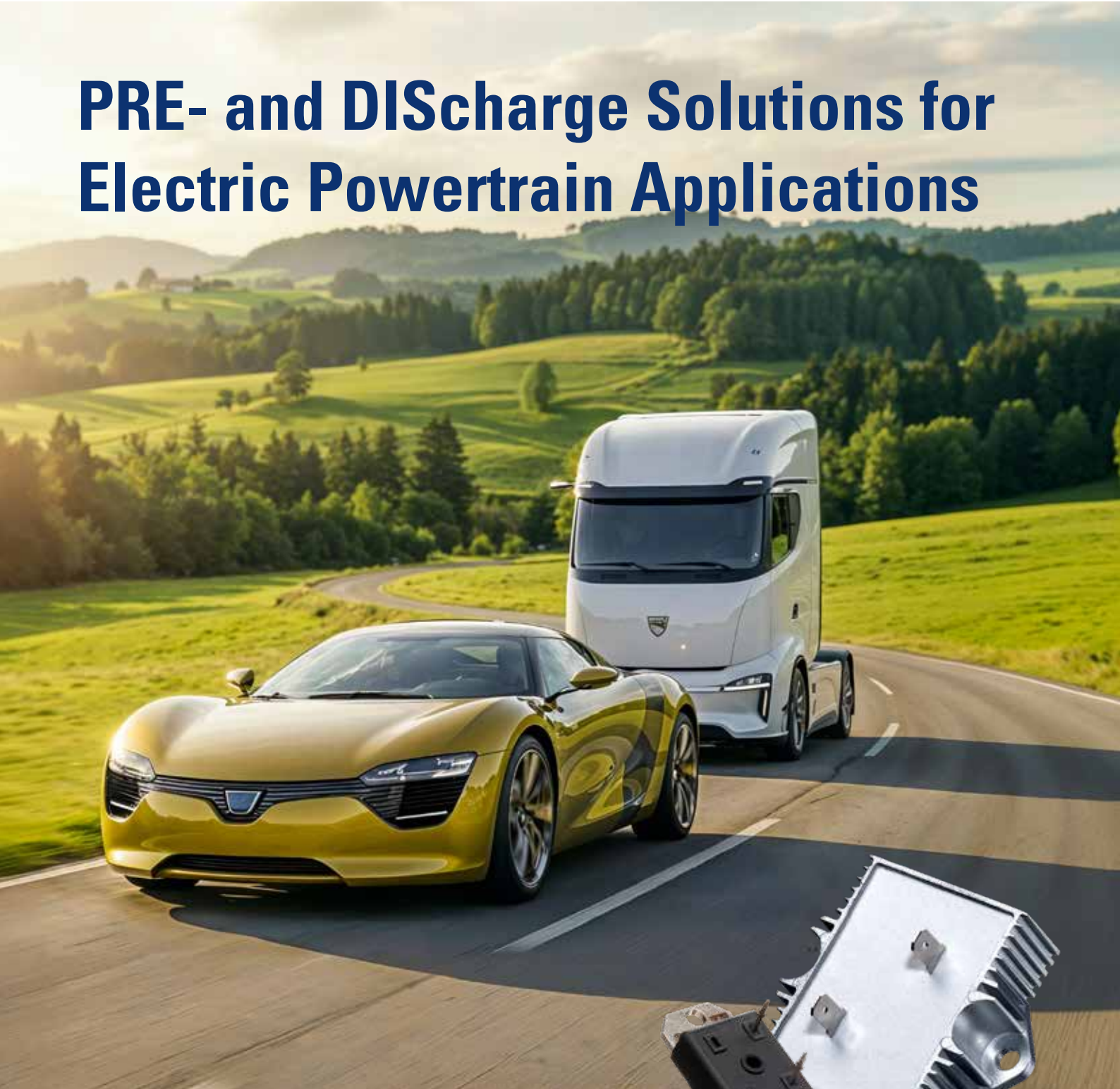


PRE- and DIScharge Solutions for Electric Powertrain Applications



OUR MISSION:
TECHNOLOGIES FOR A CLEANER PLANET



ENERGY
GENERATION



ENERGY
TRANSMISSION



ENERGY
STORAGE



ENERGY
USE

PRODUCT CATALOGUE

ISSUE 2026

OUR MISSION:

TECHNOLOGIES FOR A CLEANER PLANET

OUR VISION:

NO POWER WITHOUT MIBA TECHNOLOGY

We strive for product and technology leadership in technologically demanding niches along the entire energy value chain. Our products make an important contribution to the efficient and sustainable

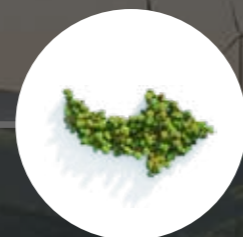
generation, transmission, storage and use of energy. They are making our customer applications even more sustainable and environmentally friendly.

