

## CX-6V-SM

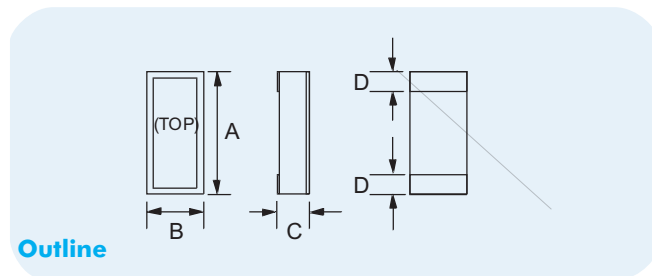
18kHz to 600kHz  
ULTRA-LOW PROFILE  
MINIATURE SMD CRYSTAL

Page  
1 of 2

Telephone: +44(0)1460 230000  
Fax: +44(0)1460 230001  
Email: sales@euroquartz.co.uk  
Web: www.euroquartz.co.uk

## General Description

The CX-6V-SM quartz crystals are leadless devices designed for surface mounting on printed circuit boards or hybrid substrates. The crystals are intended for use in Pierce oscillators. Hermetically sealed in a miniature ceramic package, the crystals are produced utilizing a photo-lithographic process ensuring consistent high quality production units.



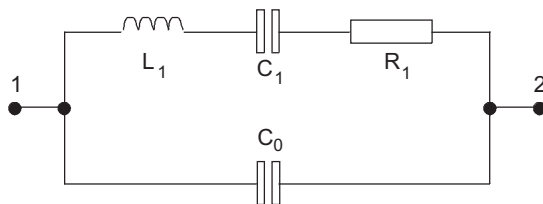
Outline

### CX-6V-SM Package Dimensions

Dimension	Typical (mm)	Maximum (mm)
A	6.73	7.11
B	2.62	2.90
C	-	see below
D	1.27	1.52

Dimension "C"	Glass Lid (mm max.)	Ceramic Lid (mm max.)
SM1	0.99	1.35
SM2	1.04	1.40
SM3	1.12	1.47

### Equivalent Circuit



$R_1$  Motional Resistance     $L_1$  Motional Inductance  
 $C_1$  Motional Capacitance     $C_0$  Shunt Capacitance

- Miniature tuning fork design
- Ultra-low profile (1mm)
- High shock resistance
- Designed for low power applications
- Compatible with hybrid or PCB packaging
- Low ageing
- Full military environmental testing available
- Ideal for battery operated applications

## Specification

<b>Frequency Range:</b>	18kHz to 600kHz
<b>Functional Mode:</b>	Tuning Fork (Flexure)
<b>Calibration Tolerance*:</b>	A, B or C (see table below)
<b>Motional Resistance (<math>R_1</math>):</b>	See Figure 1 Max.: 18~25kHz, 2x typ. 25~600kHz, 2.5x typ.
<b>Motional Capacitance (<math>C_1</math>):</b>	See Figure 2
<b>Quality Factor (Q):</b>	See Figure 3 Min. is 0.25 typ.
<b>Shunt Capacitance (<math>C_0</math>):</b>	1.4pF
<b>Drive Level:</b>	18~25kHz 0.5μW max. 25~600kHz 1.0μW max.
<b>Turning Point (<math>T_0</math>)**:</b>	See Figure 4
<b>Temperature Coefficient (k):</b>	-0.035ppm/°C <sup>2</sup>
<b>Ageing, first year:</b>	±5ppm max.
<b>Shock, survival***:</b>	1,500g 0.3ms, ½ sine
<b>Vibration, survival***:</b>	10g rms 20-2,000Hz random
<b>Operating Temperature:</b>	-10°~+70°C (commercial) -40°~+85°C (industrial) -55°~+125°C (military)
<b>Storage Temperature:</b>	-55°C~+125°C
<b>Process Temperature:</b>	260°C for 20 sec.

Specifications are typical at 25°C unless otherwise indicated.

