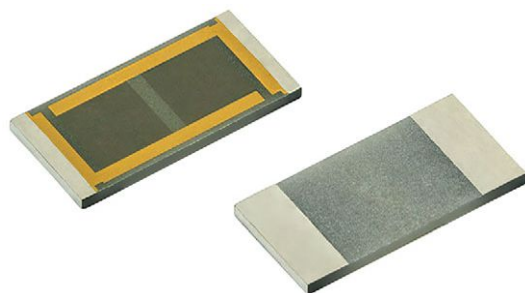


High Power Aluminum Nitride, Wraparound Surface Mount, Precision Thin Film Non-Magnetic Chip Resistor (up to 6 W)



PCNM 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 k Ω
- Resistor tolerance to ± 0.1 %
- TCR to ± 25 ppm/ $^{\circ}$ C
- Flame resistant UL 94 V-0

APPLICATIONS

- Power supplies
- Power switching
- Braking system

TYPICAL PERFORMANCE

	ABSOLUTE
TCR	25
TOL.	0.1

STANDARD ELECTRICAL SPECIFICATIONS

TEST	SPECIFICATIONS	CONDITIONS
Material	Nichrome	-
Resistance Range	2 Ω to 30.1 k Ω	-
TCR: Absolute	25 ppm/ $^{\circ}$ C (standard) and 100 ppm/ $^{\circ}$ C	-
Tolerance: Absolute	0.1 %, 0.25 %, 0.5 %, 1.0 % and 5.0 %	-55 $^{\circ}$ C to +150 $^{\circ}$ C
Power Rating: Resistor	0.5 W to 6.0 W ⁽¹⁾	Maximum at +70 $^{\circ}$ C
Stability: Absolute	ΔR 1.0 %	1000 h at +70 $^{\circ}$ C
Voltage Coefficient	< 0.1 ppm/V	-
Working Voltage	75 V to 100 V	-
Operating Temperature Range	-55 $^{\circ}$ C to +155 $^{\circ}$ C	-
Storage Temperature Range	-55 $^{\circ}$ C to +155 $^{\circ}$ C	-
Noise	< -30 dB	-
Shelf Life Stability: Absolute	± 0.01 %	1 year at +25 $^{\circ}$ C

Note

⁽¹⁾ Dependant on component mounting by user

COMPONENT RATINGS

CASE SIZE	POWER RATING (mW)	WORKING VOLTAGE (V)	RESISTANCE RANGE (Ω)
1206	2000 ⁽¹⁾	100	2 to 30.1K
2512	6000 ⁽¹⁾	100	2 to 30.1K

Notes

- 0603 and 0805 case size under engineering qualification

⁽¹⁾ Dependant on component mounting by user

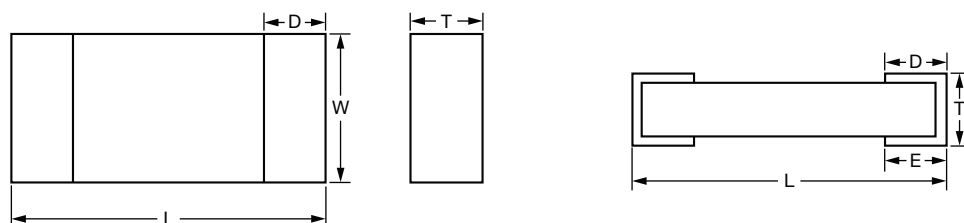
ENVIRONMENTAL TESTS

ENVIRONMENTAL TEST ⁽¹⁾	TEST LIMITS	TYPICAL VISHAY PERFORMANCE
Resistance temperature characteristic	$\pm 25 \text{ ppm/}^{\circ}\text{C}$	$\pm 15 \text{ ppm/}^{\circ}\text{C}$
Maximum ambient temperature at rated wattage	$+70 \text{ }^{\circ}\text{C}$	$+70 \text{ }^{\circ}\text{C}$
Maximum ambient temperature at power derating	$+150 \text{ }^{\circ}\text{C}$	$+150 \text{ }^{\circ}\text{C}$
Thermal shock	$\pm 0.25 \%$	$\pm 0.10 \%$
Low temperature operation	$\pm 0.25 \%$	$\pm 0.01 \%$
Short time overload	$\pm 0.5 \%$	$\pm 0.2 \%$
High temperature exposure	$\pm 0.2 \%$	$\pm 0.05 \%$
Resistance to soldering heat	$\pm 0.25 \%$	$\pm 0.02 \%$
Moisture resistance	$\pm 0.4 \%$	$\pm 0.01 \%$
Life at $+70 \text{ }^{\circ}\text{C}$ for 1000 h	$\pm 1.00 \%$	$\pm 0.02 \%$

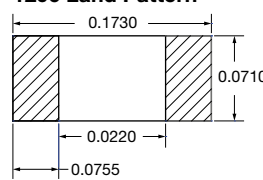
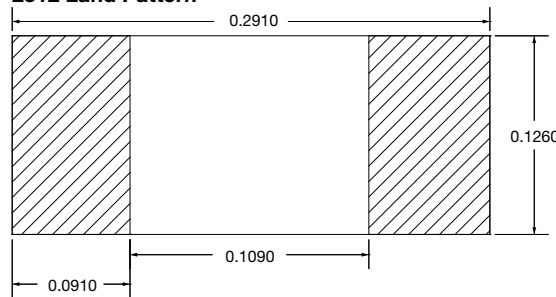
Note

