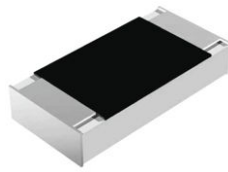


## Standard Thick Film Chip Resistors



### FEATURES

- Very small standard size (0.4 mm x 0.2 mm)
- Low tolerance (1 %)
- Material categorization:  
For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

| STANDARD ELECTRICAL SPECIFICATIONS  |                       |                     |                               |  |                                     |                |                                 |          |
|---|-----------------------|---------------------|-------------------------------|--|-------------------------------------|----------------|---------------------------------|----------|
| TYPE  | CASE SIZE<br>IMPERIAL | CASE SIZE<br>METRIC | POWER RATING<br>$P_{70}$<br>W | LIMITING<br>ELEMENT<br>VOLTAGE<br>$U_{max.}$<br>AC <sub>RMS</sub> /DC<br>V | TEMPERATURE<br>COEFFICIENT<br>ppm/K | TOLERANCE<br>% | RESISTANCE<br>RANGE<br>$\Omega$ | SERIES   |
| CRCW01005   | 01005                 | RR0402M             | 0.031                         | 15   | ± 250                               | ± 1            | 10.0 to 1M                      | E24; E96 |
|   |                       |                     |                               |  |                                     | ± 2, ± 5       |                                 | E24      |
|   |                       |                     |                               |  | -200/+600                           | ± 1            | 1.0 to 9.76                     | E24; E96 |
|   |                       |                     |                               |  |                                     | ± 2, ± 5       | 1.0 to 9.1                      | E24      |
| Zero-Ohm-Resistor: $R_{max.} = 50 \text{ m}\Omega$ , $I_{max.} = 0.5 \text{ A}$ |                       |                     |                               |  |                                     |                |                                 |          |

### Notes

- These resistors do not feature a limited lifetime when operated within the permissible limits. However, resistance value drift increasing over operating time may result in exceeding a limit acceptable to the specific application, thereby establishing a functional lifetime.
- Power rating depends on the max. temperature at the solder point, the component placement density and the substrate material.

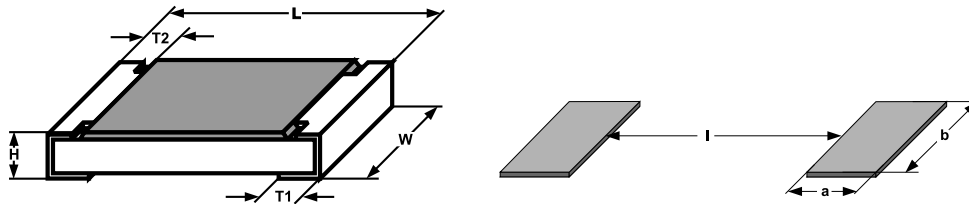
| TECHNICAL SPECIFICATIONS                           |          |                   |
|--|----------|-------------------|
| PARAMETER  | UNIT     | CRCW01005         |
| Rated Dissipation $P_{70}$ <sup>(1)</sup>          | W        | 0.031             |
| Operating Voltage $U_{max.}$ AC <sub>RMS</sub> /DC | V        | 15                |
| Insulation Voltage $U_{ins}$ (1 min)               | V        | 30                |
| Insulation Resistance                              | $\Omega$ | > 10 <sup>9</sup> |
| Operating Temperature Range                        | °C       | -55 to +125       |
| Mass   | mg       | 0.07              |

### Note

- <sup>(1)</sup> The power dissipation on the resistor generates a temperature rise against the local ambient, depending on the heat flow support of the printed-circuit board (thermal resistance). The rated dissipation applies only if the permitted film temperature of 125 °C is not exceeded.

| PART NUMBER AND PRODUCT DESCRIPTION               |   |  |  |           |                                  |                     |
|---|---|--|--|-----------|----------------------------------|---------------------|
| PART NUMBER: CRCW01001K00FREL                     |   |  |  |           |                                  |                     |
| C   | R   | C  | W  | 0         | 1                                | 0 0 1 K 0 0 F R E L |
| TYPE  | VALUE   | TOLERANCE  | TCR  |           | PACKAGING                        |                     |
| CRCW0100  | R = Decimal<br>K = Thousand<br>M = Million<br>0000 = Jumper | F = ± 1.0 %<br>G = ± 2.0 %<br>J = ± 5.0 %<br>Z = Jumper                            | R = ± 250 ppm/K<br>Y = -200 ppm/K/+600 ppm/K<br>0 = Jumper |           | EL                               |                     |
| PRODUCT DESCRIPTION: CRCW01005 250 1K0 1 % ET3 e3 |   |  |  |           |                                  |                     |
| CRCW01005   | 250   | 1K0  | 1 %  | ET3       | e3                               |                     |
| TYPE  | TCR   | RESISTANCE VALUE   | TOLERANCE VALUE  | PACKAGING | LEAD (Pb)-FREE                   |                     |
| CRCW01005   | ± 250 ppm/K<br>-200/+600 ppm/K                              | 1R0 = 1 Ω<br>10R = 10 Ω<br>1K0 = 1 kΩ<br>10K = 10 kΩ<br>1M0 = 1 MΩ<br>0R0 = Jumper | ± 1 %<br>± 2 %<br>± 5 %                                    | ET3       | e3 = Pure tin termination finish |                     |

