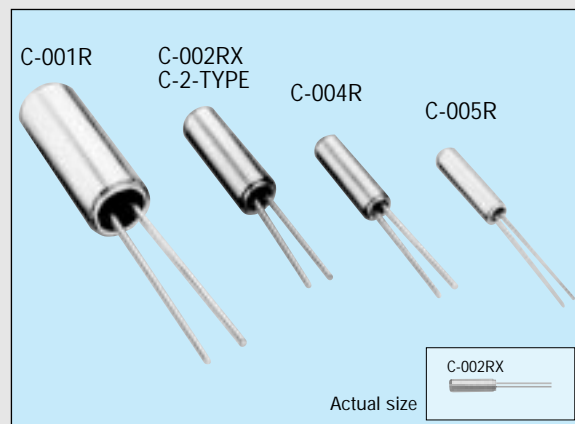


## CYLINDER LOW/MEDIUM-FREQUENCY CRYSTAL UNIT

**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)	T <sub>a</sub> =25°C, DL=0.1μW
Peak temperature (frequency)	θT	25°C ±5°C	
Temperature coefficient (frequency)	a	-0.04ppm/°C <sup>2</sup> 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.	T <sub>a</sub> =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			T <sub>a</sub> =25°C, DL=0.1μW
Peak temperature (frequency)	θT		25°C ±5°C			
Temperature coefficient (frequency)	a		-0.04ppm/°C <sup>2</sup> 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.			T <sub>a</sub> =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