

TR Series

TO-220 and TO-247 Style Power Resistor

- Features:
- TR20/30/35/50/50H comes in TO-220 style power package
 - TR100 available in TO-247 style power package
 - TR30/35/50H/100 has single screw mounting to heat sink
 - Molded case for environmental protection
 - Electrically isolated case
 - Non-inductive package
 - RoHS compliant



| Electrical Specifications | | | | | | | | | |
|---------------------------|---------------|---|-----------------------------|--|------------------------------------|-------------------------------|-------------|------------|-----|
| Type / Code | Package Style | Power Rating (Watts) @ 25°C with Heat Sink ⁽³⁾ | Power Rating (Watts) @ 25°C | Maximum Working Voltage ⁽¹⁾ | Resistance Temperature Coefficient | Ohmic Range (Ω) and Tolerance | | | |
| | | | | | | 0.5% | 1% | 5% | 10% |
| TR20 | TO-220 | 20W | 3W | 350V | ±50 ppm/°C | 10 - 1M | | | |
| | | | | | ±100 ppm/°C | 5.05 - 1M | 3.01 - 1M | 3.3 - 1M | |
| | | | | | ±200 ppm/°C | 10 - 1M | 3.01 - 1M | 3.3 - 1M | |
| | | | | | ±300 ppm/°C | - | 1.02 - 3.01 | 1.1 - 3 | |
| | | | | | Unspecified ⁽²⁾ | - | | 0.05 - 1 | |
| TR30 | TO-220 | 30W | 2.25W | 350V | ±50 ppm/°C | 10 - 100K | | | |
| | | | | | ±100 ppm/°C | 5.05 - 100K | 3.01 - 100K | 3.3 - 100K | |
| | | | | | ±200 ppm/°C | 10 - 100K | 3.01 - 100K | 3.3 - 100K | |
| | | | | | ±300 ppm/°C | - | 1.02 - 3.01 | 1.1 - 3 | |
| | | | | | Unspecified ⁽²⁾ | - | | 0.05 - 1 | |
| TR35 | TO-220 | 35W | 2.5W | 350V | ±50 ppm/°C | 10 - 10K | | | |
| | | | | | ±100 ppm/°C | 5.05 - 10K | 3.01 - 10K | 3.3 - 10K | |
| | | | | | ±200 ppm/°C | 10 - 10K | 3.01 - 10K | 3.3 - 10K | |
| | | | | | ±300 ppm/°C | - | 1.02 - 3.01 | 1.1 - 3 | |
| | | | | | Unspecified ⁽²⁾ | - | | 0.05 - 1 | |
| TR50 | TO-220 | 50W | 3W | 350V | ±50 ppm/°C | 10 - 10K | | | |
| | | | | | ±100 ppm/°C | 5.05 - 10K | 3.01 - 10K | 3.3 - 10K | |
| | | | | | ±200 ppm/°C | 10 - 10K | 3.01 - 10K | 3.3 - 10K | |
| | | | | | ±300 ppm/°C | - | 1.02 - 3.01 | 1.1 - 3 | |
| | | | | | Unspecified ⁽²⁾ | - | | 0.1 - 1 | |
| TR50H | TO-220 | 50W | 2.25W | 420V | ±50 ppm/°C | 10 - 10K | | | |
| | | | | | ±100 ppm/°C | 5.05 - 10K | 3.01 - 10K | 3.3 - 10K | |
| | | | | | ±200 ppm/°C | 10 - 10K | 3.01 - 10K | 3.3 - 10K | |
| | | | | | ±300 ppm/°C | - | 1.02 - 3.01 | 1.1 - 3 | |
| | | | | | Unspecified ⁽²⁾ | - | | 0.1 - 1 | |
| TR100 | TO-247 | 100W | 3.5W | 750V | ±50 ppm/°C | 10 - 100K | | | |
| | | | | | ±100 ppm/°C | 5.05 - 100K | 3.01 - 100K | 3.3 - 100K | |
| | | | | | ±200 ppm/°C | 10 - 100K | 3.01 - 100K | 3.3 - 100K | |
| | | | | | ±300 ppm/°C | - | 1.02 - 3.01 | 1.1 - 3 | |
| | | | | | Unspecified ⁽²⁾ | - | | 0.05 - 1 | |

