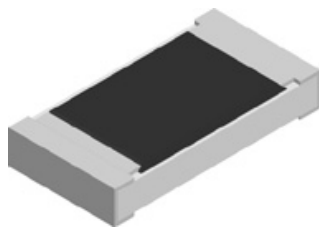


Thick Film, Rectangular, Trimmable, Resistor Chips



FEATURES

- Thick film on high quality ceramic
- Solder contacts on Ni barrier layer
- Can be trimmed to required value after insertion
- For applications in precision circuitry where relative tolerances can be compensated by trimming

STANDARD ELECTRICAL SPECIFICATIONS

| MODEL | SIZE | | POWER RATING P _{70°C} W | LIMITING ELEMENT VOLTAGE MAX V _≡ | TEMPERATURE COEFFICIENT ppm/K | TOLERANCE % | RESISTANCE RANGE Ω | E-SERIES |
|----------------------------|------|--------|--|---|-------------------------------------|--------------------------------|--------------------------|----------|
| | INCH | METRIC | CECC 40401-802/EIA-575 | | | | | |
| D10TR --- CRCW0402TR | 0402 | 1005 | 0.063 | 50 | ± 100 | ± 10; ± 15; ± 20 + 0 / - 30 | 10R - 10M | 24 |
| | | | | | ± 200 | ± 10; ± 15; ± 20 + 0 / - 30 | R47 - 10M | 24 |
| D11TR --- CRCW0603TR | 0603 | 1608 | 0.1 | 75 | ± 100 | ± 10; ± 15; ± 20 + 0 / - 30 | 10R - 10M | 24 |
| | | | | | ± 200 | ± 10; ± 15; ± 20 + 0 / - 30 | R47 - 10M | 24 |
| D12TR --- CRCW0805TR | 0805 | 2012 | 0.125 | 150 | ± 100 | ± 10; ± 15; ± 20 + 0 / - 30 | 10R - 10M | 24 |
| | | | | | ± 200 | ± 10; ± 15; ± 20 + 0 / - 30 | R47 - 10M | 24 |
| D25TR --- CRCW1206TR | 1206 | 3216 | 0.25 | 200 | ± 100 | ± 10; ± 15; ± 20 + 0 / - 30 | 10R - 10M 10R - 20M | 24 |
| | | | | | ± 200 | ± 10; ± 15; ± 20 + 0 / - 30 | R47 - 10M R47 - 20M | 24 |
| CRCW1210TR | 1210 | 3225 | 0.33 | 200 | ± 200 | ± 15 | 10R - 4M7 | 24 |
| CRCW2010TR | 2010 | 5025 | 0.5 | 200 | ± 200 | ± 15 | 10R - 4M7 | 24 |
| CRCW2512TR | 2512 | 6332 | 1.0 | 200 | ± 200 | ± 15 | 10R - 4M7 | 24 |

- Power rating depends on the max. temperature at the solder point, the component placement density and the substrate material
- Values from R10 to R43 with TC500 on request

- Marking: no marking on device, on label only
- Packaging: see appropriate catalog or web page
- Tolerance + 0 ... - 10% and ± 15% for D10 to D25 on request

TECHNICAL SPECIFICATIONS

| PARAMETER | UNIT | D10TR CRCW0402TR | D11TR CRCW0603TR | D12TR CRCW0805TR | D25TR CRCW1206TR | CRCW1210TR | CRCW2010TR | CRCW2512TR |
|---|-------------------|-----------------------|---------------------|---------------------|---------------------|---------------------|--------------------|--------------------|
| Rated Dissipation at 70°C (CECC 40401 EIA 575) | W | 0.063 | 0.1 | 0.125 | 0.25 | 0.33 | 0.5 | 1.0 |
| Limiting Element Voltage ²⁾ | V _≡ | 50 | 75 | 150 | 200 | 200 | 200 | 200 |
| Insulation Voltage (1 min) | V _{peak} | 75 | 100 | 200 | 300 | 300 | 300 | 300 |
| Thermal Resistance ¹⁾ | K/W | ≤ 870 ¹⁾ | ≤ 550 ¹⁾ | ≤ 440 ¹⁾ | ≤ 220 ¹⁾ | ≤ 140 ³⁾ | ≤ 88 ³⁾ | ≤ 65 ³⁾ |
| Insulation Resistance | Ω | > 10 ⁹ | | | | | | |
| Category Temperature Range | °C | - 55 to + 125 (+ 155) | | | | | | |
| Weight / 1000pcs | g | 0.65 | 2 | 5.5 | 10 | 16 | 29.5 | 40.5 |

