PHP

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Vishay Dale Thin Film

High Power Thin Film Wraparound Chip Resistor



LINKS TO ADDITIONAL RESOURCES



PHP series chip resistors are designed with enlarged backside terminations to reduce the thermal resistance between the topside resistor layer and the solder joint on the end users circuit board.

Actual power handling capability is limited by the end user mounting process. As with any high power chip resistor the ability to remove the generated heat is critical to the overall performance of the device.

FEATURES

- High purity ceramic substrate
- Power rating to 2.5 W
- Resistance range 10 Ω to 30.1 k Ω
- Resistor tolerance to ± 0.1 %
- TCR to ± 25 ppm/°C
- Flame resistant UL 94 V-0

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

APPLICATIONS

- Power supplies
- · Power switching
- Braking system
- Test and measurement equipment
- Motor deflection circuits

TYPICAL PERFORMANCE

	ABSOLUTE
TCR	25
TOL.	0.1

STANDARD ELECTRICAL SPECIFICATIONS				
TEST	SPECIFICATIONS	CONDITIONS		
Material	Nichrome	-		
Resistance Range	10 Ω to 30.1 kΩ	-		
TCR: Absolute	25 ppm/°C, 50 ppm/°C (standard) and, 100 ppm/°C	-55 °C to +125 °C		
Tolerance: Absolute	0.1 %, 0.5 %, 1.0 % and, 5.0 %	+25 °C		
Power Rating: Resistor	0.375 W to 2.5 W ⁽¹⁾	Maximum at +70 °C		
Stability: Absolute	∆R 0.1 %	2000 h at +70 °C		
Stability: Ratio	Not applicable	-		
Voltage Coefficient	< 0.1 ppm/V	-		
Working Voltage	75 V to 200 V	-		
Operating Temperature Range	-55 °C to +155 °C	-		
Storage Temperature Range	-55 °C to +155 °C	-		
Noise	< -30 dB	-		
Shelf Life Stability: Absolute	± 0.01 %	1 year at +25 °C		

COMPONENT RATINGS				
CASE SIZE	POWER RATING (mW)	WORKING VOLTAGE (V)	RESISTANCE RANGE (Ω)	
0603	375 (1)	75	10 to 30.1K	
0805	625 ⁽¹⁾	100	10 to 30.1K	
1206	1000 (1)	200	10 to 30.1K	
2512	2500 ⁽¹⁾	200	10 to 30.1K	

Note

⁽¹⁾ Dependent on component mounting by user

Revision: 04-Apr-2024

1

Document Number: 60076

Pb-free Available

RoHS*

HALOGEN FREE Available

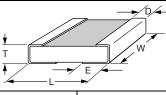
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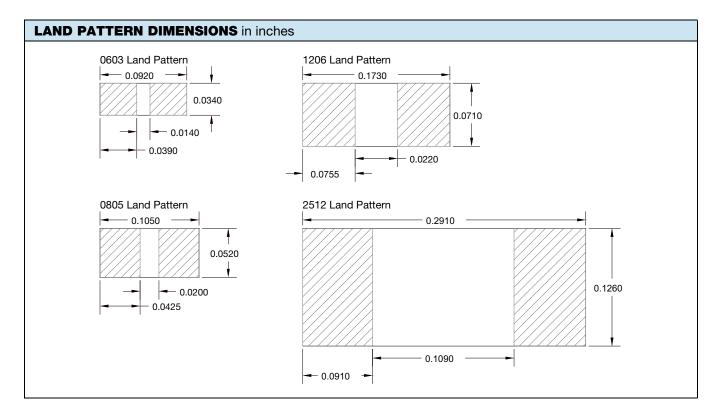
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ENVIRONMENTAL TESTS (Vishay Performance vs. MIL-PRF-55342 Requirements)				
ENVIRONMENTAL TEST	LIMITS MIL-PRF-55342 CHARACTERISTIC "E"	TYPICAL VISHAY PERFORMANCE		
Resistance Temperature Characteristic	± 25 ppm/°C	± 15 ppm/°C		
Maximum Ambient Temperature at Rated Wattage	+70 °C	+70 °C		
Maximum Ambient Temperature at Power Derating	+150 °C	+150 °C		
Thermal Shock	± 0.1 %	± 0.04 %		
Low Temperature Operation	± 0.1 %	± 0.001 %		
Short Time Overload	± 0.1 %	± 0.003 %		
High Temperature Exposure	± 0.1 %	± 0.030 %		
Resistance to Soldering Heat	± 0.2 %	± 0.007 %		
Moisture Resistance	± 0.2 %	± 0.002 %		
Life at +70 °C for 2000 h	± 0.5 %	± 0.100 %		

