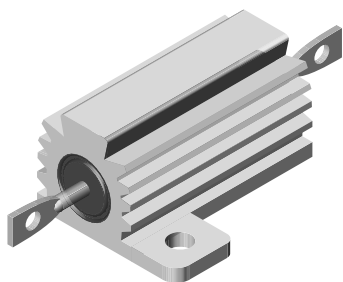


Wirewound Resistors, Industrial Power, Aluminum Housed, Chassis Mount



FEATURES

- Molded construction for total environmental protection
- Complete welded construction
- Available in non-inductive styles (NI special) with Ayrton-Perry winding for lowest reactive components
- Mounts on chassis to utilize heat-sink effect
- Excellent stability in operation (< 1 % change in resistance)
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912



STANDARD ELECTRICAL SPECIFICATIONS

GLOBAL MODEL	HISTORICAL MODEL	POWER RATING $P_{25^{\circ}\text{C}}$ W	RESISTANCE RANGE Ω	TOLERANCE $\pm \%$	WEIGHT (typical) g
TMC005	TMC-5	7.5	0.02 to 24.5K	1, 3, 5	3
TMC005...NI	TMC-5-...-NI	7.5	0.05 to 12.75K	1, 3, 5	3
TMC010	TMC-10	12.5	0.01 to 47.1K	1, 3, 5	5
TMC010...NI	TMC-10-...-NI	12.5	0.05 to 23.5K	1, 3, 5	5
TMC025	TMC-25	25	0.01 to 95.2K	1, 3, 5	12
TMC025...NI	TMC-25-...-NI	25	0.05 to 47.6K	1, 3, 5	12
TMC050	TMC-50	50	0.01 to 273K	1, 3, 5	28
TMC050...NI	TMC-50-...-NI	50	0.05 to 136K	1, 3, 5	28
TMC100	TMC-100	100	0.05 to 90K	1, 3, 5	353
TMC100...NI	TMC-100-...-NI	100	0.05 to 37.5K	1, 3, 5	353
TMC250	TMC-250	250	0.05 to 116K	1, 3, 5	637
TMC250...NI	TMC-250-...-NI	250	0.05 to 48.5K	1, 3, 5	637

Note

- The NI is for two digit "special" number to indicate a non-inductive part.

TECHNICAL SPECIFICATIONS

PARAMETER	UNIT	TMC RESISTOR CHARACTERISTICS
Temperature Coefficient	ppm/°C	± 20 for 10 Ω and above; ± 50 for 1 Ω to 9.9 Ω , ± 100 for 0.5 Ω to 0.99 Ω
Maximum Working Voltage	V	$(P \times R)^{1/2}$
Insulation Resistance	Ω	10 000 M Ω minimum dry, 1000 M Ω minimum after moisture test
Solderability	-	Meets requirements of ANSI J-STD-002
Operating Temperature Range	°C	- 55 to + 250

GLOBAL PART NUMBER INFORMATION

Global Part Numbering example: TMC0054R125FE02NI (visit www.vishay.net Vishay Dale parts numbering manual for all options)

T M C 0 0 5 4 R 1 2 5 F E 0 2 N I

GLOBAL MODEL
(6 digits)
(See Standard Electrical Specifications Global Model column for options)

VALUE
(5 digits)
R = Decimal
K = Thousand
15R00 = 15 Ω
10K00 = 10 k Ω

TOLERANCE
(1 digit)
F = 1 %
H = 3 %
J = 5 %

PACKAGING CODE
(3 digits)
E02 = Lead (Pb)-free, card pack (TMC005 to TMC050)
E01 = Lead (Pb)-free, skin pack (TMC100 and TMC250)

SPECIAL
(up to 2 digits)
NI = Non-inductive (Dash Number) From 1 to 99 as applicable

Historical Part Number example: TMC-5-4.125-1%-NI

TMC-5
HISTORICAL MODEL

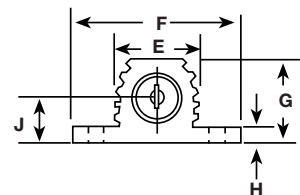
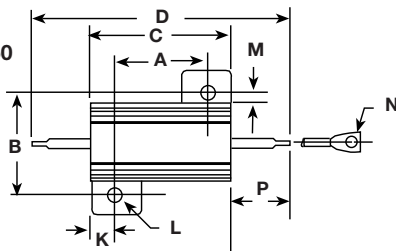
4.125 Ω
RESISTANCE VALUE

