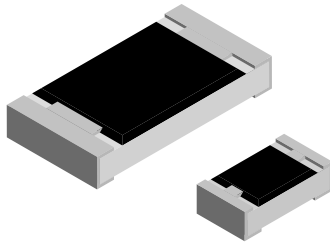


Thick Film, Rectangular, Low Value Resistors



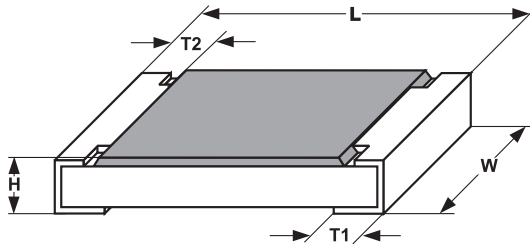
FEATURES

- Special metal glaze on high quality ceramic
- Protective overglaze
- Solder contacts on Ni barrier layer
- Extremely low resistance values
- Suitable for current sensors and shunts

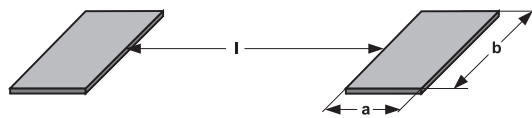
| STANDARD ELECTRICAL SPECIFICATIONS | | | | | | | | |
|------------------------------------|------|--------|---|--|---|----------------|---------------------------------|----------|
| MODEL | SIZE | | POWER RATING $P_{70^{\circ}\text{C}}$ W CECC 40401-802/EIA-575 | LIMITING ELEMENT VOLTAGE MAX V_{\cong} | TEMPERATURE COEFFICIENT ppm/ $^{\circ}\text{C}$ | TOLERANCE % | RESISTANCE RANGE Ω | E-SERIES |
| | INCH | METRIC | | | | | | |
| D10LR CRCW0402 | 0402 | 1005 | 0.063 | \sqrt{PxR} | 400 600 | 5 5 | R47 – R91 R22 – R43 | 24 24 |
| D11LR CRCW0603 | 0603 | 1608 | 0.1 | \sqrt{PxR} | 200 400 | 5 5 | R47 – R91 R10 – R43 | 24 24 |
| D12LR CRCW0805 | 0805 | 2012 | 0.125 | \sqrt{PxR} | 200 300 | 5 5 | R47 – R91 R10 – R43 | 24 24 |
| D25LR CRCW1206 | 1206 | 3216 | 0.25 | \sqrt{PxR} | 300 200 | 5 5 | R10 – R43 R47 – R91 | 24 24 |
| CRCW1210 | 1210 | 3225 | 0.33 | \sqrt{PxR} | 200 | 5 | R10 – R91 | 24 |
| CRCW1218 | 1218 | 3246 | 1.0 | \sqrt{PxR} | 200 | 5 | R10 – R91 | 24 |
| CRCW2010 | 2010 | 5025 | 0.5 | \sqrt{PxR} | 200 | 5 | R10 – R91 | 24 |
| CRCW2512 | 2512 | 6332 | 1.0 | \sqrt{PxR} | 200 | 5 | R10 – R91 | 24 |

- Ask about further value ranges
- Marking and packaging: see appropriate catalog or web page
- Power rating depends on the max. temperature at the solder point, the component placement density and the substrate material
- 1% tolerance for TC100 on request

| ORDERING INFORMATION | | | | |
|--|--------------------------------------|---|---------------------------------------|--|
| D-SERIES | | | | |
| D11LR MODEL | 200 TC ppm/ $^{\circ}\text{C}$ | R47 RESISTANCE VALUE Ω | 5 TOLERANCE \pm % | P5 PACKAGING Papertape 5000pcs |
| CRCW-SERIES | | | | |
| CRCW0603 MODEL | R47 RESISTANCE VALUE Ω | J TOLERANCE \pm % J = \pm 5% F = \pm 1% | 200 TC* ppm/ $^{\circ}\text{C}$ | RT1 PACKAGING Papertape 5000 pcs |
| <p>\pm 1% = 3 sig. digits, plus multiplier \pm 5% = 2 sig. digits, plus multiplier Example: R36J = 0.36Ω, \pm 5% R750F = 0.75Ω, \pm 1% R11J = 0.11Ω, \pm 5%</p> <p>*NOTE: Entering a TC value in this field is optional. If no TC specified by the Customer, the default TC will be highest listed for tolerance specified</p> | | | | |

