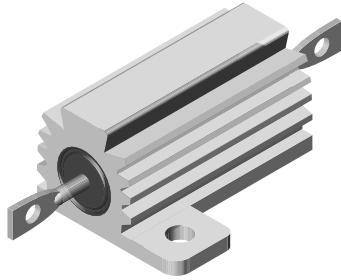




**THE DATASHEET OF  
TMC0503R300FE02**



# 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](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
**GREEN**  
(5-2008)

STANDARD ELECTRICAL SPECIFICATIONS					
GLOBAL MODEL	HISTORICAL MODEL	POWER RATING $P_{25\text{ }^\circ\text{C}}$ W	RESISTANCE RANGE $\Omega$	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

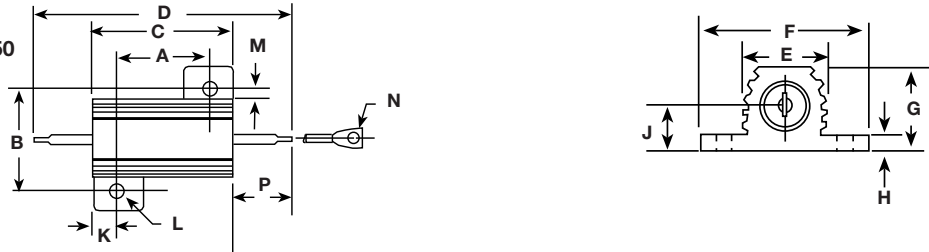
### Note

- 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	$\pm 20$ for 10 $\Omega$ and above; $\pm 50$ for 1 $\Omega$ to 9.9 $\Omega$ , $\pm 100$ for 0.5 $\Omega$ to 0.99 $\Omega$
Maximum Working Voltage	V	$(P \times R)^{1/2}$
Insulation Resistance	$\Omega$	10 000 M $\Omega$ minimum dry, 1000 M $\Omega$ 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 <a href="http://www.vishay.net">www.vishay.net</a> 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)			VALUE (5 digits)			TOLERANCE (1 digit)	PACKAGING CODE (3 digits)			SPECIAL (up to 2 digits)						
(See Standard Electrical Specifications Global Model column for options)			R = decimal K = thousand 15R00 = 15 $\Omega$ 10K00 = 10 k $\Omega$			F = 1 % H = 3 % J = 5 %	E02 = lead (Pb)-free, card pack (TMC005 to TMC050) E01 = lead (Pb)-free, skin pack (TMC100 and TMC250)			NI = non-inductive (dash number) from 1 to 99 as applicable						
Historical Part Number example: TMC-5-4.125-1%-NI																
TMC-5			4.125 $\Omega$			1 %			NI							
HISTORICAL MODEL			RESISTANCE VALUE			TOLERANCE			SPECIAL							

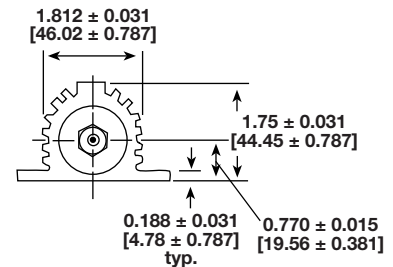
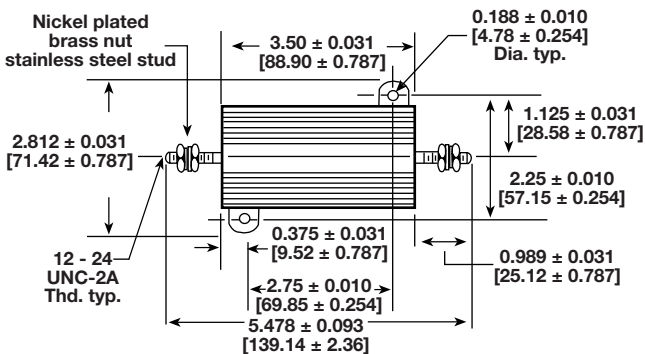
**DIMENSIONS** in inches [millimeters]

