

# Viking Tech Corporation

## TO-220 Power Resistor



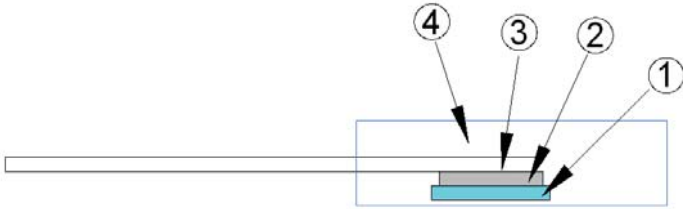
### ■ Features

- 20 Watts at 25°C case temperature heat sink mounted
- TO-220 style power package
- Molded case for protection and easy to mount
- Electrically isolated case
- Non-Inductive design

### ■ Applications

- High Speed Switching Power Supplies
- Snubber Circuits
- Load Resistor for Pulse Generators
- Voltage Regulation
- VHF Amplifiers

### ■ Construction

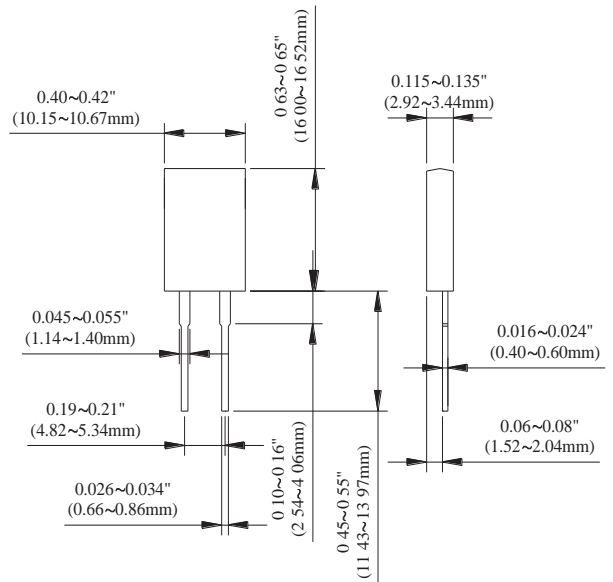


① Alumina Substrate	③ Lead
② Resistor Layer	④ Molding

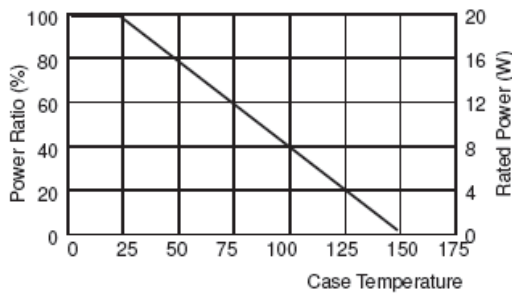
### ■ Dimensions

Unit: mm

Type	Weight (g) (1000pcs)
TR20	1290



### ■ Derating Curve



# TO-247 Power Resistors



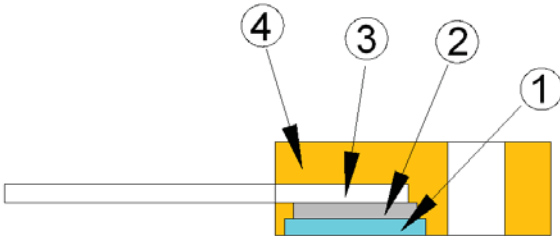
## Features

- 100 watts at 25°C case temperature heat sink mounted
- TO-247 style power package
- Single M3 screw mounting to heat sink
- Molded case for protection and easy to mount
- Electrically isolated case
- Non-Inductive design

## Applications

- Gate Resistors in Power Supplies
- Snubbers
- Load and Dumping Resistors in CRT Monitors
- Terminal Resistance in RF Power Amplifiers
- Voltage Regulation
- Low Energy Pulse Loading
- UPS

