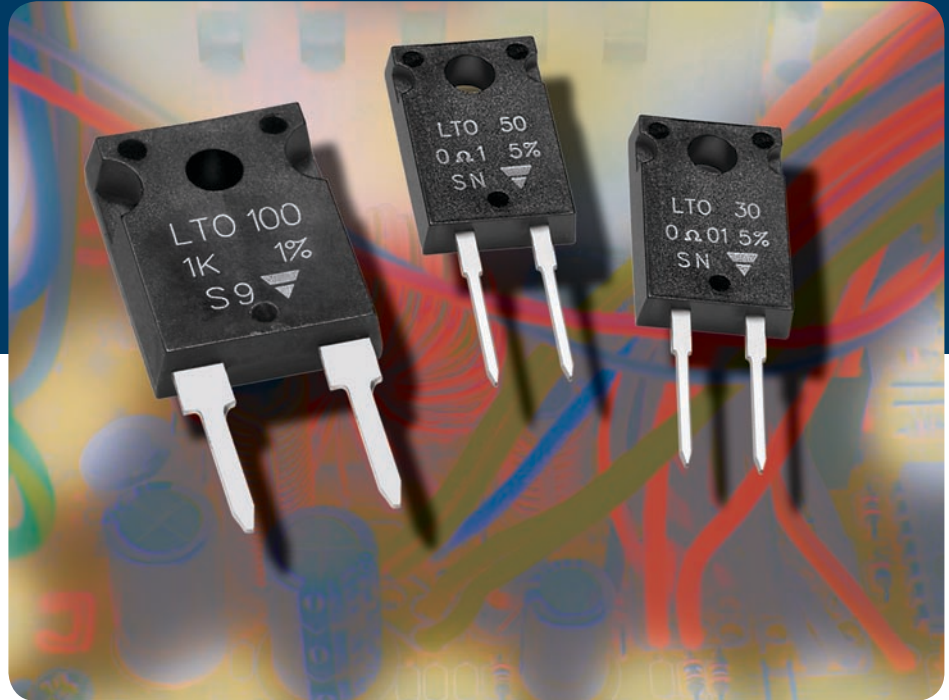




THICK FILM POWER RESISTOR

LTO 30, LTO 50, LTO 100



Thick Film Power Resistor

KEY BENEFITS

- Standard TO-220 and TO-247 packages
- Non-inductive
- Compact, low-profile 3.2-mm thickness
- Wide resistance range; low values available from R01 in 1 % tolerance
- Lead (Pb)-free and RoHS-compliant
- Direct mounting of exposed ceramic on heatsink

APPLICATIONS

- Power conversion
- High-speed switching
- RF applications
- Current sensing

Datasheets are available on our web site at www.vishay.com
for LTO 30 - <http://www.vishay.com/doc?50049>
for LTO 50 - <http://www.vishay.com/doc?50050>
for LTO 100 - <http://www.vishay.com/doc?50051>

30, 50 and 100 Watt Power Resistor Thick Film Technology

FEATURES

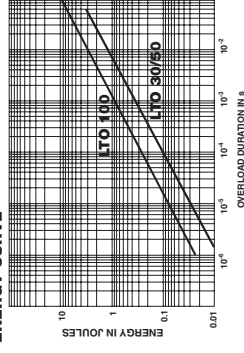
- 30, 50 and 100 W at 25 °C case temperature heatsink mounted
- Direct mounting ceramic on heatsink
- Broad resistance range: R010 to 1MΩ
- Non inductive
- TO-220 and TO-247 packages: Compact and easy to mount
- Ro-HS compliant



OVERLOADS

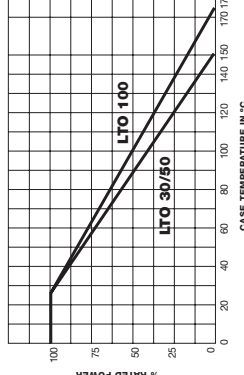
In any case the applied voltage must be lower than the maximum overload voltage of 375 V/560 V (LTO100). The values indicated on the graph below are applicable to resistors in air or mounted onto a heatsink.

