Power Resistors

Series LXP-18 TO-220
18 W Thick Film Resistor for high-frequency and pulse-loading applications

EBG

RESISTORS

A Miba Group Company

EBG Resistor offers the completely encapsulated and insulated TO-220 package for low ohmic value and Non-Inductive design for high-frequency and pulse-loading applications. Ideal use for power supplies. The LXP-18 series is rated at 18 W mounted to a heat sink.

Features

- 18 W operating power
- **TO-220 package** configuration
- Single-screw mounting simplifies attachment to heat sink
- A fully molded housing for environmental protection
- Resistor package completely insulated from heat sink
- Non-Inductive design
- ROHS compliant
- Materials in accordance with UL 94 V-0
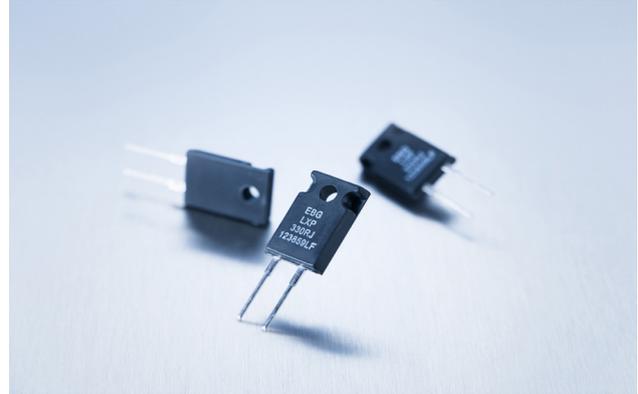
Technical Specifications

Resistance value	0.05 Ω ≤ 1 MΩ (higher values on special request)
Resistance tolerance	±1 % to ±10 % ±0.5 % on special request for limited ohmic values
Temperature coefficient	1 Ω < 10 Ω: ±100 ppm + 0.002 Ω/°C ≥ 10 Ω: ±50 ppm/°C (referenced to 25 °C, ΔR taken at +85°C)
Power rating	18 W at 25°C bottom case temperature depends on case temperature (see power rating curve)
Maximum operating voltage	350 V
Dielectric strength voltage	1,800 V AC
Insulation resistance	> 10 GΩ at 1,000 V DC
Momentary overload	2x rated power with applied voltage not to exceed 1.5x maximum continuous operating voltage for 5 sec. ΔR ±(0.3 % + 0.001 Ω) max.
Load life	MIL-R-39009, 2,000 hours at rated power, ΔR ±(1.0 % + 0.001 Ω) max.
Moisture resistance	MIL-STD-202, method 106 ΔR ±(0.5 % + 0.001 Ω) max.
Thermal shock	MIL-STD-202, method 107, Cond. F, ΔR ±(0.3 % + 0.001 Ω) max.
Terminal strength	MIL-STD-202, method 211, Cond. A (Pull Test) 2.4 N, ΔR ±(0.2 % + 0.001 Ω) max.
Vibration, high frequency	MIL-STD-202, method 204, Cond. D, ΔR ±(0.2 % + 0.001 Ω) max.
Lead material	tinned copper
Mounting - torque	0.7 Nm to 0.9 Nm using a screw and a compression washer mounting technique
Weight	~1,3 g
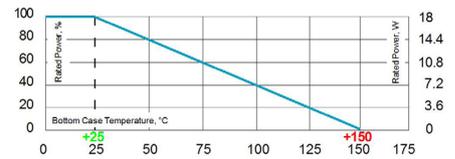
Derating (thermal resist.) LXP-18:
0.144 W/K (6.94 K/W)

Without a heat sink, when in open air at 25°C, the LXP-18 is rated for 2.25 W. Derating for temperature above 25°C is 0.018 W/K.
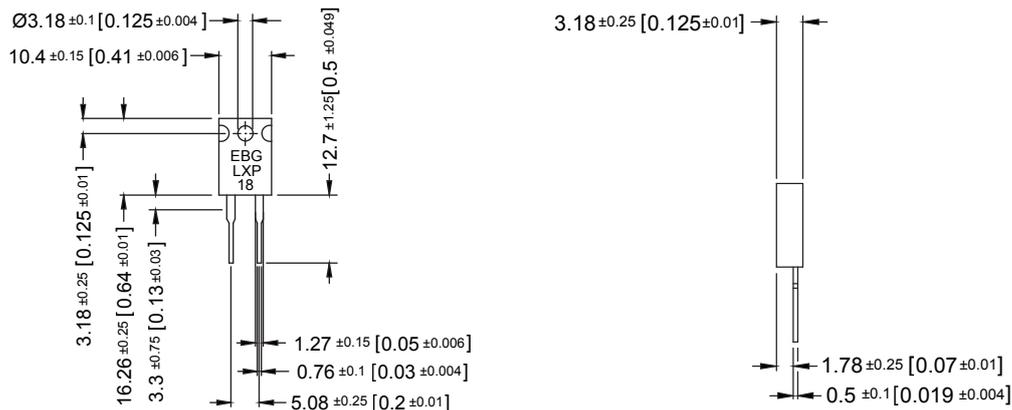
Case temperature must be used for definition of the applied power limit. Case temperature measurement must be done with a thermocouple contacting the center of the component mounted on the designed heat sink. Thermal grease should be applied properly.

