

# CC7V-T1A

## Tuning Fork Crystal 32.768 kHz

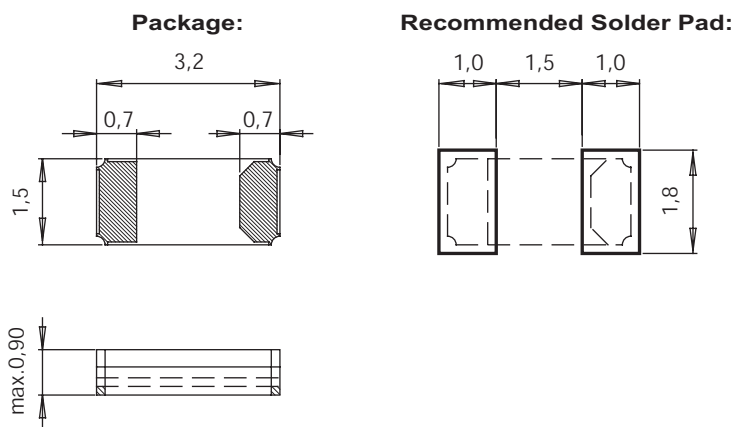


**100% leadfree, RoHS - compliant**

**Smallest SMT ceramic package**  
**Package height 0.90 mm**  
**SMD-package in Tape and Reel**  
**Industrial and MIL temp. ranges**  
**High stability**  
**Low aging**  
**Low power consumption**  
**High shock and vibration resistance**

### ELECTRICAL CHARACTERISTICS AT 25°C:

### DIMENSIONS



All dimensions in mm typical

**The CC7V-T1A is a completely leadfree product.**

### DESCRIPTION:

This SMD ceramic package has been specially designed for miniature industrial and telecom applications. A special crystal manufacturing process is used to achieve improved electrical characteristics and a miniaturized blank size.

The crystals are supplied in special trays (200 crystals per tray).

For pick-and-place equipment, the parts are available in 12 mm tape:

- 7" (178 mm) reel with 3'000 crystals
- 10" (254 mm) reel with 7'000 crystals
- 13" (330 mm) reel with 14'000 crystals

| Nominal Frequency           | <sup>1)</sup> F <sub>L</sub> | 32.768   | kHz |
|-----------------------------|------------------------------|--|-----|
| Load capacitance            | <sup>2)</sup> C <sub>L</sub> | 9.0 / 12.5   | pF  |
| Frequency tolerance         | <sup>3)</sup> ΔF/F           | +/-30  | ppm |
|                             | ΔF/F                         | +/-100   | ppm |
| Series resistance typ./max. | R <sub>s</sub>               | 50 / 70  | kΩ  |
| Motional capacitance typ.   | C <sub>1</sub>               | 4.2  | fF  |
| Static capacitance typ.     | C <sub>0</sub>               | 1.0  | pF  |
| Drive level max.            | P                            | 1.0  | μW  |
| Insulation resistance min.  | R <sub>i</sub>               | 500  | MΩ  |
| Aging first year max.       | ΔF/F                         | +/-3   | ppm |
| Turnover temperature        | T <sub>0</sub>               | 25 +/-5  | °C  |
| Frequency vs. temperature   | ΔF/F <sub>0</sub>            | -0.035 ppm/°C <sup>2</sup> (T - T <sub>0</sub> ) <sup>2</sup> +/-10% | ppm |

1) Other frequencies on request.

2) Other load capacitances on request.

3) Tighter and wider frequency tolerances on request.

## STANDARD FREQUENCIES:

| Frequency<br>kHz             |
|------------------------------|
| 32.768                       |
| Other frequencies 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                 | $\Delta F/F$ | 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                            |
|----------|-------------------------------------|---------------------------------------|
| CC7V-T1A | For SMD mounting<br>Au flashed pads | Reflow soldering<br>260°C / 20 s max. |

## PART NUMBER/ ORDERING INFORMATION EXAMPLE:

|   |  |   |  |                                      |                                |                                 |                          |                                    |                                |                                       |  |  |
|---|--|---|--|--------------------------------------|--------------------------------|---------------------------------|--------------------------|------------------------------------|--------------------------------|---------------------------------------|--|--|
| <u>Crystal package</u><br><b>C</b> = Crystal in ceramic package | <u>Package lid</u><br><b>C</b> = Ceramic lid | <u>Package size</u><br><b>7</b> = 3.2 x 1.5 x 0.90 mm | <u>Blank</u><br><b>V</b> = Tuning fork | <u>Crystal package</u><br><b>C C</b> | <u>Package lid</u><br><b>7</b> | <u>Package size</u><br><b>V</b> | <u>Blank</u><br><b>T</b> | <u>Crystal package</u><br><b>1</b> | <u>Package lid</u><br><b>A</b> | <u>Frequency</u><br><b>32.768 kHz</b> | <u>Load capacitance C<sub>L</sub></u><br><b>9.0 pF</b> | <u>Frequency tolerance</u><br><b>+/-30 ppm</b> |
|---|--|---|--|--------------------------------------|--------------------------------|---------------------------------|--------------------------|------------------------------------|--------------------------------|---------------------------------------|--|--|

All specifications subject to change without notice. 09.05



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