TR Series

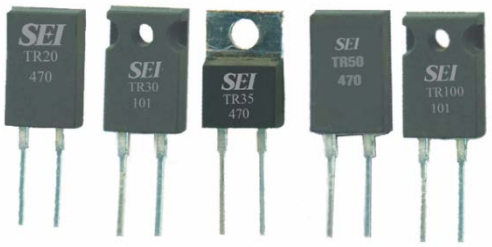
TO-220 and TO-247 Style Power Resistor

Stackpole Electronics, Inc.

Resistive Product Solutions

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)@ 25ºC with Heat Sink (3)	Power Rating (Watts) @ 25ºC	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/ºC	10 - 1M			
					±100 ppm/ºC	5.05 - 1M	3.01 - 1M	3.3 - 1M	
					±200 ppm/ºC	10 - 1M	3.01 - 1M	3.3 - 1M	
					±300 ppm/ºC	-	1.02 - 3.01	1.1 - 3	
					(2)	-		0.05 - 1	
TR30	TO-220	30W	2.25W	350V	±50 ppm/ºC	10 - 100K			
					±100 ppm/ºC	5.05 - 100K	3.01 - 100K	3.3 - 100K	
					±200 ppm/ºC	10 - 100K	3.01 - 100K	3.3 - 100K	
					±300 ppm/ºC	-	1.02 - 3.01	1.1 - 3	
					(2)	-		0.05 - 1	
TR35	TO-220	35W	2.5W	350V	±50 ppm/ºC	10 - 10K			
					±100 ppm/ºC	5.05 - 10K	3.01 - 10K	3.3 - 10K	
					±200 ppm/ºC	10 - 10K	3.01 - 10K	3.3 - 10K	
					±300 ppm/ºC	-	1.02 - 3.01	1.1 - 3	
					(2)	-		0.05 - 1	
TR50	TO-220	50W	3W	350V	±50 ppm/ºC	10 - 10K			
					±100 ppm/ºC	5.05 - 10K	3.01 - 10K	3.3 - 10K	
					±200 ppm/ºC	10 - 10K	3.01 - 10K	3.3 - 10K	
					±300 ppm/ºC	-	1.02 - 3.01	1.1 - 3	
					(2)	-		0.1 - 1	
TR50H	TO-220	50W	2.25W	420V	±50 ppm/ºC	10 - 10K			
					±100 ppm/ºC	5.05 - 10K	3.01 - 10K	3.3 - 10K	
					±200 ppm/ºC	10 - 10K	3.01 - 10K	3.3 - 10K	
					±300 ppm/ºC	-	1.02 - 3.01	1.1 - 3	
					(2)	-		0.1 - 1	
TR100	TO-247	100W	3.5W	750V	±50 ppm/ºC	10 - 100K			
					±100 ppm/ºC	5.05 - 100K	3.01 - 100K	3.3 - 100K	
					±200 ppm/ºC	10 - 100K	3.01 - 100K	3.3 - 100K	
					±300 ppm/ºC	-	1.02 - 3.01	1.1 - 3	
					(2)	-		0.05 - 1	

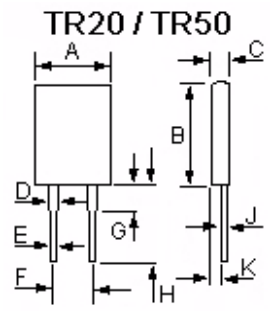
(1) Lesser of √PR or maximum working voltage

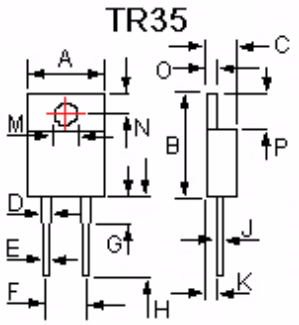
(2) Unspecified TCR. Contact Factory.

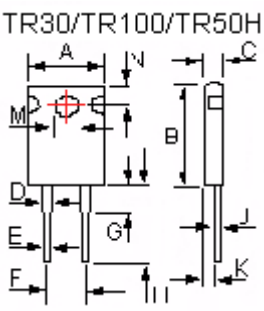
(3) The case temperature is to be used for the definition of the applied power limit. Refer to Power Derating Curve.

Thermal resistance: $((T@P0\%) - (T_{max}@P100\%)) / P@25ºC$

Mechanical Specifications







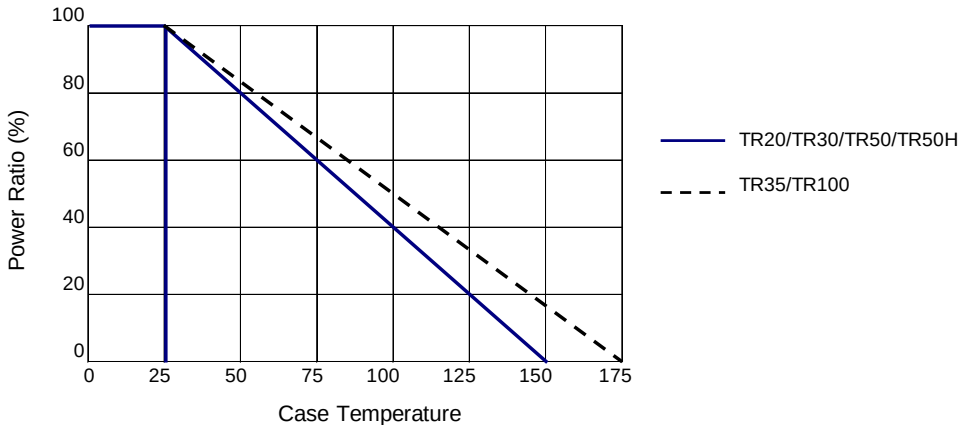
Type Code	TR20	TR30	TR35	TR50	TR50H	TR100	Unit
A	0.410 ± 0.010 10.41 ± 0.26	0.410 ± 0.010 10.41 ± 0.26	0.400 ± 0.010 10.16 ± 0.25	0.410 ± 0.010 10.41 ± 0.26	0.410 ± 0.010 10.41 ± 0.26	0.620 ± 0.010 15.75 ± 0.26	inches mm
B	0.640 ± 0.010 16.26 ± 0.26	0.640 ± 0.010 16.26 ± 0.26	0.581 ± 0.010 14.75 ± 0.25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



Environmental Characteristics

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

Operating Temperature Range: -65ºC to + 150ºC (TR20/TR30/TR50/TR50H)
-65ºC to + 175ºC (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	
TR	Standard

Size	Power
20	20W
30	30W
35	35W
50	50W
50H	50W
100	100W

Tolerance	
Code	Tol
D	0.5%
F	1%
J	5%
K	10%

Packaging			
Code	Description	Size	Quantity
B	Bulk	20, 30, 50, 50H	1,000
		100	360
		35	500

TCR	
Code	ppm
X	unspecified
C	50
D	100
L	200
M	300

Resistance Value
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