Miba components accompany the entire cycle of efficient generation, transmission, storage and use of energy



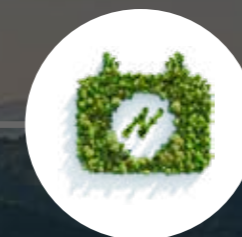
ENERGY GENERATION

- Windpower
- Solarpower
- Hydropower
- Gas and diesel gensets, turbines
- Fuel cells



ENERGY TRANSMISSION

- Efficient energy transmission
- Smart grids
- Compressors and pumps
- Components for charging infrastructure for electric vehicles



ENERGY STORAGE

- EV charging infrastructure
- Cooling solutions for traction batteries
- Coating solutions for batteries



ENERGY USE

- Highly efficient drive technology:
 - Conventional drives
 - Hybrid drives
 - Fully-electric drives
- Industrial applications

Innovation is what drives us

We at Miba have a passion for innovation. With our team of dedicated research and development employees around the globe, we are driving forward the latest technologies in the field of electric driving.

As a specialist in the world of power electronics, we have made it to our mission to save installation space while achieving higher perfor-

mance. With our development teams, we are constantly working on individual innovations for our customers and respond to the constant changes in the markets, driven by ever-increasing environmental and performance requirements.

Benefit from our experience



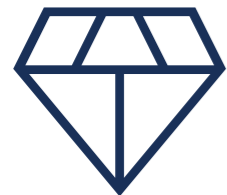
As part of a joined development process, we can respond to the wishes of our customers in detail and adapt applications flexibly based on customer-specific requirements.



We are constantly working to make our products lighter, smaller and more powerful. We are happy to incorporate our development expertise and product knowledge into our customers' applications.



All components are extensively tested in our in-house laboratory. In this way, we ensure that our customers receive a high-quality product for their applications.



Continuous Improvement Process is the base for our high product quality. Every single production process is proven over the long history in manufacturing. Quality gates after every process step are mandatory to keep the high quality.



We offer automotive-compliant manufacturing, automated according to IATF 16949 certification, technologically demanding projects.

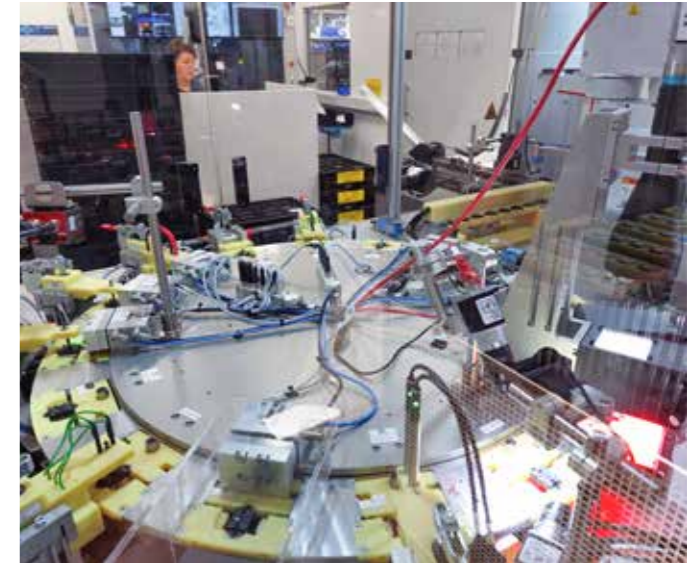


We produce and develop close to you: Miba has 30 production sites with 7500 employees worldwide.

State-of-the-art production lines

Miba produces resistors using state-of-the-art standards at its facilities in Kirchbach-Zerlach (Austria) and Dongguan (China). Both locations feature advanced automated manufacturing machines to ensure a seamless and efficient production process.

Our high level of automation and stable, standardized production processes are a decisive quality factor, especially in the production of resistors for the automotive industry. From the receipt of raw materials to the final product coming off the production line, automation is seamlessly integrated into every step of the process. Our state-of-the-art facilities feature automated material printers, soldering machines, wire bending machines and much more - all carefully linked together in a flawless clean room environment to ensure the highest level of quality.



We ensure the highest quality

We strive for excellence in quality. After our products are manufactured fully automatic in a clean room environment, each one is thoroughly tested in our automated end-of-line tester. Weight, size, ohmic value, load, insulation and much more are checked to ensure that we always deliver first-class quality. Following this, the resistor is printed on the underside with a thermal paste, enabling easy and swift integration for the customer.

