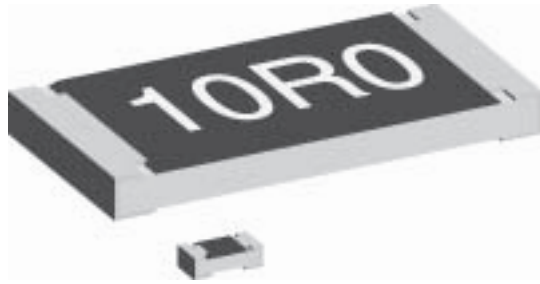


Thick Film, Rectangular Chip Resistors



FEATURES

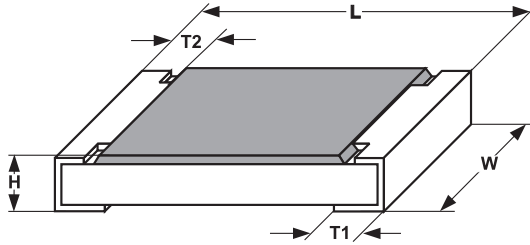
- Metal glaze on high quality ceramic
- Protective overlaze
- Solder contacts on Ni barrier layer
- Excellent stability in different environmental conditions
- High volume product suitable for commercial and special applications

| STANDARD ELECTRICAL SPECIFICATIONS | | | | | | | | |
|------------------------------------|------|--------|--|--|----------------------------|-----------|---------------------|----------|
| MODEL | SIZE | | POWER RATING $P_{70^{\circ}\text{C}}$ W | LIMITING ELEMENT VOLTAGE MAX V_{\cong} | TEMPERATURE COEFFICIENT | TOLERANCE | RESISTANCE RANGE | E-SERIES |
| | INCH | METRIC | CECC 40401-802/EIA-575 | | ppm/K | % | Ω | |
| CRCW0201 | 0201 | 0525 | 0.05 | 30 | 200 | 5 | 10R– 1M0 | 24 |
| | | | Zero-Ohm-Resistor : $R_{\text{max}} = 20\text{m}\Omega$ $I_{\text{max}} = 1\text{A}$ | | | | | |
| D10 | 0402 | 1005 | 0.063 | 50 | 200 ¹⁾ | 1 | 1R0 – 9R76 | 24 + 96 |
| CRCW0402 | | | | | 100 | 1 | 10R – 10M | 24 + 96 |
| | | | Zero-Ohm-Resistor : $R_{\text{max}} = 20\text{m}\Omega$ $I_{\text{max}} = 1\text{A}$ | | 200 | 5 | 1R0 – 10M | 24 |
| D11 | 0603 | 1608 | 0.10 | 75 | 200 ¹⁾ | 1 | 1R0 – 9R76 | 24 + 96 |
| CRCW0603 | | | | | 100 | 1 | 10R – 10M | 24 + 96 |
| | | | Zero-Ohm-Resistor : $R_{\text{max}} = 20\text{m}\Omega$ $I_{\text{max}} = 1.5\text{A}$ | | 200 | 5 | 1R0 – 10M | 24 |
| D12 | 0805 | 2012 | 0.125 | 150 | 200 ¹⁾ | 1 | 1R0 – 9R76 | 24 + 96 |
| CRCW0805 | | | | | 100 | 1 | 10R - 10M | 24 + 96 |
| | | | Zero-Ohm-Resistor : $R_{\text{max}} = 20\text{m}\Omega$ $I_{\text{max}} = 2\text{A}$ | | 200 | 5 | 1R0 – 10M | 24 |
| D25 | 1206 | 3216 | 0.25 | 200 | 200 ¹⁾ | 1 | 1R0 – 9R76 | 24 + 96 |
| CRCW1206 | | | | | 100 | 1 | 10R – 10M | 24 + 96 |
| | | | Zero-Ohm-Resistor : $R_{\text{max}} = 20\text{m}\Omega$ $I_{\text{max}} = 2.5\text{A}$ | | 200 | 5 | 1R0 – 10M | 24 |
| CRCW1210 | 1210 | 3225 | 0.33 | 200 | 200 ¹⁾ | 1 | 1R0 – 9R76 | 24 + 96 |
| | | | Zero-Ohm-Resistor : $R_{\text{max}} = 20\text{m}\Omega$ $I_{\text{max}} = 2.5\text{A}$ | | 100 | 1 | 10R – 1M0 | 24 + 96 |
| | | | | | 200 | 5 | 1R0 – 10M | 24 |
| CRCW1218 | 1218 | 3246 | 1.0 | 200 | 200 ¹⁾ | 1 | 1R0 – 9R76 | 24 + 96 |
| | | | Zero-Ohm-Resistor : $R_{\text{max}} = 20\text{m}\Omega$ $I_{\text{max}} = 4\text{A}$ | | 100 | 1 | 10R – 2M2 | 24 + 96 |
| | | | | | 200 | 5 | 1R0 – 2M2 | 24 |
| CRCW2010 | 2010 | 5025 | 0.5 | 400 | 200 ¹⁾ | 1 | 1R0 – 9R76 | 24 + 96 |
| | | | Zero-Ohm-Resistor : $R_{\text{max}} = 20\text{m}\Omega$ $I_{\text{max}} = 3\text{A}$ | | 100 | 1 | 10R – 10M | 24 + 96 |
| | | | | | 200 | 5 | 1R0 – 10M | 24 |
| CRCW2512 | 2512 | 6332 | 1.0 | 500 | 200 ¹⁾ | 1 | 1R0 – 9R76 | 24 + 96 |
| | | | Zero-Ohm-Resistor : $R_{\text{max}} = 20\text{m}\Omega$ $I_{\text{max}} = 4\text{A}$ | | 100 | 1 | 10R – 10M | 24 + 96 |
| | | | | | 200 | 5 | 1R0 – 10M | 24 |

