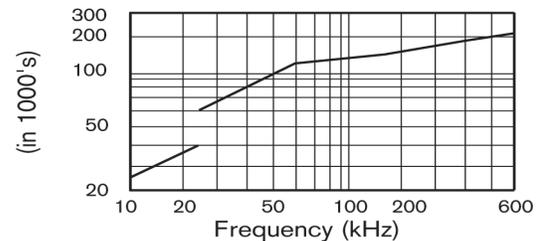
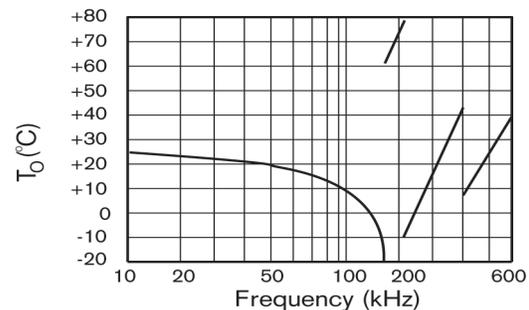


FIGURE 4
CX1V TYPICAL TURNING POINT TEMP. (T_0)



Note: Frequency f at temperature T is related to frequency f_0 at turning point temperature T_0 by: $\frac{f-f_0}{f_0} = k(T-T_0)^2$