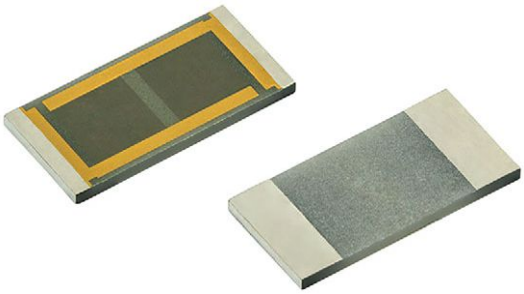
High Power Aluminum Nitride, Wraparound Surface Mount, Precision Thin Film Chip Resistor (up to 6 W)



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 Ω to 30.1 kΩ
- Resistor tolerance to ± 0.1 %
- TCR to ± 25 ppm/°C
- Flame resistant UL 94 V-0
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb Available
RoHS* Available
HALOGEN FREE GREEN (5-2008) Available

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 % and 5.0 %	-55 °C to +150 °C
Power Rating: Resistor	0.5 W to 6.0 W (1)	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 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

Note
(1) Dependant on component mounting by user.

COMPONENT RATINGS

CASE SIZE	POWER RATING (mW)	WORKING VOLTAGE (V)	RESISTANCE RANGE (Ω)
0603	500 (2)	75	2 to 30.1K
0805	1000 (2)	100	2 to 30.1K
1206	2000 (2)	200	2 to 30.1K
2512	6000 (2)	200	2 to 30.1K

Note
(2) Dependant on component mounting by user.

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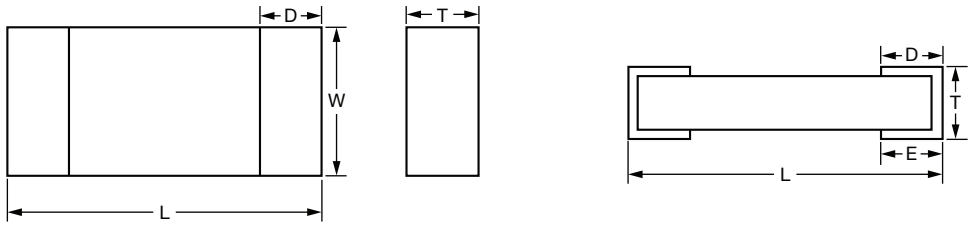
ENVIRONMENTAL TESTS

ENVIRONMENTAL TEST	LIMITS MIL-PRF-55342 CHARACTERISTIC "H"	TYPICAL VISHAY PERFORMANCE
Resistance temperature characteristic	± 50 ppm/°C	± 25 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 %	± 0.10 %
Short time overload	± 0.1 %	± 0.10 %
High temperature exposure	± 0.2 %	± 0.10 %
Resistance to soldering heat	± 0.25 %	± 0.10 %
Moisture resistance	± 0.4 %	± 0.50 %
Life at +70 °C for 1000 h	± 0.5 %	± 1.00 %

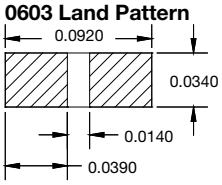
DIMENSIONS in inches



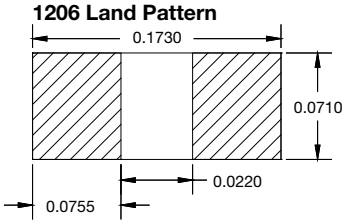
CASE SIZE	LENGTH L	WIDTH W	THICKNESS T MIN./MAX.	TOP PAD D	BOTTOM PAD E
0603	0.064 ± 0.006	0.032 ± 0.005	0.015 ± 0.003	0.012 ± 0.005	0.021 ± 0.005
0805	0.080 ± 0.006	0.050 ± 0.005	0.015 ± 0.003	0.016 ± 0.005	0.025 ± 0.005
1206	0.126 ± 0.008	0.063 ± 0.005	0.015 ± 0.003	0.020 + 0.005 / - 0.010	0.040 ± 0.005
2512	0.259 + 0.009 / - 0.015	0.124 ± 0.005	0.015 ± 0.003	0.020 ± 0.005	0.050 ± 0.005