## Construction

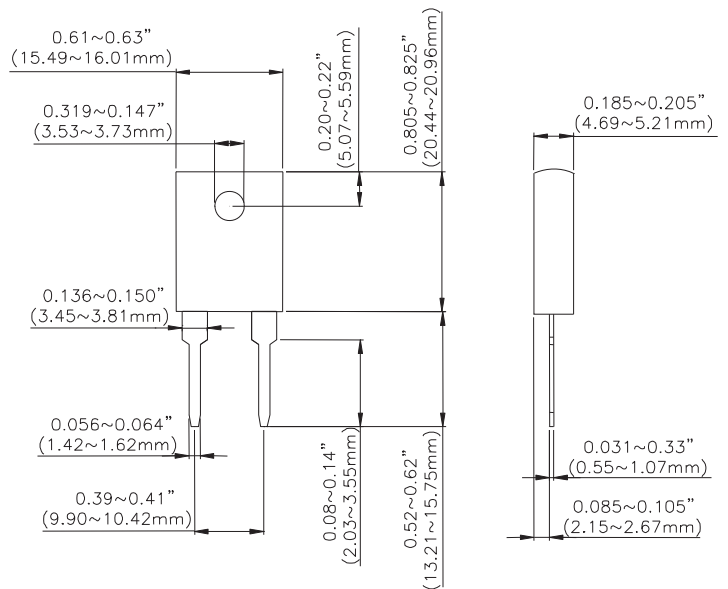


① Alumina Substrate	③ Lead
② Resistor Layer	④ Molding

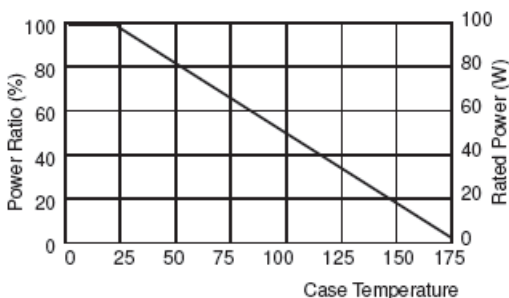
## Dimensions

Unit: mm

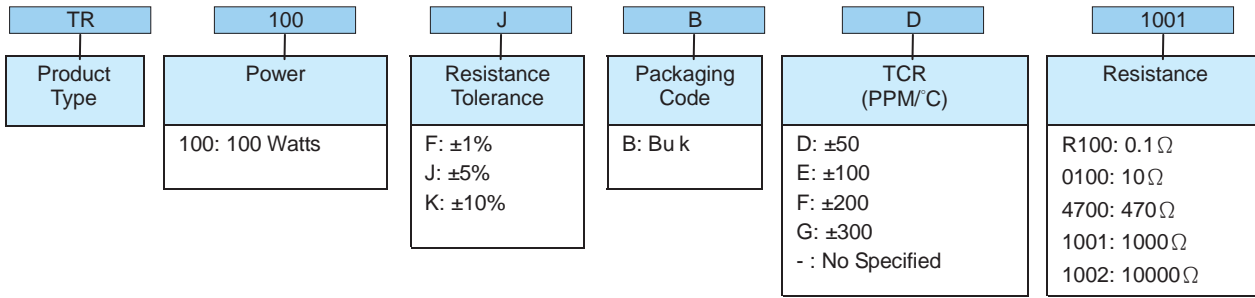
Type	Weight (g) (1000pcs)
TR100	3381



## Derating Curve



## Part Numbering



## Electrical Characteristics Specifications

Type	Item	Resistance Range			TCR (PPM/°C)
		±1%	±5%	±10%	
TR100	-	0.05Ω -1Ω			No Specified
		>1Ω -3Ω			±300
		>3Ω -10Ω			±100 ±200
		>10Ω -10KΩ			±50 ±100 ±200

- Operating Voltage: 700V Max.
- Dielectric Strength: 1800V AC
- Insulation Resistance: 10GΩ min.
- Working Temperature Range: -65°C to +175°C

## Environmental Characteristics

Item	Requirement	Test Method
Temperature Coefficient of Resistance (T.C.R.)	As Spec.	Referenced to 25°C, ΔR taken at +105°C
Load Life	ΔR±1.0%	Rated power, 2,000 hours
Solderability	90% min. coverage	245±5 C for 3 seconds
Momentary Overload	ΔR±0.5%	1.5 times rated power and V (dc) ≤ 1.5VMax. for 5 seconds
Dielectric strength	ΔR±0.15%	1800v AC, 60 seconds
Moisture resistance	ΔR±0.5%	-10 C ~+65 C, RH>90%, cycle 240 hours
Thermal Shock	ΔR±0.5%	-65 C ~150 C, 100 cycles
Terminal Strength	ΔR±0.2%	(Pull Test) 2.4N
Vibration, High Frequency	ΔR±0.4%	20g peak

