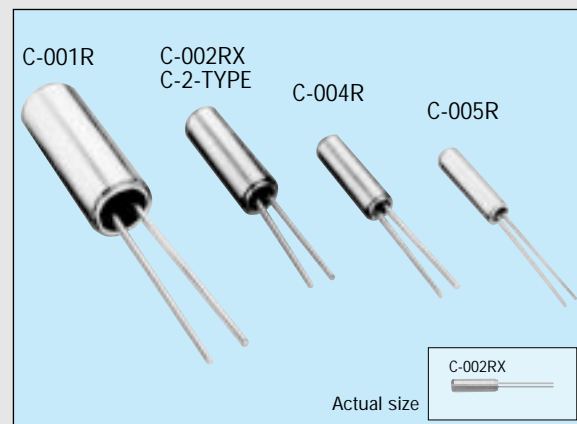


## CYLINDER LOW/MEDIUM-FREQUENCY CRYSTAL UNIT

**C-2-TYPE/C-TYPE**

- Photolithography finished allows uniform and stable performance.
- Excellent shock resistance and environmental capability.
- Respond to an extensive range of frequency, from 20 kHz to 165 kHz, and 307.2 kHz.



## ■ Specifications for C-2-TYPE (characteristics)

Item	Symbol	Specifications	Remarks
Nominal frequency range	f	20.000 kHz to 165.000 kHz, 307.2 kHz	Please refer to frequency example page 16
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.	
Soldering condition (lead part)	T <sub>SOL</sub>	Under 280°C within 5 sec.	Do not heat the package at more than 150°C
Frequency tolerance (standard)	Δf/f	±20ppm, ±50ppm, ±100ppm (307.2 kHz: ±100ppm)	Ta=25°C, DL=0.1μW
Peak temperature (frequency)	θT	25°C ±5°C	
Temperature coefficient (frequency)	a	-0.04ppm/°C² max.	
Load capacitance	C <sub>L</sub>	6pF to ∞	Please specify
Series resistance	R <sub>1</sub>	20 kHz ≤ f < 30 kHz: 55 kΩ max. 30 kHz ≤ f < 40 kHz: 45 kΩ max. 40 kHz ≤ f < 60 kHz: 20 kΩ max. 60 kHz ≤ f < 70 kHz: 15 kΩ max. 70 kHz ≤ f < 120 kHz: 12 kΩ max. 120 kHz ≤ f < 165 kHz: 10 kΩ max. 307.2 kHz: 6 kΩ max.	
Motional capacitance	C <sub>1</sub>	4.0fF max.	
Shunt capacitance	C <sub>0</sub>	2.0pF max.	
Insulation resistance	IR	500 MΩ min.	
Aging	fa	±5ppm/year max.	Ta=25°C±3°C, first year
Shock resistance	S.R.	±5ppm 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

• Please refer to the external dimensions on page 15.

## ■ Specifications for C-TYPE (characteristics)

Item	Symbol	C-001R	C-002RX	C-004R	C-005R	Remarks
Nominal frequency range	f		32.768 kHz			
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.			
Soldering condition (lead part)	T <sub>SOL</sub>		Under 280°C within 5 sec.			*1
Frequency tolerance (standard)	Δf/f		±20ppm			Ta=25°C, DL=0.1μW
Peak temperature (frequency)	θ T		25°C ±5°C			
Temperature coefficient (frequency)	a		-0.04ppm/°C² max.			
Load capacitance	C <sub>L</sub>		6pF to ∞			Please specify
Series resistance	R <sub>1</sub>	35 kΩ max. (18 kΩ typ.)	50 kΩ max. (30 kΩ typ.)		50 kΩ max. (37 kΩ typ.)	
Motional capacitance	C <sub>1</sub>	2.1fF typ.	2.0fF typ.		1.9fF typ.	
Shunt capacitance	C <sub>0</sub>	0.9pF typ.	0.8pF typ.		0.7pF typ.	
Insulation resistance	IR		500 MΩ min.			
Aging	fa		±3.0ppm/year max.			Ta=25°C ± 3°C, first year
Shock resistance	S. R.		±5ppm 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

• Please refer to the external dimensions on page 15.

\*1 Do not heat the package to more than 150°C

# THE CRYSTALMASTER



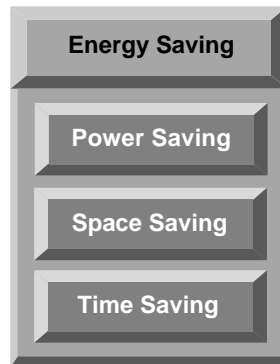
## ENERGY SAVING EPSON

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.

**Resource Saving**



**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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