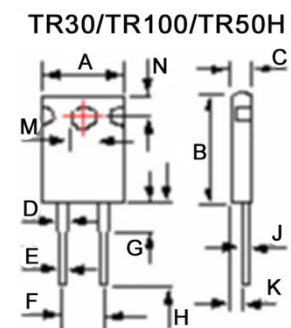
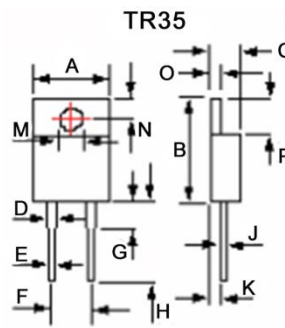
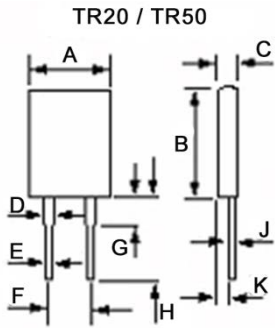
(1) Lesser of \sqrt{PR} or maximum working voltage

(2) Unspecified TCR. Contact Factory.

(3) The case temperature is to be used for the definition of the applied power limit. Refer to Power Derating Curve.

Thermal resistance: $(T@P0\%) - (T_{max}@P100\%)$

Mechanical Specifications

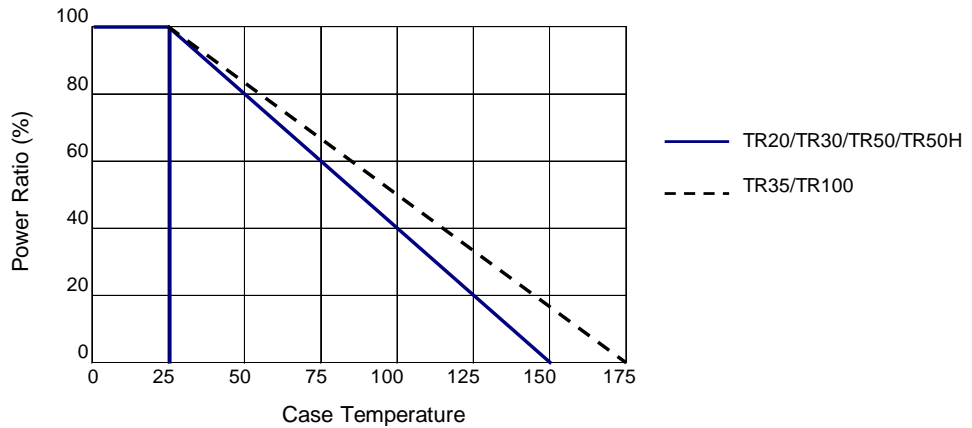


| Type Code | TR20 | TR30 | TR35 | TR50 | TR50H | TR100 | Unit |
|-----------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|--------------|
| A | 0.410 ± 0.010 10.41 ± 0.26 | 0.410 ± 0.010 10.41 ± 0.26 | 0.400 ± 0.010 10.16 ± 0.25 | 0.410 ± 0.010 10.41 ± 0.26 | 0.410 ± 0.010 10.41 ± 0.26 | 0.620 ± 0.010 15.75 ± 0.26 | inches mm |
| B | 0.640 ± 0.010 16.26 ± 0.26 | 0.640 ± 0.010 16.26 ± 0.26 | 0.581 ± 0.010 14.75 ± 0.25 | 0.640 ± 0.010 16.26 ± 0.26 | 0.640 ± 0.010 16.26 ± 0.26 | 0.815 ± 0.010 20.70 ± 0.26 | inches mm |
| C | 0.125 ± 0.010 3.18 ± 0.26 | 0.125 ± 0.010 3.18 ± 0.26 | 0.175 ± 0.015 4.44 ± 0.38 | 0.125 ± 0.010 3.18 ± 0.26 | 0.125 ± 0.010 3.18 ± 0.26 | 0.195 ± 0.010 4.95 ± 0.26 | inches mm |
| D | 0.050 ± 0.005 1.27 ± 0.13 | 0.050 ± 0.005 1.27 ± 0.13 | 0.050 ± 0.005 1.27 ± 0.13 | 0.050 ± 0.005 1.27 ± 0.13 | 0.050 ± 0.005 1.27 ± 0.13 | 0.143 ± 0.007 3.63 ± 0.18 | inches mm |
| E | 0.030 ± 0.004 0.76 ± 0.10 | 0.030 ± 0.004 0.76 ± 0.10 | 0.031 ± 0.003 0.78 ± 0.08 | 0.030 ± 0.004 0.76 ± 0.10 | 0.030 ± 0.004 0.76 ± 0.10 | 0.060 ± 0.004 1.52 ± 0.10 | inches mm |
| F | 0.200 ± 0.010 5.08 ± 0.26 | 0.200 ± 0.010 5.08 ± 0.26 | 0.200 ± 0.010 5.08 ± 0.26 | 0.200 ± 0.010 5.08 ± 0.26 | 0.200 ± 0.010 5.08 ± 0.26 | 0.400 ± 0.010 10.16 ± 0.26 | inches mm |