LAND PATTERN DIMENSIONS in inches

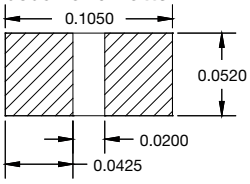
0603 Land Pattern



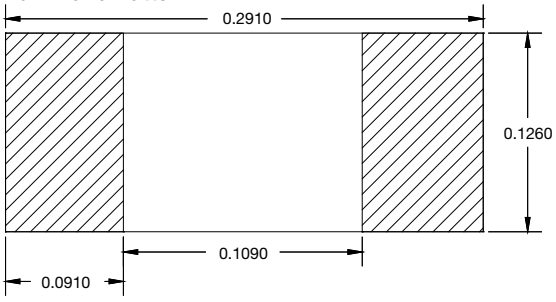
1206 Land Pattern



0805 Land Pattern



2512 Land Pattern



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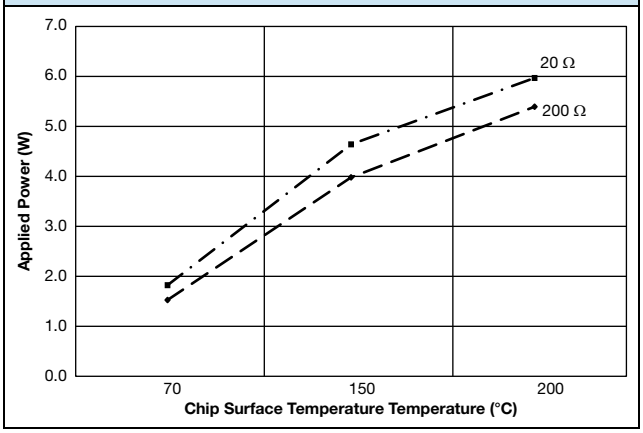
STANDARD MATERIAL SPECIFICATIONS	
Resistive element	Passivated nichrome
Substrate material	Aluminum nitride
Terminations (Tin/lead)	Tin/lead solder over nickel barrier
Terminations (Lead (Pb)-free)	Tin/silver/copper (Sn96.5/Ag3.0/Cu0.5) solder over nickel barrier

