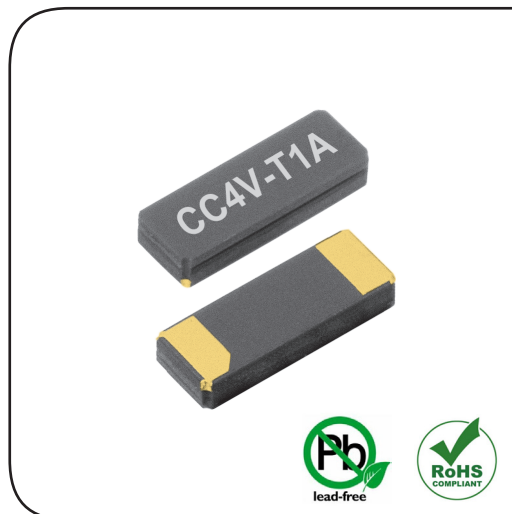
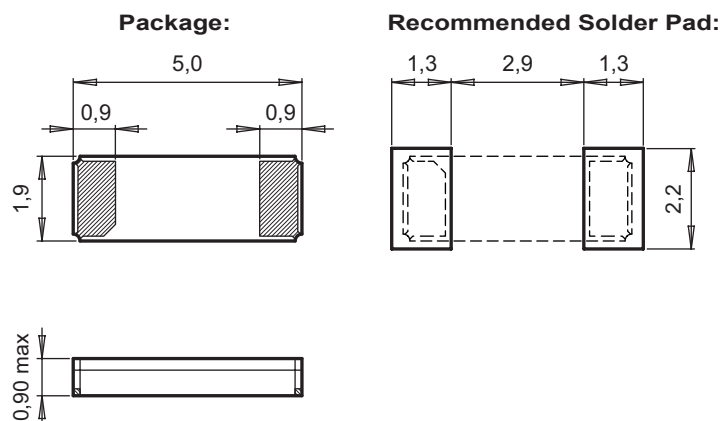


# CC4V-T1A

**Tuning Fork Crystal 30 kHz – 1.0 MHz**



## DIMENSIONS



All dimensions in mm typical

## APPLICATIONS

Metering  
Industrial  
Automotive  
Health Care  
Medical Implantable  
Harsh Environments

## DESCRIPTION

The CC4V-T1A is a low frequency SMT Quartz Crystal Unit that incorporates a tuning fork Quartz Crystal Resonator. It operates under vacuum in a hermetically sealed ceramic package with ceramic lid.

*CC4V-T1A is compatible with other suppliers' same footprint crystals.*

## FEATURES

Mature product for harsh environments.  
Outstanding hermetic sealing with gold-tin preform.  
High stability and low aging guaranteed by hermetic sealing.  
Available for extended operating temperature range.  
High shock and vibration resistant.  
100% Pb-free, RoHS-compliant.  
Automotive qualification according to AEC-Q200 available.

## ELECTRICAL CHARACTERISTICS AT 25°C

| Frequency Range                   | F <sub>L</sub> | 30–200                            | 201–560 | 1'000       | kHz |
|-----------------------------------|----------------|-----------------------------------|---------|-------------|-----|
| Load capacitance <sup>1)</sup>    | C <sub>L</sub> | 6.0<br>7.0<br>9.0<br>10.0<br>12.5 | 9.0     | 7.0<br>10.0 | pF  |
| Frequency tolerance <sup>2)</sup> | ΔF/F           | ±20                               | ±100    | ±100        | ppm |
|                                   | ΔF/F           | ±100                              | ±250    | ±500        | ppm |
| Drive level max.                  | P              | 1.0                               |         |             | μW  |
| Insulation resistance min.        | R <sub>i</sub> | 500                               |         |             | MΩ  |
| Aging first year max.             | ΔF/F           | ±3                                |         |             | ppm |

