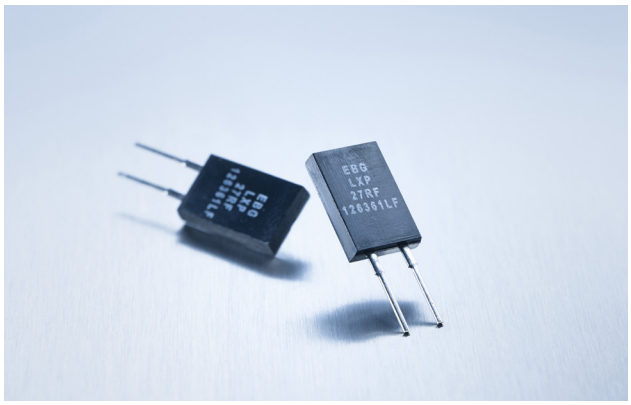
Series LXP-20 TO-220

20 W Thick Film Resistor for high-frequency and pulse-loading applications

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-20 series is rated at 20 W mounted to a heat sink.

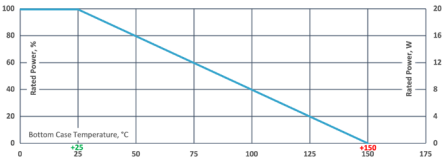


Features

- 20 W operating power
- **TO-220 package** configuration
- Snap-on style TO-220 heat sink required
- High pulse tolerant design
- 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	20 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)
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 ±(0.20 % + 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
Weight	~1,4 g



Derating (thermal resist.) LXP-20:
0.16 W/K (6.25 K/W)

Without a heat sink, when in open air at 25°C, the LXP-20 is rated for 3 W. By using the element with a snap-on heat sink, the resistor is rated for 5 W. Derating for temperature above 25°C is 0.018 W/K.

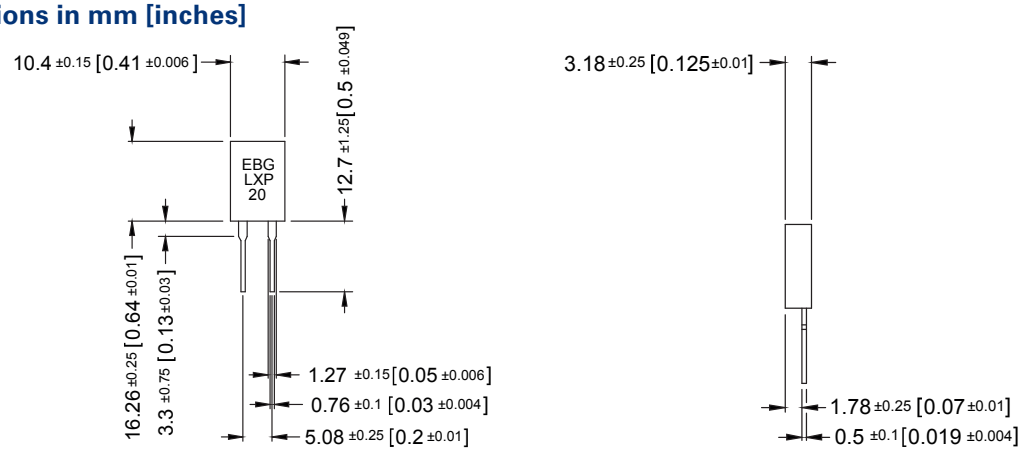
Case temperature must be used for definition of the applied power limit. Case temperature measurement must be done with a thermocouple contacting the center of the component mounted on the designed heat sink. Thermal grease should be applied properly.

How to make a request

LXP-20_Ohmic Value_Tolerance

For example:
LXP-20 20R 10%

Dimensions in mm [inches]



sales@ebg-resistors.com · sales@ebg-us.com

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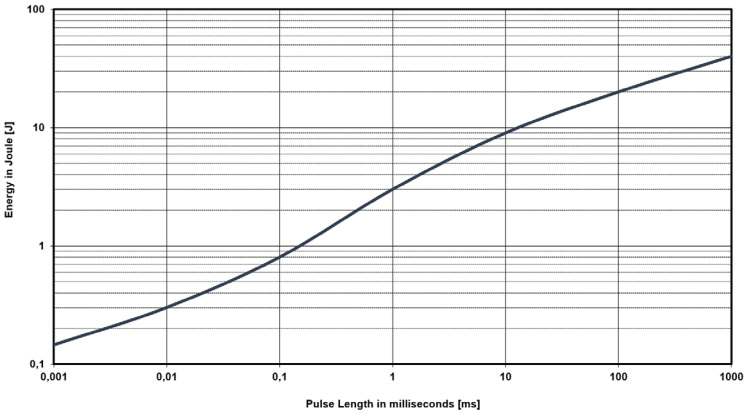
Pulse Energy Curve (typical rating for LXP-20)

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)

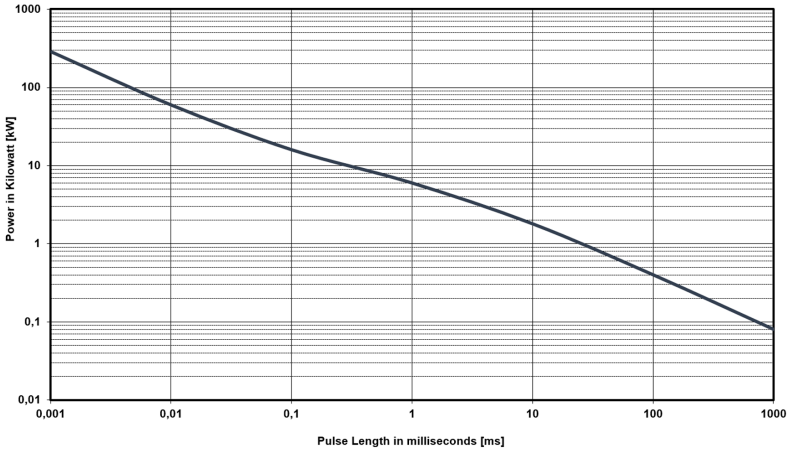
Example

At 1 ms tau the LXP-20 with e.g. 1 Ω to 10 Ω can withstand an energy level of about 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-20 is a result out of the nominal power 20 W divided by the operating frequency (at 25°C bottom case) (E = 20 W / F)

Pulse Power Curve (typical rating for LXP-20)

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 6 kW max. (Pp = 2*E / T)→, if the time between two such peaks is ≥ 1s

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Disclaimer

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