- Lead Material: Tinned Copper
- Maximum Torque: 0.9 Nm
- When in Free Air at 25°C, the TR100 is Rated for 3.5W
- 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
- Thermal Grease should be Applied Properly

# TO-220 Power Resistor



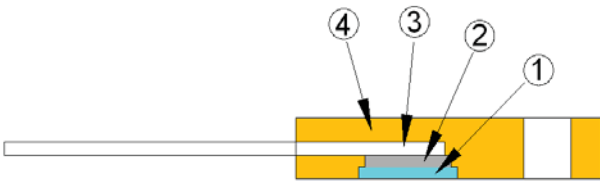
## Features

- 50 watts at  $\leq 25^{\circ}\text{C}$  case temperature heat sink mounted
- TO-220 style power package
- Fixed with a M3 screw on system heat sink.
- Improve the heat dissipation by ceramic exposure design with external fix jig to mount the chip on heat sink

## Applications

- Power Supplies
- Non-inductive Design for High Frequency
- Pulsing Applications

## Construction



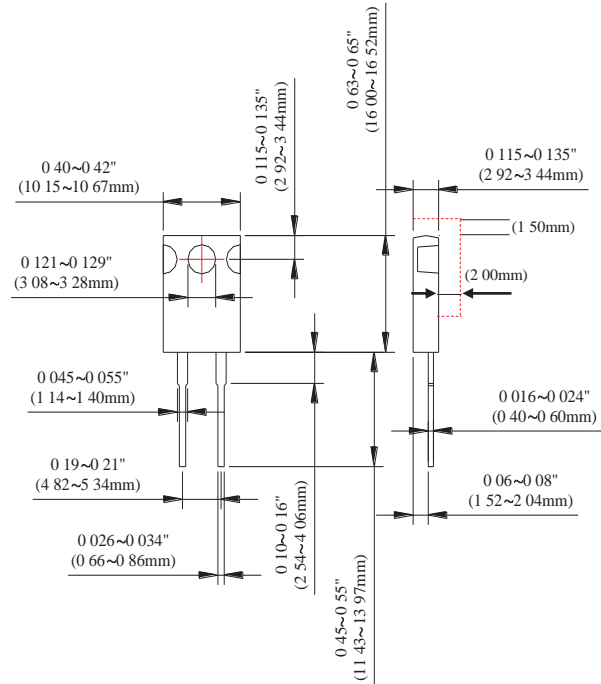
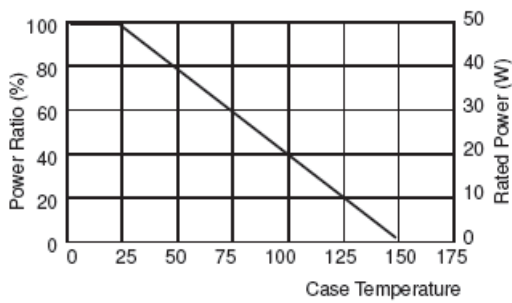
① Alumina Substrate	③ Lead
② Resistor Layer	④ Molding

## Dimensions

Unit : mm

Type	Weight (g) (1000pcs)
TR50-H	2770

## Derating Curve



## Part Numbering

TR	50	J	B	D	1001	-H
Product Type	Power	Resistance Tolerance	Packaging Code	TCR (PPM/°C)	Resistance	Code
	50: 50 Watts	D: ±0.5% F: ±1% J: ±5% K: ±10%	B: Bulk	D: ±50 E: ±100 F: ±200 G: ±300 -:No Specified	R100: 0.1Ω 0100: 10Ω 4700: 470Ω 1001: 1000Ω 1002: 10000Ω	H: Hole

## Electrical Characteristics Specifications

Item Type	Resistance Range				TCR (PPM/°C)
	±0.5%	±1%	±5%	±10%	
TR50-H	-	-	0.1Ω -1Ω		No Specified
	-	>1Ω -3Ω			±300
	-	>3Ω -10Ω			±100 ±200
	>10Ω -10KΩ				±50 ±100 ±200

- Operating Voltage: 420V DC Max.
- Dielectric Strength: 1800VAC
- Insulation Resistance: 10GΩ min.

