

Product Catalog Information

Product No	Q11C02RX1012900
Model	C-002RX 32.768KHz 12.5pf +/-20PPM
Description	12.5pF +/-20ppm (Pb-free Model)

Note:

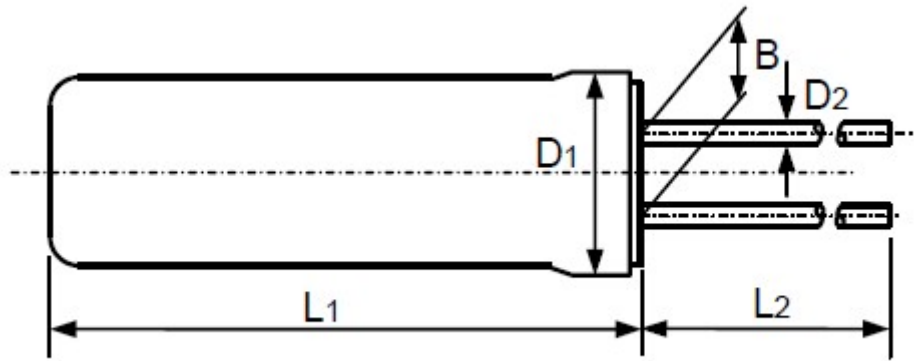
1. The contents are subject to change without notice.
2. This sheet is not intended to guarantee or provide an approval of implementation of industrial patents
3. We have prepared this as carefully as possible. If you find it incomplete or unsatisfactory in any respect. We would welcome your comments

Specifications for C-002RXtype (Characteristics)

Item	Symbol	C-002RX	Remark	
Nominal Frequency range	f	32.768kHz	Fundamental	
Temperature	Storage	TSTG	-20 ° C to +70 ° C	Store as bare product after unpacking
	Operating	TOPR	-10 ° C to +60 ° C	
Maximum drive level	GL	1.0 μ W Max		
Frequency tolerance (standard)	$\Delta f/f$	$\pm 20 \times 10^{-6}$	Ta= +25 ° C, DL=0.1 μ W	
Peak temperature (frequency)	θT	+25 ° C \pm 5		
Temperature coefficient (frequency)	a	$-0.04 \times 10^{-6} / \text{° C}^2$ max		
Load capacitance	CL	12.5pF		
Series resistance	R1	50k Ω Max (30k Ω Typ.)	DL = 1.0uW	
Motional Capacitance	C1	2.0fF Typ.		
Shunt Capacitance	C0	0.85pF Typ.		
Insulation resistance	IR	500M Ω Min		
Aging	fa	$\pm 3.0 \times 10^{-6} / \text{year}$ Max	Ta=+25 ° C \pm 3, first year	
Shock resistance	S.R	$\pm 5 \times 10^{-6}$ Max	Three drops on hard board from 750mm or excitation test with 29400 m/s ² x 0.3ms x 1/2 sine wave x 3 directions	

Dimensions

Unit: mm



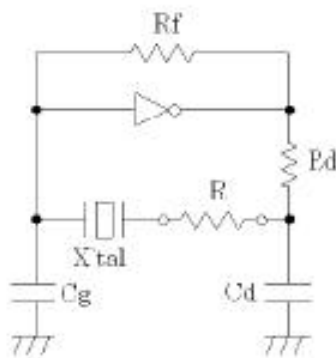
Model	L1	L2	D1	D2	B
C-002RX C-2-TYPE	6.0 Max.	4.0 Min.	ϕ 2.0 Max.	ϕ 0.2	0.7
C-004R C-4-TYPE	5.0 Max.	4.0 Min.	ϕ 1.5 Max.	ϕ 0.18	0.5
C-005R	4.6 Max.	4.0 Min.	ϕ 1.2 Max.	ϕ 0.15	0.3

160 kHz~165 kHz:D1= ϕ 2.2 Max.(C-2-TYPE)

Appendix: Note

1. If the temperature of the package exceeds +150 °C., the crystal resonator may be damaged or its characteristic may be impaired.
2. Bending the lead too closely to the case or pulling the lead strongly may cause the hermetic glass seal to crack. If the lead needs to bend, please leave more than 0.5 mm from the lead to the case.
3. Excessive pressure may cause leakage of hermetically. Please take caution not to give excessive press to the sealed part of the package.
4. Excessive shock or vibration is not allowed. The internal crystal resonator may be damaged from machine shock during assembly. Please check conditions carefully prior to use.
5. To avoid condensation, do not store or use in an environment where temperatures may change rapidly. We recommend that products be stored in an environment where temperature and humidity are normal.
6. Products using a tuning fork crystal can not be guaranteed for ultrasonic cleaning because they may be damaged by resonance vibration.
7. Applying excessive drive level to the crystal resonator may cause deterioration or damage. Circuit design must be such that the proper drive level is maintained.
8. Unless adequate negative resistance is allocated in the oscillation circuit, start up time of oscillation may be increased or stopped. In order to avoid this, please provide enough negative resistance in the circuit design.

(How to check the negative resistance [-NR])



- (1) Connect the resistor (R) to the circuit in series with the crystal resonator
- (2) Adjust (R) so that oscillation can start (or stop).
- (3) Measure (R) when oscillation just start (or stop) in above (2).
- (4) Get the negative resistance.
[-NR] = R + CI value
- (5) Recommended [-NR]
[-NR] > CI (Max.) × (5 to 10)