DIMENSIONS


| SIZE | | DIMENSIONS [in millimeters] | | | | |
|------|--------|--|------------|------------|--|----------|
| INCH | METRIC | L | W | H | T1 | T2 |
| 0402 | 1005 | 1.0 ±0.05 | 0.5 ±0.05 | 0.35 ±0.05 | 0.25 ^{+0.05} / _{-0.10} | 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 | 0.60 ±0.05 | 0.6 ±0.2 | 0.6 ±0.2 |
| 2512 | 6332 | 6.3 ±0.2 | 3.15 ±0.15 | 0.60 ±0.05 | 0.6 ±0.2 | 0.6 ±0.2 |

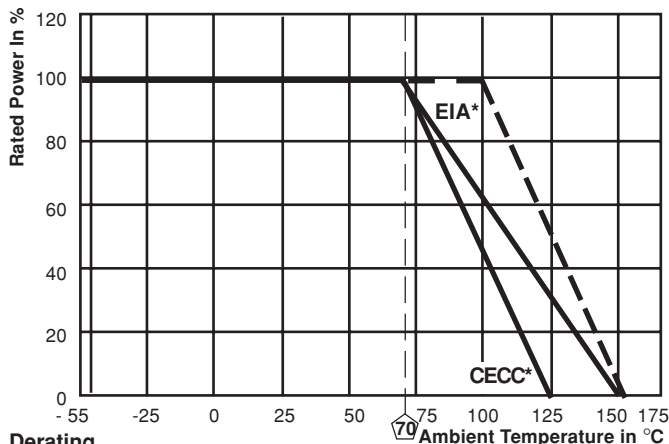
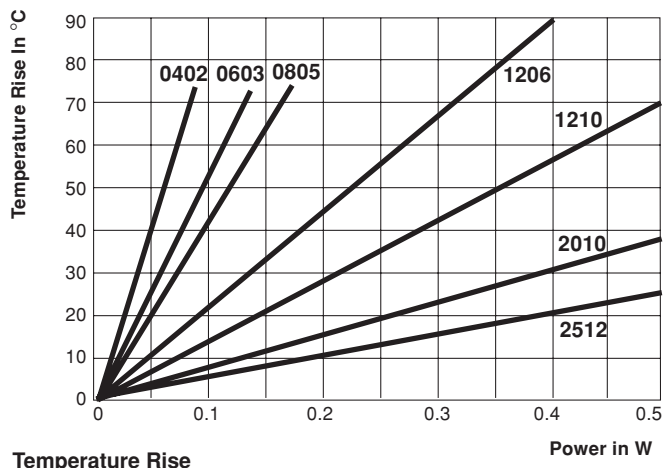


| SIZE | | SOLDER PAD DIMENSIONS [in millimeters] | | | | | |
|------|--------|--|-----|-----|----------------|-----|-----|
| | | REFLOW SOLDERING | | | WAVE SOLDERING | | |
| INCH | METRIC | A | B | L | A | B | L |
| 0402 | 1005 | 0.4 | 0.6 | 0.5 | | | |
| 0603 | 1608 | 0.5 | 0.9 | 1.0 | 0.9 | 0.9 | 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 | 0402 | 0603 | 0805 | 1206 | 1210 | 1218 | 2010 | 2512 |
| Rated Dissipation at 70°C (CECC 40401 EIA 575) | W | 0.063 | 0.1 | 0.125 | 0.25 | 0.33 | 1.0 | 0.5 | 1.0 |
| Limiting Element Voltage | V_{\cong} | $\sqrt{P \times R}$ | | | | | | | |
| Insulation Voltage (1 min) | V_{peak} | > 75 | > 100 | > 200 | > 300 | > 300 | > 300 | > 300 | > 300 |
| Thermal Resistance | K/W | ≤ 870 ¹⁾ | ≤ 550 ¹⁾ | ≤ 440 ¹⁾ | ≤ 220 ¹⁾ | ≤ 140 ²⁾ | ²⁾ | ≤ 88 ²⁾ | ≤ 45 ²⁾ |
| Insulation Resistance | Ω | > 10 ⁹ | | | | | | | |
| Category Temperature Range | °C | - 55 / + 125 (+ 155) | | | | | | | |
| Weight / 1000pcs | g | 0.65 | 2 | 5.5 | 10 | 16 | 29.5 | 25.5 | 40.5 |

¹⁾ Measuring conditions in acc. to CECC 40401

²⁾ Dependent on solder pad dimensions



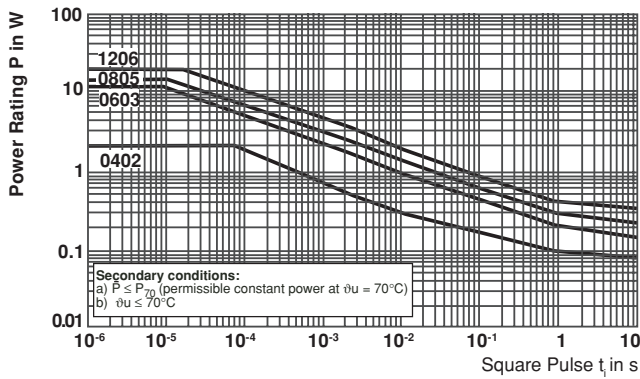
Derating

*There are differences in board layout and measurements between CECC and EIA.