| G | 0.130 ± 0.030 3.30 ± 0.76 | 0.130 ± 0.030 3.30 ± 0.76 | 0.130 ± 0.030 3.30 ± 0.76 | 0.130 ± 0.030 3.30 ± 0.76 | 0.130 ± 0.030 3.30 ± 0.76 | 0.110 ± 0.030 2.79 ± 0.76 | inches mm |
| H | 0.500 ± 0.050 12.70 ± 1.27 | 0.500 ± 0.050 12.70 ± 1.27 | 0.539 ± 0.039 13.70 ± 1.00 | 0.500 ± 0.050 12.70 ± 1.27 | 0.500 ± 0.050 12.70 ± 1.27 | 0.570 ± 0.050 14.48 ± 1.27 | inches mm |
| J | 0.020 ± 0.004 0.50 ± 0.10 | 0.020 ± 0.004 0.50 ± 0.10 | 0.024 ± 0.003 0.62 ± 0.08 | 0.020 ± 0.004 0.50 ± 0.10 | 0.020 ± 0.004 0.50 ± 0.10 | 0.032 ± 0.010 0.81 ± 0.26 | inches mm |
| K | 0.070 ± 0.010 1.78 ± 0.26 | 0.070 ± 0.010 1.78 ± 0.26 | 0.090 ± 0.010 2.28 ± 0.25 | 0.070 ± 0.010 1.78 ± 0.26 | 0.070 ± 0.010 1.78 ± 0.26 | 0.095 ± 0.010 2.41 ± 0.26 | inches mm |
| M | - | 0.125 ± 0.004 3.18 ± 0.10 | 0.144 ± 0.004 3.65 ± 0.10 | - | 0.125 ± 0.004 3.18 ± 0.10 | 0.143 ± 0.007 3.63 ± 0.18 | inches mm |
| N | - | 0.125 ± 0.010 3.18 ± 0.26 | 0.116 ± 0.004 2.95 ± 0.10 | - | 0.125 ± 0.010 3.18 ± 0.26 | 0.210 ± 0.010 5.33 ± 0.26 | inches mm |
| O | - | - | 0.051 ± 0.004 1.30 ± 0.10 | - | - | - | inches mm |
| P | - | - | 0.240 ± 0.004 6.10 ± 0.10 | - | - | - | inches mm |

Mounting Note:

- When mounting ensure entire ceramic portion of case is mounted on a clean, flat heat sink with an appropriate thermal interface, such as thermal grease. For screw mounting use of a compression washer at a force of 150 to 300lbs (665 to 1330N) is recommended without exceeding mounting torque of 8 in-lbs (0.9 N-m) to avoid package damage. For clip mounting use of a round or smooth clip in contact area is recommended to avoid a concentrated hot spot on package.
- TR50/100 must be mounted to heat sink using proper mounting clip for efficient heat dissipation.

Power Derating Curve:



| Performance Characteristics | | | |
|-----------------------------|---|--------------------------------------|--------------------------------------|
| Test | Test Method | Test Specification | |
| | | TR20/30/35/50/50H | TR100 |
| Short Time Overload | 2 times rated power with applied voltage not to exceed 1.5 times maximum continuous operating voltage for 5 seconds | $\Delta R \pm (0.3\% + 0.001\Omega)$ | $\Delta R \pm (0.5\% + 0.001\Omega)$ |
| Load Life | MIL-R-39009, 2000 hours at rated power | $\Delta R \pm (1\% + 0.001\Omega)$ | $\Delta R \pm (1\% + 0.001\Omega)$ |
| Moisture Resistance | MIL-STD-202, Method 103B | $\Delta R \pm (0.5\% + 0.001\Omega)$ | $\Delta R \pm (0.5\% + 0.001\Omega)$ |
| Thermal Shock | MIL-STD-202, Method 107G | $\Delta R \pm (0.3\% + 0.001\Omega)$ | $\Delta R \pm (0.5\% + 0.001\Omega)$ |
| Terminal Strength | MIL-STD-202, Method 211, Condition A (Pull Test) 2.4N | $\Delta R \pm (0.2\% + 0.001\Omega)$ | $\Delta R \pm (0.2\% + 0.001\Omega)$ |
| Vibration, High Frequency | MIL-STD-202, Method 204, Condition D | $\Delta R \pm (0.2\% + 0.001\Omega)$ | $\Delta R \pm (0.4\% + 0.001\Omega)$ |
| Dielectric Strength | | 1800VAC | |
| Insulation Resistance | | 10GΩ min. | |

Operating Temperature Range: -65°C to + 150°C (TR20/TR30/TR50/TR50H)
-65°C to + 175°C (TR35/TR100)

How to Order

1 2 3 4 5 6 7 8 9 10 11

T R 2 0 F B D 1 K 0 0

| Product Series | | Size | Power | Tolerance | | Packaging | | | TCR | | Resistance Value | |
|----------------|----------|------|-------|-----------|------|-----------|-------------|-----------------|----------|------|------------------|---|
| TR | Standard | | | Code | Tol | Code | Description | Size | Quantity | Code | | ppm |
| | | 20 | 20W | D | 0.5% | B | Bulk | 20, 30, 50, 50H | 1,000 | X | unspecified | Four characters with the multiplier used as the decimal holder. "L" used as multiplier of 10 ⁻³ for any value under 0.1 ohm. |
| | | 30 | 30W | F | 1% | | | 35 | 500 | C | 50 | |
| | | 35 | 35W | J | 5% | | | 100 | 105 | D | 100 | |
| | | 50 | 50W | K | 10% | | | | | L | 200 | |
| | | 50H | 50W | | | | | | | M | 300 | |
| | | 100 | 100W | | | | | | | | | |

RoHS Compliance

Stackpole Electronics has joined the worldwide effort to reduce the amount of lead in electronic components and to meet the various regulatory requirements now prevalent, such as the European Union’s directive regarding “Restrictions on Hazardous Substances” (RoHS 2). As part of this ongoing program, we periodically update this document with the status regarding the availability of our compliant components. All our standard part numbers are compliant to EU Directive 2011/65/EU of the European Parliament.

| RoHS Compliance Status | | | | | | |
|-------------------------|---|----------------------------|--------------------------------|-----------------------------------|--|---------------------------------------|
| Standard Product Series | Description | Package / Termination Type | Standard Series RoHS Compliant | Lead-Free Termination Composition | Lead-Free Mfg. Effective Date (Std Product Series) | Lead-Free Effective Date Code (YY/WW) |
| TR | TO-220 and TO-247 Style Power Leaded Resistor | Radial Special | YES(1) | 100% Matte Sn | Always | Always |

Note (1): RoHS Compliant by means of exemption 7c-l.

“Conflict Metals” Commitment

We at Stackpole electronics, Inc. are joined with our industry in opposing the use of metals mined in the “conflict region” of the Easter Democratic Republic of the Congo (DRC) in our products. Recognizing that the supply chain for metals used in the electronics industry is very complex, we work closely with our own suppliers to verify to the extent possible that the materials and products we supply do not contain metals sourced from this conflict region. As such, we are in compliance with the requirements of Dodd-Frank Act regarding Conflict Minerals.

Compliance to “REACH”

We certify that all passive components supplied by Stackpole Electronics, Inc. are SVHC (Substances of Very High Concern) free and compliant with the requirements of EU Directive 1907/2006/EC, “The Registration, Evaluation, Authorization and Restriction of Chemicals”, otherwise referred to as REACH. Contact us for complete list of REACH Substance Candidate List.

Environmental Policy

It is the policy of Stackpole Electronics, Inc. (SEI) to protect the environment in all localities in which we operate. We continually strive to improve our effect on the environment. We observe all applicable laws and regulations regarding the protection of our environment and all requests related to the environment to which we have agreed. We are committed to the prevention of all forms of pollution.