



# RESISTORS

Models RTO 20 and RTO 50



## Thick Film Power Resistor

### FEATURES

- TO-220 package: Compact and easy to mount
- 20-watt and 50-watt power ratings available with through-hole or SMD versions
- Broad resistance range: 0.01  $\Omega$  to 1 M $\Omega$
- Low thermal resistance down to 2.6  $^{\circ}\text{C}/\text{W}$
- Non-inductive element

### APPLICATIONS

- Industrial and medical power supplies
- Test equipment
- Power conversion
- Current sensing
- Snubbers

Datasheet is available on our web site at [www.vishay.com](http://www.vishay.com)  
for RTO 20 and RTO 50 - <http://www.vishay.com/doc?50005> and  
<http://www.vishay.com/doc?50035>

### Power Resistors, Thick Film Technology

#### FEATURES

- 20 W at 25 °C Heatsink Mounted
- High Power Dissipation to size ratio
- Wide Resistance Range from 0.01 Ω to 1 MΩ
- Negligible inductance
- Easy Mounting
- TO 220 package: Compact and easy to mount
- Two versions of this thick film resistor are available:
  - A Radial Leaded version for PCB Mounting
  - A Flat Lead version for Surface Mounting



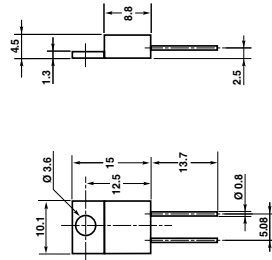
RoHS COMPLIANT



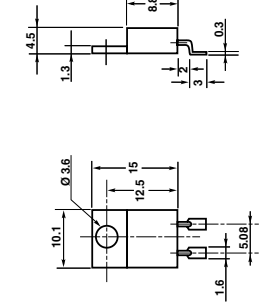
The well known TO 220 package is compact and easy to mount.

#### DIMENSIONS in millimeters

##### RTO 20F - LEADED



##### RTO 20C - FOR SURFACE MOUNTING



\* Tolerance unless otherwise specified: ± 0.4 mm

\* Only for RTO 20 version C = during surface mount soldering temperature profile must not cause the metal tab of this device to exceed 220 °C.

#### MECHANICAL SPECIFICATIONS

- Mechanical Protection** Insulated Case
- Resistive Element** Thick Film
- Connections** Tinned copper
- Weight** 2.2 g max.

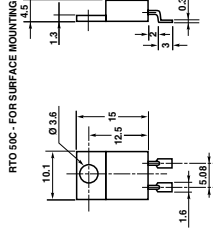
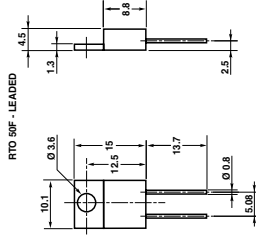
#### DIMENSIONS

- Standard Package** TO 220
- Insulated case** Insulated case

#### ENVIRONMENTAL SPECIFICATIONS

- Temperature Range** - 55 °C to + 155 °C
- Climatic Category** 55/155/56
- Sealing** Sealed container  
Solder immersion
- Flammability** IEC 60695-11-5  
2 applications 30 s separated by 60 s

#### DIMENSIONS in millimeters



Because of the knowledge and experience in Thick Film technology, Vishay Sfernice has been able to develop a high power resistor in a TO 220 package called RTO 50. The special design of this component allows the dissipation of 50 W when mounted on a heatsink. The ohmic value is adjusted by sand trimming. This process does not generate hot spots as in laser trimming, which could lead to microcracks on each side of the curve. This process improves the reliability and the stability of the resistor and at the same time gives a good overload capability.

Only for RTO 50 version C = during surface mount soldering, the soldering temperature profile must not cause the metal tab of this device to exceed 220 °C.

#### MECHANICAL SPECIFICATIONS

- Mechanical Protection** Molded
- Resistive Element** Thick Film
- Connections** Tinned copper alloy
- Weight** 2.2 g max.

#### DIMENSIONS

- Standard Package** TO 220
- Insulated Case** Insulated Case

#### ENVIRONMENTAL SPECIFICATIONS

- Temperature Range** - 55 °C to + 155 °C
- Climatic Category** 55/155/56
- Sealing** Sealed container  
Solder immersion
- Flammability** IEC 60695-11-5  
2 applications 30 seconds separated by 60 seconds

#### ELECTRICAL SPECIFICATIONS

|   |   |
|---|---|
| <b>Resistance Range</b>                     | 0.010 Ω to 1 MΩ serie E24   |
| <b>Tolerances (Standard)</b>                | ± 1 % to ± 10 %   |
| <b>Dissipation and Associated:</b>          | Onto a heatsink   |
| <b>Thermal Resistance and Nominal Power</b> | 50 W at + 25 °C<br>R <sub>TH (l-c)</sub> : 2.6 °C/W<br>free air:<br>2.25 W at + 25 °C |
| <b>Temperature Coefficient</b>              | See Performance table   |
| <b>Standard (- 55 °C; + 150 °C)</b>         | ± 150 ppm/°C  |
| <b>Limiting Element Voltage</b>             | 300 V   |
| <b>Dielectric Strength</b>                  | 2000 V <sub>RMS</sub> - 1 Minute  |
| <b>MIL STD 202 (301)</b>                    | 10 mA Max   |
| <b>Insulation Resistance</b>                | ≥ 10 <sup>8</sup> MΩ  |
| <b>Inductance</b>                           | ≤ 0.1 μH  |
| <b>Critical Resistance</b>                  | 1.8 kΩ  |

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Revision 20-Sep-07

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