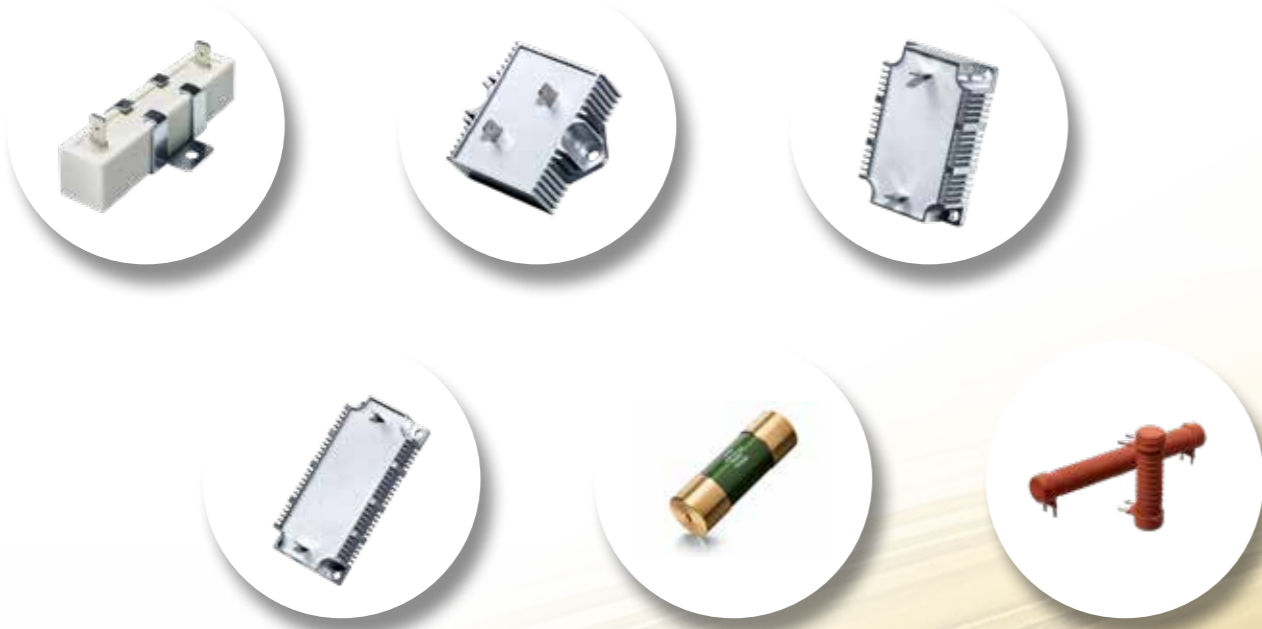
Miba products are built to last

Our resistors are designed for up to 300000 precharge or discharge cycles. Our high quality standards are also confirmed by numerous certifications: Miba is ISO 9001, ISO 14001, IATF 16949 and TISAX certified. Our products are designed to meet the high requirements of AEC-Q200 and are ideally suited for the automotive industry.



Highly reliable PREcharge and DIScharge components for safe and secure operation

Electrically powered vehicles have various electrical energy sources. In addition to the HV-drive battery, capacitors are installed in different modules such as drive inverter, DC-DC converter and much more. The largest capacitor is located in the drive control unit, also known as the drive inverter.



PREcharge Resistors



DIScharge Resistors



Customized Resistor Solution

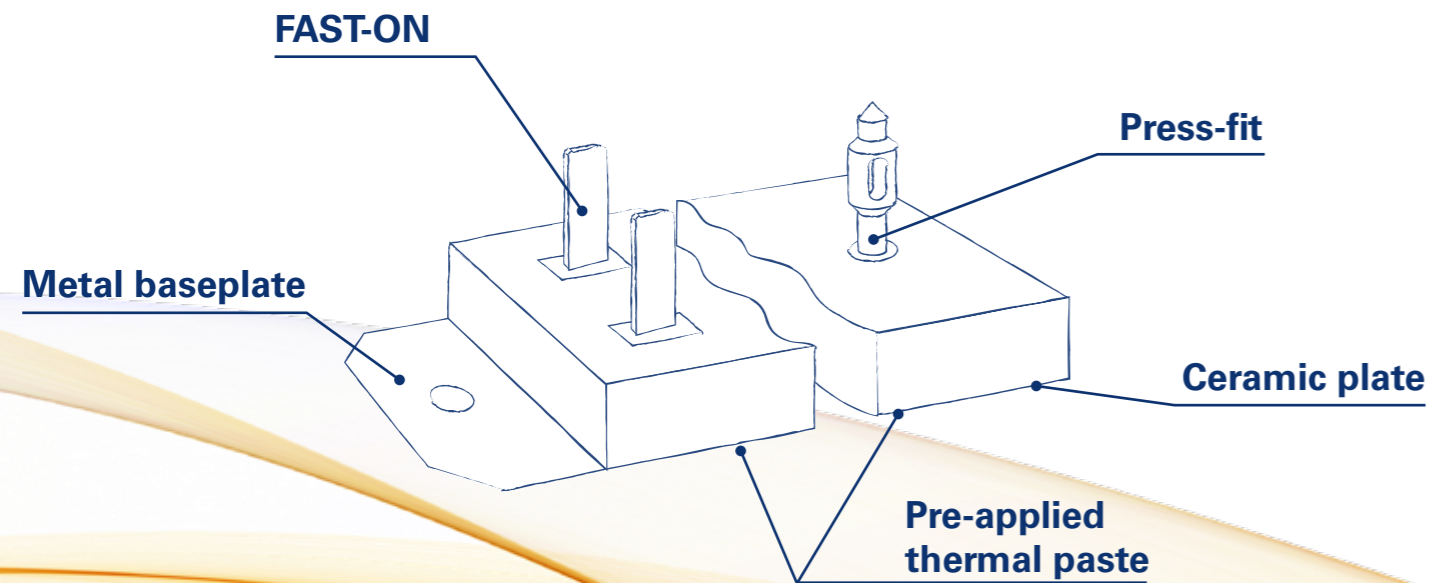
We develop the optimal resistor solution for you

