

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



Aluminum nitride  
over 3 x more power - same size

## 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: -55 °C to +155 °C
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://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.

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

STANDARD ELECTRICAL SPECIFICATIONS							
GLOBAL MODEL	CASE SIZE	POWER RATING <sup>(1)</sup> (Standard Board Mount) $P_{25\text{ }^\circ\text{C}}$ W	POWER RATING <sup>(1)</sup> (Active Temperature Control) W	MAXIMUM WORKING VOLTAGE V	RESISTANCE RANGE $\Omega$	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.

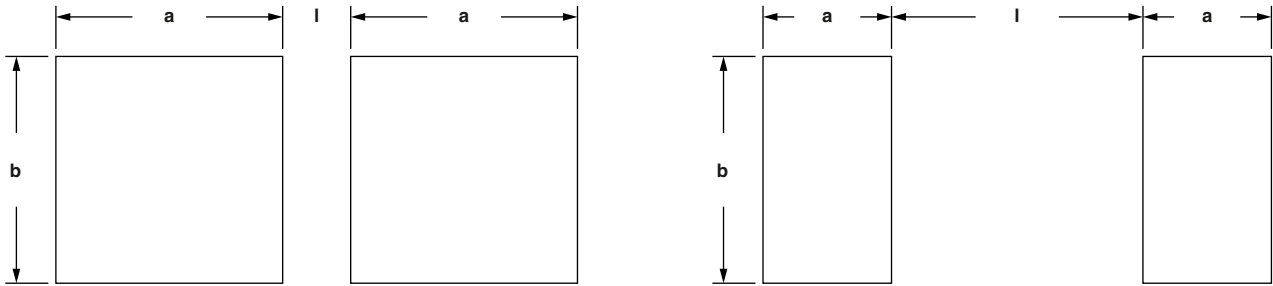
GLOBAL PART NUMBER INFORMATION																	
New Global Part Numbering: RCP1206W100RGWB (preferred part numbering format)																	
R	C	P	1	2	0	6	W	1	0	0	R	G	W	B			
GLOBAL MODEL	BOTTOM TERM.		RESISTANCE VALUE		TOLERANCE CODE		PACKAGING CODE				SPECIAL						
RCP0505 RCP0603 RCP1206 RCP2512	W = wide B = traditional		R = $\Omega$ K = k $\Omega$ 10R0 = 10 $\Omega$ 1K30 = 1.3 k $\Omega$		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](http://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	≤ ± 0.10 %	
	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	No evidence of mechanical damage
	RCP0603	2 kg force applied	
	RCP1206	2 kg force applied	
	RCP2512	3 kg force applied	

DIMENSIONS in inches (millimeters)					
<b>GLOBAL MODEL</b>	<b>A (LENGTH)</b>	<b>B (WIDTH)</b>	<b>C (HEIGHT)</b>	<b>D (TOP TERM)</b>	<b>E (BOTTOM TERM)</b>
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.

## Material Category Policy

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.**

**Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.**

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.**