CX-2-SM

9.6MHz to 160MHz

MINIATURE AT-CUT SMD CRYSTAL

EUROQUARTZ

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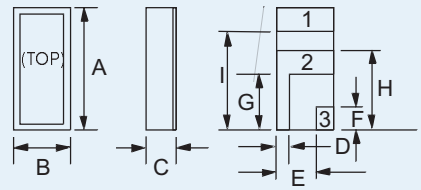
General Description

The miniature CX-2-SM AT-cut crystals in leadless ceramic packages have been designed for surface-mounting on printed circuit boards or hybrid circuits. These crystal have a low profile and a very small footprint. Manufactured by a photo-lithographic process, the CX-2-SM is a robust crystal that has gained widespread acceptance in the industry.

- Surface-mount - infrared, vapour phase, wave solder or epoxy mount techniques
- Low profile, hermetically sealed package
- Available with glass or ceramic lid
- High shock and vibration resistance
- Custom designs available
- Full military environmental testing available



Terminal 1 is electrically connected to terminal 3

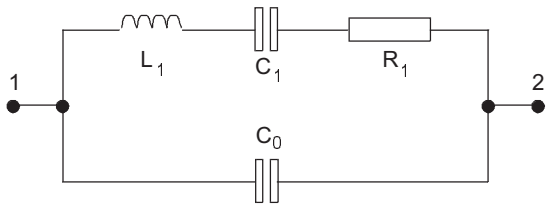
Outline

CX-2-SM Package Dimensions

Dimension	Typical (mm)	Maximum (mm)
A	6.60	6.99
B	2.39	2.74
C	-	see below
D	0.89	1.14
E	1.50	1.75
F	1.27	1.52
G	2.67	2.92
H	3.94	4.19
I	5.33	5.59

Dimension "C"	Glass Lid (mm max.)	Ceramic Lid (mm max.)
SM1	1.65	1.91
SM2	1.70	1.96
SM3	1.78	2.03

Equivalent Circuit



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

Specification

Frequency Range:	9.6MHz to 160MHz
Calibration Tolerance*:	A ±0.01% (±100ppm) B ±0.1% C ±1.0%
Load Capacitance:	20pF (unless other required)
Motional Resistance (R_1):	See table
Motional Capacitance (C_1):	See table
Quality Factor (Q):	See table
Shunt Capacitance (C_0):	See table
Drive Level:	500µW max.
Temperature Stability:**	-10° to +70°C from ±10ppm -40° to +85°C from ±20ppm -55° to +125°C from ±30ppm
Ageing, first year:	±5ppm max.
Shock, survival*:**	3000g 0.3ms, ½ sine
Vibration, survival:	20g rms 10-2,000Hz random
Operating Temperature:	-10°~+70°C (commercial) -40°~+85°C (industrial) -55°~+125°C (military)
Storage Temperature:	-55°C~+125°C
Process Temperature:	260°C for 20 seconds

Specifications are typical at 25°C unless otherwise indicated.
Frequency stability characteristics follow that of AT-cut, thickness-shear mode crystals.

* Closer calibration available, as low as ±5ppm
** Does not include calibration tolerance
** A higher shock version is available, refer to data sheet for the model CX-1HG

CX-2-SM Motional Parameters, Q and C_0

Frequency	Motional Resistance R_1 (Ω)	Motional Capacitance C_1 (fF)	Quality Factor '000s	Shunt Capacitance C_0 (pF)
10.0MHz	60	2.8	95	1.4
32MHz	20	7.8	36	2.4
155MHz	50	0.5	41	3.2

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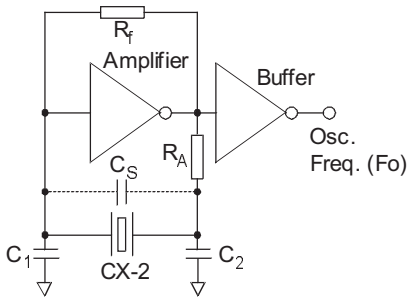
Circuit Design

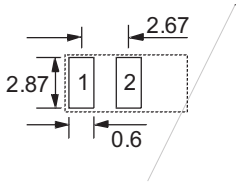
Conventional HCMOS Pierce Oscillator Circuit



Packaging

CX-1-SM - Bulk Pack (Standard)
- 16mm tape, 178mm or 330mm reels (Optional) per EIA 481
- Tray Pack (Optional)

Solder Pad Layout



Terminations

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

Order Code

CX-2 — O.T. = 3rd O.T. Mode, Blank = Fundamental
"S" if special or custom design, Blank if standard
C = Ceramic Lid, Blank = Glass Lid

-SM1 — SM1, SM2, SM3

32MHz — Frequency

(A / 25ppm / 50ppm / I)

- A — Calibration Tolerance* @ 25°C, A, B, C
- 25ppm — Frequency Stability over Temperature Range
- 50ppm — Total Frequency Tolerance
- I — Temperature Range: C = Commercial, I = Industrial, M = Military, S = Specify

*For other calibration tolerances enter figure in ppm