## Environmental Characteristics

Item	Requirement	Test Method
Temperature Coefficient of Resistance (T.C.R.)	As Spec.	Referenced to 25°C, ΔR taken at +105°C
Short Time Overload	ΔR±0.3%	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%	2,000 hours at rated power
Damp Heat with Load	ΔR±0.5%	40±2 C, 90~95% R.H., RCWV for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
Solderability	90% min. coverage	245±5°C for 3 seconds
Thermal Shock	ΔR±0.3%	-65°C ~150°C, 100 cycles
Terminal Strength	ΔR±0.2%	(Pull Test) 2.4N
Vibration, High Frequency	ΔR±0.2%	20g peak

- Lead Material: Tinned Copper
- Maximum Torque: 0.9 N-m
- Without a Heat Sink, When in Free Air at 25°C, the TR50-H is Rated for 2.25W.
- 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.
- Thermal Grease Should be Applied Properly.

RCWV(Rated continuous working voltage)=  $\sqrt{(P \cdot R)}$  or Max. Operating voltage whichever is lower

# TO-220 Power Resistor



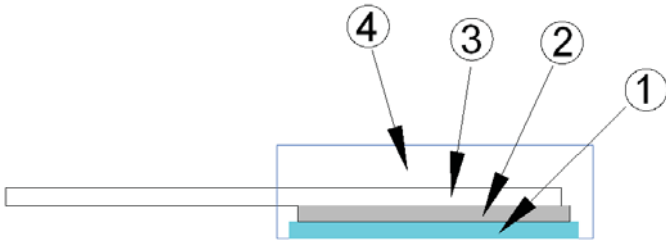
## Features

- 50 watts at 25°C case temperature heat sink mounted
- TO-220 style power package
- Molded case for protection and easy to mount
- Electrically isolated case
- Non-Inductive design

## Applications

- Switching Power Supplies
- Non-inductive Design for High Frequency
- Pulsing Applications
- UPS
- Voltage Regulation

## Construction



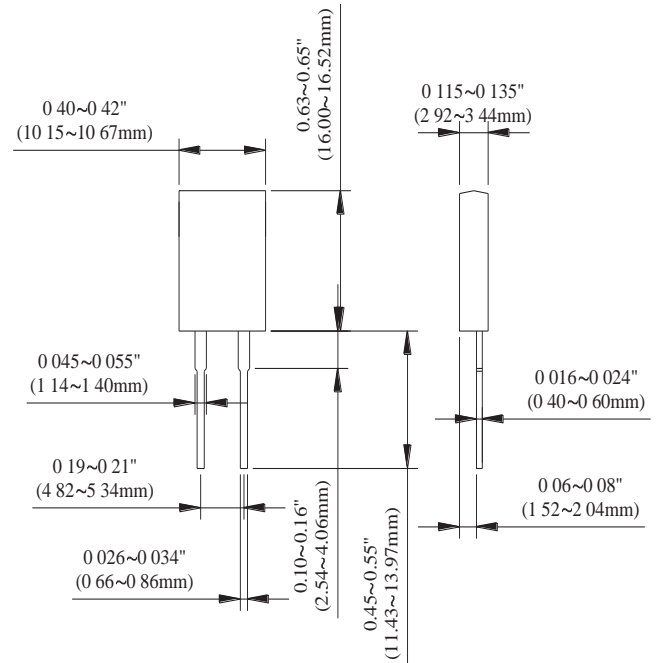
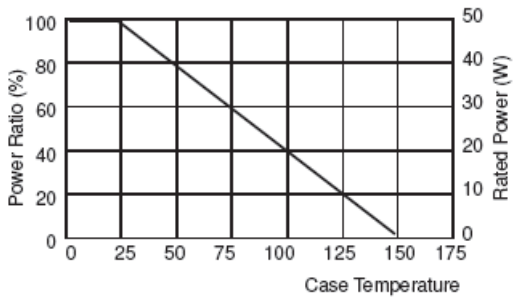
① Alumina Substrate	③ Lead
② Resistor Layer	④ Molding