Throughout the entire development process, from concept development to final implementation, we work closely and transparently with our customers. This allows us to respond flexibly to customer

requirements and offer customized solutions. Regardless of whether it is a more compact design or specific material requirements. We will be happy to advise you!

Electrical connection

Electrical connection of the power resistor is important and differs for every customer requirement. Thus, our power resistors are designed for maximum flexibility. FAST-ON, wires, solder pins, screws, press-fit or any other are possible.



Heat sink

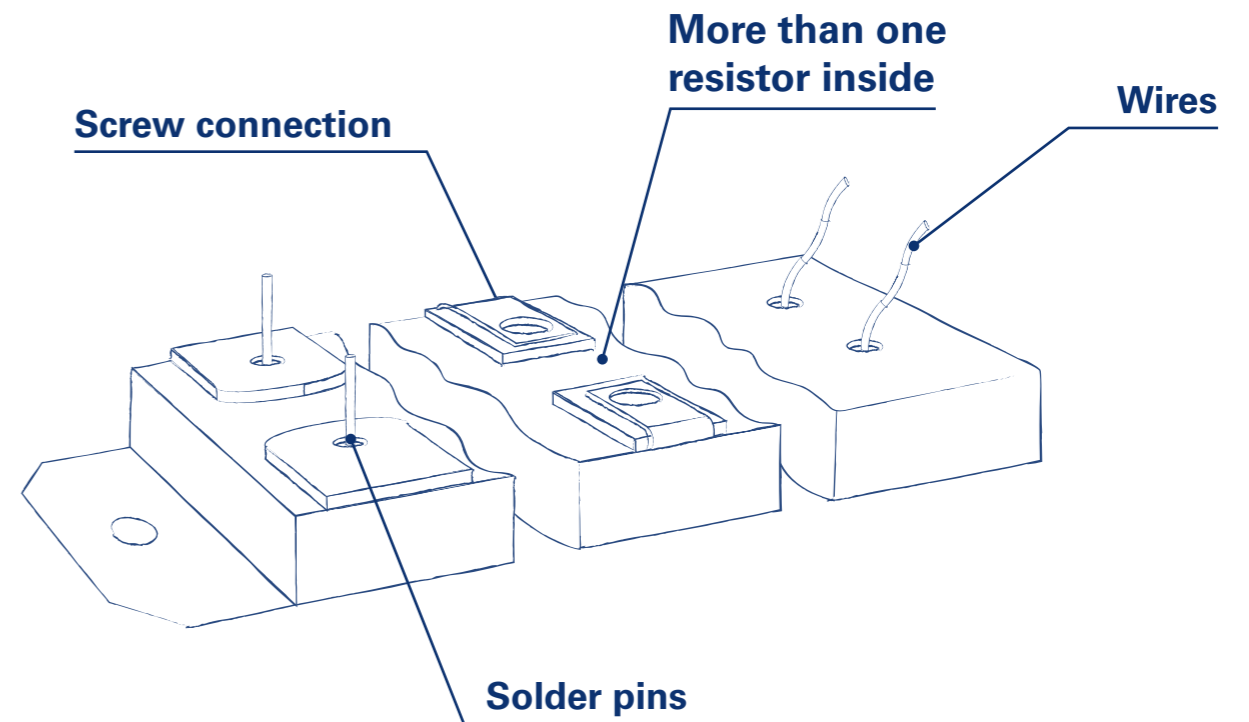
Our DIScharge resistors require a heat sink connection to ensure the optimal heat dissipation. This is crucial to provide the promised resistor power. We offer power resistors with or without a copper

baseplate for maximum robustness and are able to prefabricate the thermal paste on the product for a fast final assembly process.

