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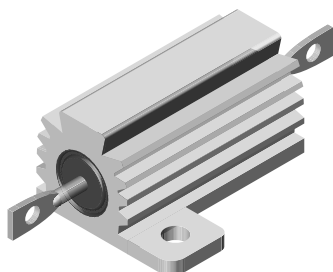


www.vishay.com

TMC

Vishay Huntington

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



RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

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



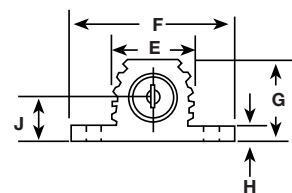
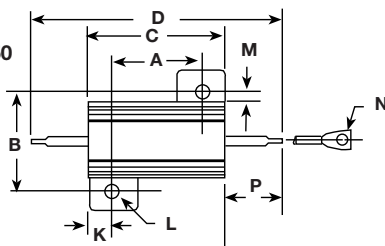
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DIMENSIONS in inches [millimeters]

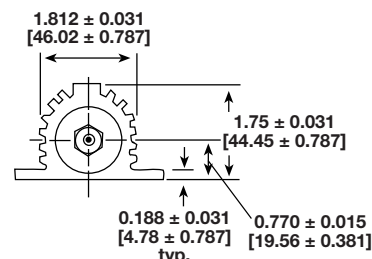
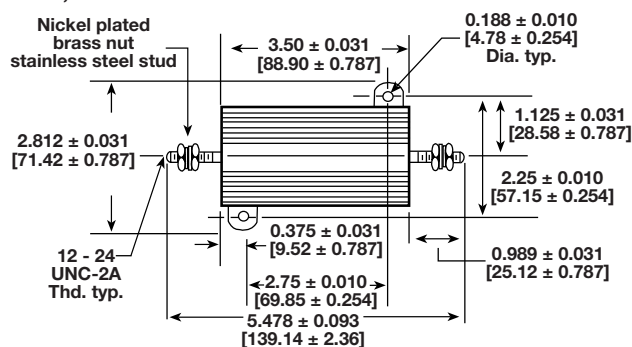
TMC005, 010, 025, 050
TMC005...NI, 010, 025, 050



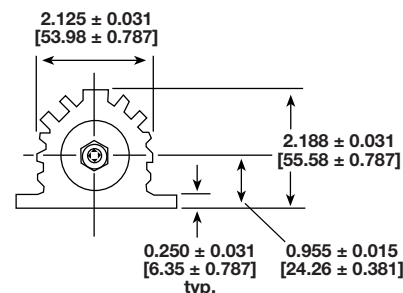
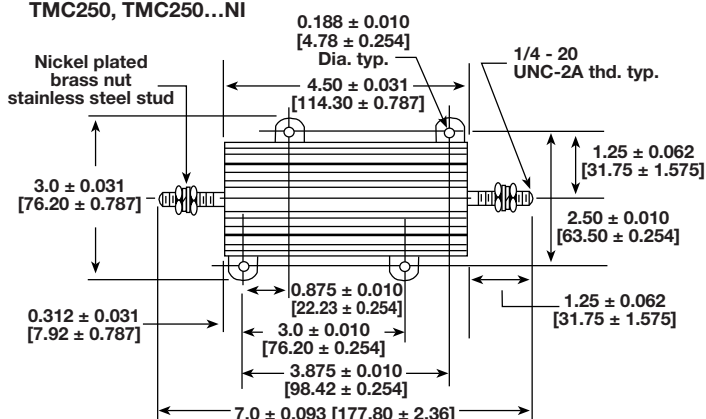
| GLOBAL MODEL | DIMENSIONS in inches [millimeters] | | | | | | | | | | | | | |
|-----------------------|--|--|--|---------------------------------------|--|--|--|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| | 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





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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.

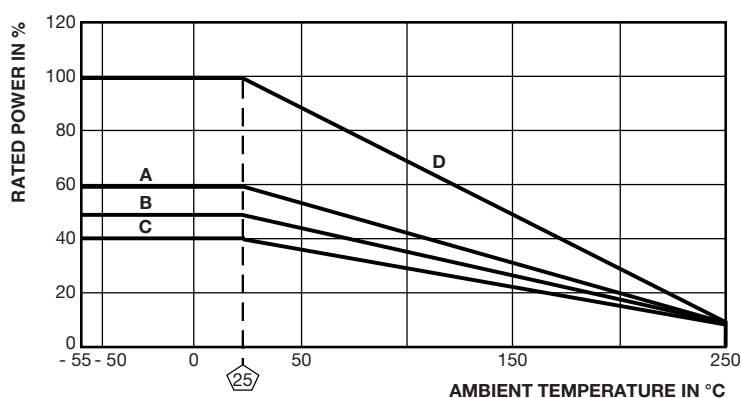
Curves **A**, **B**, **C** apply to operation of unmounted resistors. Curve **D** applies to all types when mounted to specified heat sink.

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



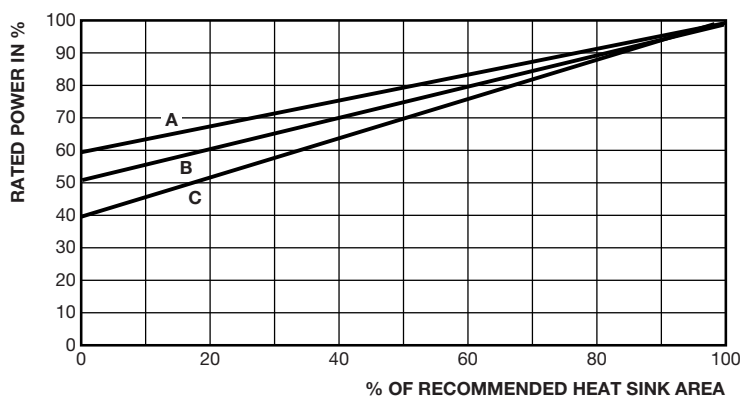
REDUCED HEAT SINK DERATING

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





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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 | 5x 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 | $\pm (0.2 \% + 0.05 \Omega) \Delta R$ |



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