DIMENSIONS in inches



CASE SIZE	LENGTH	WIDTH W (± 0.005)	THICKNESS MIN./MAX.	TOP PAD D (± 0.005)	BOTTOM PAD E (± 0.005)
0603	0.064 ± 0.006	0.032	0.020 max.	0.012	0.021
0805	0.080 ± 0.006	0.050	0.015/0.033	0.016	0.025
1206	0.126 ± 0.008	0.063	0.015/0.033	0.020 + 0.005/- 0.010	0.040
2512	0.259 + 0.009/- 0.015	0.124	0.015/0.033	0.02	0.050



Revision: 04-Apr-2024

2

Document Number: 60076

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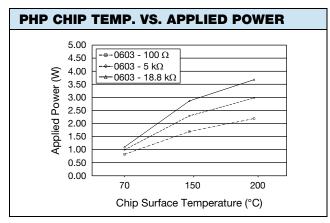


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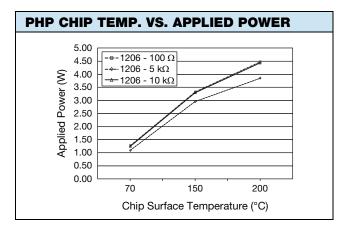
STANDARD MATERIAL SPECIFICATIONS

Resistive Element	Nichrome	
Substrate Material	Alumina (Al ₂ O ₃)	
Terminations (Tin/Lead)	Tin/lead solder over nickel barrier	
Terminations (Lead (Pb)-free)	Tin/silver/copper (Sn96.5Ag3.0Cu0.5) solder over nickel barrier	



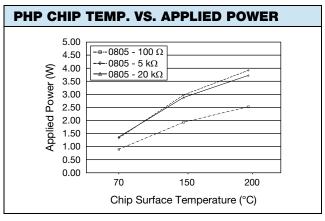
Note

 Chip surface temperature measured using FLIR SC645 thermal imaging system with an approximate test card surface temperature of 85 °C



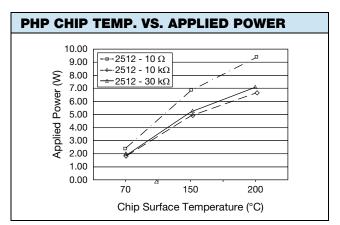
Notes

- Chip surface temperature measured using FLIR A40 thermal imaging system with an approximate test card surface temperature of 25 °C
- Thermal imaging was conducted under ambient conditions resulting in a steady state test card surface temperature of 85 °C over the full range of power levels
- Thermal imaging and load life testing was conducted mounting one device to 2" x 3" test cards with 2.5 mil copper plating on both surfaces. Thermal vias on 120 mil centers were utilized for heat transfer between surfaces of the test card



Note

 Chip surface temperature measured using FLIR SC645 thermal imaging system with an approximate test card surface temperature of 85 °C



Notes

 Chip surface temperature measured using FLIR A40 thermal imaging system with an approximate test card surface temperature of 25 °C

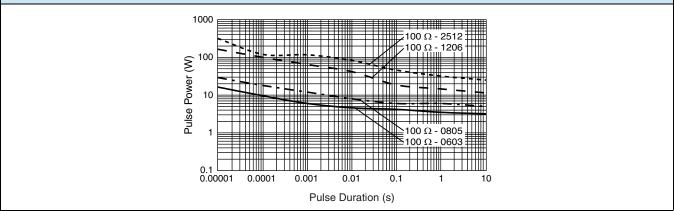
Case Size	2512	2512	2512
Resistance Value	Up to 10 Ω	Up to 10 $k\Omega$	Up to 30 k Ω
Temperature	Power (W)		
70	2.44	1.81	1.87
150	6.82	4.89	5.19
200	9.33	6.63	7.09



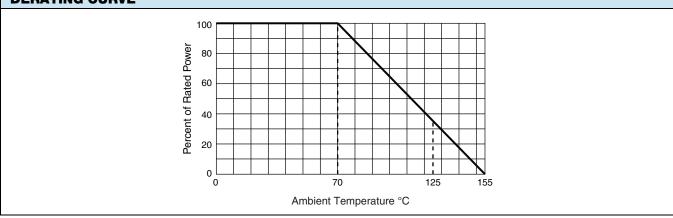
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SINGLE PULSE CURVES







GLOBAL PART NUMBER INFORMATION					
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Revision: 04-Apr-2024

Document Number: 60076

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1