- \* Closer calibration available
- \*\* Other Turning Point available
- \*\* A higher shock and vibration version is available

### CX-6V-SM Crystal Calibration Tolerance at 25°C

Calibration	Frequency Range (kHz)			
	18~74.9	75~169.9	170~249.9	250~600
A	±0.003%	±0.005%	±0.01%	±0.02%
B	±0.01%	±0.01%	±0.02%	±0.05%
C	±0.1%	±0.1%	±0.2%	±0.5%

Other calibration values are available - consult Euroquartz sales office

### Load Capacitance ( $C_L$ ) Used to Calibrate CX-6V

Frequency Range (kHz)	Load Cap. (pF)	Frequency Range (kHz)	Load Cap. (pF)
18~24.9	10	100.1~179.9	5
25~54.9	9	180~160	4
55~100	8		

(Other  $C_L$  available)

**CX-6V-SM**  
**18kHz to 600kHz**  
 ULTRA-LOW PROFILE  
 MINIATURE SMD CRYSTAL

Page  
 2 of 2

Telephone: +44(0)1460 230000  
 Fax: +44(0)1460 230001  
 Email: sales@euroquartz.co.uk  
 Web: www.euroquartz.co.uk

## Circuit Design

Figure 1 - CX-6V Typical Motional Resistance (R<sub>1</sub>)

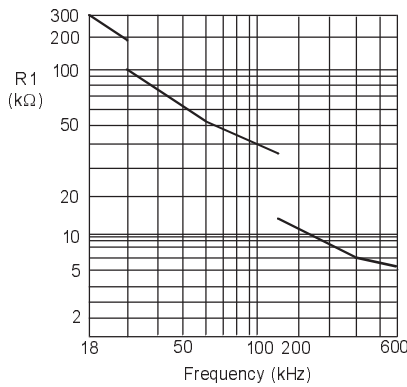


Figure 2 - CX-6V Typical Motional Capacitance (C1)

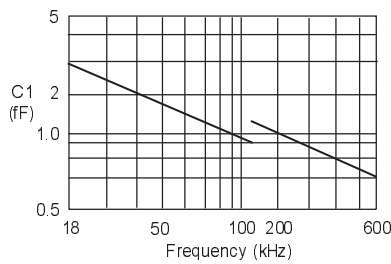


Figure 3 - CX-1H Typical Quality Factor (Q)

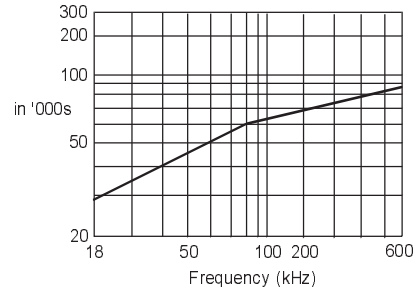
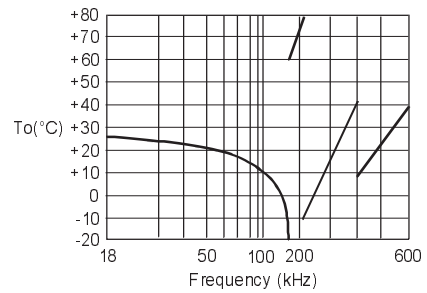


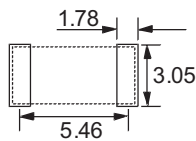
Figure 4 - CX-1H Typical Turning Point Temp. (°C)



Note: Frequency (f) deviation from frequency (fo) @ turning point

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

## Solder Pad Layout



## Order Code

**CX-6V**      **C = Ceramic Lid**  
                  **Blank = Glass Lid**  
                  **-SM1**      **Frequency**  
    **32.768kHz**      **( A / I )**

"S" if special  
 or custom design  
 Blank if standard

SM1  
 SM2  
 SM3

Calibration  
 Tolerance\*  
 @ 25°C  
 A, B, C

Temperature  
 Range:  
 C = Commercial  
 I = Industrial  
 M = Military  
 S = Specify

\*For other calibration  
 tolerances enter  
 figure in ppm

## Terminations

Designation	Termination
SM1	Gold Plated
SM2	Nickel, Solder Plated
SM3	Nickel, Solder Plated and Solder Dipped

## Packaging

- CX-6V-SM- Bulk Pack (Standard)
- 16mm tape, 178mm or 330mm reels (Optional) per EIA 481
  - Tray Pack (Optional)