

Thick Film Chip Resistors, Industrial, High Power, Aluminum Nitride Substrate



Aluminum nitride
over 3 x more power - same size

| MATERIAL SPECIFICATIONS | |
|-------------------------|-------------------------------------|
| Resistive element | Ruthenium oxide |
| Encapsulation | Epoxy |
| Substrate | Aluminum nitride |
| Termination | Solder-coated nickel barrier |
| Solder finish | Pure tin or tin / lead solder alloy |

FEATURES

- Thick film resistive element on an aluminum nitride (AlN) substrates
- Very high thermal conductivity in a small package size
- Termination: tin / lead wraparound termination over nickel barrier. Also available with lead (Pb)-free wraparound terminations.
- Capability to develop specific reliability programs designed to customer requirements
- Operating temperature range: -65 °C to +155 °C
- High frequency performance to 6 GHz
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



Note

* This datasheet provides information about parts that are RoHS-compliant and / or parts that are non RoHS-compliant. For example, parts with lead (Pb) terminations are not RoHS-compliant. Please see the information / tables in this datasheet for details

| STANDARD ELECTRICAL SPECIFICATIONS | | | | | | | |
|------------------------------------|-----------|--|--|------------------------------|------------------------------|----------------------|---|
| GLOBAL MODEL | CASE SIZE | POWER RATING ⁽¹⁾ (Standard Board Mount) $P_{25^\circ\text{C}}$ W | POWER RATING ⁽¹⁾ (Active Temperature Control) W | MAXIMUM WORKING VOLTAGE V | RESISTANCE RANGE Ω | TOLERANCE \pm % | TEMPERATURE COEFFICIENT \pm ppm/°C |
| RCP0505 | 0505 | 1.4 | 5.0 | $\sqrt{P \times R}$ | 10 to 2K | 1, 2, 5 | 150 |
| RCP0603 | 0603 | 1.5 | 3.9 | $\sqrt{P \times R}$ | 10 to 2K | 1, 2, 5 | 150 |
| RCP1206 | 1206 | 2.4 | 11 | $\sqrt{P \times R}$ | 10 to 2K | 1, 2, 5 | 150 |
| RCP2512 | 2512 | 3.5 | 22 | $\sqrt{P \times R}$ | 10 to 2K | 1, 2, 5 | 150 |

Notes

- Consult factory for availability of additional case sizes
- ⁽¹⁾ The power rating depends on the maximum temperature of the resistive element. The temperature of the resistive element and adjacent materials will rise due to the power dissipation of the resistor. The majority of this heat/energy is dissipated by conduction through the substrate, terminations, solder joints, and printed circuit board. The maximum power rating in a particular application only applies if the temperature of the resistive element is maintained at or below 155 °C

| GLOBAL PART NUMBER INFORMATION | | | | | | | | | | | | | | |
|--|-----------------------------|---|---|---|---|---|--|---|---|---|---|---|---|---|
| New Global Part Numbering: RCP1206W100RGWB (preferred part numbering format) | | | | | | | | | | | | | | |
| R | C | P | 1 | 2 | 0 | 6 | W | 1 | 0 | 0 | R | G | W | B |
| GLOBAL MODEL | BOTTOM TERM. | | RESISTANCE VALUE | | TOLERANCE CODE | | PACKAGING CODE | | | | SPECIAL | | | |
| RCP0505 RCP0603 RCP1206 RCP2512 | W = wide B = traditional | | R = Ω K = k Ω 10R0 = 10 Ω 1K30 = 1.3 k Ω | | F = \pm 1 % G = \pm 2 % J = \pm 5 % | | TP = tin / lead, T/R (full reel) S3 = tin / lead, T/R (1000 pieces) WB = tin / lead, tray S2 = tin / lead, T/R (500 pieces) S6 = tin / lead, T/R (300 pieces) EA = lead (Pb)-free, T/R (full reel) EB = lead (Pb)-free, T/R (1000 pieces) ET = lead (Pb)-free, tray EC = lead (Pb)-free, T/R (500 pieces) ED = lead (Pb)-free, T/R (300 pieces) | | | | Blank = standard (dash number) (up to 3 digits) from 1 to 999 as applicable | | | |

Note

- For additional information on packaging, refer to the Surface Mount Resistor Packaging document (www.vishay.com/doc?31543)