How to make an order

LXP-18_Ohmic Value_Tolerance

For example:
LXP-18 20R 10%

Dimensions in mm [inches]

Ø3.18 ±0.1 [0.125 ±0.004]
10.4 ±0.15 [0.41 ±0.006]
12.7 ±1.25 [0.5 ±0.049]
EBG LXP 18
3.18 ±0.25 [0.125 ±0.01]
16.26 ±0.25 [0.64 ±0.01]
3.3 ±0.75 [0.13 ±0.03]
1.27 ±0.15 [0.05 ±0.006]
0.76 ±0.1 [0.03 ±0.004]
5.08 ±0.25 [0.2 ±0.01]

3.18 ±0.25 [0.125 ±0.01]
1.78 ±0.25 [0.07 ±0.01]
0.5 ±0.1 [0.019 ±0.004]

The above spec. sheet features our standard products. For further options please contact our local EBG representative or contact us directly.

Series LXP-18 TO-220

Pulse Energy Curve (typical rating for LXP-18)

Note: These energy values are reference values → depending on ohmic value e.g. 1 Ω to 10 Ω and used resistive paste, a variation in max. energy load capability is possible

Test procedure

Every test resistor was mounted with thermal compound (0.9 W/mK) on a water cooled heatsink

- Constant inlet water temperature: +50°C
- The test time of each tested resistor: 10min.
- Break time between two pulses: 1sec.
- To determine good / defect parts the ohmic value was measured before and after tests:
  a change of tolerance of more than 0.1% means defect

Description of Pulse Energy Curve

- Shape of pulse = e-function
- Time between two pulses = 1 second
- Pulse length = time constant of 1 tau
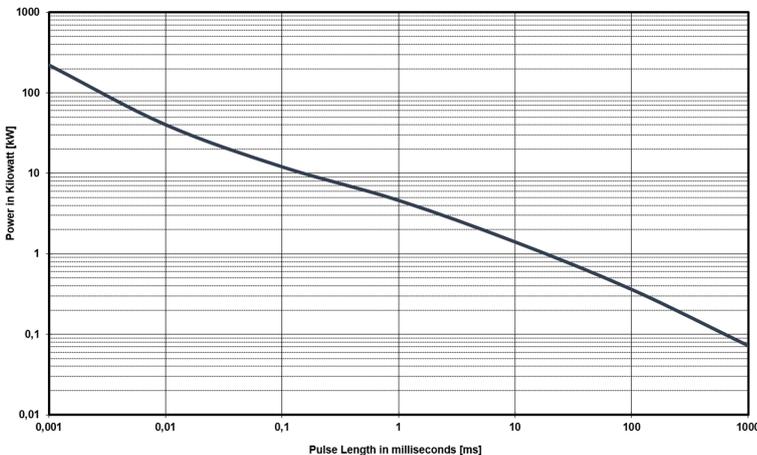 (1 means ... tau = 1ms)

Example

At 1 ms tau the LXP-18 with e.g. 1 Ω to 10 Ω can withstand an energy level of about 2.3 J, when the pulse pause time is ≥ 1s

At a symmetrical frequency > 1 kHz at pulse length ≥ 10 µsec. the maximum applied pulse energy for LXP-18 is a result out of the nominal power 18 W divided by the operating frequency (at 25°C bottom case) (E = 18 W / F)

Pulse Power Curve (typical rating for LXP-18)

The power curve shows the max. possible power which can be applied for a certain duration.
Referring to the same test procedure as described above.

Description of Pulse Power Curve

- Shape of pulse = e-function
- Time between two pulses = 1 second
- Pulse length = time constant of 1 tau
  (1 means ... tau = 1ms)

Example

For the time-constant of 1 ms you can apply about 4.6 kW max. (Pp = 2*E / T)→, if the time between two such peaks is ≥ 1s