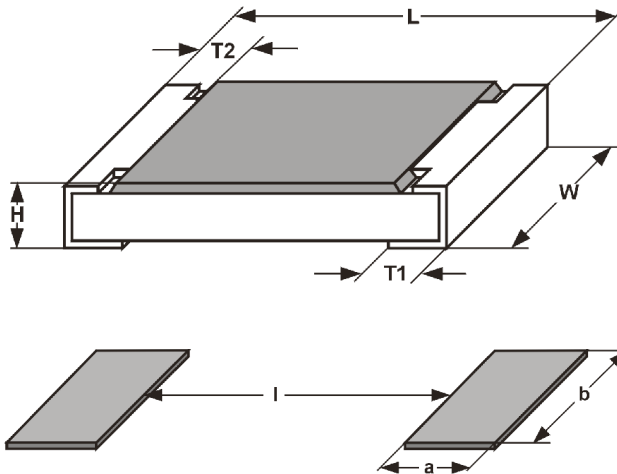
¹⁾ Measuring conditions in acc. to CECC 40401-802

²⁾ Rated voltage: $\sqrt{P \times R}$

³⁾ Depending on solder pad dimensions



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 ^{+0.20} / _{-0.10} | 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 |
| 2010 | 5025 | 5.0 ± 0.15 | 2.5 ± 0.15 | 0.6 ± 0.05 | 0.6 ± 0.25 | 0.6 ± 0.25 |
| 2512 | 6332 | 6.3 ± 0.2 | 3.15 ± 0.15 | 0.6 ± 0.05 | 0.6 ± 0.25 | 0.6 ± 0.25 |

| SIZE | | SOLDER PAD DIMENSIONS [in millimeters] | | | | | |
|------|--------|--|-----|-----|------|-----|-----|
| INCH | METRIC | REFLOW SOLDERING | | | WAVE | | |
| | | 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 |
| 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 |

PART NUMBER AND PRODUCT DESCRIPTION

PART NUMBER: D120805IB2509KP0

D 1 2 0 8 0 5 I B 2 5 0 9 K P 0

| | | | | | | |
|---|--|---|--|--|--|----------------------------------|
| MODEL/SIZE D100402 D110603 D120805 D251206 | SPECIAL CHARACTER I = Customer Trimmable | T.C. B = ± 100 ppm/K A = ± 200 ppm/K | VALUE 3 digit value 1 digit multiplier MULTIPLIER 7 = *10 ⁻³ 2 = *10 ² 8 = *10 ⁻² 3 = *10 ³ 9 = *10 ⁻¹ 4 = *10 ⁴ 0 = *10 ⁰ 5 = *10 ⁵ 1 = *10 ¹ 6 = *10 ⁶ | TOLERANCE K = ± 10 % L = ± 15 % M = ± 20 % 3 = 0 % / - 30 % | PACKING P0 P5 PN B5 BN PZ | SPECIAL up to 2 digits |
|---|--|---|--|--|--|----------------------------------|

PRODUCT DESCRIPTION: D12TR 100 25R 10% P5

| | | | | |
|---|--|---|--|--|
| D12TR MODEL D10TR D11TR D12TR D25TR | 100 TC ± 100 ppm/K ± 200 ppm/K | 25R RESISTANCE VALUE 49K9 = 49.9KΩ 5R1 = 5.1Ω | 10 % TOLERANCE ± 10 % ± 15 % ± 20 % + 0 % / - 30 % | P5 PACKING ¹⁾ P0 P5 PN B5 BN PZ |
|---|--|---|--|--|