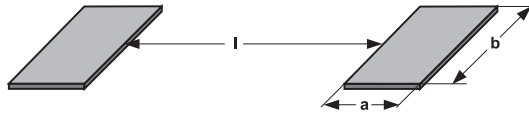
¹⁾ 100ppm/K on request

- Ask about further value ranges
- For low values see Thick Film rectangular low value resistors
- For high values see Thick Film rectangular high values.

- Marking and packaging: see appropriate catalog or web pages
- For precision Thick Film CRCW see Thick Film rectangular Precision Resistors
- Power rating depends on the max. temperature at the solder point, the component placement density and the substrate material
- AgPd or Pd terminations for conductive adhesive attachment on request

DIMENSIONS


| SIZE | | DIMENSIONS [in millimeters] | | | | |
|------|--------|--|-------------|-------------|---------------------------------------|-------------|
| INCH | METRIC | L | W | H | T1 | T2 |
| 0201 | 0525 | 0.6 ± 0.05 | 0.3 ± 0.05 | 0.23 ± 0.05 | 0.15 ± 0.05 | 0.15 ± 0.05 |
| 0402 | 1005 | 1.0 ± 0.05 | 0.5 ± 0.05 | 0.35 ± 0.05 | 0.25 ± 0.05 | 0.2 ± 0.1 |
| 0603 | 1608 | 1.55 ^{+0.10} _{-0.05} | 0.85 ± 0.1 | 0.45 ± 0.05 | 0.3 ± 0.2 | 0.3 ± 0.2 |
| 0805 | 2012 | 2.0 ^{+0.20} _{-0.10} | 1.25 ± 0.15 | 0.45 ± 0.05 | 0.3 ^{+0.20} _{-0.10} | 0.3 ± 0.2 |
| 1206 | 3216 | 3.2 ^{+0.10} _{-0.20} | 1.6 ± 0.15 | 0.55 ± 0.05 | 0.45 ± 0.2 | 0.4 ± 0.2 |
| 1210 | 3225 | 3.2 ± 0.2 | 2.5 ± 0.2 | 0.55 ± 0.05 | 0.45 ± 0.2 | 0.4 ± 0.2 |
| 1218 | 3246 | 3.2 ^{+0.10} _{-0.20} | 4.6 ± 0.15 | 0.55 ± 0.05 | 0.45 ± 0.2 | 0.4 ± 0.2 |
| 2010 | 5025 | 5.0 ± 0.15 | 2.5 ± 0.15 | 0.6 ± 0.05 | 0.6 ± 0.2 | 0.6 ± 0.2 |
| 2512 | 6332 | 6.3 ± 0.2 | 3.15 ± 0.15 | 0.6 ± 0.05 | 0.6 ± 0.2 | 0.6 ± 0.2 |



