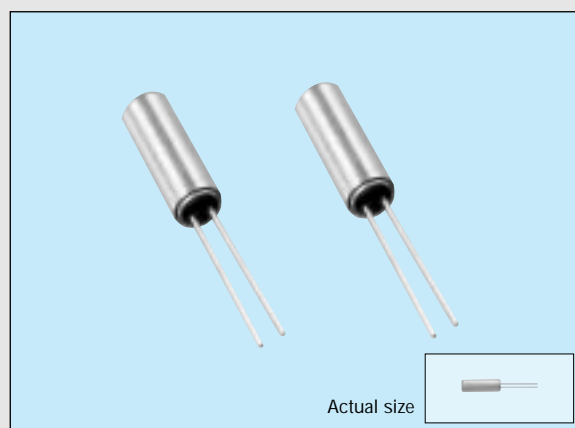


SMALL CYLINDER LOW/MEDIUM-FREQUENCY  
CRYSTAL UNIT

## C-4-TYPE

- Photolithography finished allows uniform and stable performance.
- Small and light weight. ( $\phi 1.5 \times 6\text{mm}$ )
- Excellent shock resistance and environmental capability.
- Most suitable for pagers and card products like PCMCIA.



## Specifications (characteristics)

Item	Symbol	Specifications	Remarks
Nominal frequency	f	32.000 kHz to 120.000 kHz 192 kHz	Please refer to frequency list below
Temperature range	Storage temperature	T <sub>STG</sub>	-20°C to +70°C
	Operating temperature	T <sub>OPR</sub>	-10°C to +60°C
Maximum drive level	GL	1.0μW max.	
Recommended drive level (characteristics)	DL	0.1μW typ.	
Soldering condition	T <sub>SOL</sub>	Under 280°C with in 5 sec.	Do not heat the package at more than 150°C
Frequency tolerance (standard)	$\Delta f/f$	$\pm 50\text{ppm}, \pm 100\text{ppm}$	T <sub>a</sub> =25°C, DL=0.1μW
Peak temperature (frequency)	$\theta T$	25°C $\pm 5^\circ\text{C}$	
Temperature coefficient (frequency)	a	-0.04ppm/°C <sup>2</sup> max.	
Load capacitance	C <sub>L</sub>	6pF to $\infty$	Please specify
Series resistance	R <sub>1</sub>	32 kHz $\leq f < 40$ kHz: 55 k $\Omega$ max. 40 kHz $\leq f < 60$ kHz: 30 k $\Omega$ max. 60 kHz $\leq f < 70$ kHz: 25 k $\Omega$ max. 70 kHz $\leq f \leq 100$ kHz: 22 k $\Omega$ max. 100 kHz $< f \leq 120$ kHz: 15 k $\Omega$ max. 192 kHz: 10 k $\Omega$ max.	
Motional capacitance	C <sub>1</sub>	3.0fF max.	
Shunt capacitance	C <sub>0</sub>	1.5pF max.	
Insulation resistance	I <sub>R</sub>	500 M $\Omega$ min.	
Aging	f <sub>a</sub>	$\pm 5\text{ppm/year}$ max.	T <sub>a</sub> =25°C $\pm 3^\circ\text{C}$ , first year
Shock resistance	S.R.	$\pm 5\text{ppm}$ max.	Three drops on a hard board from 75 cm or excitation test with 3000G x 0.3ms x 1/2 sine wave x 3 directions

## Frequency example

Type	Frequency	C <sub>L</sub> Value
C-2-TYPE	26.6667 kHz	10.0pF, 11.0pF
	32.5600 kHz	7.0pF
	36.8640 kHz	13.5pF
	38.4000 kHz	10.0pF
	44.7340 kHz	10.0pF
	48.0000 kHz	15.0pF
	75.0000 kHz	6.5pF, 9.0pF, 20.0pF
	77.5030 kHz	10.0pF, 20.0pF
	76.8000 kHz	6.0pF, 10.0pF, 11.0pF
	96.0000 kHz	6.0pF, 8.4pF, 11.0pF
C-4-TYPE	153.6000 kHz	11.0pF
	307.2000 kHz	11.0pF
	38.4000 kHz	11.0pF
	50.0000 kHz	9.0pF
	76.8000 kHz	11.0pF
	77.5030 kHz	10.0pF
	192.0000 kHz	11.0pF

## External dimensions

(Unit: mm)

Model	L <sub>1</sub>	L <sub>2</sub>	D <sub>1</sub>	D <sub>2</sub>	B
C-2-TYPE	6.0 max.	4.0 min.	$\phi 2.0$ max.	$\phi 0.2$	0.7
C-001R	8.0 max.	9.0 min.	$\phi 3.1$ max.	$\phi 0.3$	1.1
C-002RX	6.0 max.	4.0 min.	$\phi 2.0$ max.	$\phi 0.2$	0.7
C-004R	5.0 max.	4.0 min.	$\phi 1.5$ max.	$\phi 0.2$	0.5
C-005R	4.6 max.	4.0 min.	$\phi 1.2$ max.	$\phi 0.15$	0.3
C-4-TYPE	5.0 max.	4.0 min.	$\phi 1.5$ max.	$\phi 0.2$	0.5

(160 to 165kHz, 307.2 kHz: D<sub>1</sub>= $\phi 2.2$  max.)

# THE CRYSTALMASTER



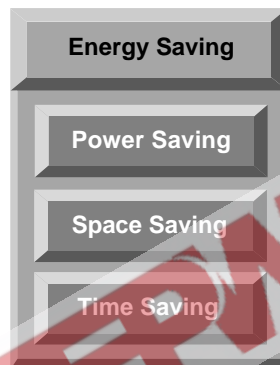
## ENERGY SAVING EPSON

EPSON offers effective savings to its customers through a wide range of electronic devices, such as semiconductors, liquid crystal display (LCD) modules, and crystal devices. These savings are achieved through a sophisticated melding of three different efficiency technologies.

Power saving technology provides low power consumption at low voltages.

Space saving technology provides further reductions in product size and weight through super-precise processing and high-density assembly technology.

Time saving technology shortens the time required for design and development on the customer side and shortens delivery times.



Our concept of Energy Saving technology conserves resources by blending the essence of these three efficiency technologies. The essence of these technologies is represented in each of the products that we provide to our customers.

In the industrial sector, leading priorities include measures to counter the greenhouse effect by reducing CO<sub>2</sub>, measures to preserve the global environment, and the development of energy-efficient products. Environmental problems are of global concern, and although the contribution of energy-saving technology developed by EPSON may appear insignificant, we seek to contribute to the development of energy-saving products by our customers through the utilization of our electronic devices. EPSON is committed to the conservation of energy, both for the sake of people and of the planet on which we live.



**SEIKO EPSON CORP. QUARTZ DEVICE DIVISION acquired ISO9001 and ISO14001 certification by B.V.Q.I. (Bureau Veritas Quality International) .**

**ISO9001 in October, 1992.**

**ISO14001 in November, 1997.**

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