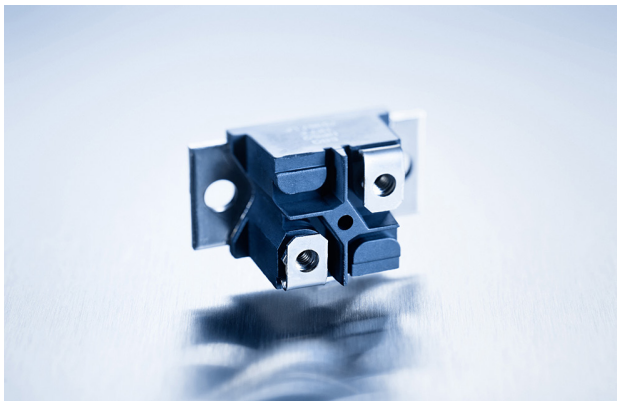
Series HPS 150

150 W Power Resistor – only configuration 2 possible

Miba Resistors 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.

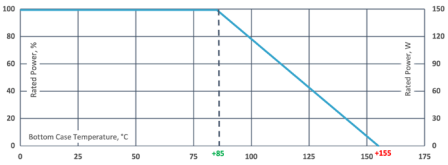


Features

- 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)
- Thermal interface management available (ask for details)

Technical Specifications

Resistance value	1 Ω to 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
Operating working voltage	500 V up to 1500 V = "S"-version up to 1500 V + higher pulse capability = "U"-version
Voltage proof	5000 V DC, 3000 V AC
Insulations resistance	> 10 GΩ at 1000 V DC
Comparative Tracking Index (CTI)	standard > 200 V (> 600 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 temperatur 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



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.

Air distance contact to contact:

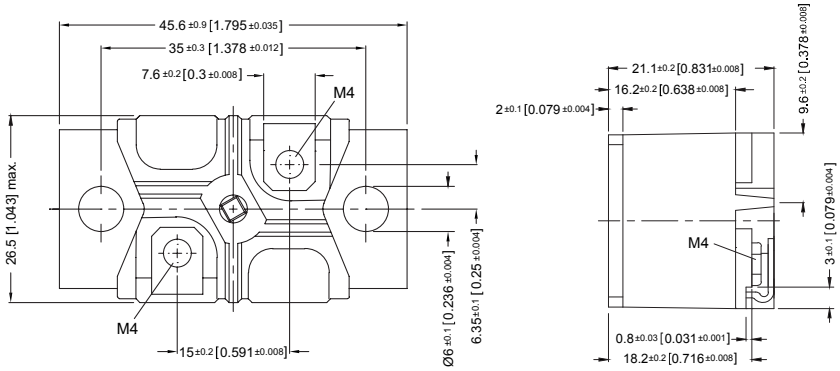
Contact to contact	> 9.2 mm
Contact to base plate	> 13.2 mm

(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]



How to make a request

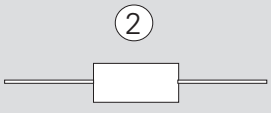
HPS-2_Ohmic Value_Tolerance

For example:
HPS-2 1R 10%

Example for higher working voltage:
HPS-2-S 40K 2%

"S"-version: special trimming process
"U"-version: untrimmed
"H"-version: type with CTI >600

Configuration



150W
only 1 configuration possible

Series HPS 150

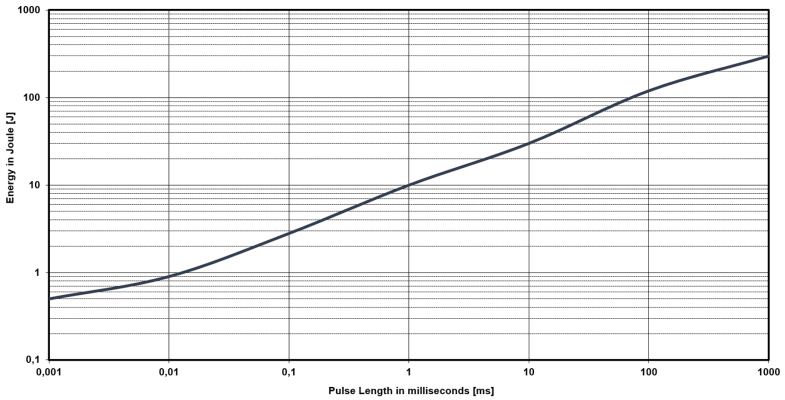
Pulse Energy Curve (typical rating for HPS 150)

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: 1s.
- 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)

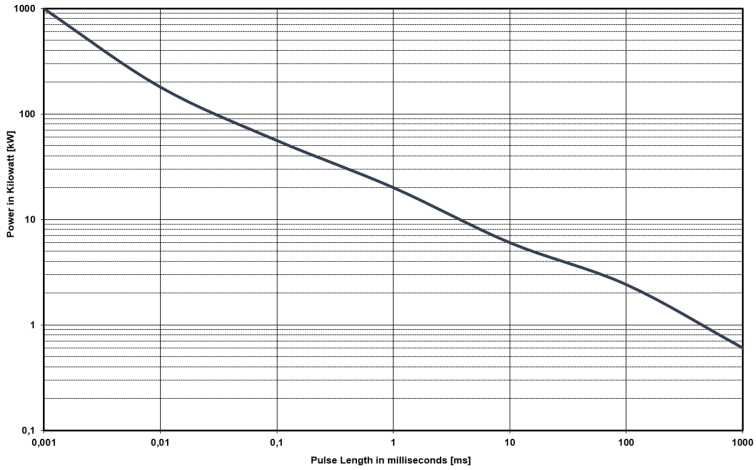
Example

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

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