1 %
TOLERANCE

NI
SPECIAL

DIMENSIONS in inches [millimeters]

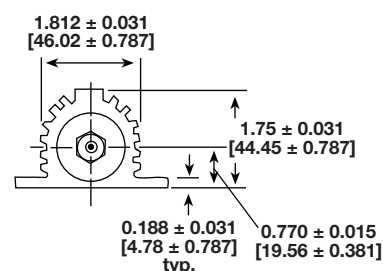
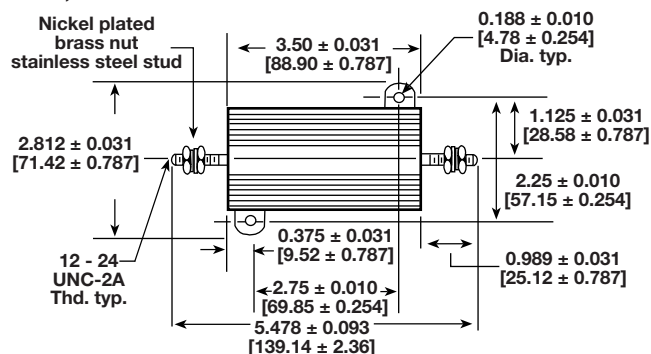
TMC005, 010, 025, 050
TMC005...NI, 010, 025, 050



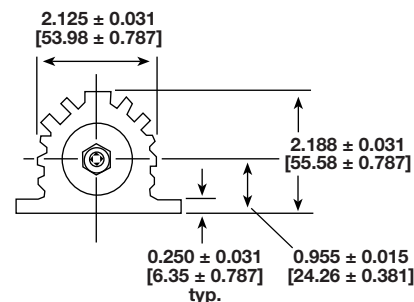
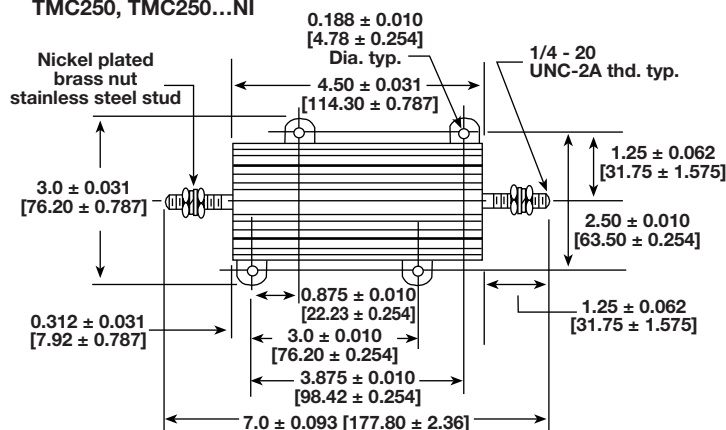
GLOBAL MODEL	DIMENSIONS in inches [millimeters]													
	A	B	C	D	E	F	G	H	J	K	L	M	N	P
TMC005 TMC005...NI	0.444 ± 0.005 [11.28 ± 0.127]	0.490 ± 0.005 [12.45 ± 0.127]	0.600 ± 0.030 [15.24 ± 0.787]	1.125 ± 0.062 [28.58 ± 1.57]	0.334 ± 0.015 [8.48 ± 0.381]	0.646 ± 0.015 [16.41 ± 0.381]	0.320 ± 0.015 [8.13 ± 0.381]	0.065 ± 0.010 [1.65 ± 0.254]	0.133 ± 0.010 [3.38 ± 0.254]	0.078 ± 0.010 [1.98 ± 0.254]	0.093 ± 0.005 [2.36 ± 0.127]	0.078 ± 0.015 [1.98 ± 0.381]	0.050 ± 0.005 [1.27 ± 0.127]	0.266 ± 0.062 [6.76 ± 1.57]
TMC010 TMC010...NI	0.562 ± 0.005 [14.27 ± 0.127]	0.625 ± 0.005 [15.88 ± 0.127]	0.750 ± 0.031 [19.05 ± 0.787]	1.375 ± 0.062 [34.93 ± 1.57]	0.420 ± 0.015 [10.67 ± 0.381]	0.800 ± 0.015 [20.32 ± 0.381]	0.390 ± 0.015 [9.91 ± 0.381]	0.075 ± 0.010 [1.91 ± 0.254]	0.165 ± 0.010 [4.19 ± 0.254]	0.093 ± 0.010 [2.36 ± 0.254]	0.094 ± 0.005 [2.39 ± 0.127]	0.102 ± 0.015 [2.59 ± 0.381]	0.085 ± 0.005 [2.16 ± 0.127]	0.312 ± 0.062 [7.92 ± 1.57]
TMC025 TMC025...NI	0.719 ± 0.005 [18.26 ± 0.127]	0.781 ± 0.005 [19.84 ± 0.127]	1.062 ± 0.031 [26.97 ± 0.787]	1.938 ± 0.062 [49.23 ± 1.57]	0.550 ± 0.015 [13.97 ± 0.381]	1.080 ± 0.015 [27.43 ± 0.381]	0.546 ± 0.015 [13.87 ± 0.381]	0.075 ± 0.010 [1.91 ± 0.254]	0.231 ± 0.010 [5.87 ± 0.254]	0.172 ± 0.010 [4.37 ± 0.254]	0.125 ± 0.005 [3.18 ± 0.127]	0.115 ± 0.015 [2.92 ± 0.381]	0.085 ± 0.005 [2.16 ± 0.127]	0.438 ± 0.062 [11.13 ± 1.57]
TMC050 TMC050...NI	1.562 ± 0.005 [39.67 ± 0.127]	0.844 ± 0.005 [21.44 ± 0.127]	1.968 ± 0.031 [49.99 ± 0.787]	2.781 ± 0.062 [70.64 ± 1.57]	0.630 ± 0.015 [16.00 ± 0.381]	1.140 ± 0.015 [28.96 ± 0.381]	0.610 ± 0.015 [15.49 ± 0.381]	0.088 ± 0.010 [2.24 ± 0.254]	0.260 ± 0.010 [6.60 ± 0.254]	0.196 ± 0.010 [4.98 ± 0.254]	0.125 ± 0.005 [3.18 ± 0.127]	0.107 ± 0.015 [2.72 ± 0.381]	0.085 ± 0.005 [2.16 ± 0.127]	0.438 ± 0.062 [11.13 ± 1.57]