| Standard Frequencies <sup>3)</sup> | F <sub>L</sub>    | 32.768                                     | 200.000   | 1'000     | kHz |
|------------------------------------|-------------------|--------------------------------------------|-----------|-----------|-----|
| Series resistance typ./max.        | R <sub>S</sub>    | 50 / 65                                    | 3.2 / 5.0 | 0.5 / 1.0 | kΩ  |
| Motional capacitance typ.          | C <sub>1</sub>    | 2.1                                        | 2.1       | 2.1       | fF  |
| Static capacitance typ.            | C <sub>0</sub>    | 1.2                                        | 1.3       | 1.0       | pF  |
| Turnover temperature               | T <sub>0</sub>    | 25 ±5                                      | 30 ±5     | 32 ±5     | °C  |
| Frequency vs. temperature          | ΔF/F <sub>0</sub> | −0.035 ppm/°C² (T - T <sub>0</sub> )² ±10% |           |           | ppm |

1) Other load capacitances on request.

2) Tighter frequency tolerances on request.

3) Other standard frequencies, see below.

## STANDARD FREQUENCIES

| Frequencies                  |             |             |             |
|------------------------------|-------------|-------------|-------------|
| 32.768 kHz                   | 38.400 kHz  | 40.000 kHz  | 100.000 kHz |
| 128.000 kHz                  | 153.600 kHz | 200.000 kHz | 1.0000 MHz  |
| Other frequencies on request |             |             |             |

## ENVIRONMENTAL CHARACTERISTICS

|                                |              | Conditions               | Max. Dev. |
|--------------------------------|--------------|--------------------------|-----------|
| Storage temp. range            |              | -55 to +125°C            |           |
| TA Operating temperature range |              | -40 to +85°C             |           |
| TB Extended oper. temp. range  |              | -40 to +125°C            |           |
| TC Extended oper. temp. range  |              | -55 to +125°C            |           |
| Shock resistance               | $\Delta F/F$ | 5000 g, 0.3 ms, 1/2 sine | ±5 ppm    |
| Vibration resistance           | $\Delta F/F$ | 20 g / 10–2000 Hz        | ±5 ppm    |

## TERMINATIONS AND PROCESSING

| Type     | Termination                                   | Processing                                |
|----------|-----------------------------------------------|-------------------------------------------|
| CC4V-T1A | Au flashed pads                               | IPC/JEDEC J-STD-020C<br>260°C / 20 - 40 s |
| CC4V-T2A | SnPb plated pads<br>available only on request |                                           |

## ORDERING INFORMATION

| C C 4 V - T 1 A 32.768 kHz 12.5 pF ±20 ppm TA QC |                                          |
|--------------------------------------------------|------------------------------------------|
| <b>Ceramic package</b>                           | <b>Frequency <math>F_L</math></b>        |
| <b>Ceramic lid</b>                               | <b>Load capacitance <math>C_L</math></b> |
| <b>Package size</b>                              | 6.0 pF, 7.0 pF                           |
| <b>4 = 5.0 x 1.9 x 0.90 mm</b>                   | 9.0 pF                                   |
| <b>Tuning fork</b>                               | 10.0 pF                                  |
| <b>SMT Package</b>                               | 12.5 pF                                  |
| <b>Pads</b>                                      | Other $C_L$ on request                   |
| 1 = Au flashed pads                              | <b>Frequency tolerance</b>               |
| 2 = SnPb plated pads                             | ±20 ppm, ±100 ppm                        |
| <b>Pads on both ends</b>                         | ±250 ppm, ±500 ppm                       |
|                                                  | Tighter freq. tolerances on request      |
|                                                  | <b>Temperature range</b>                 |
|                                                  | TA = -40 to +85°C (Standard)             |
|                                                  | TB = -40 to +125°C                       |
|                                                  | TC = -55 to +125°C                       |
|                                                  | <b>Qualification</b>                     |
|                                                  | QC = Commercial Grade (Standard)         |
|                                                  | QA = Automotive Grade AEC-Q200           |
|                                                  | QM = Medical Grade                       |

|                                                                             |                                        |
|-----------------------------------------------------------------------------|----------------------------------------|
| A unique part number will be generated for each product specification, i.e: |                                        |
| 20xxxx-MG02                                                                 | 2'000 pcs (in 12 mm tape on 7" reel)   |
| 20xxxx-PG10                                                                 | 10'000 pcs (in 12 mm tape on 13" reel) |

All specifications subject to change without notice.



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