More than one power resistor

Most of our resistor housing capabilities offer plenty of room to add more functions. We are happy to fulfill your specific requirements for the product. In addition to the active DIScharge resistor, we are also prepared to implement the passive DIScharge resistor. Furthermore,

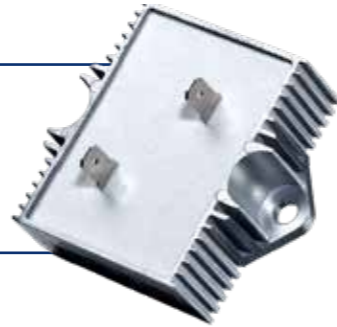
we can integrate a thermal sensor as an additional safety function. Simply let us know your requirements and we will incorporate them into the overall package while optimizing your costs.



Cutting-edge technology for your function-critical applications to enhance performance and improve safety

PREcharge Resistors

High voltage systems often use PREcharge circuits to limit the inrush current. If this current is not limited and controlled, it can cause significant stress or damage to other components in the system.



A PREcharge circuit allows the current to flow in a controlled manner until the voltage level rises to a value close to the source voltage before the main contactors close. This precharging normally takes place within one second by limiting the inrush current. To limit the inrush current, power resistors are used in combination with a relay. As soon as the capacitors have reached the operating voltage, the pre-charging relay opens and interrupts the process. The driver can now drive the vehicle safely.

PREcharge resistors thus protect the system from damage, extend the service life and increase reliability.



DIScharge Resistors

DIScharge resistors are used to discharge the DC link capacitors after an electric car has been switched off.

According to IEC 60204-1:2015 and other various EN standards, all capacitors and DC links must be below 60 volts within five seconds of use. To achieve this voltage level, it is possible to short-circuit the IGBTs of the inverter, transfer energy to the electric motor or use power resistors. Power resistors are the safest way to discharge, especially after a crash event. The important

IGBTs are not additionally stressed by the discharge. When discharging, a distinction is made between active and passive discharging. With active discharging, there is an actively connected power resistor to bring the voltage below 60 volts. Passive discharging is carried out with power resistors, that are permanently connected to HV+ and HV-.

Fast DIScharge Resistors

The approach of various vehicle manufacturers is to discharge the vehicle within milli seconds in case of a crash to ensure electrically safe conditions.



In the event of an accident, the vehicle manufacturer must be sure that all the energy is discharged, even if the vehicle is severely deformed. Fast DIScharge resistors are designed for such a case in order to quickly bring the vehicle into an electrically safe state.

Series CWR



The high power resistors from Miba ensure safe and reliable operation for PREcharge applications in battery distribution units and inverters.

Features

- Slim shape
- Robust design
- FAST-on connection
- Mounting clips as an option available (ask for details)



Technical Specifications

Items	Requirements	Methods
Terminal tensile strength	No mechanical damage	40 N for 30 s
Short time overload	$\leq \pm (2\% R + 0.05 \Omega)$	10 PR, 5 s
Vibration	$\leq \pm (2\% R + 0.05 \Omega)$	10 Hz - 1000 Hz, 0.75 mm, 200 m/s ²
Fast temperature change	$\leq \pm (2\% R + 0.05 \Omega)$	-55 °C, 30 min / 125 °C, 30 min, 5 cycles
Constant damp-heat	$\leq \pm (2\% R + 0.05 \Omega)$	40 °C \pm 2 °C, 93 % \pm 3 % rel. humidity

Model no.	Resistance value	Resistance tolerance	Temperature coefficient	Power rating	Operating voltage
CWR 30	10 Ω to 200 Ω	$\pm 5\%$ to $\pm 10\%$	± 500 ppm/°C	30 W at 25 °C Ta (360 s continuous operation)	600 V
CWR 50	10 Ω to 200 Ω	$\pm 5\%$ to $\pm 10\%$	± 500 ppm/°C	50 W at 25 °C Ta (210 s continuous operation)	1000 V

Dimensions in mm

Model no.	A ± 1.0	B ± 2.0	C ± 1.5	D ± 1.0	E ± 1.0	F ± 0.5	G ± 0.2	H ± 0.3	I ± 0.2
CWR 30	60.5	29	76.5	19	19	1	0.8	6.3	1.65
CWR 50	68	29	90	18.5	19	1	0.8	6.3	1.65

