

ISSUE 1; January 2016

Description

- An increasing number of applications require the use of high-temperature crystals. For these applications, we offer CX4VHT crystals. These crystals are designed to operate at temperatures up to and including 200°C, and feature an expected life in excess of 1,000 hours at these temperatures. The frequency range offered is 30kHz to 250kHz
- SM1 SM1 (gold plated, RoHS compliant)
- SM5 SM5 (Solder dipped, RoHS compliant)
- Please note that all data is only valid at 25°C unless otherwise stated.

Frequency Parameters

- Frequency 30.0kHz to 250.0kHz
- Frequency Tolerance $\pm 30.00\text{ppm}$ to $\pm 5,000.00\text{ppm}$
- Tolerance Condition @ 25°C
- Ageing $\pm 5\text{ppm}$ max in first year @ 25°C

Electrical Parameters

- Load Capacitance (CL) 9.0pF
- Shunt Capacitance (C0) 1.1pF typ
- Drive Level 0.5μW Max
- Typical Motional Values @ 32.768kHz:
 - R1 70kΩ
 - C1 2.3fF
 - Q 31k
 - Co 1.1pF
 - Turnover Temperature 23°C
 - R1 @ 150°C 100kΩ
 - R1 @ 200°C 125kΩ
 - Drive Level 0.5μW max
- Actual Frequency Shift (@ 32.768kHz):

1008 Hours	1824 Hours
150°C 1.97ppm	2.51ppm
175°C 4.80ppm	5.66ppm
200°C 29.40ppm	36.82ppm
- Projected Frequency Shift (@ 32.768kHz using curve fitting):

4320 Hours	8760 Hours
150°C 3.30ppm	3.94ppm
175°C 6.94ppm	7.99ppm
200°C 47.61ppm	56.46ppm

Frequency Adjustment

- Temperature Coefficient: $-0.035\text{ppm}/^\circ\text{C}^2$

Operating Temperature Ranges

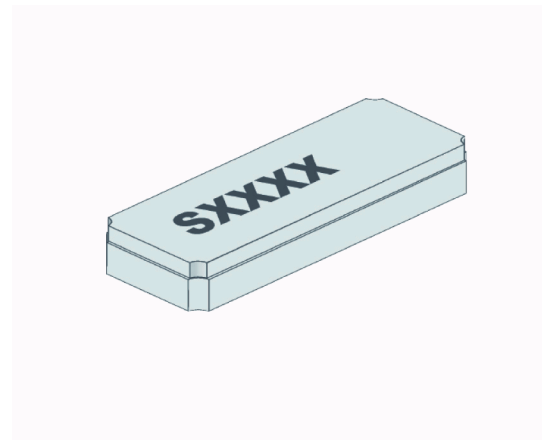
- 0 to 200°C

Environmental Parameters

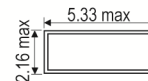
- Vibration: 20G rms, 10-2000Hz
- Shock: 5000G 0.3ms, 1/2 sine
- Storage temperature range -55 to 125°C

Manufacturing Details

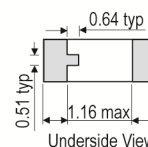
- Maximum process temperature: 260°C for 20s



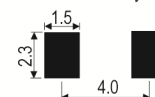
Outline (mm) -SM1 = SM1 (gold plated, RoHS compliant)



Height (H) =	Ceramic Lid
SM1	1.27 max
SM5	1.35 max



Solder Pad Layout



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Ordering Information

- Termination Variants:
SM1 = Gold Plated (RoHS)
SM5 = Solder Dipped (RoHS)
- Example:
32.768kHz CX4VHT TF-SM1
±100ppm 0+200C FUND
- Minimum Required*:
Frequency*
Model*
Termination Variant*
Frequency Tolerance (@25°C)*
Operating Temperature Range*
Load Capacitance

Compliance

- RoHS Status (2011/65/EU) Optional
- REACh Status Compliant
- MSL Rating (JDEC-STD-033): Not Applicable

Packaging Details

- Pack Style: Reel Tape & reel in accordance with EIA-481-D
Pack Size: 1,000
- Pack Style: Tray Supplied on a tray
Pack Size: 1

Electrical Specification - maximum limiting values

Frequency Min	Frequency Max	Temperature Range	Stability (Min)	Over Tone Order	ESR
		°C	ppm		Ω
30.00kHz	250.00kHz	0 to 200		Fundamental	-

*Stability Maximum values ±0ppm

This document was correct at the time of printing; please contact your local sales office for the latest version.

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