ENERGY CURVE



POWER RATING CHART

The temperature of the case should be maintained within the limits specified. To improve the thermal conductivity, surfaces in contact should be coated with a silicone grease and the torque applied on the screw for tightening should be around 1 Nm.



CHOICE OF THE HEATSINK

The user must choose according to the working conditions of the component (power, room temperature). Maximum working temperature must not exceed 150 °C. The dissipated power is simply calculated by the following ratio:

$$P = [R_{TH}(j-c) + R_{TH}(c-a)] \cdot \Delta T \quad (1)$$

P: Expressed in W

ΔT: Difference between maximum working temperature and room temperature

R_{TH}(j - c): Thermal resistance value measured between resistive layer and outer side of the resistor. It is the thermal resistance of the component.

R_{TH}(c - a): Thermal resistance value measured between outer side of the resistor and room temperature. It is the thermal resistance of the heatsink itself (type, shape) and the quality of the fastening device, and the thermal resistance of the thermal compound.

Example:

R_{TH}(c - a) for LTO 30 power rating 10 W at ambient temperature + 25 °C

Thermal resistance R_{TH}(j - c): 4.2 °C/W

Considering equation (1) we have:

$$\Delta T = 150 \text{ °C} - 25 \text{ °C} = 125 \text{ °C}$$

$$R_{TH}(j - c) + R_{TH}(c - a) = \frac{P}{W} = \frac{10}{0.5} = 20 \text{ °C/W}$$

$$R_{TH}(c - a) = 20 \text{ °C/W} - 4.2 \text{ °C/W} = 15.8 \text{ °C/W}$$

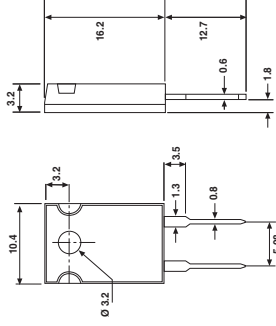
$$R_{TH}(c - a) = 12.5 \text{ °C/W} - 4.2 \text{ °C/W} = 8.3 \text{ °C/W}$$

with a thermal grease R_{TH}(c - h) = 1 °C/W, we need a heatsink with R_{TH}(h - a) = 7.3 °C/W

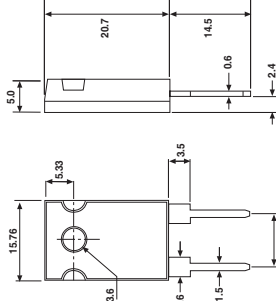


LTO Series is the extension of RTO types. We use the direct ceramic design (no metal tab) applied to semiconductor packages.

DIMENSIONS in millimeters



LTO 100



* Tolerance unless otherwise specified: ± 0.3 mm

MECHANICAL SPECIFICATIONS

Mechanical Protection	Molded Thick Film
Resistive Element	Alumina
Substrate	Timed copper
Connections	2 g max (3.5 g for LTO 100)
Weight	1 Nm
Mounting Torque	

DIMENSIONS

Standard Package TO-220 and TO-247 isolated case

ENVIRONMENTAL SPECIFICATIONS

Temperature Range	-55 °C to +155 °C (175 °C for LTO 100)
Climatic Category	55/155/66

ELECTRICAL SPECIFICATIONS

Resistance Range	0.010 Ω to 1 MΩ
Tolerance (Standard)	± 1 % to ± 10 %
Dissipation and Associated	Onto a heatsink
Power Rating and Thermal Resistance of the Component	30, 50, 100 W at + 25 °C (case temp.) R _{TH} (j-c) = 25 °C/W, 2.5 W, and 3.5 W
Temperature Coefficient	See Special Features Table
Standard	± 150 ppm/°C
Limiting Element Voltage	250 V/375 V
Dielectric Strength MIL STD 202	1500 Vrms - 1 Min 10 mA max.
Insulation Resistance	≥ 10 ⁴ MΩ
Inductance	≤ 0.1 μH
Critical Resistance	2.8 kΩ/1.41 kΩ (LTO 100)

Revision 11-Jun-08

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