| PERFORMANCE | | |
|---------------------------------------|--------------------------------------|----------------------------------|
| TEST | CONDITIONS OF TEST | TEST RESULTS (TYPICAL TEST LOTS) |
| Resistance to soldering heat | 2 cycles; > 183 °C for 90 s to 120 s | ≤ ± 0.20 % |
| Resistance temperature characteristic | -55 °C to +125 °C | ≤ ± 120 ppm |
| Low temperature operation | -65 °C at rated voltage | ≤ ± 0.02 % |
| Short time overload | RCP0505 | 3.1 W applied for 5 s |
| | RCP0603 | 4.4 W applied for 5 s |
| | RCP1206 | 4.7 W applied for 5 s |
| | RCP2512 | 7.7 W applied for 5 s |
| High temperature exposure | +150 °C for 100 h | ≤ ± 0.10 % |
| Moisture resistance | 240 h at ≥ 80 % RH | ≤ ± 0.15 % |
| Life | 1000 h at +70 °C | ≤ ± 0.10 % |
| Solderability | J-STD-202, test B | 95 % coverage |
| Solder mounting integrity | Per MIL-PRF-55342: | |
| | RCP0505 | 1 kg force applied |
| | RCP0603 | 2 kg force applied |
| | RCP1206 | 2 kg force applied |
| | RCP2512 | 3 kg force applied |
| | | No evidence of mechanical damage |

| DIMENSIONS in inches (millimeters) | | | | | |
|------------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| | | | | | |
| | | WIDE BOTTOM TERMINAL (W) | | TRADITIONAL TERMINAL (B) | |
| GLOBAL MODEL | A (LENGTH) | B (WIDTH) | C (HEIGHT) | D (TOP TERM) | E (BOTTOM TERM) |
| RCP0505W | 0.055 ± 0.005 (1.40 ± 0.13) | 0.050 ± 0.005 (1.27 ± 0.13) | 0.020 ± 0.005 (0.51 ± 0.13) | 0.010 ± 0.005 (0.25 ± 0.13) | 0.020 ± 0.005 (0.51 ± 0.13) |
| RCP0505B | 0.055 ± 0.005 (1.40 ± 0.13) | 0.050 ± 0.005 (1.27 ± 0.13) | 0.020 ± 0.005 (0.51 ± 0.13) | 0.010 ± 0.005 (0.25 ± 0.13) | 0.015 ± 0.005 (0.38 ± 0.13) |
| RCP0603W | 0.063 ± 0.005 (1.60 ± 0.13) | 0.032 ± 0.005 (0.81 ± 0.13) | 0.018 ± 0.005 (0.46 ± 0.13) | 0.012 ± 0.005 (0.30 ± 0.13) | 0.023 ± 0.005 (0.58 ± 0.13) |
| RCP0603B | 0.063 ± 0.005 (1.60 ± 0.13) | 0.032 ± 0.005 (0.81 ± 0.13) | 0.018 ± 0.005 (0.46 ± 0.13) | 0.012 ± 0.005 (0.30 ± 0.13) | 0.015 ± 0.005 (0.38 ± 0.13) |
| RCP1206W | 0.122 ± 0.005 (3.10 ± 0.13) | 0.060 ± 0.005 (1.52 ± 0.13) | 0.020 ± 0.005 (0.51 ± 0.13) | 0.015 ± 0.005 (0.38 ± 0.13) | 0.048 ± 0.005 (1.22 ± 0.13) |
| RCP1206B | 0.122 ± 0.005 (3.10 ± 0.13) | 0.060 ± 0.005 (1.52 ± 0.13) | 0.020 ± 0.005 (0.51 ± 0.13) | 0.015 ± 0.005 (0.38 ± 0.13) | 0.015 ± 0.005 (0.38 ± 0.13) |
| RCP2512W | 0.250 ± 0.005 (6.35 ± 0.13) | 0.124 ± 0.005 (3.15 ± 0.13) | 0.020 ± 0.005 (0.51 ± 0.13) | 0.020 ± 0.005 (0.51 ± 0.13) | 0.113 ± 0.005 (2.87 ± 0.13) |
| RCP2512B | 0.250 ± 0.005 (6.35 ± 0.13) | 0.124 ± 0.005 (3.15 ± 0.13) | 0.020 ± 0.005 (0.51 ± 0.13) | 0.020 ± 0.005 (0.51 ± 0.13) | 0.020 ± 0.005 (0.51 ± 0.13) |

RECOMMENDED SOLDER PAD DIMENSIONS in inches (millimeters)

WIDE BOTTOM TERMINAL (W)
TRADITIONAL TERMINAL (B)

| GLOBAL MODEL | a (LENGTH) | b (WIDTH) | l (SPACING) |
|--------------|-----------------|-----------------|-----------------|
| RCP0505W | 0.040 (1.02) | 0.055 (1.40) | 0.015 (0.38) |
| RCP0505B | 0.035 (0.89) | 0.055 (1.40) | 0.025 (0.64) |
| RCP0603W | 0.043 (1.09) | 0.037 (0.94) | 0.018 (0.46) |
| RCP0603B | 0.035 (0.89) | 0.037 (0.94) | 0.033 (0.84) |
| RCP1206W | 0.068 (1.73) | 0.066 (1.68) | 0.018 (0.46) |
| RCP1206B | 0.037 (0.94) | 0.066 (1.68) | 0.081 (2.06) |
| RCP2512W | 0.133 (3.38) | 0.129 (3.28) | 0.024 (0.61) |
| RCP2512B | 0.040 (1.02) | 0.129 (3.28) | 0.210 (5.33) |



Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.