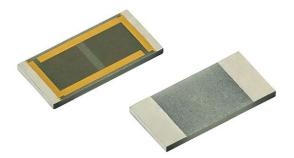
# Vishay Dale Thin Film

# High Power Aluminum Nitride, Wraparound Surface Mount, Precision Thin Film Chip Resistor (up to 6 W)



www.vishay.com

### **ADDITIONAL RESOURCES**



PCAN series chip resistors are designed on aluminum nitride ceramic substrates with enlarged backside terminations to reduce the thermal resistance between the topside resistor layer and the solder joint on the end users circuit assembly.

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

## FEATURES

- High thermal conductivity aluminum nitride substrate
- Power rating up to 6.0 W
- Resistance range 2  $\Omega$  to 30.1  $k\Omega$
- Resistor tolerance to ± 0.1 %
- TCR to ± 25 ppm/°C
- Flame resistant UL 94 V-0
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>

## 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

## TYPICAL PERFORMANCE

	ABSOLUTE
TCR	25
TOL.	0.1

STANDARD ELECTRICAL SPECIFICATIONS			
TEST	SPECIFICATIONS	CONDITIONS	
Material	Passivated nichrome	-	
Resistance Range	2 Ω to 30.1 kΩ	-	
TCR: Absolute	25 ppm/°C (standard) and 100 ppm/°C	-	
Tolerance: Absolute	0.1 %, 0.25 %, 0.5 %, 1.0 %, 2.0 %, and 5.0 %	-55 °C to +150 °C	
Power Rating: Resistor	0.5 W to 6.0 W <sup>(1)</sup>	Maximum at +70 °C	
Stability: Absolute	ΔR 1.0 %	1000 h at +70 °C	
Voltage Coefficient	< 0.1 ppm/V	-	
Working Voltage	75 V to 100 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	

### Note

<sup>(1)</sup> Dependant on component mounting by user

COMPONENT RATINGS			
CASE SIZE	POWER RATING (mW)	WORKING VOLTAGE (V)	<b>RESISTANCE RANGE (</b> $\Omega$ <b>)</b>
0603	500 (1)	75	2 to 30.1K
0805	1000 (1)	100	2 to 30.1K
1206	2000 (1)	100	2 to 30.1K
2512	6000 (1)	100	2 to 30.1K

### Note

<sup>(1)</sup> Dependant on component mounting by user

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PCAN

Available

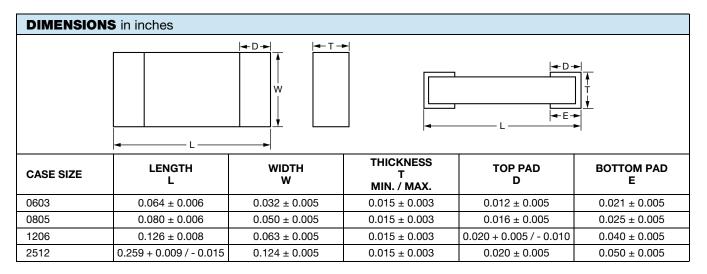
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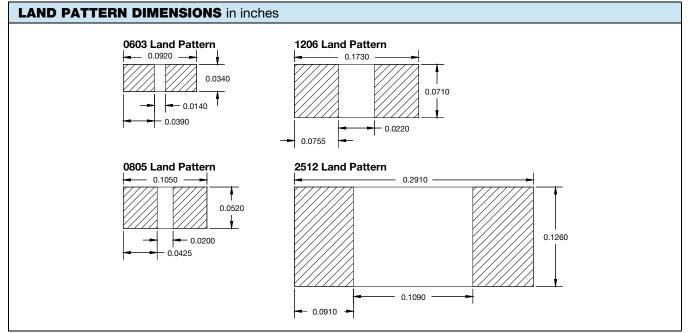
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ENVIRONMENTAL TESTS		
ENVIRONMENTAL TEST (1)	TEST LIMITS	TYPICAL VISHAY PERFORMANCE
Resistance temperature characteristic	± 25 ppm/°C	± 15 ppm/°C
Maximum ambient temperature at rated wattage	+70 °C	+70 °C
Maximum ambient temperature at power derating	+150 °C	+150 °C
Thermal shock	± 0.25 %	± 0.10 %
Low temperature operation	± 0.25 %	± 0.01 %
Short time overload	± 0.5 %	± 0.2 %
High temperature exposure	± 0.2 %	± 0.05 %
Resistance to soldering heat	± 0.25 %	± 0.025 %
Moisture resistance	± 0.4 %	± 0.01 %
Life at +70 °C for 1000 h	± 1.00 %	± 0.4 %