| SIZE | | SOLDER PAD DIMENSIONS [in millimeters] | | | | | |
|------|--------|--|------|------|----------------|-----|-----|
| INCH | METRIC | REFLOW SOLDERING | | | WAVE SOLDERING | | |
| | | a | b | l | a | b | l |
| 0201 | 0525 | 0.28 | 0.43 | 0.23 | | | |
| 0402 | 1005 | 0.4 | 0.6 | 0.5 | | | |
| 0603 | 1608 | 0.5 | 0.9 | 1.0 | 0.9 | 0.9 | 1.0 |
| 0805 | 2012 | 0.7 | 1.3 | 1.2 | 0.9 | 1.3 | 1.3 |
| 1206 | 3216 | 0.9 | 1.7 | 2.0 | 1.1 | 1.7 | 2.3 |
| 1210 | 3225 | 0.9 | 2.5 | 2.0 | 1.1 | 2.5 | 2.2 |
| 1218 | 3246 | 1.05 | 4.9 | 1.9 | 1.25 | 4.8 | 1.9 |
| 2010 | 5025 | 1.0 | 2.5 | 3.9 | 1.2 | 2.5 | 3.9 |
| 2512 | 6332 | 1.0 | 3.2 | 5.2 | 1.2 | 3.2 | 5.2 |