Typical Pulse Load

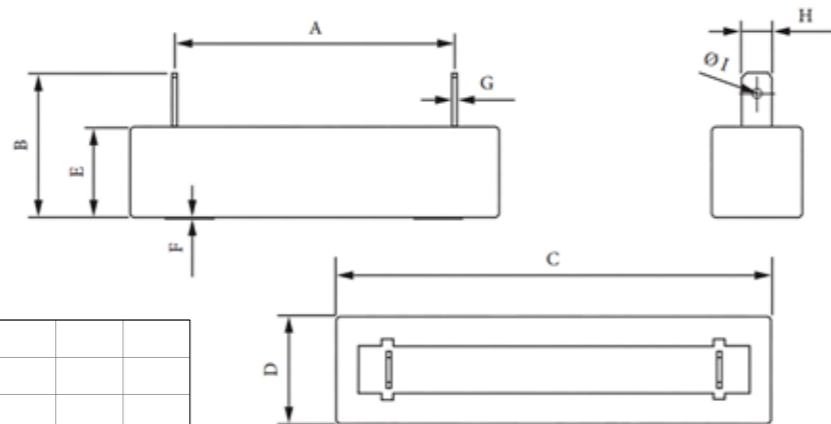
(initial resistor temperatur ≤ 85 °C)

CWR 30

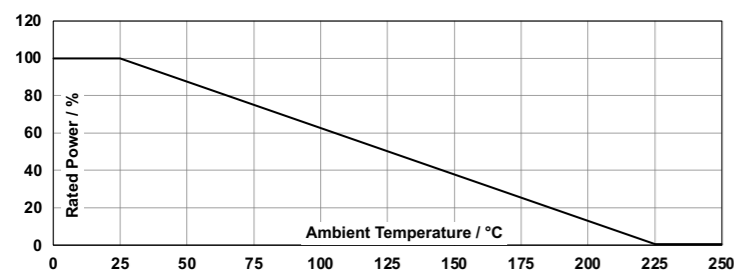
360 J for $\tau = 0.1$ s
470 J for $\tau = 0.2$ s
740 J for $\tau = 0.5$ s

CWR 50

430 J for $\tau = 0.1$ s
550 J for $\tau = 0.2$ s
870 J for $\tau = 0.5$ s



Derating Curve



Series RST 100



Absorbes high pulse energy within a very short period. Has high thermal capacity. Used in dumping, circuit breaking etc.

Features

- Aluminum housing for better heat dissipation
- Different connection possible (FAST-ON, wires)
- Huge short time overload capability



Technical Specifications

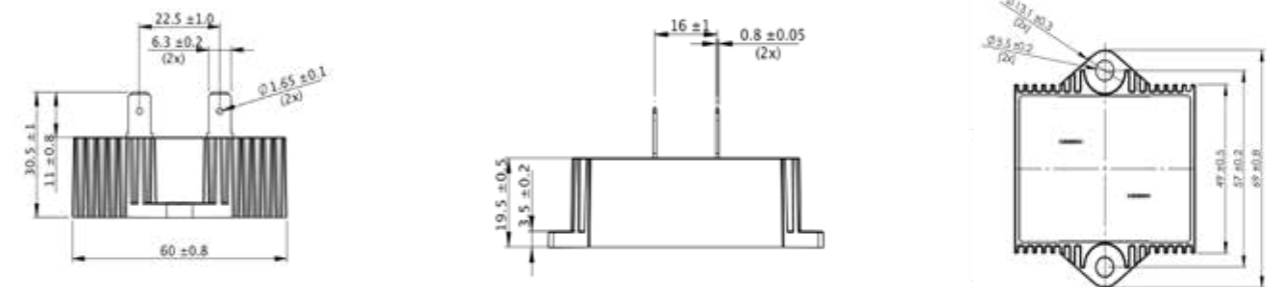
Resistance value range	10 Ω to 200 Ω
Resistance tolerance	$\pm 5\%$ to $\pm 10\%$
Temperature coefficient	± 500 ppm/°C (referenced to 25 °C, ΔR taken at ~ 105 °C)
Power rating	100 W at 70 °C Ta (90 s continuous operation)
Operating voltage	≤ 1000 V DC (pre-charge voltage)
Insulation resistance	1000 V DC min. 500 M Ω
Short time overload	2800 W, 70 °C 3 s
Dielectric strength	3 kV rms, 50 Hz, 1 min.
Operating temperature	-55 °C to +225 °C
Mounting	M5 screw
Weight	~ 149 g

Typical Pulse Load

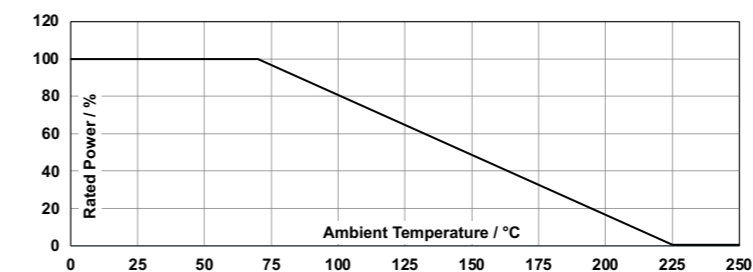
(initial resistor temperatur ≤ 85 °C)

950 J for $\tau = 0.1$ s
1150 J for $\tau = 0.2$ s
2500 J for $\tau = 0.5$ s

Dimensions in mm



Derating Curve



Series RST 150

AEC-Q200 ready

Absorbes high pulse energy within a very short period. Has high thermal capacity. Used in dumping, circuit breaking etc.