DIMENSIONS in inches [millimeters]

TMC100, TMC100...NI



TMC250, TMC250...NI



**POWER RATING**

Vishay TMC resistor wattage ratings are based on mounting to the following heat sink:

TMC005 and TMC010: 4" x 6" x 2" x 0.040" thick aluminum chassis (129 sq. in. surface area)

TMC025: 5" x 7" x 2" x 0.040" thick aluminum chassis (167 sq. in. surface area)

TMC050: 12" x 12" x 0.059" thick aluminum panel (291 sq. in. surface area)

TMC100 and TMC250: 12" x 12" x 0.125" thick aluminum panel (294 sq. in. surface area)

FREE AIR POWER RATING

GLOBAL MODEL	TMC005 TMC005...NI	TMC010 TMC010...NI	TMC025 TMC025...NI	TMC050 TMC050...NI	TMC100 TMC100...NI	TMC250 TMC250...NI
W at 25 °C	4.5	7.5	12.5	20	40	100

AMBIENT TEMPERATURE DERATING

Derating is required for ambient temperatures above 25 °C, see the following graph.

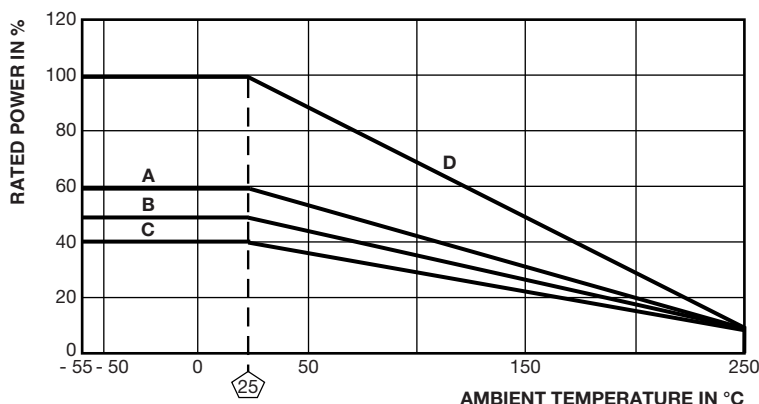
Curves **A**, **B**, **C** apply to operation of unmounted resistors. Curve **D** applies to all types when mounted to specified heat sink.