PART NUMBER: CRCW080525R0KKTATR

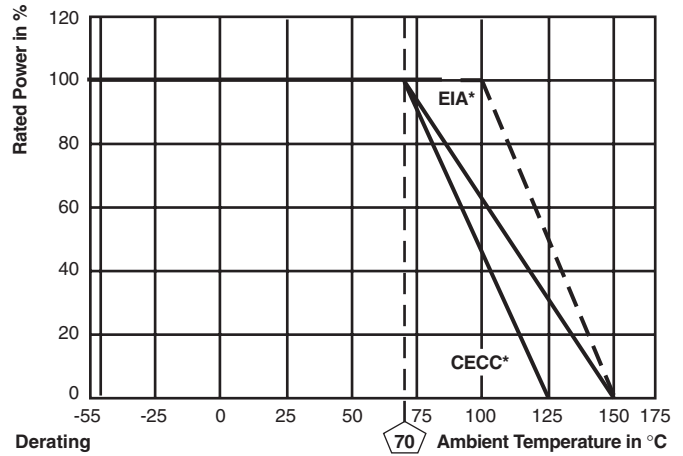
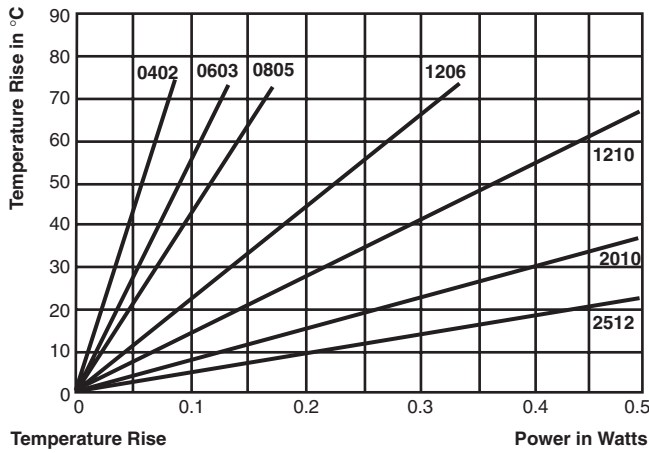
C R C W 0 8 0 5 2 5 R 0 K K T A T R

| | | | | | |
|---|--|--|---|--|---|
| MODEL/SIZE CRCW0402 CRCW0603 CRCW0805 CRCW1206 CRCW1210 CRCW2010 CRCW2512 | VALUE R = Decimal K = Thousand M = Million | TOLERANCE K = ± 10 % L = ± 15 % M = ± 20 % W = + 0 %, - 30% | T.C. K = ± 100 ppm/K N = ± 200 ppm/K | PACKING TA = RT1 TB = RT5 TC = RT6 TD = RT7 TE = RF4 TF = R02 TG = R67 TH = R82 | SPECIAL up to 2 digits TR = Customer Trimmable |
|---|--|--|---|--|---|

PRODUCT DESCRIPTION: CRCWTR 0805 250 K 100 RT1

| | | | | |
|--|--|---|--|---|
| CRCW0805TR MODEL CRCW0402TR CRCW0603TR CRCW0805TR CRCW1206TR CRCW1210TR CRCW2010TR CRCW2512TR | 250 RESISTANCE VALUE 250 = 25R 392 = 3k9 105 = 1M0 ± 5 % = 2 sig.digits, plus multiplier | K TOLERANCE K = ± 10 % L = ± 15 % M = ± 20 % W = + 0 %, - 30% | 100 T.C. ± 100 ppm/K ± 200 ppm/K | RT1 PACKING ¹⁾ RT1 RF4 RT5 R02 RT6 R67 RT7 R82 |
|--|--|---|--|---|

NOTE: 1) Please refer to table PACKING, page 3.

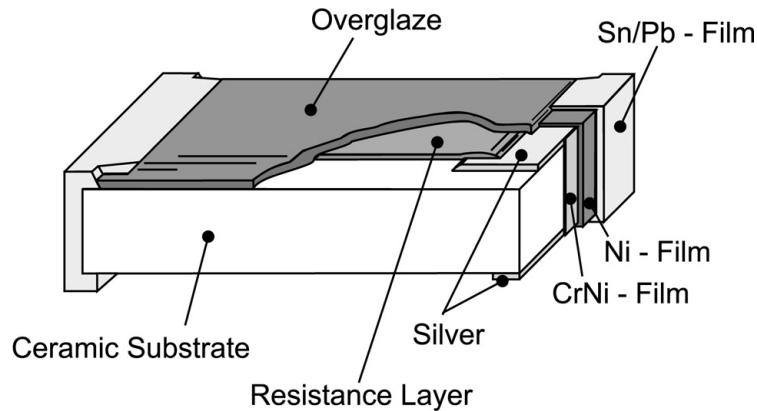


*There are differences in board layout and measurements between CECC and EIA.