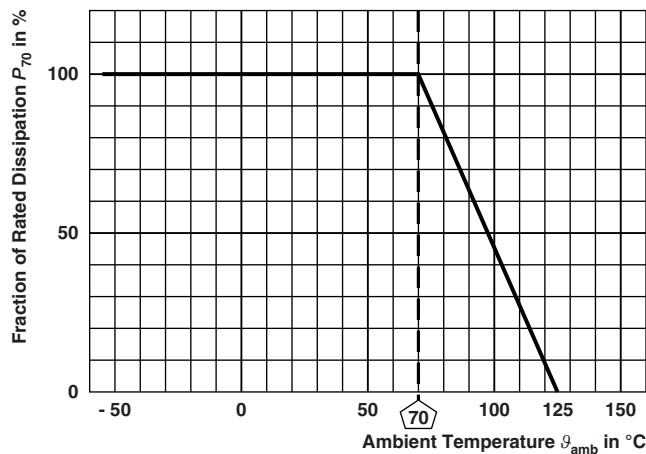
| PACKAGING |          |          |   |       |       |               |
|-----------|----------|----------|---|-------|-------|---------------|
| TYPE      | CODE     | QUANTITY | CARRIER TAPE                            | WIDTH | PITCH | REEL DIAMETER |
| CRCW01005 | EL = ET3 | 20 000   | Paper tape acc. to IEC 60286-3, Type 1a | 8 mm  | 2 mm  | 180 mm/7"     |

**DIMENSIONS** in millimeters


| SIZE     |         | DIMENSIONS |            |             |             |             | RECOMMENDED SOLDER PAD DIMENSIONS |     |     |
|----------|---------|------------|------------|-------------|-------------|-------------|-----------------------------------|-----|-----|
| IMPERIAL | METRIC  | L          | W          | H           | T1          | T2          | a                                 | b   | l   |
| 01005    | RR0402M | 0.4 ± 0.02 | 0.2 ± 0.02 | 0.13 ± 0.02 | 0.10 ± 0.03 | 0.10 ± 0.03 | 0.15                              | 0.2 | 0.2 |

**Note**

- No marking for 01005 size.

**DERATING**




| TEST PROCEDURES AND REQUIREMENTS |                                  |  |   |  |
|----------------------------------|----------------------------------|--|---|--|
| EN 60115-1<br>CLAUSE             | IEC<br>60068-2<br>TEST<br>METHOD | TEST                                       | PROCEDURE   | REQUIREMENTS<br>PERMISSIBLE CHANGE ( $\Delta R$ )                                      |
|                                  |                                  |  | STABILITY CLASS 1 OR BETTER   |  |
|                                  |                                  |  | CRCW01005 e3  |  |
| 4.5                              | -                                | Resistance                                 | -   | $1 \Omega$ to $1 M\Omega$<br>$\pm 1 \%$ ; $\pm 2 \%$ ; $\pm 5 \%$                      |
| 4.13                             | -                                | Short time overload                        | $U = 2.5 \times \sqrt{P_{70} \times R} \leq 2 \times U_{max.}$ ;<br>duration according to style         | $\pm (2 \% R + 0.1 \Omega)$  |
| 4.17.2                           | 58 (Td)                          | Solderability                              | Solder bath method;<br>Sn60Pb40<br>non activated flux;<br>( $235 \pm 5$ ) °C<br>( $2 \pm 0.2$ ) s       | Good tinning ( $\geq 95 \%$ covered)<br>no visible damage                              |
|                                  |                                  |  | Solder bath method;<br>Sn96.5Ag3Cu0.5<br>non-activated flux;<br>( $235 \pm 3$ ) °C<br>( $2 \pm 0.5$ ) s | Good tinning ( $\geq 95 \%$ covered)<br>no visible damage                              |
| 4.8.4.2                          | -                                | Temperature coefficient                    | (20/-55/20) °C and<br>(20/125/20) °C  | - 200 ppm/K/+600 ppm/K,<br>$\pm 250$ ppm/K   |
| 4.33                             | 21 (Uu <sub>1</sub> )            | Substrate bending                          | Depth 3 mm; 1 time  | No visible damage,<br>no open circuit in bent position<br>$\pm (1 \% R + 0.05 \Omega)$ |
| 4.19                             | 14 (Na)                          | Rapid change<br>of temperature             | 15 min. at -55 °C;<br>15 min. at 125 °C;<br>300 cycles  | $\pm (2 \% R + 0.1 \Omega)$  |
| 4.25.1                           | -                                | Endurance at 70 °C                         | $U = \sqrt{P_{70} \times R} \leq U_{max.}$ ;<br>1.5 h on; 0.5 h off;<br>70 °C; 1000 h                   | $\pm (5 \% R + 0.1 \Omega)$  |
| 4.18.2                           | 58 (Td)                          | Resistance to<br>soldering heat            | Solder bath method<br>( $260 \pm 5$ ) °C; ( $10 \pm 1$ ) s  | $\pm (2 \% R + 0.1 \Omega)$  |
| 4.24                             | 78 (Cab)                         | Damp heat, steady state                    | ( $40 \pm 2$ ) °C; (90 to 95) % RH;<br>1000 h   | $\pm (5 \% R + 0.1 \Omega)$  |
| 4.25.3                           | -                                | Endurance at upper<br>category temperature | 125 °C, 1000 h  | $\pm (2 \% R + 0.1 \Omega)$  |
| 4.29                             | 45 (XA)                          | Component<br>solvent resistance            | Isopropyl alcohol;<br>(20 to 25) °C; ( $5 \pm 0.5$ ) min  | No visible damage  |

All tests are carried out in accordance with the following specifications:

- EN 60115-1, generic specification
- EN 140400, sectional specification
- EN 140401-802, detail specification
- IEC 60068-2-x, environmental test procedures

Packaging of components is done in paper tapes according to IEC 60286-3.



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