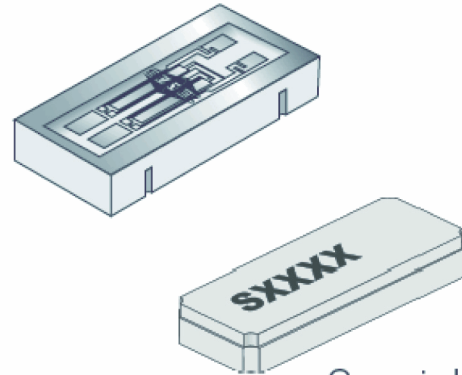


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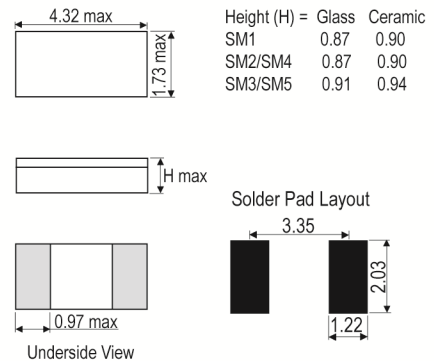
## Description

- 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 an ultra-miniature ceramic package to ensure high stability and low ageing. Tight calibration and high frequency/temperature stability make the CX9V TF ideally suited for all low frequency applications.
- -SM1 SM1 (Gold Plated RoHS)
- -SM1-C SM1-C (Gold Plated, ceramic lid, RoHS)
- -SM2 SM2 (Solder plated, non RoHS)
- -SM2-C SM2-C (Solder plated, ceramic lid, non RoHS)
- -SM3 SM3 (Solder dipped, non RoHS)
- -SM3-C SM3-C (Solder dipped, ceramic lid, non RoHS)
- -SM4 SM4 (Solder Plated, RoHS)
- -SM4-C SM4-C (Solder Dipped, ceramic lid, RoHS)
- -SM5 SM5 (Solder Dipped, RoHS)
- -SM5-C SM5-C (Solder Dipped, ceramic lid, RoHS)
- FEATURES:
  - Ultra-miniature, surface mount design
  - Low profile
  - Available with glass or ceramic lid
  - Hermetically sealed ceramic package
  - High shock and vibration survival
  - Excellent ageing characteristics
  - Designed for low power applications
  - Full military testing available
- 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
- Please note that all data is only valid at 25°C unless otherwise stated.

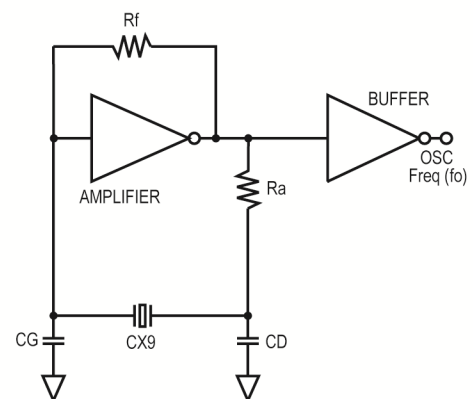


Ceramic Lid

Outline (mm) -SM1 = SM1 (Gold Plated RoHS)



## Conventional CMOS Pierce Oscillator Circuit



## Frequency Parameters

- Frequency: 32.0kHz to 160.0kHz
- Frequency Tolerance: ±30.00ppm to ±10,000.00ppm
- Tolerance Condition: @ 25°C
- Ageing: ±5ppm max in 1st year @ 25°C
- Frequency (f) at temperature (T) deviation from frequency (fo) at turning point temperature (To):  $(f - fo)/fo = k(T - To)^2$
- Note: Tighter Frequency Tolerances are available - please contact an IQD Sales Office

### Sales Office Contact Details:

UK: +44 (0)1460 270200  
Germany: 0800 1808 443

France: 0800 901 383  
USA: +1.760.318.2824

Email: [info@iqdfrequencyproducts.com](mailto:info@iqdfrequencyproducts.com)  
Web: [www.iqdfrequencyproducts.com](http://www.iqdfrequencyproducts.com)

### Electrical Parameters

- Load Capacitance (CL)            5.0pF to 9.0pF
- Shunt Capacitance (C0)            1.0pF typ
- Drive Level                            0.5µW max
- Typical Motional Values:
 

Frequency	32.768kHz	100kHz
Motional Resistance R1 (kΩ)	60	19
Motional Capacitance C1 (fF)	2.2	1.0
Quality Factor Q (k)	37	80
Shunt Capacitance C0 (pF)	1.0	0.84
Load Capacitance (pF)	9	5
Turning Point (°C)	20	16
- Note: Other load capacitances and other turning point temperatures are available - please contact an IQD Sales Offices
- Temperature Coefficient: -0.035ppm/°C<sup>2</sup>

### Operating Temperature Ranges

- -10 to 70°C
- -40 to 85°C
- -55 to 125°C

### Environmental Parameters

- Shock: 5000G, 0.3ms, 1/2 sine  
Note: Higher shock values also available - please contact an IQD Sales Offices
- Vibration: 20G rms, 10-2000Hz random
- Storage Temperature Range: -55 to 125°C

### Manufacturing Details

- Maximum Process Temperature: 260°C for 20sec max

### Ordering Information

- Frequency\*
- Model\*
- Lid Variant\*
- Termination Variant\*
- Frequency Tolerance (@ 25°C)\*
- Operating Temperature Range\*
- Load Capacitance\*
- (\*minimum required)
- Lid Variants:
  - Blank = Glass
  - C = Ceramic
- Termination Variants:
  - SM1 = Gold Plated
  - SM4 = Solder Plated
  - SM5 = Solder Dipped
 Note: non-RoHS compliant terminations SM2 and SM3 are available - please contact an IQD Sales Office
- Example  
100.0kHz CX9V TF-C-SM1  
100/-/-40 to 85C/5 FUND

### Compliance

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

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Web: [www.iqdfrequencyproducts.com](http://www.iqdfrequencyproducts.com)

**Packaging Details**

- Pack Style: Tray      Tray pack  
Pack Size: 1
- Pack Style: Reel      Tape & reel in accordance with EIA-481-D  
Pack Size: 1,000

**Electrical Specification - maximum limiting values**

Frequency Min	Frequency Max	Temperature Range	Stability (Min)	Over Tone Order	ESR
		°C	ppm		Ω
32.000kHz	160.00kHz	-10 to 70 -40 to 85 -55 to 125		Fundamental	- - -

\*Stability Maximum values ±0ppm

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

[Click to view latest version on our website.](#)

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