TECHNICAL SPECIFICATIONS

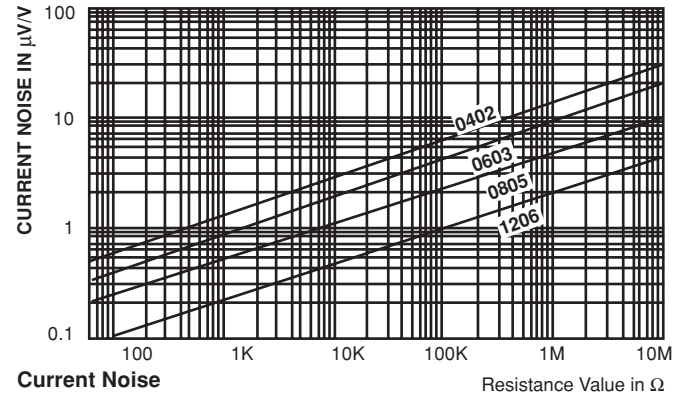
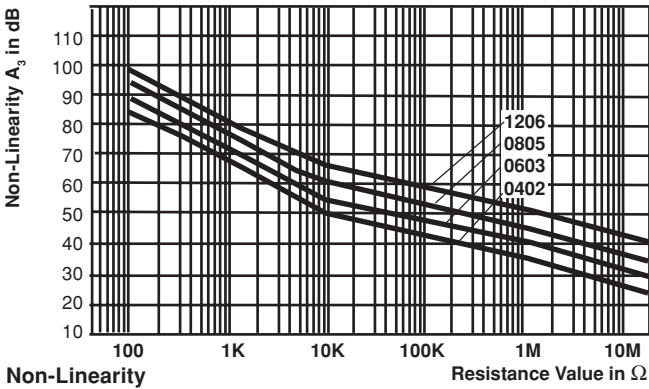
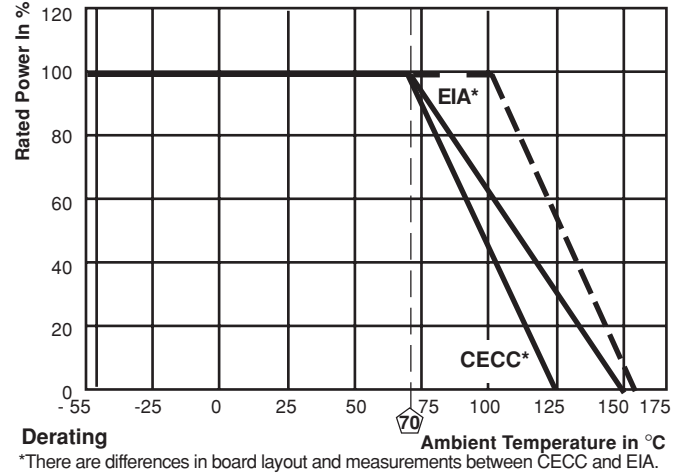
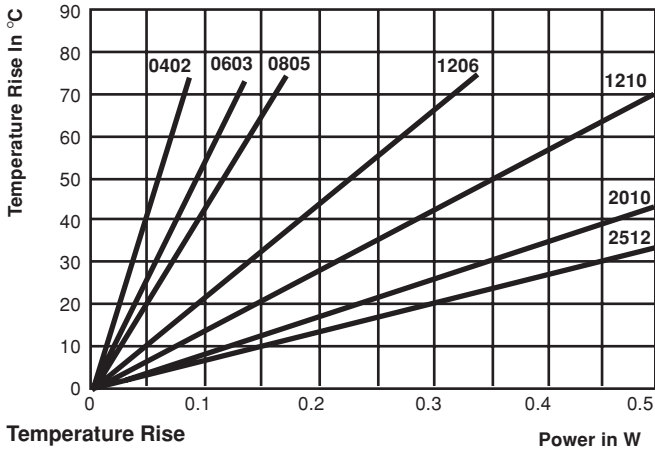
| PARAMETER | UNIT | CRCW0201 | D10 CRCW0402 | D11 CRCW0603 | D12 CRCW0805 | D25 CRCW1206 | CRCW1210 | CRCW1218 | CRCW2010 | CRCW2512 |
|---|-------------------|----------------------|------------------------|---------------------|---------------------|---------------------|---------------------|---------------|--------------------|--------------------|
| Rated Dissipation at 70°C (CECC 40401 EIA 575) | W | 0.05 | 0.063 | 0.10 | 0.125 | 0.25 | 0.33 | 1.0 | 0.5 | 1.0 |
| Limiting Element Voltage ²⁾ | V _≧ | 30 | 50 | 75 | 150 | 200 | 200 | 200 | 400 | 500 |
| Insulation Voltage (1 min) | V _{peak} | 50 | > 75 | > 100 | > 200 | > 300 | > 300 | > 300 | > 300 | > 300 |
| Thermal Resistance | K/W | | ≤ 870 ¹⁾ | ≤ 550 ¹⁾ | ≤ 440 ¹⁾ | ≤ 220 ¹⁾ | ≤ 140 ³⁾ | ³⁾ | ≤ 88 ³⁾ | ≤ 65 ³⁾ |
| Insulation Resistance | Ω | > 10 ⁹ | | | | | | | | |
| Category Temperature Range | °C | - 55 / + 125 (+ 155) | | | | | | | | |
| Failure Rate | h ⁻¹ | 1.10 ⁻⁹ | 0.3 · 10 ⁻⁹ | | | | | | | |
| Weight / 1000pcs | g | 0.17 | 0.65 | 2 | 5.5 | 10 | 16 | 29.5 | 25.5 | 40.5 |