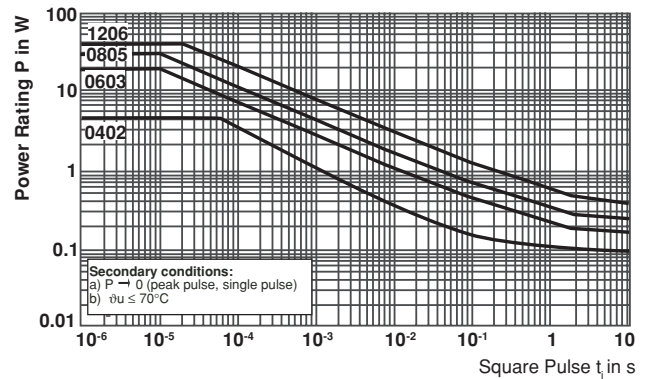
| PACKAGING | | | | | |
|-----------------|--------------------------------|--|------------------------|----------------------------------|-----------------------|
| MODEL | REEL | | | | |
| | TAPE WIDTH | DIAMETER | PIECES / REEL | PACKAGING CODE | |
| | | | | PAPER ¹⁾ | BLISTER ¹⁾ |
| D10 CRCW0402 | 8mm Paper/tape | 180mm / 7" 330mm / 13" | 10000 50000 | P0 / RT7 PZ / RF4 | |
| D11 CRCW0603 | 8mm Paper-/ Blister-tape | 180mm / 7" 255mm / 10" 330mm / 13" | 5000 10000 20000 | P5 / RT1 P0 / RT5 PN / RT6 | B5 BN |
| D12 CRCW0805 | 8mm Paper-/ Blister-tape | 180mm / 7" 255mm / 10" 330mm / 13" | 5000 10000 20000 | P5 / RT1 P0 / RT5 PN / RT6 | B5 BN |
| D25 CRCW1206 | 8mm Paper-/ Blister-tape | 180mm / 7" 255mm / 10" 330mm / 13" | 5000 10000 20000 | P5 / RT1 P0 / RT5 PN / RT6 | B5 BN |
| CRCW1210 | 8mm Paper/Blister-tape | 180mm / 7" 330mm / 13" | 5000 20000 | P5 / RT1 PN / RT6 | B5 BN |
| CRCW1218 | 12mm Blister-tape | 180mm / 7" | 4000 | | B4 / RT9 |
| CRCW2010 | 12mm Blister-tape | 180mm / 7" | 4000 | | B4 / RO2 |
| CRCW2512 | 12mm Blister-tape | 180mm / 7" | 2000 4000 | | B2 / R67 B4 / R82 |

¹⁾ European / N. American packaging codes

• Further information about packaging: see appropriate catalog or web page



Pulse Rating $\bar{P} \leq P_{70}$



Pulse Rating $\bar{P} \rightarrow 0$

| PERFORMANCE | | |
|---|---|----------------------------|
| TEST | CONDITIONS OF TEST | REQUIREMENTS ¹⁾ |
| Endurance Test at 70°C IEC 60115-1 4.25.1 | 1000 hours at 70°C, 1.5 hours "ON" 0.5 hours "OFF" | $\leq \pm 2 \%$ |
| Endurance at UCT IEC 60115-1 4.25.3 | 1000 hours at 125 °C without load | $\leq \pm 0.5 \%$ |
| Overload Test IEC 60115-1 4.13 | Short time overload for 2 seconds | $\leq \pm 1 \%$ |
| Thermal Shock IEC 60115-1 4.19 IEC 60068-2-14 | Rapid change between upper and lower category temperature | $\leq \pm 1 \%$ |
| Damp Heat Steady State IEC 60115-1 4.24 IEC 60068-2-3 | 56 days at 40°C and 93% relative humidity | $\leq \pm 2 \%$ |
| Resistance to Soldering Heat IEC 60115-1 4.18 IEC 60068-2-20 | 10 seconds at 260°C solder bath temperature | $\leq \pm 1 \%$ |

¹⁾ Limits for change of resistance at test.

| APPLICABLE SPECIFICATIONS |
|---|
| <ul style="list-style-type: none"> • CECC40000 / 40400 / 40401 • IEC 60115 – 1 • EIA 575 |