## Dimensions

Unit : mm

Type	Weight (g) (1000pcs)
TR50	1290

## Derating Curve



## Part Numbering

TR	50	J	B	D	1001
Product Type	Power	Resistance Tolerance	Packaging Code	TCR (PPM/°C)	Resistance
	50: 50 Watts	D: ±0.5% F: ±1% J: ±5% K: ±10%	B: Bulk	D: ±50 E: ±100 F: ±200 G: ±300 - : No Specified	R100: 0.1Ω 0100: 10Ω 4700: 470Ω 1001: 1000Ω 1002: 10000Ω

## Electrical Characteristics Specifications

Type	Item	Resistance Range				TCR (PPM/°C)
		±0.5%	±1%	±5%	±10%	
TR50	-	-	0.1Ω -1Ω		No Specified	
	-	>1Ω -3Ω			±300	
	-	>3Ω -10Ω			±100 ±200	
	>10Ω -10KΩ				±50 ±100 ±200	

- Operating Voltage: 350V Max.
- Dielectric Strength: 1800VAC
- Insulation Resistance: 10GΩ min.
- Working Temperature Range: -65°C to +150°C
- Resistance Value < 1Ω is available

## Environmental Characteristics

Item	Requirement	Test Method
Temperature Coefficient of Resistance (T.C.R.)	As Spec.	Referenced to 25°C, ΔR taken at +105°C
Short Time Overload	ΔR±0.3%	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%	2,000 hours at rated power
Damp Heat with Load	ΔR±0.5%	40±2 C, 90~95% R.H., RCWV for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
Solderability	90% min. coverage	245±5°C for 3 seconds
Thermal Shock	ΔR±0.3%	-65°C ~150°C, 100 cycles
Terminal Strength	ΔR±0.2%	(Pull Test) 2.4N
Vibration, High Frequency	ΔR±0.2%	20g peak

- Lead Material: Tinned Copper
- Without a Heat Sink, When in Free Air at 25°C, the TR50 is Rated for 3W.
- 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.
- Thermal Grease Should be Applied Properly.

RCWV(Rated continuous working voltage)=  $\sqrt{P \cdot R}$  or Max. Operating voltage whichever is lower

# TO-220 Power Resistors – TR35 Series



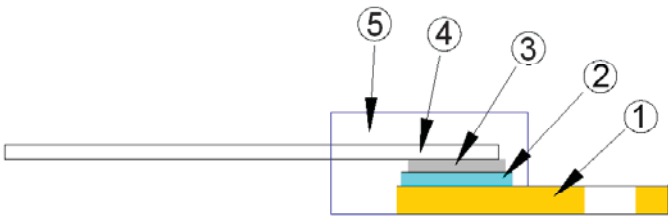
## Features

- 35 watts at 25°C case temperature heat sink mounted
- TO-220 style power package
- Single screw mounting to heat sink
- Molded case for protection and easy to mount
- Electrically isolated case
- Non-Inductive design

## Applications

- Switching Power Supplies
- Snubbers Circuits
- Automated Machine Controller
- RF Power Amplifiers
- Low Energy Pulse Loading
- UPS
- Voltage Regulation

