

### FEATURES

- Frequency Range 32kHz to 160kHz
- High shock resistance
- Ultra-small ceramic package
- Low ageing
- Designed for low power applications
- Full MIL testing available

### DESCRIPTION

CX9VSM crystals are leadless devices designed for surface mounting on PCBs or hybrid substrates. The crystals have a very low-profile (<0.94mm) and are suited for all low frequency applications.

### SPECIFICATION

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

Parameters	Fundamental	
Frequency (kHz):	32.768	100.0
Motional Resistance R1 (kΩ):	70	19
Motional Capacitance C1 (ff):	2.2	1.0
Quality Factor Q (k):	27	80
Shunt Capacitance C0 (pF):	1.1	0.84
Load Capacitance (pF) <sup>1</sup> :	9	5
Turning Point (°C) <sup>2</sup> :	20	16

Standard Calibration Tolerance for 32.768kHz (3)			
Glass Lid:	A = ±50ppm (0.003%)	B = ±100ppm (0.01%)	C = ±1000ppm (0.1%)
Ceramic Lid:	A = ±100ppm (0.01%)	B = ±1000ppm (0.1%)	C = ±10000ppm (1.0%)

Drive Level:	0.5µW max.
Temperature Coefficient (k):	-0.035ppm/°C <sup>2</sup>
Ageing, first year:	5ppm max.

Note: Frequency f at temperature T is related to frequency Fo at turning point temperature To by:

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

Shock, survival:	5000g, 0.3ms, ½ sine
Vibration, survival:	20g rms, 10~2000Hz random

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:	+260°C for 20 seconds

1. Other load capacitance values are available.
2. Other temperature available.
3. Tighter tolerances available.

### HOW TO ORDER CX9VSM CRYSTALS

**CX9V - S - C - SM1 - 100.0K, 100 / I**

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

Blank = glass lid  
C = ceramic lid

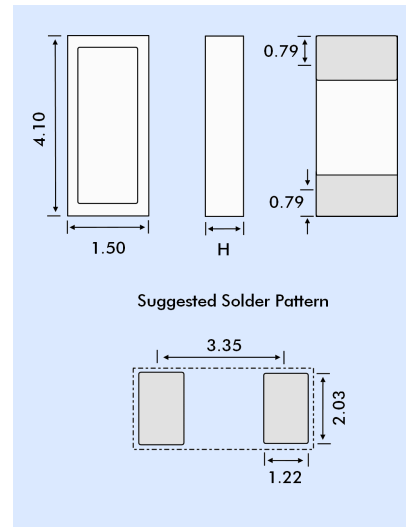
Terminations  
SM1 = Gold plated \*  
SM2 = Solder plated  
SM3 = Solder dipped  
SM4 = Solder plated \*  
SM5 = Solder dipped \*  
\* = Lead free

Frequency  
K = kHz

Calibration Tolerance\*  
A  
B  
C

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

### OUTLINE & DIMENSIONS

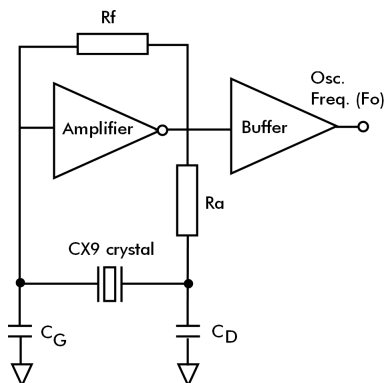


Dim. H	Glass Lid	Ceramic Lid
SM1	0.87	0.90
SM2	0.87	0.90
SM3	0.91	0.94
SM4	0.87	0.90
SM5	0.91	0.94

### TERMINATIONS - PLATING

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

### Conventional CMOS Pierce Oscillator Circuit



### PACKAGING OPTIONS

CX9VSM crystals are available either tray packed (<250pcs) or tape and reel (>250 pieces).  
16mm tape, 178mm or 330mm reels (EIA 418).