

CAR Series

Thin Film Precision Chip Resistor



- Resistances from 1 Ohm to 3M Ohms
- Power Rating 0.06 to 0.75 Watt
- Resistance Tolerances to $\pm 0.01\%$
- TCR's to ± 5 ppm/ $^{\circ}\text{C}$
- Sizes: 0402 / 0603 / 0805 / 1206 / 2010 / 2512
- Operating Temperature: -55°C to 155°C



SPECIFICATIONS - STANDARD

Package Size	Power Rating (W) at 70°C	MAX Operating Voltage ¹	MAX Overload Voltage ²	Resistance Range						TCR PPM/ $^{\circ}\text{C}$		
				$\pm 0.01\%$	$\pm 0.05\%$	$\pm 0.1\%$	$\pm 0.25\%$	$\pm 0.5\%$	$\pm 1\%$			
0402	0.0625	25V	50V	49.9 Ω - 4.99K Ω						± 5		
				49.9 Ω - 12K Ω						± 10		
				49.9 Ω - 12K Ω		49.9 Ω - 69.8K Ω				± 15		
				-	49.9 Ω - 12K Ω	10 Ω - 255K Ω				± 25		
				10 Ω - 255K Ω		1 Ω - 255K Ω				± 50		
0603	0.0625	50V	100V	24.9 Ω - 15K Ω						± 5		
				24.9 Ω - 100K Ω	4.7 Ω - 332K Ω				± 10			
				-		4.7 Ω - 332K Ω	4.7 Ω - 1M Ω	2 Ω - 1M Ω		± 25		
				-		1 Ω - 1M Ω						± 50
0805	0.100	100V	200V	24.9 Ω - 30K Ω						± 5		
				24.9 Ω - 200K Ω	4.7 Ω - 511K Ω				± 10			
				-		4.7 Ω - 511K Ω	4.7 Ω - 2M Ω	1 Ω - 2M Ω		± 25		
				-								± 50
1206	0.125	150V	300V	24.9 Ω - 49.9K Ω						± 5		
				24.9 Ω - 499K Ω	4.7 Ω - 1M Ω				± 10			
				-		4.7 Ω - 1M Ω	4.7 Ω - 2.49M Ω	1 Ω - 2.49M Ω		± 25		
				-								± 50
2010	0.250	150V	300V	24.9 Ω - 100K Ω						± 5		
				24.9 Ω - 499K Ω	4.7 Ω - 1M Ω				± 10			
				-		4.7 Ω - 1M Ω	4.7 Ω - 3M Ω	1 Ω - 3M Ω		± 25		
				-								± 50
2512	0.500	150V	300V	24.9 Ω - 100K Ω						± 5		
				24.9 Ω - 499K Ω	4.7 Ω - 1M Ω				± 10			
				-		4.7 Ω - 1M Ω	4.7 Ω - 3M Ω	1 Ω - 3M Ω		± 25		
				-								± 50

¹ Operating Voltage = $\sqrt{P \cdot R}$ or MAX Listed, whichever is lower.

² Overload Voltage = $2.5 \cdot \sqrt{P \cdot R}$ or MAX Listed, whichever is lower.

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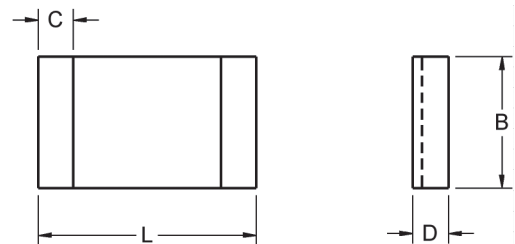


SPECIFICATIONS - HIGH POWER RATING										
Package Size	Power Rating (W) at 70°C	MAX Operating Voltage ¹	MAX Overload Voltage ²	Resistance Range						TCR PPM/°C
				±0.01%	±0.05%	±0.1%	±0.25%	±0.5%	±1%	
0603 HP	0.100	75V	150V	24.9Ω - 15KΩ						±5
				24.9Ω - 100KΩ	4.7Ω - 332KΩ	4.7Ω - 332KΩ				±10
						4.7Ω - 1MΩ				±15
						4.7Ω - 1MΩ				±25
4.7Ω - 1MΩ				±50						
0805 HP	0.125	150V	300V	24.9Ω - 30KΩ						±5
				24.9Ω - 200KΩ	4.7Ω - 511KΩ	4.7Ω - 511KΩ				±10
						4.7Ω - 1MΩ				±15
						4.7Ω - 1MΩ	1Ω - 1MΩ			±25
1Ω - 1MΩ				±50						
1206 HP	0.250	200V	400V	24.9Ω - 49.9KΩ						±5
				24.9Ω - 499KΩ	4.7Ω - 1MΩ				±10	
					4.7Ω - 1MΩ				±15	
					4.7Ω - 1MΩ				±25	
4.7Ω - 1MΩ				±50						
2010 HP	0.333	200V	400V	24.9Ω - 49.9KΩ						±5
				24.9Ω - 499KΩ	4.7Ω - 1MΩ				±10	
					4.7Ω - 1MΩ				±15	
					4.7Ω - 1MΩ				±25	
4.7Ω - 1MΩ				±50						
2512 HP	0.750	200V	400V	24.9Ω - 2KΩ	4.7Ω - 2KΩ	1Ω - 2KΩ		±10		
						1Ω - 2KΩ		±15		
						1Ω - 2KΩ		±25		
						1Ω - 2KΩ		±50		