¹⁾ Measuring conditions in acc. to CECC 40401

³⁾ Depending on solder pad dimensions

²⁾ Rated voltage: $\sqrt{P \times R}$
ORDERING INFORMATION

| | | | | | |
|--|-----------------------------|--|--|--|--|
| D-SERIES | | | | | |
| D11 MODEL | 100 TC ppm / K | 562R RESISTANCE VALUE Ω | 1% TOLERANCE ± % F = ± 1%, J = ± 5% | PN PACKAGING Papertape 20000 pcs | |
| CRCW-SERIES CRCW MODEL | 0603 SIZE | 5620 RESISTANCE VALUE Ω ± 1% = 3 sig. digits, plus multiplier ± 5% = 2 sig. digits, plus multiplier Example: 49R9F = 49.9Ω, ± 1% 5R1J = 5.1Ω, ± 5% 3011F = 3.01KΩ, ± 1% 000Z = 0Ω Jumper | F TOLERANCE ± % D = ± 0.5% F = ± 1% J = ± 5%, Z = 0Ω Jumper | 100 TC* 50ppm 100ppm 200ppm *NOTE: Entering a TC value in this field is optional. If no TC is specified by the Customer, the default TC will be highest listed for Tolerance specified. | RT6 PACKAGING Papertape 20000 pcs |

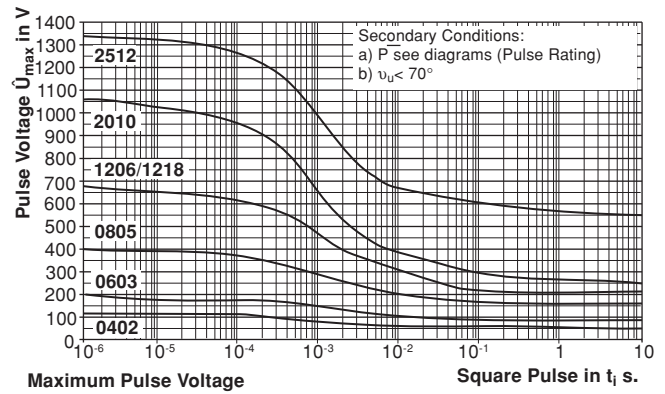
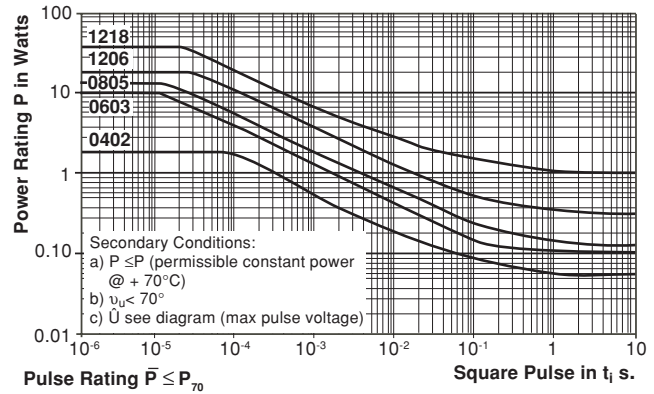
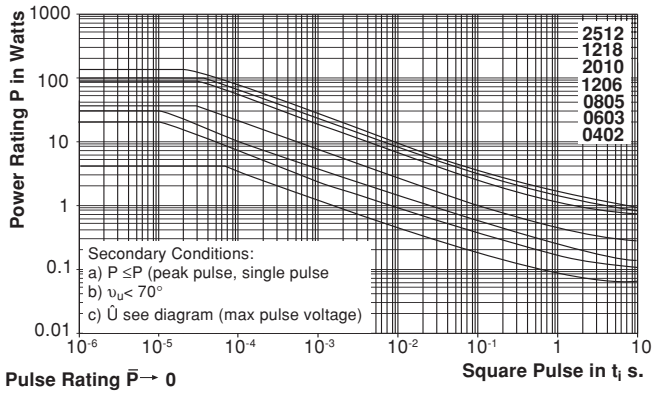


