

DESCRIPTION

Designed and manufactured in the USA, the CX9V TF quartz crystal is available in frequencies from 32 kHz to 160 kHz. Using micro-machining processes, this surface-mountable crystal is hermetically sealed within a ultra-miniature ceramic package to ensure high stability and low ageing. Tight calibration and high frequency/temperature stability make the CX9V ideally suited for all low frequency applications.

FEATURES

- Ultra-miniature, surface mount design (4.1mm x 1.5mm)
- Low profile (typically 0.80mm)
- Available with glass or ceramic lid
- Hermetically sealed ceramic package
- High shock and vibration survival
- Excellent aging characteristics
- Designed for low power applications
- Full military testing available
- Designed and manufactured in the USA

APPLICATIONS

Medical

- Pacemaker, defibrillator, and other implantables
- Medical instruments

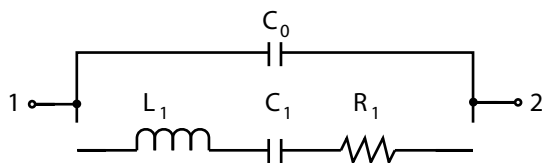
Industrial, Computer, & Communications

- Smart card
- Down hole instrumentation
- Transponder / Animal migration
- Process instrumentation

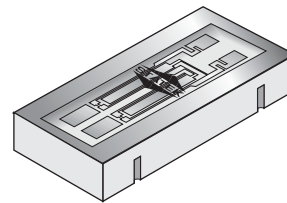
Military & Aerospace

- Airborne hybrid
- Navigational computer
- Real time clock

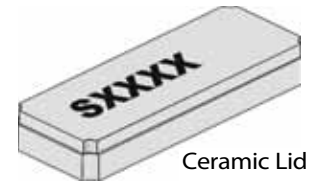
EQUIVALENT CIRCUIT



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

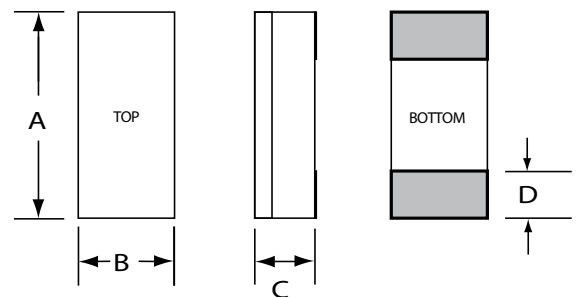


Glass Lid



Ceramic Lid

PACKAGE DIMENSIONS

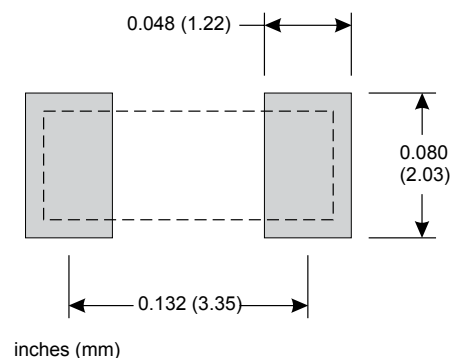


DIM	TYP.		MAX.	
	inches	mm	inches	mm
A	0.160	4.10	0.170	4.32
B	0.060	1.50	0.068	1.73
C	-	-	see below	
D	0.031	0.79	0.038	0.97

THICKNESS (DIM C) MAXIMUM

MAX	GLASS LID		CERAMIC LID	
	inches	mm	inches	mm
SM1	0.034	0.87	0.035	0.90
SM2/SM4	0.034	0.87	0.035	0.90
SM3/SM5	0.036	0.91	0.037	0.94

SUGGESTED LAND PATTERN





SPECIFICATIONS

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

	32.768 kHz	100 kHz
Motional Resistance R ₁ (kΩ)	60	19
Motional Capacitance C ₁ (fF)	2.2	1.0
Quality Factor Q (k)	27	80
Shunt Capacitance C ₀ (pF)	1.1	0.84
Load Capacitance (pF) ¹	9	5
Turning Point (°C) ²	20	16

Standard Calibration Tolerance³

Glass Lid:	±30 ppm (0.003%)	±100 ppm (0.01%)	±1000 ppm (0.1%)
Ceramic Lid:	±100 ppm (0.01%)	±1000 ppm (0.1%)	±10000 ppm (1.0%)

Drive Level	0.5 μW MAX
Temperature Coefficient (k)	-0.035 ppm/°C ²
Aging, first year	5 ppm
Shock, survival ⁴	5,000 g, 0.3 ms, 1/2 sine
Vibration, survival	20 g RMS, 10-2,000 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.

Note: Frequency f at temperature T is related to frequency f₀ at turning point temperature T₀ by: $\frac{f-f_0}{f_0} = k(T-T_0)^2$

- 1. Other load capacitance values available
- 2. Other temperatures available
- 3. Tighter tolerances available
- 4. Higher shock available. Please contact Sales office

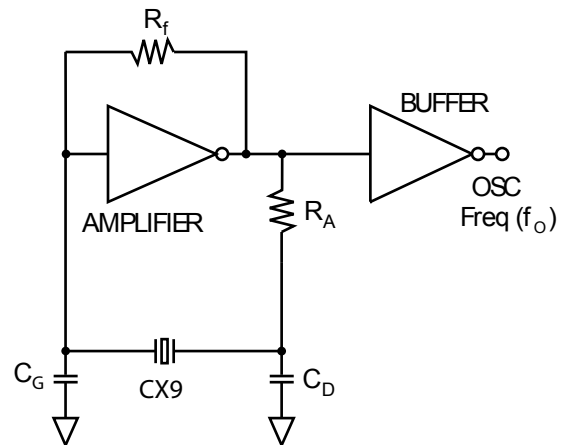
TERMINATION VARIANTS

Designation	Termination
SM1	Gold Plated (RoHS Compliant)
SM2	Solder Plated (non RoHS Compliant)
SM3	Solder Dipped (non RoHS Compliant)
SM4	Solder Plated (RoHS Compliant)
SM5	Solder Dipped (RoHS Compliant)
Max Process Temperature 260°C for 20 sec.	

PACKAGING OPTIONS

CX9V TF	-Tray Pack -16mm tape, 7" or 13" reels
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CONVENTIONAL CMOS PIERCE OSCILLATOR CIRCUIT



HOW TO ORDER CX9V TF SURFACE MOUNT CRYSTAL

Part Description Example: 32.768kHz CX9V TF-C-SM1 100/-55 to 125C/9 FUND

Frequency _____

Model _____

Lid: C=Ceramic, Blank=Glass _____

Variant: SM1, SM2, SM3, SM4, SM5 _____

Frequency Tolerance @25°C _____

Operating Temperature Range: -10 to 70°C, -40 to 85°C, -55 to 125°C _____

Load Capacitance _____

Overtone _____