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


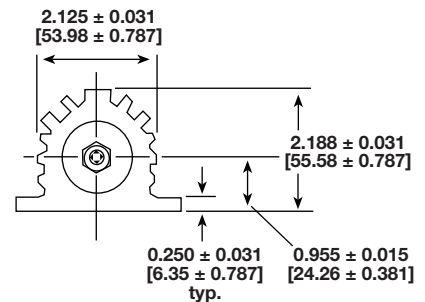
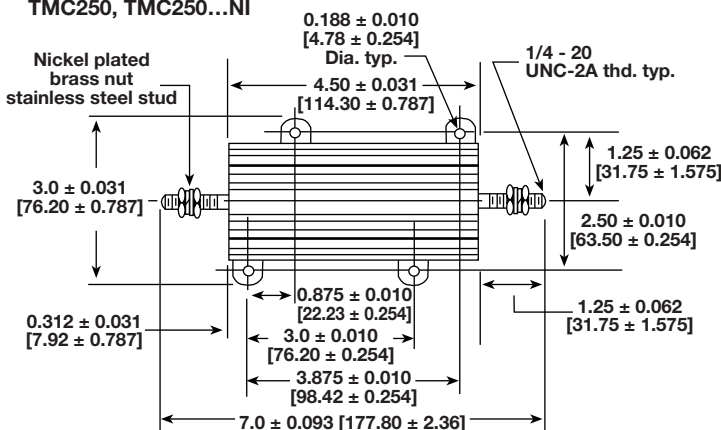
GLOBAL MODEL	DIMENSIONS in inches [millimeters]													
	A	B	C	D	E	F	G	H	J	K	L	M	N	P
<b>TMC005</b> <b>TMC005...NI</b>	0.444 ± 0.005 [11.28 ± 0.127]	0.490 ± 0.005 [12.45 ± 0.127]	0.600 ± 0.030 [15.24 ± 0.787]	1.125 ± 0.062 [28.58 ± 1.57]	0.334 ± 0.015 [8.48 ± 0.381]	0.646 ± 0.015 [16.41 ± 0.381]	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]
<b>TMC010</b> <b>TMC010...NI</b>	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]
<b>TMC025</b> <b>TMC025...NI</b>	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]
<b>TMC050</b> <b>TMC050...NI</b>	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.

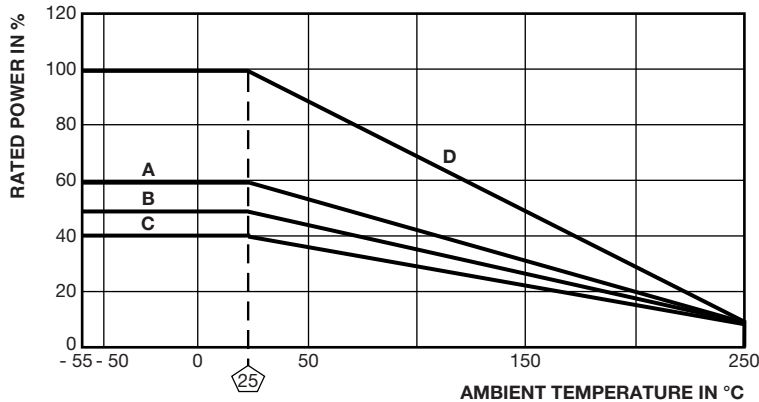
Curves **A**, **B**, **C** apply to operation of unmounted resistors. Curve **D** applies to all types when mounted to specified heat sink.

**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



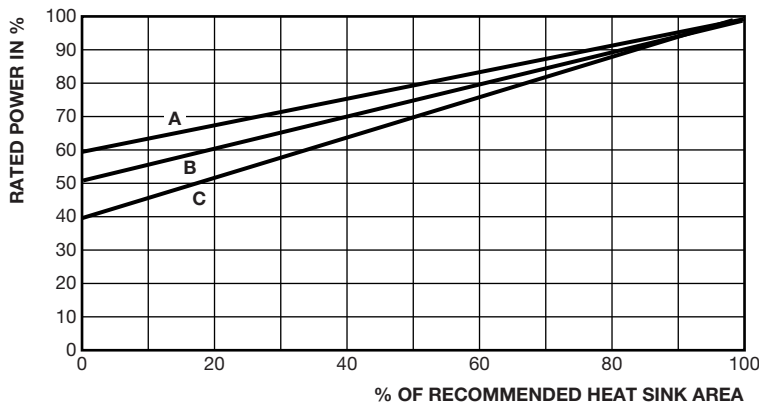
**REDUCED HEAT SINK DERATING**

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	± (0.5 % + 0.05 Ω) ΔR
Short Time Overload	5x rated power for 5 s	± (0.5 % + 0.05 Ω) ΔR
Dielectric Withstanding Voltage	1000 V <sub>RMS</sub> TMC005, TMC010 and TMC025; 2000 V <sub>RMS</sub> for TMC050; 4500 V <sub>RMS</sub> for TMC100 and TMC250; duration 1 min	± (0.2 % + 0.05 Ω) ΔR
High Temperature Storage	250 °C for 2 h	± (0.5 % + 0.05 Ω) ΔR
Moisture Resistance	MIL-STD-202 Method 106, 7b not applicable	± (1.0 % + 0.05 Ω) ΔR
Shock, Specified Pulse	MIL-STD-202 Method 213, 100 g's for 6 ms, 10 shocks	± (0.2 % + 0.05 Ω) ΔR
Vibration, High Frequency	Frequency varied 10 Hz to 2000 Hz, 20 g peak, 2 directions 6 h each	± (0.2 % + 0.05 Ω) ΔR
Load Life	1000 h at rated power, +25 °C, 1.5 h "ON", 0.5 h "OFF"	± (1.0 % + 0.05 Ω) ΔR
Terminal Strength	30 s, 5 pound pull test for TMC005 and TMC010, 10 pound pull test for other sizes	± (0.2 % + 0.05 Ω) ΔR



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