

# 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: -65 °C to +155 °C
- High frequency performance to 6 GHz
- 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
- <sup>(1)</sup> 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
	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)



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