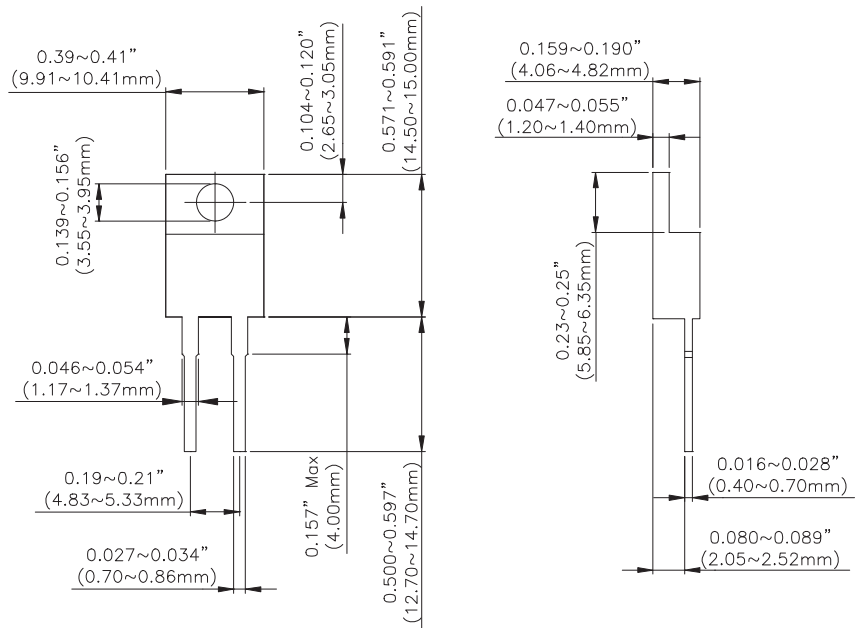
## Construction



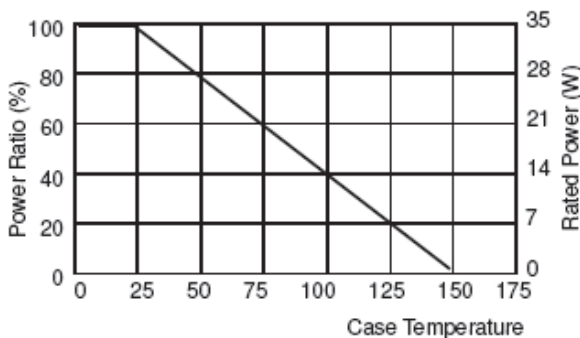
① Flange	④ Lead
② Alumina Substrate	⑤ Molding
③ Resistor Layer	

## Dimensions

Type	Weight (g) (1000pcs)
TR35	1902



## Derating Curve





## Part Numbering

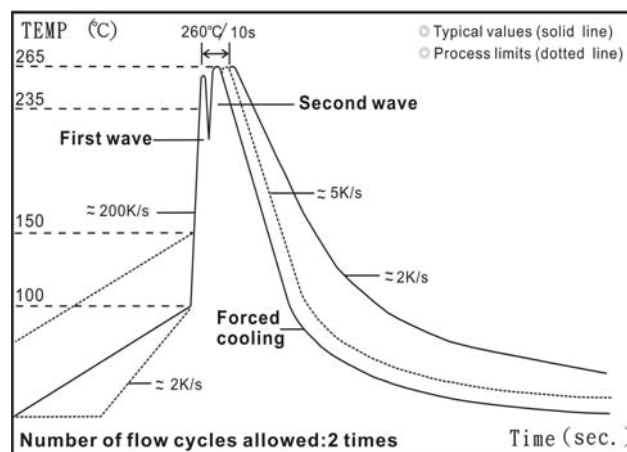
TR	35	J	B	D	1001
Product Type	Power	Resistance Tolerance	Packaging Code	TCR (PPM/°C)	Resistance
	35: 35 Watts	D: ±0.5% F: ±1% J: ±5% K: ±10%	B: Bulk	D: ±50 E: ±100 F: ±200 G: ±300 - : No Specified	R100: 0.1Ω 0100: 10Ω 4700: 470Ω 1001: 1KΩ 1002: 10KΩ

## Electrical Characteristics Specifications

Item	Resistance Range				TCR (PPM/°C)
	±0.5%	±1%	±5%	±10%	
TR35			0.05Ω -1Ω		No Specified
			>1Ω -3Ω		±300
			>3Ω -10Ω		±100 ±200
			>10Ω -10KΩ		±50 ±100 ±200

- Operating Voltage: 350V Max.
- Dielectric Strength: 1800VAC
- Insulation Resistance: 10GΩ min.
- Working Temperature Range: -65°C to +150°C
- Resistance Value < 1Ω is available

## Soldering Condition



Wave Soldering (Flow Soldering)

- (1) Time of wave soldering at maximum temperature point 260°C : 10s
- (2) Time of soldering iron at maximum temperature point 410°C : 5s