A = TMC005 and TMC010 size resistor, unmounted

B = TMC025 size resistor, unmounted

C = TMC050, TMC100 and TMC250 size resistor, unmounted

D = All types mounted to recommended aluminum heat sink

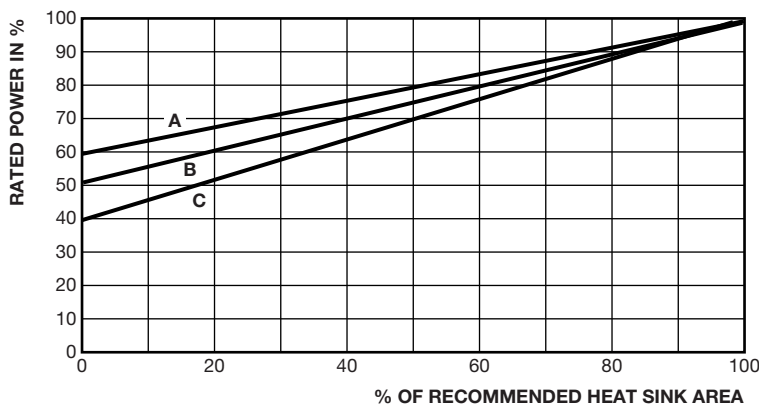
**REDUCED HEAT SINK DERATING**

Derating is also required when recommended heat sink area is reduced.

A = TMC005 and TMC010 size resistor

B = TMC025 size resistor

C = TMC050, TMC100 and TMC250 size resistor



**MATERIAL SPECIFICATIONS**

Element: Copper-nickel alloy or nickel-chrome alloy, depending on resistance value

Core: Ceramic, steatite or alumina, depending on physical size

Encapsulant: Silicone molded construction

Housing: Aluminum with hard anodic coating

End Caps: Stainless steel

Standard Terminals: For TMC005 through TMC050 size terminal finish - Lead (Pb)-free is Ni/Pd/Au, finish is on copper clad steel core terminal. For TMC100 and TMC250 terminals are threaded stainless steel.

Part Marking: HEI, model, wattage, value, tolerance, date code

TMC NON-INDUCTIVE

Models of equivalent physical and electrical specifications are available with non-inductive (Ayrton-Perry) winding. They are identified by model number with special (TMC005...NI, for example).

SPECIAL MODIFICATIONS

A number of special modifications to the aluminum housed resistor style are available upon request. Special modifications include:

- Terminal configurations and materials
- Resistance values and tolerances
- Low resistance temperature coefficient (RTC)
- Housing configuration
- Threaded mounting holes
- Preconditioning and other additional testing

PERFORMANCE		
TEST	CONDITIONS OF TEST	TEST LIMITS
Thermal Shock	Rated power applied until thermally stable, then a minimum of 15 min at - 55 °C	$\pm (0.5 \% + 0.05 \Omega) \Delta R$
Short Time Overload	5 x rated power for 5 s	$\pm (0.5 \% + 0.05 \Omega) \Delta R$
Dielectric Withstanding Voltage	1000 V _{rms} TMC005, TMC010 and TMC025; 2000 V _{rms} for TMC050; 4500 V _{rms} for TMC100 and TMC250; duration 1 min	$\pm (0.2 \% + 0.05 \Omega) \Delta R$
High Temperature Storage	250 °C for 2 h	$\pm (0.5 \% + 0.05 \Omega) \Delta R$
Moisture Resistance	MIL-STD-202 Method 106, 7b not applicable	$\pm (1.0 \% + 0.05 \Omega) \Delta R$
Shock, Specified Pulse	MIL-STD-202 Method 213, 100 g's for 6 ms, 10 shocks	$\pm (0.2 \% + 0.05 \Omega) \Delta R$
Vibration, High Frequency	Frequency varied 10 Hz to 2000 Hz, 20 g peak, 2 directions 6 h each	$\pm (0.2 \% + 0.05 \Omega) \Delta R$
Load Life	1000 h at rated power, + 25 °C, 1.5 h "ON", 0.5 h "OFF"	$\pm (1.0 \% + 0.05 \Omega) \Delta R$
Terminal Strength	30 s, 5 pound pull test for TMC005 and TMC010, 10 pound pull test for other sizes	$\pm (0.2 \% + 0.05 \Omega) \Delta R$



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.

Material Category Policy

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.

Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.