

# 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



Electrical Specifications								
Type / Code	Power Rating (Watts) @ 25°C with Heat Sink	Package Style	Maximum Working Voltage(1)	Resistance Temperature Coefficient	Ohmic Range (Ω) and Tolerance			
					0.5%	1%	5%	10%
TR 20	20W	TO-220	350V	±50 ppm/°C	11 - 10K	11 - 10K	11 - 10K	11 - 10K
TR 30	30W	TO-220		±100 ppm/°C	11 - 10K	5 - 10K	5 - 10K	5 - 10K
TR 35	35W	TO-220		±200 ppm/°C	11 - 10K	1.1 - 10K	1.1 - 10K	1.1 - 10K
TR 50	50W	TO-220		(2)	-	0.05 - 10K	0.05 - 10K	0.05 - 10K
TR 100	100W	TO-247		±50 ppm/°C	-	10 - 10K	10 - 10K	10 - 10K
				±100 ppm/°C	-	3.1 - 10K	3.1 - 10K	3.1 - 10K
				-	-	1 - 30K	1 - 30K	1 - 30K

(1) Lesser of √PR or maximum working voltage

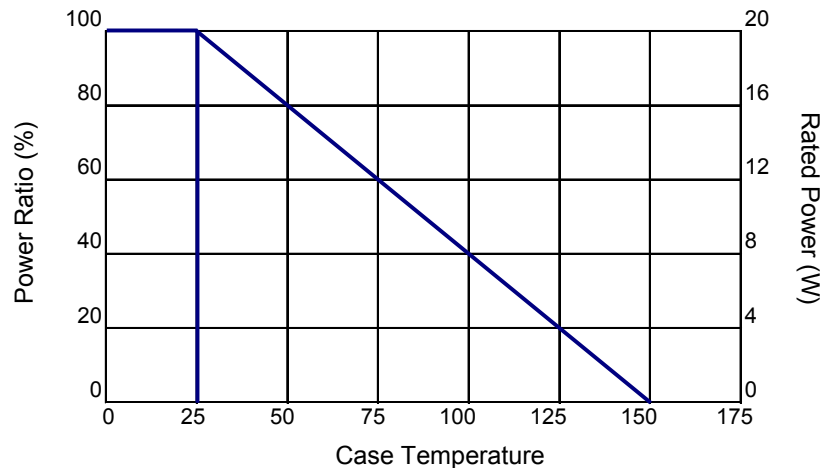
(2) Unspecified TCR. Contact Factory.

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

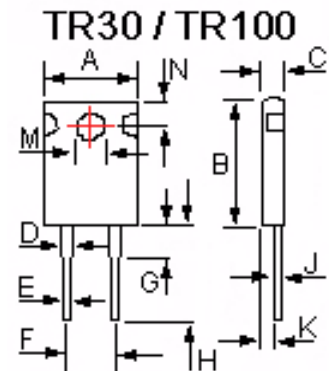
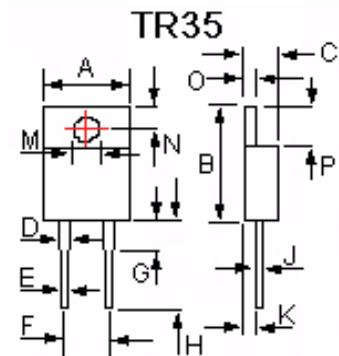
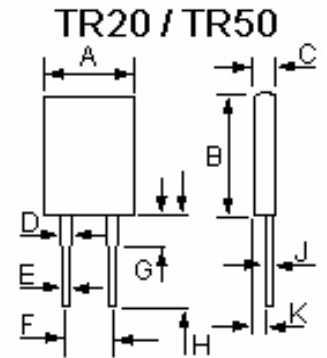
Operating Temperature Range: -65°C to + 150°C (TR20/30/35/50)

-65°C to + 175°C (TR100)

Power Derating Curve:



Mechanical Specifications						
Type / Code	TR20	TR30	TR35	TR50	TR100	Units
A	0.41 ± 0.01 10.41 ± 0.26	0.41 ± 0.01 10.41 ± 0.26	0.4 ± 0.01 10.16 ± 0.25	0.41 ± 0.01 10.41 ± 0.26	0.62 ± 0.01 15.75 ± 0.26	inches mm
B	0.64 ± 0.01 16.26 ± 0.26	0.64 ± 0.01 16.26 ± 0.26	0.58 ± 0.01 14.75 ± 0.25	0.64 ± 0.01 16.26 ± 0.26	0.815 ± 0.01 20.7 ± 0.26	inches mm
C	0.125 ± 0.01 3.18 ± 0.26	0.125 ± 0.01 3.18 ± 0.26	0.17 ± 0.015 4.44 ± 0.38	0.125 ± 0.01 3.18 ± 0.26	0.195 ± 0.01 4.95 ± 0.26	inches mm
D	0.05 ± 0.005 1.27 ± 0.13	0.05 ± 0.005 1.27 ± 0.13	0.05 ± 0.005 1.27 ± 0.13	0.05 ± 0.005 1.27 ± 0.13	0.143 ± 0.007 3.63 ± 0.18	inches mm
E	0.03 ± 0.004 0.76 ± 0.1	0.03 ± 0.004 0.76 ± 0.1	0.031 ± 0.003 0.78 ± 0.08	0.03 ± 0.004 0.76 ± 0.1	0.06 ± 0.004 1.52 ± 0.1	inches mm
F	0.2 ± 0.01 5.08 ± 0.26	0.2 ± 0.01 5.08 ± 0.26	0.2 ± 0.01 5.08 ± 0.26	0.2 ± 0.01 5.08 ± 0.26	0.4 ± 0.01 10.16 ± 0.26	inches mm
G	0.13 ± 0.03 3.3 ± 0.76	0.13 ± 0.03 3.3 ± 0.76	0.13 ± 0.03 3.3 ± 0.76	0.13 ± 0.03 3.3 ± 0.76	0.11 ± 0.03 2.79 ± 0.76	inches mm
H	0.5 ± 0.05 12.7 ± 1.27	0.5 ± 0.05 12.7 ± 1.27	0.539 ± 0.04 13.7 ± 1	0.5 ± 0.05 12.7 ± 1.27	0.57 ± 0.05 14.48 ± 1.27	inches mm
J	0.019 ± 0.004 0.5 ± 0.1	0.019 ± 0.004 0.5 ± 0.1	0.024 ± 0.003 0.62 ± 0.08	0.019 ± 0.004 0.5 ± 0.1	0.032 ± 0.01 0.81 ± 0.26	inches mm
K	0.07 ± 0.01 1.78 ± 0.26	0.07 ± 0.01 1.78 ± 0.26	0.09 ± 0.01 2.28 ± 0.25	0.07 ± 0.01 1.78 ± 0.26	0.095 ± 0.01 2.41 ± 0.26	inches mm
M	-	0.125 ± 0.004 3.18 ± 0.1	0.144 ± 0.004 3.65 ± 0.1	-	0.143 ± 0.004 3.63 ± 0.18	inches mm
N	-	0.125 ± 0.01 3.18 ± 0.26	0.116 ± 0.004 2.95 ± 0.1	-	0.21 ± 0.01 5.33 ± 0.26	inches mm
O	-	-	0.051 ± 0.004 1.3 ± 0.1	-	-	inches mm
P	-	-	0.24 ± 0.004 6.1 ± 0.1	-	-	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.

Electrical Thermal Characteristics					
	TR20	TR30	TR35	TR50	TR100
Free Air Power Rating	3W in free air at 25°C	2.25W in free air at 25°C	2.5W in free air at 25°C	3W in free air at 25°C	3.5W in free air at 25°C
The case temperature is to be used for the definition of the applied power limit					
The case temperature measurement must be made with a thermocouple contacting the center of the component mounted on the designed heat sink					
TR50/100 must be mounted to heat sink using proper mounting clip for efficient heat dissipation					

**How to Order**

SEI Type		Code		TCR		Nominal Resistance	Tolerance	Packaging (1)			
TR		20		T1		1K	1%	B			
Type	Description	Code	Wattage	Code	TCR	Tolerance		Style	Qty	Description	Code
TR	Standard	20	20W	-	Unspecified	±0.5%		TR 20, 30, 50	1,000	Box	B
		30	30W	T2	50 ppm	±1%		TR 35, 100	600		
		35	35W	T1	100 ppm	±5%					
		50	50W	T0	200 ppm	±10%					
		100	100W								

(1) Tube Packaging may be available for large volumes. Please contact factory for details.

New part number format starting January 3<sup>rd</sup>, 2011:

**How to Order**