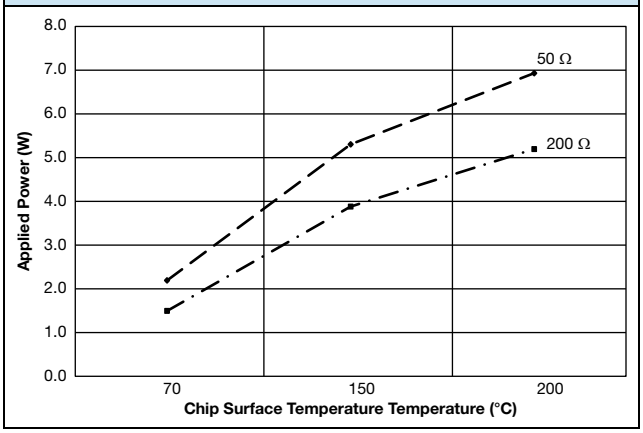
PCAN0603 CHIP TEMP VS. APPLIED POWER



Note

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

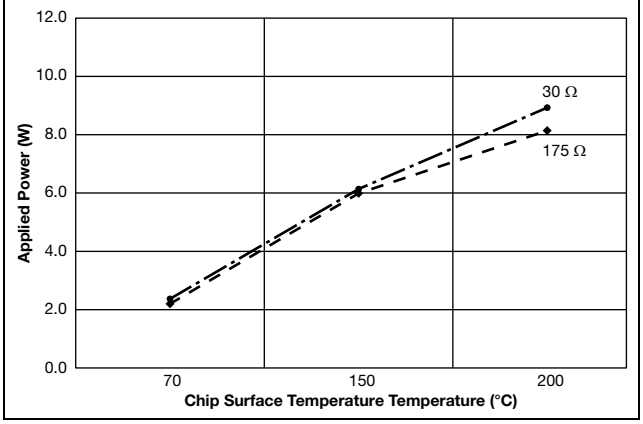
PCAN0805 CHIP TEMP VS. APPLIED POWER



Note

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

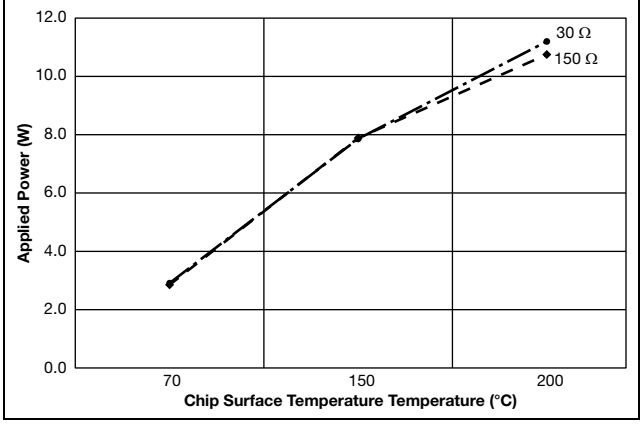
PCAN1206 CHIP TEMP VS. APPLIED POWER



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.

PCAN2512 CHIP TEMP VS. APPLIED POWER



Note

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

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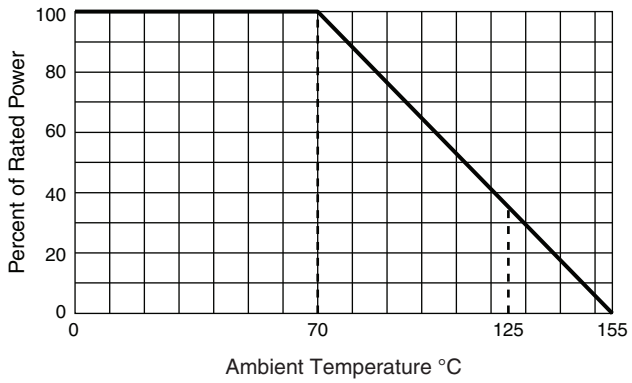
DERATING CURVE



GLOBAL PART NUMBER INFORMATION

New Global Part Numbering: PCAN1206H1000BBT1

P	C	A	N	1	2	0	6	H	1	0	0	0	B	B	T	1

GLOBAL MODEL	CASE SIZE	TCR CHARACTERISTIC	RESISTANCE	TOLERANCE	TERMINATION	PACKAGING
PCAN	**0603** **0805** **1206** **2512**	**E** = ± 25 ppm/°C **H** = ± 50 ppm/°C **K** = ± 100 ppm/°C (1)	The first 3 digits are significant figures and the last digit specifies the number of zeros to follow. "R" designates the decimal point. Example: **10R0** = 10 Ω **1000** = 100 Ω	**B** = ± 0.1 % (2) **C** = ± 0.25 % **D** = ± 0.5 % **F** = ± 1.0 % (1) **G** = ± 2.0 %	**B** = Wraparound Sn/Pb solder w/ nickel barrier **S** = Wraparound lead (Pb)-free solder (e1) RoHS compliant **G** = Wraparound Au, over Ni (gold) termination epoxy bondable RoHS compliant (e4)	**BS** = BULK 100 min., 1 mult **WS** = WAFFLE 100 min., 1 mult **W0** = 100 pc min. waffle, 1 mult **WI** = 100 min., 1 mult (package unit single lot date code) TAPE AND REEL **T0** = 100 min., 100 mult **T1** = 1000 min., 1000 mult **T3** = 300 min., 300 mult **T5** = 500 min., 500 mult **TF** = Full reel **TS** = 100 min., 1 mult **TI** = 100 min., 1 mult (item single lot date code) **TP** = 100 min., 1 mult (package unit single lot date code)

Notes

(1) Less than 10 Ω. 100 ppm/°C and 1 % tolerance best.

(2) Available on 10 Ω and higher.

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