CX6VSM CRYSTAL

18 kHz to 600 kHz

Ultra-Low Profile (1mm) Miniature Surface Mount Quartz Crystal for Pierce Oscillators

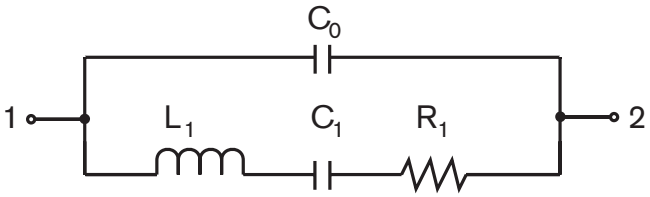
DESCRIPTION

The CX6VSM quartz crystals are leadless devices designed for surface mounting on printed circuit boards or hybrid substrates and intended to be used in Pierce oscillators.They are hermetically sealed in a rugged, miniature ceramic package. They are manufactured using the STATEK-developed photolithographic process, and are designed utilizing the experience acquired by producing millions of crystals for industrial, commercial, military and medical applications. Maximum process temperature should not exceed 260°C.

FEATURES

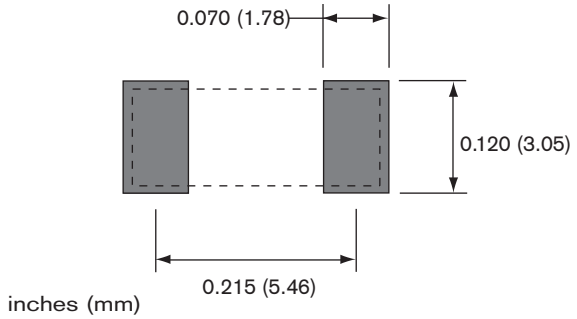
- Miniature tuning fork design
- Ultra-low profile (1mm)
- High shock resistance
- Designed for low power applications
- Compatible with hybrid or PC board packaging
- Low aging
- Full military testing available
- Ideal for battery operated applications
- Designed and manufactured in the USA

EQUIVALENT CIRCUIT

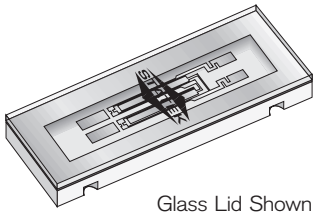


R_1 Motional Resistance L_1 Motional Inductance
C_1 Motional Capacitance C_0 Shut Capacitance

SUGGESTED LAND PATTERN



inches (mm)

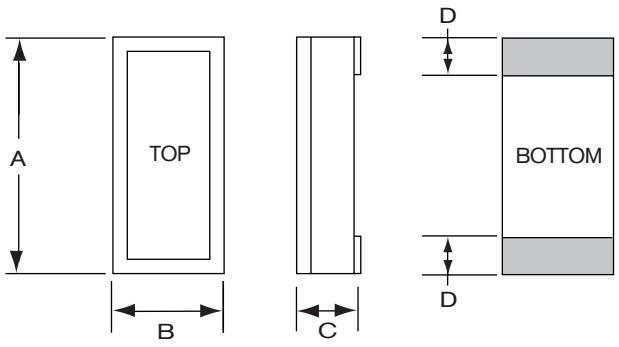


Glass Lid Shown

actual size

side view

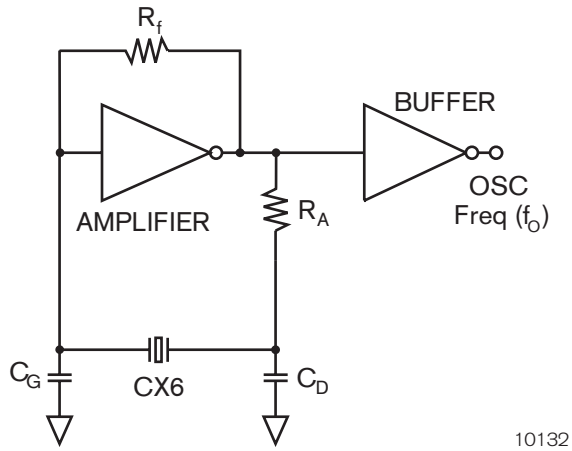
PACKAGE DIMENSIONS



	TYP.		MAX.	
DIM	inches	mm	inches	mm
A	0.265	6.73	0.280	7.11
B	0.103	2.62	0.114	2.90
C	-	-	see below	
D	0.050	1.27	0.060	1.52

DIM "C"	GLASS LID		CERAMIC LID	
MAX	inches	mm	inches	mm
SM1	0.039	0.99	0.053	1.35
SM2/SM4	0.041	1.04	0.055	1.40
SM3/SM5	0.044	1.12	0.058	1.47