### Note

(1) Environmental testing was performed based on MIL-STD-202 standard test methods





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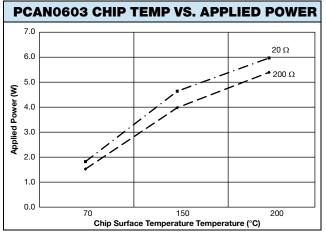
2 For technical questions, contact: <u>thinfilm@vishay.com</u> Document Number: 60125

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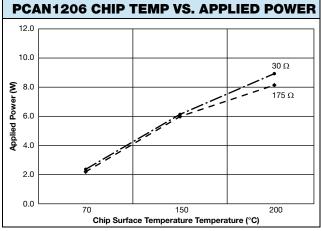
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STANDARD MATERIAL SPECIFICATIONS		
Resistive element	Passivated nichrome	
Substrate material	Aluminum nitride	
Terminations (tin/lead)	Tin / lead solder over nickel barrier	
Terminations (lead (Pb)-free)	Tin / silver / copper (Sn96.5 / Ag3.0 / Cu0.5) solder over nickel barrier	



#### Note

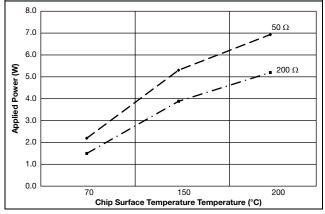
 Chip surface temperature measured using FLIR SC645 thermal imaging system with an approximate testcard surface temperature of 75 °C



### Note

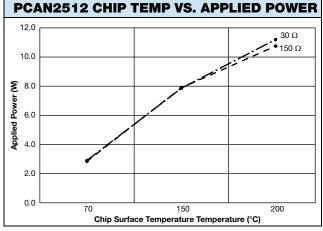
- Chip surface temperature measured using FLIR SC645 thermal imaging system with an approximate test card surface temperature of 85 °C
- Thermal imaging was conducted under ambient conditions resulting in a steady state test card surface temperature of 85 °C over the full range of power levels
- Thermal imaging and load life testing was conducted mounting one device to a 1.6" x 3.7" test card with 3.5 mil copper plating on both surfaces. Thermal vias on 50 mil centers were utilized for heat transfer between surfaces of the test card

## PCAN0805 CHIP TEMP VS. APPLIED POWER



### Note

 Chip surface temperature measured using FLIR SC645 thermal imaging system with an approximate testcard surface temperature of 75 °C



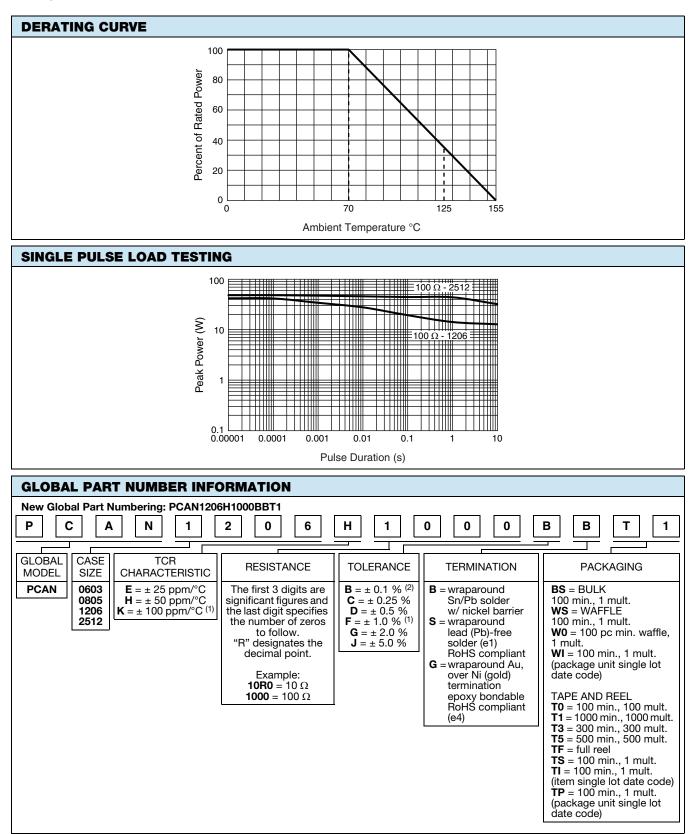


 Chip surface temperature measured using FLIR SC645 thermal imaging system with an approximate test card surface temperature of 85 °C



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Notes

 $^{(1)}$  Less than 10  $\Omega.$  100 ppm/°C and 1 % tolerance best

 $^{(2)}$  Available on 10  $\Omega$  and higher

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