¹ Operating Voltage = $\sqrt{P \cdot R}$ or MAX Listed, whichever is lower.

² Overload Voltage = $2.5 \cdot \sqrt{P \cdot R}$ or MAX Listed, whichever is lower.

Dimensions (mm)				
Type	L	B	D	C
CAR0402	1.00 ± 0.05	0.50 ± 0.05	0.30 ± 0.05	0.20 ± 0.10
CAR0603	1.55 ± 0.10	0.80 ± 0.10	0.45 ± 0.10	0.30 ± 0.20
CAR0805	2.00 ± 0.15	1.25 ± 0.15	0.55 ± 0.10	0.30 ± 0.20
CAR1206	3.05 ± 0.15	1.55 ± 0.15	0.55 ± 0.10	0.42 ± 0.20
CAR2010	4.90 ± 0.15	2.40 ± 0.15	0.55 ± 0.10	0.60 ± 0.30
CAR2512	6.30 ± 0.15	3.10 ± 0.15	0.55 ± 0.10	0.6 ± 0.30

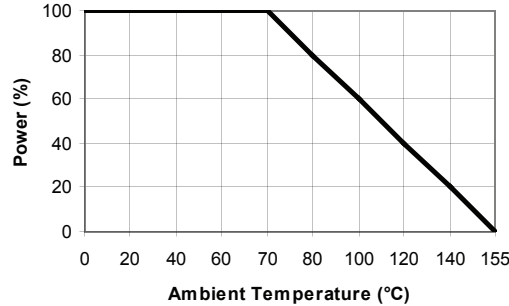


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Power Derating Curve



Environmental Characteristics			
Test	Requirement		Conditions
	Tol. $\leq 0.05\%$	Tol. $>0.05\%$	
TCR	As Spec.		+25/-55/+25/+125/+25°C
Short Time Overload	$\Delta R \pm 0.05\%$	$\Delta R \pm 0.2\%$	RCWV*2.5 or Max. overload voltage for 5 seconds
	$\Delta R \pm 0.2\%$ for high power rating		
Insulation Resistance	$>1000 \text{ M}\Omega$		Apply 100VDC for 1 minute
Load Life	$\Delta R \pm 0.05\%$	$\Delta R \pm 0.2\%$	70±2°C, Max. working voltage for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
	$>7\text{k}\Omega \Delta R \pm 0.5\%$		
	$\Delta R \pm 0.5\%$ for high power rating		
Damp Heat with Load	$\Delta R \pm 0.05\%$	$\Delta R \pm 0.3\%$	40±2°C, 90~95% R.H. Max. working voltage for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
	$\Delta R \pm 0.5\%$ for high power rating		
Bending Strength	$\Delta R \pm 0.05\%$	$\Delta R \pm 0.2\%$	Bending amplitude 3 mm for 10 seconds
Solderability	95% min. coverage		245±5°C for 3 seconds
Resistance to Soldering Heat	$\Delta R \pm 0.05\%$	$\Delta R \pm 0.2\%$	260±5°C for 10 seconds
Thermal Shock	$\Delta R \pm 0.05\%$	$\Delta R \pm 0.25\%$	-55°C~150°C, 100 cycles
Low Temperature Operation	$\Delta R \pm 0.05\%$	$\Delta R \pm 0.2\%$	1 hour, -65°C, followed by 45 minutes of RCWV
	$\Delta R \pm 0.5\%$ for high power rating		

Ordering Information

Part Description: Part Type - Package Size- Resistance - Tolerance - TCR - HP option

Example: CAR0402 50 Ohms 0.05% 25ppm HP

(Note: if no TCR is specified: The highest value will be supplied)