CONVENTIONAL CMOS PIERCE OSCILLATOR CIRCUIT



10132 - Rev C

SPECIFICATIONS

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

Frequency Range	18 kHz to 600 kHz
Functional Mode	Tuning Fork (Flexure)
Standard Calibration Tolerance[1]	(see table below)
Motional Resistance (R_1)	See Figure 1 MAX: 18-25 kHz, 2x Typ 25-600 kHz, 2.5x Typ
Motional Capacitance (C_1)	Figure 2
Quality Factor (Q)	Figure 3 MIN is 0.25x Typ
Shunt Capacitance (C_0)	1.4 pF
Drive Level	18-25 kHz 0.5 µW MAX 25-600 kHz 1.0 µW 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]	1,500 g, 0.3 ms, 1/2 sine
Vibration, survival[3]	10 g RMS, 20-2,000 Hz random
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.

CX6V Standard Calibration Tolerance at 25°C

Frequency Range (kHz)			
18-74.9	75-169.9	170-249.9	250-600
± 30 ppm (0.003%)	± 50 ppm (0.003%)	± 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 CX6V (other C_L available)

Frequency Range (kHz)	Load Capacitance (pF)	Frequency Range (kHz)	Load Capacitance (pF)
18-24.9	10	100.1-179.9	5
25-54.9	9	180-600	4
55-100.0	8		

HOW TO ORDER CX6VSM CRYSTALS

CX6V [S] C SM1 – 32.768K , 100 / I

- [S]: "S" if special or custom design. Blank if Srd.
- C: Blank = Glass Lid; C = Ceramic Lid
- SM1: SM1 = Gold Plated (Lead Free); SM2 = Solder Plated; SM3 = Solder Dipped; SM4 = Solder Plated (Lead Free); SM5 = Solder Dipped (Lead Free)
- 32.768K: Frequency K = kHz
- 100: Calibration Tolerance @ 25°C (in ppm)
- I: 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
CX6V TYPICAL MOTIONAL RESISTANCE (R_1)

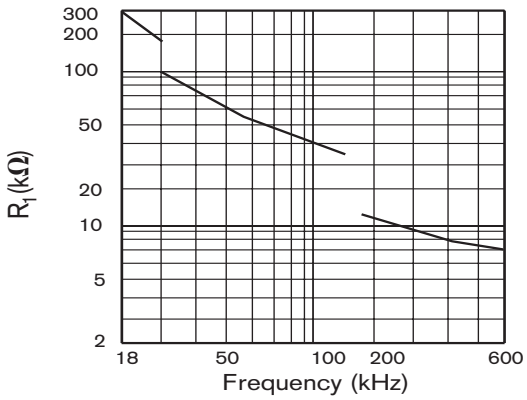


FIGURE 2
CX6V TYPICAL MOTIONAL CAPACITANCE (C_1)

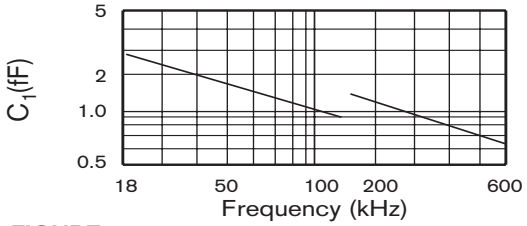


FIGURE 3
CX6V TYPICAL QUALITY FACTOR (Q)

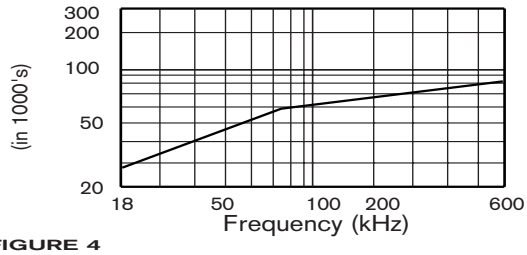
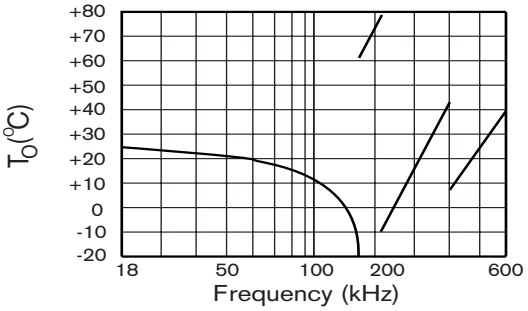


FIGURE 4
CX6V TYPICAL TURNING POINT TEMP. (T_o)



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

TERMINATIONS

Designation	Termination
SM1	Gold Plated (Lead Free)
SM2	Solder Plated
SM3	Solder Dipped
SM4	Solder Plated (Lead Free)
SM5	Solder Dipped (Lead Free)

PACKAGING OPTIONS

CX6VSM - Tray Pack

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

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