Features

- Aluminum housing for better heat dissipation
- Different connection possible (FAST-ON, wires)



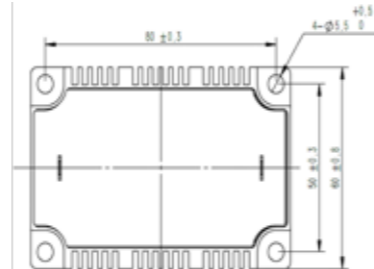
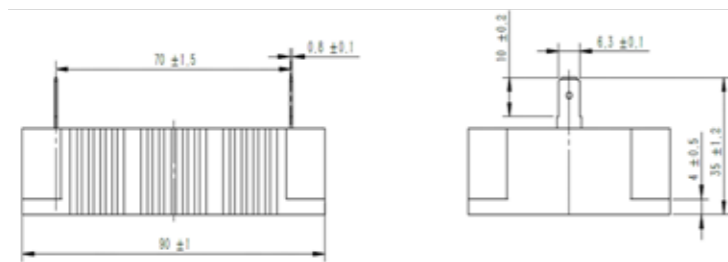
Technical Specifications

Resistance value	10 Ω to 300 Ω
Resistance tolerance	± 5 % to ± 10 %
Temperature coefficient	± 500 ppm/°C (referenced to 25 °C, ΔR taken at ~ 105 °C)
Power rating	150 W at 70 °C Ta (90 s continuous operation)
Operating voltage	≤ 1000 V DC (pre-charge voltage)
Insulation resistance	1000 V DC, min. 500 MΩ
Short time overload	3000 W, 70 °C 3 s
Insulation layer withstand voltage	3.5 kV rms, 50 Hz, 1 min.
Operating temperature	- 55 °C to + 225 °C
Mounting	M5 screw
Weight	~ 225 g

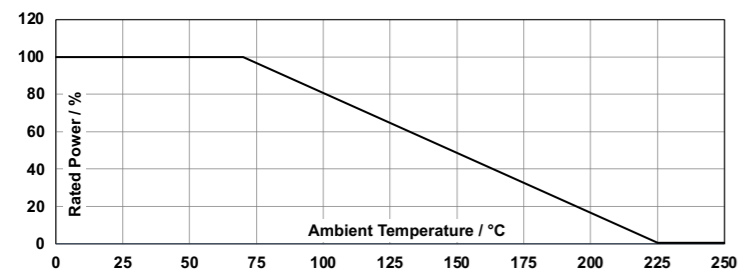
Typical Pulse Load (initial resistor temperatur ≤ 85 °C)

1550 J for $\tau = 0.1$ s
2100 J for $\tau = 0.2$ s
3000 J for $\tau = 0.5$ s

Dimensions in mm



Derating Curve



Series RST 200

AEC-Q200 ready

Absorbes high pulse energy within a very short period. Has high thermal capacity. Used in dumping, circuit breaking etc.

Features

- Aluminum housing for better heat dissipation
- Different connection possible (FAST-ON, wires)



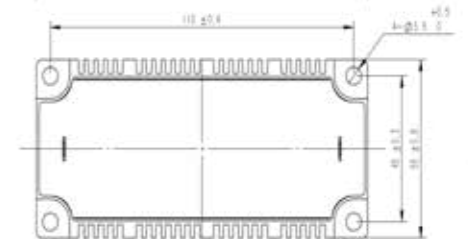
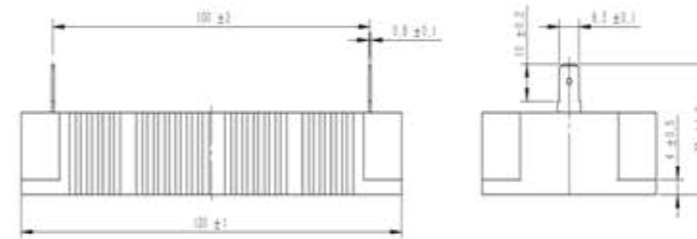
Technical Specifications