## ■ Environmental Characteristics

Item	Requirement	Test Method
Temperature Coefficient of Resistance (T.C.R.)	As Spec.	Referenced to 25°C, ΔR taken at +105°C
Short Time Overload	ΔR±0.3%	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%	2,000 hours at rated power
Damp Heat with Load	ΔR±0.5%	40±2°C, 90~95% R.H., RCWV for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
Solderability	90% min. coverage	245±5°C for 3 seconds
Thermal Shock	ΔR±0.3%	-65°C~150°C, 100 cycles
Terminal Strength	ΔR±0.2%	(Pull Test) 2.4N
Vibration, High Frequency	ΔR±0.2%	20g peak

- Lead Material: Tinned Copper
- Maximum Torque: 0.9 N-m
- Without a Heat Sink, When in Free Air at 25°C, the TR35 is Rated for 2.50W
- 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.
- Thermal Grease should be Applied Properly
- RCWV(Rated continuous working voltage)= $\sqrt{P \cdot R}$  or Max. Operating voltage whichever is lower.

# TO-220 Power Resistor



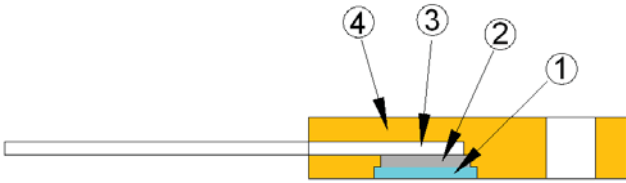
## Features

- 30 watts at 25°C case temperature heat sink mounted
- TO-220 style power package
- Single screw mounting to heat sink
- Molded case for protection and easy to mount
- Electrically isolated case
- Non-Inductive design

## Applications

- Gate Resistors in Power Supplies
- Snubbers
- Load and Dumping Resistors in CRT Monitors
- Terminal Resistance in RF Power Amplifiers
- Voltage Regulation
- Low Energy Pulse Loading
- UPS

## Construction



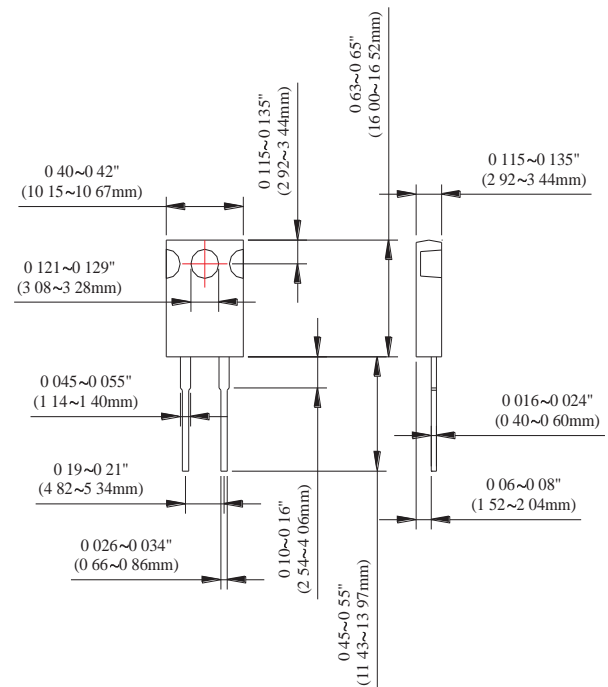
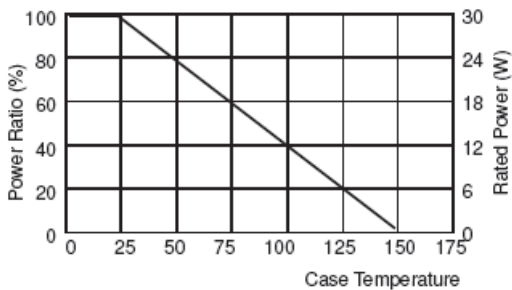
① Alumina Substrate	③ Lead
② Resistor Layer	④ Molding