| PACKING | | | | | |
|---------------------|------------|-----------|-------------|---------------------|-----------------------|
| MODEL | REEL | | | | |
| | TAPE WIDTH | DIAMETER | PIECES/REEL | PACKING CODE | |
| | | | | PAPER ¹⁾ | BLISTER ¹⁾ |
| D10TR CRCW0402TR | 8mm | 180mm/7" | 10 000 | P0/RT7 | |
| | | 330mm/13" | 50 000 | PZ/RF4 | |
| D11TR CRCW0603TR | 8mm | 180mm/7" | 5 000 | P5/RT1 | |
| | | 255mm/10" | 10 000 | P0/RT5 | B5/na BN/na |
| | | 330mm/13" | 20 000 | PN/RT6 | |
| D12TR CRCW0805TR | 8mm | 180mm/7" | 5 000 | P5/RT1 | |
| | | 255mm/10" | 10 000 | P0/RT5 | B5/na BN/na |
| | | 330mm/13" | 20 000 | PN/RT6 | |
| D25TR CRCW1206TR | 8mm | 180mm/7" | 5 000 | P5/RT1 | |
| | | 255mm/10" | 10 000 | P0/RT5 | B5/na BN/na |
| | | 330mm/13" | 20 000 | PN/RT6 | |
| CRCW1210TR | 8mm | 180mm/7" | 5 000 | P5/RT1 | B5/na |
| | | 330mm/13" | 20 000 | PN/RT6 | BN/na |
| CRCW2010TR | 12mm | 180mm/7" | 4 000 | | R02 |
| CRCW2512TR | 12mm | 180mm/7" | 2 000 | | R67 |
| | | | 4 000 | | R82 |

¹⁾ European / N. American packing codes

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


Trimming Instructions:

YAG-Laser:

The trimming length should not exceed 50% of the dimension W (width)

Maximum trimming factor = 1.6

Distance between end termination and trimming cut = 0.2mm min

Double cut: Distance between two cuts = 0.5mm min

The laser-cut should be protected with epoxy resins

| PERFORMANCE | | | | | |
|--|---|-------------------|----------------------|--------------|--|
| TEST | CONDITIONS OF TEST | REQUIREMENTS IN % | | | |
| | | 0402 0603 | 0805 1206 1210 | 2010 2512 | |
| Endurance Test at 70°C IEC 60115-1 4.25.1 | 1000 hours at 70°C, 1.5 hours "ON", 0.5 hours "OFF" | ≤ ± 1.0 | ≤ ± 0.5 | ≤ ± 1.0 | |
| Endurance at UCT IEC 60115-1 4.25.3 | 1000 hours at 125°C without load | ≤ ± 1.0 | ≤ ± 0.5 | ≤ ± 1.0 | |
| Overload Test IEC 60115-1 4.13 | Short time overload | ≤ ± 0.5 | ≤ ± 0.25 | ≤ ± 0.5 | |
| Thermal Shock IEC 60115-1 4.19; IEC 60068-2-14; | Rapid change between upper and lower category temperature | ≤ ± 0.5 | ≤ ± 0.25 | ≤ ± 0.5 | |
| Damp Heat Steady State IEC 60115-1 4.24; IEC 60068-2-3 | 56 days at 40°C and 93% relative humidity | ≤ ± 0.25 | ≤ ± 0.5 | ≤ ± 1.0 | |
| Resistance to Soldering Heat IEC 60115-1 4.18; IEC 60068-2-20 | 10 seconds at 260°C solder bath temperature | ≤ ± 0.5 | ≤ ± 0.25 | ≤ ± 0.5 | |

1) Limits for change of resistance at test. Data are valid for the non trimmed resistors only. Depending on trimming process some properties can change

| APPLICABLE SPECIFICATIONS |
|---|
| <ul style="list-style-type: none"> • CECC40000 / 40400 / 40401-802 • EN140400 / IEC 60115 – 1 • EIA 575 • MIL-PRF-55342 |



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