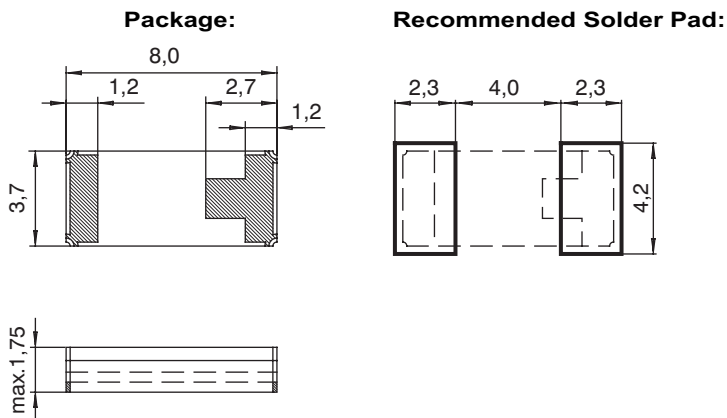


CC1V-T1A

Tuning Fork Crystal 10 kHz – 2.1 MHz



DIMENSIONS



All dimensions in mm typical

Small ceramic package
Package height 1.75 mm
SMD-package in Tape and Reel
Industrial and MIL temp. ranges
High stability
Low aging
Low power consumption
High shock and vibration resistance

The CC1V-T1A is a completely leadfree product.

DESCRIPTION:

In the range between 10 and 200 kHz, the tuning fork resonators vibrate in the fundamental mode. From 201 to 560 kHz, an overtone mode is used. The frequency range from 561 kHz to 2.1 MHz is covered with length extensional resonators.

The crystals are supplied in special trays (100 crystals per tray).

For pick-and-place equipment, the parts are available in 16 mm tapes:

7" (178 mm) reel with 1'000 crystals

10" (254 mm) reel with 2'000 crystals

13" (330 mm) reel with 4'000 crystals

ELECTRICAL CHARACTERISTICS AT 25°C:

Frequency Range	F_L	10–200	201–560	561–2'100	kHz
Load capacitance ¹⁾	C_L	9.0 / 12.5	4.0	10.0	pF
Frequency tolerance ²⁾	$\Delta F/F$	+/-30	+/-100	+/-100	ppm
	$\Delta F/F$	+/-100	+/-250	+/-500	ppm
Drive level max.	P	1.0			μW
Insulation resistance min.	R_i	500			MΩ
Aging first year max.	$\Delta F/F_0$	+/-3			ppm

Frequency Example ³⁾	F_L	32.768	307.200	1'000	kHz
Series resistance typ./max.	R_S	37 / 60	1.4 / 3.5	0.6 / 1.2	kΩ
Motional capacitance typ.	C_1	2.3	1.7	1.4	fF
Static capacitance typ.	C_0	1.6	1.6	1.2	pF
Quality factor min.	Q	35'000	85'000	85'000	
Turnover temperature	T_0	25 +/-5	22 +/-5	39 +/-5	°C
Frequency vs. temperature	$\Delta F/F_0$	$-0.035 \text{ ppm}/^\circ\text{C}^2 (T - T_0)^2$ +/-10%			ppm

1) Other load capacitances on request.

2) Tighter and wider frequency tolerances on request.

3) Values for other frequencies consult factory.

STANDARD FREQUENCIES:

Frequency kHz					Frequency MHz
10.000	12.800	16.000	16.384	20.480	1.0000
31.200	32.000	32.768	38.400	40.000	1.2288
40.960	60.000	75.000	76.800	100.000	1.8432
128.000	153.600	240.000	307.200	455.000	2.0000
768.000					
Other frequencies between 10 kHz and 2.1 MHz on request					

ENVIRONMENTAL CHARACTERISTICS:

		Conditions	Max. Dev.
Storage temp. range		−55 to +125°C	
Industrial operating temp. range		−40 to +85°C	
Military operating temp. range		−55 to +125°C	
Shock resistance	ΔF/F	5000 g, 0.3 ms, ½ sine	+/-5 ppm
Vibration resistance	ΔF/F	20 g / 10–2000 Hz	+/-5 ppm

TERMINATIONS AND PROCESSING:

Type	Termination	Processing
CC1V-T1A	For SMD mounting Au flashed pads	Reflow soldering 260°C/20 s max.

**PART NUMBER/
ORDERING INFORMATION
EXAMPLE:**

Code	Meaning
C	Crystal in ceramic package
1	Package size: 8.0 x 3.7 x 1.75 mm
V	Blank: Tuning fork or length extension
T	Package type: For SMD mounting
A	Package pad form: Pads on both ends
32.768 kHz	Frequency
9.0 pF	Load capacitance C_L
+/-30 ppm	Frequency tolerance

07.04



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