## Dimensions

Unit: mm

Type	Weight (g) (1000pcs)
TR30	1155

## Derating Curve



## Part Numbering

TR	30	J	B	D	1001
Product Type	Power	Resistance Tolerance	Packaging Code	TCR (PPM/°C)	Resistance
	30: 30 Watts	D: ±0.5% F: ±1% J: ±5% K: ±10%	B: Bulk	D: ±50 E: ±100 F: ±200 G: ±300 - : No Specified	R100: 0.1Ω 0100: 10Ω 4700: 470Ω 1001: 1000Ω 1002: 10000Ω

## Electrical Characteristics Specifications

Type	Item	Resistance Range				TCR (PPM/°C)
		±0.5%	±1%	±5%	±10%	
TR30	-	-	-	0.05Ω -1Ω		No Specified
	-	>1Ω -3Ω				±300
	-	>3Ω -10Ω				±100 ±200
	>10Ω -10KΩ					±50 ±100 ±200

- Operating Voltage: 420V max.
- Dielectric Strength: 1800VAC
- Insulation Resistance: 10GΩ min.
- Working Temperature Range: -65°C to +150°C
- Resistance Value < 1Ω is available

## Environmental Characteristics

Item	Requirement	Test Method
Temperature Coefficient of Resistance (T.C.R.)	As Spec.	Referenced to 25°C, ΔR taken at +105°C
Short Time Overload	ΔR±0.3%	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%	2,000 hours at rated power
Damp Heat with Load	ΔR±0.5%	40±2 C, 90~95% R.H., RCWV for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
Solderability	90% min. coverage	245±5°C for 3 seconds
Thermal Shock	ΔR±0.3%	-65°C~150°C, 100 cycles
Terminal Strength	ΔR±0.2%	(Pull Test) 2.4N
Vibration, High Frequency	ΔR±0.2%	20g peak

- Lead Material: Tinned Copper
- Maximum Torque: 0.9 N-m
- When in Free Air at 25°C, the TR30 is Rated for 2.25W
- 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.
- Thermal Grease should be Applied Properly

RCWV(Rated continuous working voltage)=  $\sqrt{P \cdot R}$  or Max. Operating voltage whichever is lower

## Part Numbering

TR	20	J	B	D	1001
Product Type	Power	Resistance Tolerance	Packaging Code	TCR (PPM/°C)	Resistance
	20: 20 Watts	D: ±0.5% F: ±1% J: ±5% K: ±10%	B: Bulk	D: ±50 E: ±100 F: ±200 G: ±300 - : No Specified	R100: 0.1Ω 0100: 10Ω 4700: 470Ω 1001: 1000Ω 1002: 10000Ω

## Electrical Characteristics Specifications

Type	Item	Resistance Range				TCR (PPM/°C)
		±0.5%	±1%	±5%	±10%	
TR20	-	-	-	0.05Ω -1Ω		No Specified
	-	>1Ω -3Ω				±300
	-	>3Ω -10Ω				±100 ±200
	>10Ω -1MΩ					±50 ±100 ±200

- Operating Voltage: 350V max.
- Dielectric Strength: 1800VAC
- Insulation Resistance: 10GΩ min.
- Working Temperature Range: -65°C to +150°C
- Resistance Value < 1Ω is available

## Environmental Characteristics

Test Item	Requirement	Test Method
Temperature Coefficient of Resistance (T.C.R.)	As Spec.	Referenced to 25°C, ΔR taken at +105°C
Short Time Overload	ΔR±0.3%	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%	2,000 hours at rated power
Damp Heat with Load	ΔR±0.5%	40±2 C, 90-95% R.H. Max. RCWV for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
Solderability	90% min. coverage	245±5°C for 3 seconds
Thermal Shock	ΔR±0.3%	-65°C~150°C, 100 cycles
Terminal Strength	ΔR±0.2%	(Pull Test) 2.4N
Vibration, High Frequency	ΔR±0.2%	20g peak

- Lead Material: Tinned Copper
  - Without a Heat Sink
  - When in Free Air at 25°C, the TR20 is Rated for 3W
  - 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.
  - Thermal Grease should be Applied Properly
- RCWV(Rated continuous working voltage)=  $\sqrt{P \cdot R}$  or Max. Operating voltage whichever is lower