PACKAGING

| MODEL | REEL | | | | BULK | | | |
|----------|------------------------------|-------------|---------------|-------|---------------------|-----------------------|-----------------------|--------------------|
| | TAPE WIDTH | DIAMETER | PIECES / REEL | PITCH | PACKAGING CODE | | BULK FEEDING MAGAZINE | |
| | | | | | PAPER ²⁾ | BLISTER ²⁾ | PIECES ¹⁾ | CODE ²⁾ |
| D10 | 8mm Papertape | 180mm / 7" | 10000 | 2mm | P0 / RT7 | | 50000 | MZ / B27 |
| CRCW0402 | | 330mm / 13" | 50000 | 2mm | PZ / RF4 | | | |
| D11 | 8mm Paper-/ Blisertape | 180mm / 7" | 5000 | 4mm | P5 / RT1 | B5/na | 25000 | MU / B27 |
| CRCW0603 | | 255mm / 10" | 10000 | 4mm | P0 / RT5 | BN/na | | |
| D12 | 8mm Paper-/ Blisertape | 180mm / 7" | 5000 | 4mm | P5 / RT1 | B5/na | 10000 | MO / B27 |
| CRCW0805 | | 255mm / 10" | 10000 | 4mm | P0 / RT5 | BN/na | | |
| D25 | 8mm Paper-/ Blisertape | 180mm / 7" | 5000 | 4mm | P5 / RT1 | B5/na | | |
| CRCW1206 | | 255mm / 10" | 10000 | 4mm | P0 / RT5 | BN/na | | |
| CRCW1210 | 8mm Paper-/Blisertape | 180mm / 7" | 5000 | 4mm | P5 / RT1 | B5/na | | |
| | | 330mm / 13" | 20000 | 4mm | PN / RT6 | BN/na | | |
| CRCW1218 | 12mm Blisertape | 180mm / 7" | 4000 | 4mm | | B4 / RT9 | | |
| CRCW2010 | 12mm Blisertape | 180mm / 7" | 4000 | 4mm | | B4 / R02 | | |
| CRCW2512 | 12mm Blisertape | 180mm / 7" | 2000 | 8mm | | B2 / R67 | | |
| | | | 4000 | 4mm | | B4 / R82 | | |

1) On request,

2) European / N.American packaging codes na = NOT AVAILABLE • Further information about packaging: see appropriate catalog or web page.



| PERFORMANCE | | | | | |
|---|---|---------------------------------|----------------------|----------------------|----------------|
| TEST | CONDITIONS OF TEST | REQUIREMENTS IN % ¹⁾ | | | |
| | | 0402 0603 | 0805 1206 1210 | 1218 2010 2512 | 0201 |
| Endurance Test at 70°C IEC 60115-1 4.25.1; EIA-575 | 1000 hours at 70°C 1.5 hours "ON" 0.5 hours "OFF" | $\leq \pm 1.0$ | $\leq \pm 0.5$ | $\leq \pm 1.0$ | $\leq \pm 3.0$ |
| Endurance at UCT IEC 60115-1 4.25.3 | 1000 hours at 125°C without load | $\leq \pm 1.0$ | $\leq \pm 0.5$ | $\leq \pm 1.0$ | $\leq \pm 2.0$ |
| Overload Test IEC 60115-1 4.13; EIA-575 | Short time overload, 2.5 x rated voltage or 2 x limiting element voltage. | $\leq \pm 0.25$ | $\leq \pm 0.25$ | $\leq \pm 0.5$ | $\leq \pm 1.0$ |
| Thermal Shock IEC 60115-1 4.19; IEC 60068-2-14; EIA-575 | Rapid change between upper and lower category temperature | $\leq \pm 0.25$ | $\leq \pm 0.25$ | $\leq \pm 0.5$ | $\leq \pm 0.5$ |
| Damp Heat Steady State IEC 60115-1 4.24; IEC 60068-2-3 | 56 days at 40°C and 93% relative humidity | $\leq \pm 1.0$ | $\leq \pm 0.5$ | $\leq \pm 1.0$ | $< \pm 2.0$ |
| Resistance to Soldering Heat IEC 60115-1 4.18; IEC 600 68-2-20; EIA-575 | 10 seconds at 260°C solder bath temperature | $\leq \pm 0.25$ | $\leq \pm 0.25$ | $\leq \pm 0.5$ | $\leq \pm 1.0$ |

¹⁾ Limits for change of resistance at test acc. to CECC

| APPLICABLE SPECIFICATIONS |
|---|
| <ul style="list-style-type: none"> CECC40000 / 40400 / 40401-004,-006,-007,-802 EN140400 / IEC 60115 – 1 EIA-575 |