

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 and halogen free



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

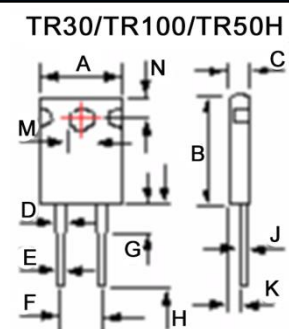
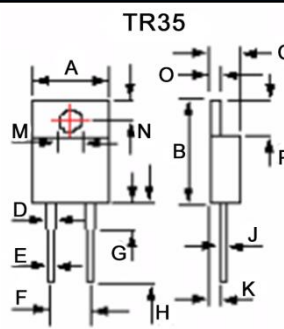
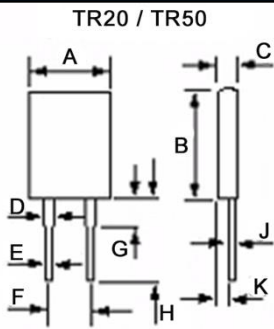
(1) Lesser of \sqrt{PR} or maximum working voltage

(2) Unspecified TCR. Contact Stackpole.

(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

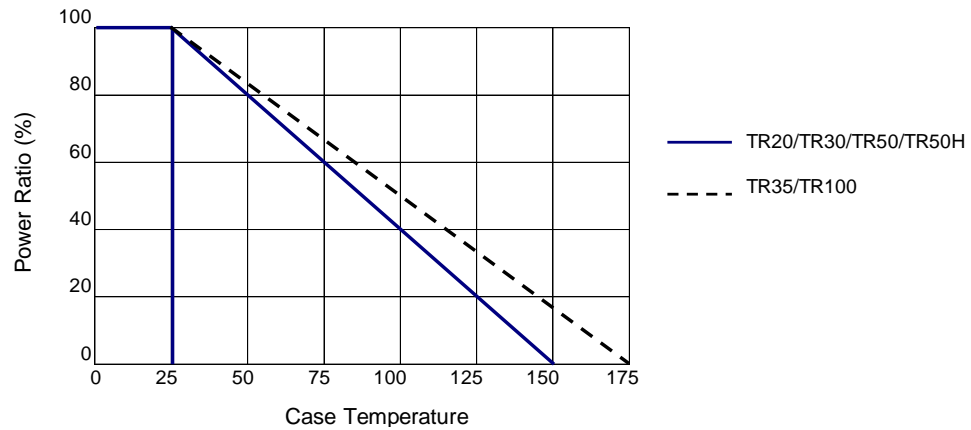


Type Code	TR20	TR30	TR35	TR50	TR50H	TR100	Unit
A	0.410 ± 0.010 10.41 ± 0.26	0.410 ± 0.010 10.41 ± 0.26	0.400 ± 0.010 10.16 ± 0.25	0.410 ± 0.010 10.41 ± 0.26	0.410 ± 0.010 10.41 ± 0.26	0.620 ± 0.010 15.75 ± 0.26	inches mm
B	0.640 ± 0.010 16.26 ± 0.26	0.640 ± 0.010 16.26 ± 0.26	0.581 ± 0.010 14.75 ± 0.25	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:

- (1) 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.
- (2) 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		1800 VAC	
Insulation Resistance		10 GΩ min.	

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

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 3). 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 as amended by Directive (EU) 2015/863/EU as regards the list of restricted substances.

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 Ledged Resistor	Radial Special	YES ⁽¹⁾	100% Matte Sn	Always	Always

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

“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 Eastern 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.

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		Power Rating		Tolerance		Packaging				TCR		Resistance Value
TR	Standard	Size	W	Code	Tol	Code	Description	Size	Quantity	Code	ppm	
		20	20	D	0.5%	B	Bulk	20, 30, 50, 50H	1000	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. 0.05 ohm = 50L0 1.02 ohm = 1R02 100 Kohm = 100K
		30	30	F	1%			35	500	C	50	
		35	35	J	5%			100	105	D	100	
		50	50	K	10%					L	200	
		50H	50							M	300	
		100	100									