(1) Environmental testing was performed based on MIL-STD-202 Standard Test Methods

DIMENSIONS in inches

					
CASE SIZE	LENGTH L	WIDTH W	THICKNESS T MIN./MAX.	TOP PAD D	BOTTOM PAD E
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

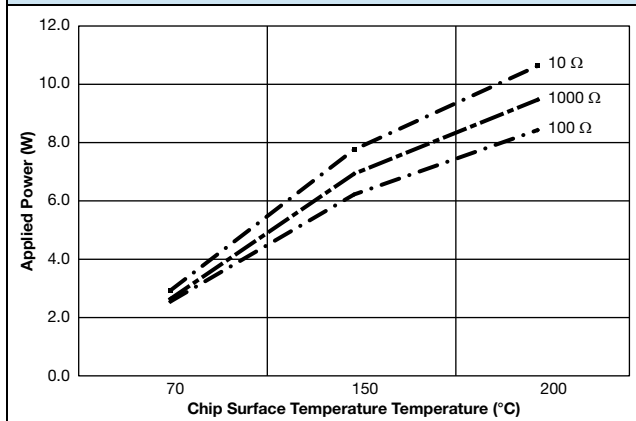
1206 Land Pattern 	2512 Land Pattern 
---	--

STANDARD MATERIAL SPECIFICATIONS

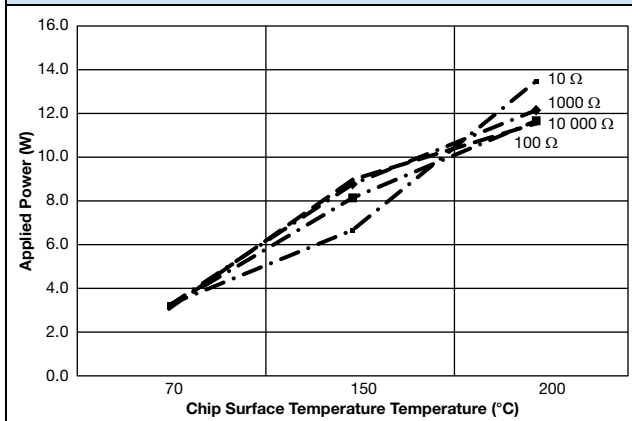
Resistive element	Nichrome
Substrate material	Aluminum nitride
Terminations (tin / lead)	Tin / lead solder over copper
Terminations (lead (Pb)-free)	Tin / silver / copper (Sn96.5 / Ag3.0 / Cu0.5) solder over copper



PCAN1206 CHIP TEMP VS. APPLIED POWER



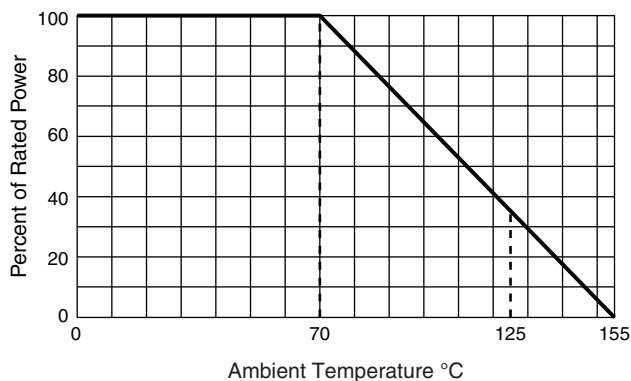
PCNM2512 CHIP TEMP VS. APPLIED POWER



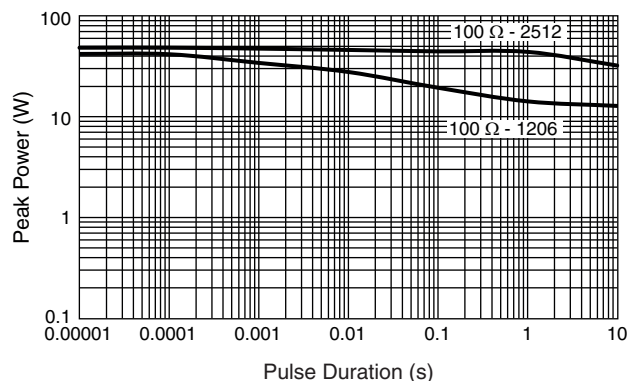
Notes

- 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

DERATING CURVE



PULSE HANDLING RESULTS





GLOBAL PART NUMBER INFORMATION

New Global Part Numbering: PCNM1206H1000BBT1

P	C	N	M	1	2	0	6	H	1	0	0	0	B	B	T	1
GLOBAL MODEL	CASE SIZE	TCR CHARACTERISTIC		RESISTANCE				TOLERANCE	TERMINATION				PACKAGING			
PCNM	1206 2512	E = ± 25 ppm/ $^{\circ}$ C H = ± 50 ppm/ $^{\circ}$ C K = ± 100 ppm/ $^{\circ}$ 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 W1 = 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/ $^{\circ}$ C and 1 % tolerance best
⁽²⁾ Available on 10 Ω and higher



Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.