

Series HPS 150

150 W Power Resistor – only configuration 2 possible

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EBG Resistors's HPS series is rated at 150 W mounted to a heat sink. The increased height of the package makes this resistor ideal in applications where creeping distance must meet the VDE 0160 and UL 94 V-0 standards.

Main applications are: motor drives & controls, medical, frequency converters and instrumentation.

Features

- 150 W operating power
- Easy mounting using already existing infrastructure
- Non-Inductive design
- ROHS compliant
- Materials in accordance with UL 94 V-0 and VDE 0160
- Resistor is also available with UL certification (ask for details)
- Resistor is also available with preapplied PCM (Phase Change Material) (ask for details)

Technical Specifications

| | |
|--|--|
| Resistance value | 1 Ω ≤ 1 MΩ (other values on special request) |
| Resistance tolerance | ±1 % to ±10 % |
| Temperature coefficient | ±250 ppm/°C (at +85°C ref. to + 25°C) lower TCR on special request for limited ohmic values |
| Power rating | 150 W at 85°C bottom case temperature |
| Maximum working voltage | 500 V (up to 1,000 V DC on special request = "S"-version) |
| Voltage proof | 5,000 V DC, 3,000 V AC |
| Insulations resistance | > 10 GΩ at 1,000 V DC |
| Comparative Tracking Index (CTI) | standard > 200 V (> 500 V on special request = "H"-version) |
| Heat resistance to cooling plate | Rth < 0.47 K/W |
| Capacitance/mass | 45pF (typical), measuring frequency 10 kHz |
| Working temperature range | -55°C to +155°C |
| Mounting - torque for base plate (static) | 1.3 Nm to 1.5 Nm M5 screws |
| Mounting - torque for contacts (static) | 1.1 Nm to 1.5 Nm M4 screws, screw-in depth max. 5 mm |
| Weight | ~38 g |

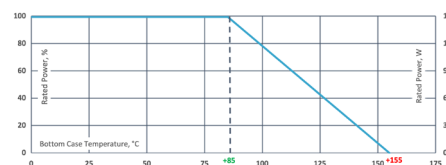
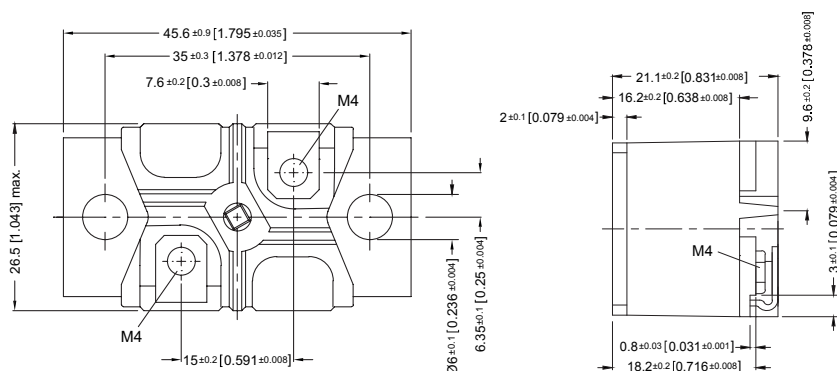
Air distance contact to contact:

Contact to contact > 9.2 mm
 Contact to base plate > 13.2 mm
 (with mounting screw M5 and washer)

Creeping distance:

Contact to base plate 17.0 mm
 Contact to contact
 - without PT-screw > 22.8 mm
 - with PT-screw > 20.2 mm

Dimensions in mm [inches]



Derating (thermal resist.) HPS-150:
 2.14 W/K (0.47 K/W)

Best results can be reached by using a thermal transfer compound with a heat conductivity of at least 1 W/mK. The flatness of the cooling plate must be better than 0.05 mm overall. Surface roughness should not exceed 6.4 μm.

How to make a request

HPS-2_Ohmic Value_Tolerance

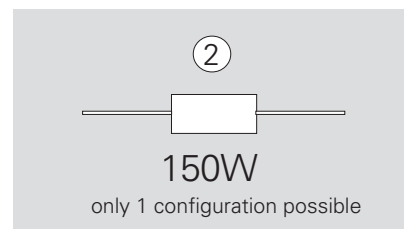
For example:

HPS-2 1R 10%

Example for higher working voltage:

HPS-2-S 40K 2%

Configuration



Series HPS 150

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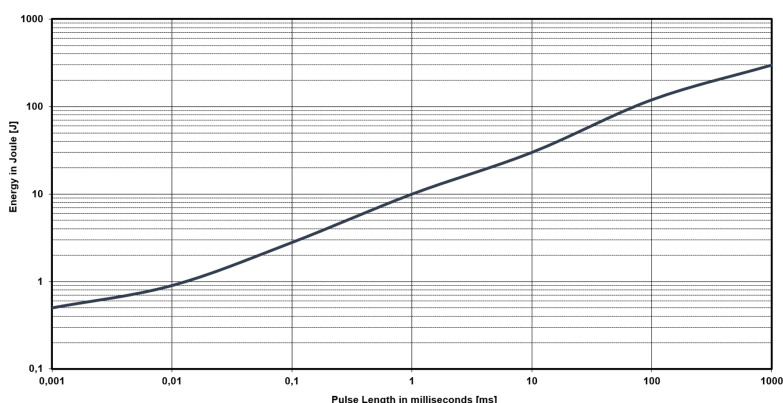
Pulse Energy Curve (typical rating for HPS 150)

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)

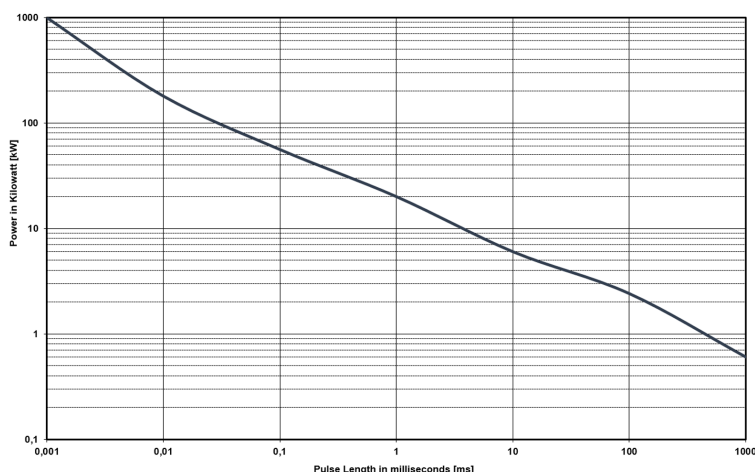
Example

At 1 ms tau the HPS 150 with e.g. 1 Ω to 10 Ω can withstand an energy level of about 10 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 HPS 150 is a result out of the nominal power 150 W divided by the operating frequency (at 85°C bottom case) ($E = 150 \text{ W} / F$)

Pulse Power Curve (typical rating for HPS 150)

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 20 kW max. ($P_p = 2 \cdot E / T$) →, if the time between two such peaks is ≥ 1s

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