



## Description

- An increasing number of applications require the use of high-temperature crystals. For these applications, IQD offers Statek's CX1VHT 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 10kHz to 600kHz.
- SM1 (Gold Plated, RoHS compliant)
- Model CX1VHT TF-SM1
- Model Issue number 2

## Frequency Parameters

- Frequency 32.7680kHz
- Frequency Tolerance  $\pm 50.00\text{ppm}$
- Operating Temperature Range 25.00 to 150.00°C
- Overtone Order Fundamental
- Ageing  $\pm 5\text{ppm}$  max in 1st year @ 25°C
- Frequency Stability:  $(f(T) - f(T_0))/f(T_0) = k(T-T_0)^2$   
where  $f(T)$  = frequency at temperature  $T$ ,  $T$  = temperature,  $T_0$  = turnover temperature,  $F_0$  = frequency at turnover temperature  $T_0$
- Temperature Coefficient (k):  $-0.035\text{ppm}/^\circ\text{C}^2$

## Electrical Parameters

- Load Capacitance (CL) 9.00pF
- Shunt Capacitance (C0) 1.7pF typ 32.768kHz
- Drive Level 0.5 $\mu\text{W}$  10-24.9kHz, 1 $\mu\text{W}$  max 25-
- Motional Resistance (@ 32.768kHz): 40k $\Omega$  typ, 55k $\Omega$  @ 150°C, 73k $\Omega$  @ 200°C
- Motional Capacitance (@ 32.768kHz): 2.3fF typ
- Quality Factor (@ 32.768kHz): 53k typ
- Turnover Temperature (To): 26°C
- Please note that all data is only valid at 25°C unless otherwise stated.

## Environmental Parameters

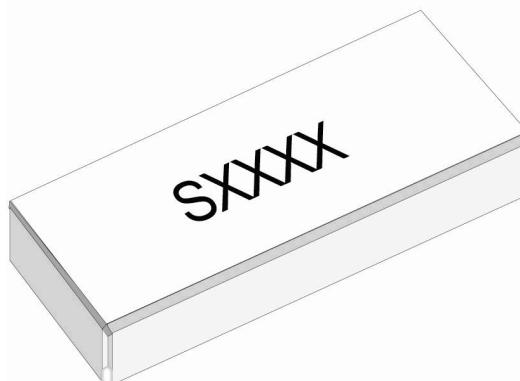
- Shock: 1000g, 1ms, 1/2 sine
- Vibration: 20g rms, 10-2000Hz
- Storage Temperature: -55 to 125°C
- RoHS Terminations
- RoHS Reflow Temp 260°C max for 20 sec max

## Compliance

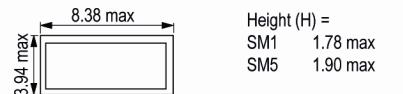
- RoHS Status (2011/65/EU) Optional
- REACH Status Compliant
- MSL Rating (JDEC-STD-033): Not Applicable

## Packaging Details

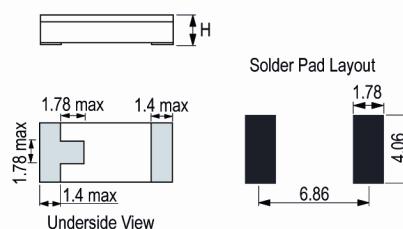
- Pack Style: Tray
- Pack Size: 1
- Alternative packing option available



## Outline (mm)



Height (H) =  
SM1 1.78 max  
SM5 1.90 max



Solder Pad Layout

## Frequency Shift vs Time

Temp.	Frequency shift after:			
	1008 hours (Actual Data)	1824 hours (Actual Data)	4320 hours <sup>2</sup> (Actual Data)	8760 hours <sup>2</sup> (Actual Data)
150°C	1.97ppm	2.51ppm	3.30ppm	3.94ppm
175°C	4.80ppm	5.66ppm	6.94ppm	7.99ppm
200°C	29.40ppm	36.82ppm	47.61ppm	56.46ppm

1. The data listed in this table is for a 32.768kHz CX4 crystal.

2. The data shown for 4320 hours and 8760 hours is data that has been projected using a curve-fitting method.

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