

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 0.5 $\mu$ W Max
- Typical Motional Values @ 32.768kHz:
  - R1 70k $\Omega$
  - C1 2.3fF
  - Q 31k
  - Co 1.1pF
  - Turnover Temperature 23°C
  - R1 @ 150°C 100k $\Omega$
  - R1 @ 200°C 125k $\Omega$
  - Drive Level 0.5 $\mu$ W 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: -0.035ppm/°C<sup>2</sup>

### Operating Temperature Ranges

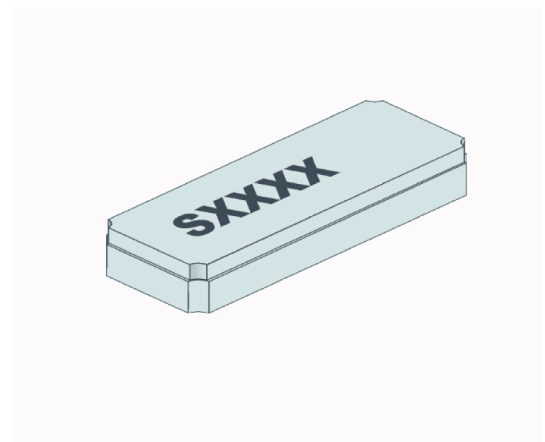
- 0 to 200°C

### Environmental Parameters

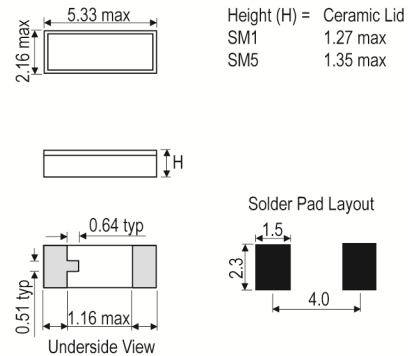
- Vibration: 20G rms, 10-2000Hz
- Shock: 5000G 0.3ms, 1/2 sine
- Storage temperature range -55 to 125°C

### Manufacturing Details

- Maximum process temperature: 260°C for 20s



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



### Sales Office Contact Details:

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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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