Resistance value	10 Ω to 300 Ω
Resistance tolerance	± 5 % to ± 10 %
Temperature coefficient	± 500 ppm/°C (referenced to 25 °C, ΔR taken at ~ 105 °C)
Power rating	200 W at 70 °C Ta (120 s continuous operation)
Operating voltage	≤ 1000 V DC (pre-charge voltage)
Insulation resistance	1000 V DC, min. 500 MΩ
Short time overload	3000 W, 70 °C 3 s
Insulation layer withstand voltage	3.5 kV rms, 50 Hz, 1 min.
Operating temperature	- 55 °C to + 225 °C
Mounting	M5 screw
Weight	~ 285 g

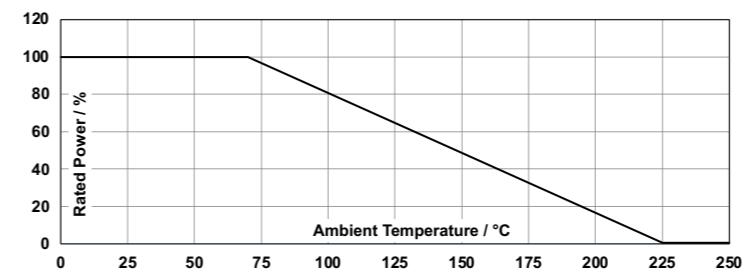
Typical Pulse Load (initial resistor temperatur ≤ 85 °C)

2300 J for $\tau = 0.1$ s
3150 J for $\tau = 0.2$ s
4000 J for $\tau = 0.5$ s

Dimensions in mm



Derating Curve



Series NWR



High short-time overload pulse application resistor, perfect for PCB mount. Can be used as DIScharge or PREcharge Resistor.

Features

- High pulse proof
- No flammable materials



Technical Specifications

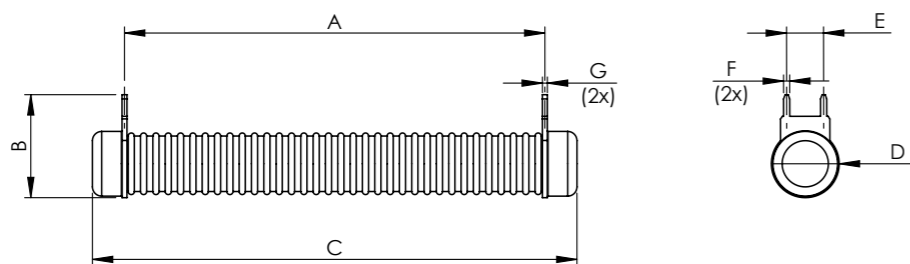
Resistance value	NWR 38: 10 Ω to 250 Ω NWR 50: 10 Ω to 400 Ω
Resistance tolerance	± 5 % to ± 10 %
Temperature coefficient	± 550 ppm/°C (referenced to 25 °C, dR taken at ~ 85 °C)
Power rating	NWR 38: 7 W at 25 °C Ta NWR 50: 11 W at 25 °C Ta
Operating voltage	600 V
Dielectric strength voltage	1800 V AC
Operating temperature	- 40 °C to + 175 °C
Storage temperature	- 40 °C to + 125 °C
Weight	NWR 38: ~ 13 g NWR 50: ~ 25 g

Typical Pulse Load (initial resistor temperatur ≤ 85 °C)

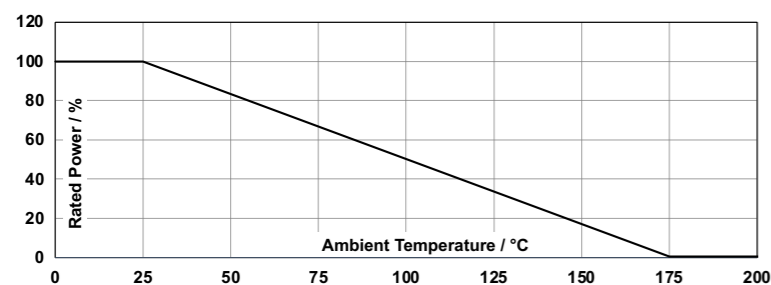
NWR 38	NWR 50
170 J for τ = 0.1 s	250 J for τ = 0.1 s
200 J for τ = 0.2 s	300 J for τ = 0.2 s
270 J for τ = 0.5 s	410 J for τ = 0.5 s

Dimensions in mm

Model no.	A	B	C	D	E	F	G
NWR 38	27.1	16.7	37.5	11.0	6.0	1.0	0.8
NWR 50	68.2	16.7	78.6	11.0	6.0	1.0	0.8



Derating Curve



Series ESP 60/20



The ESP thick-film resistor series is designed for PREcharge applications where space is limited. Its shape is similar to conventional fuses. It can be mounted using screws or fuse holders.

Features

- Robust power resistor without heat sink requirement
- Shape of a fuse for easy integration
- Screw or snap-in in connection



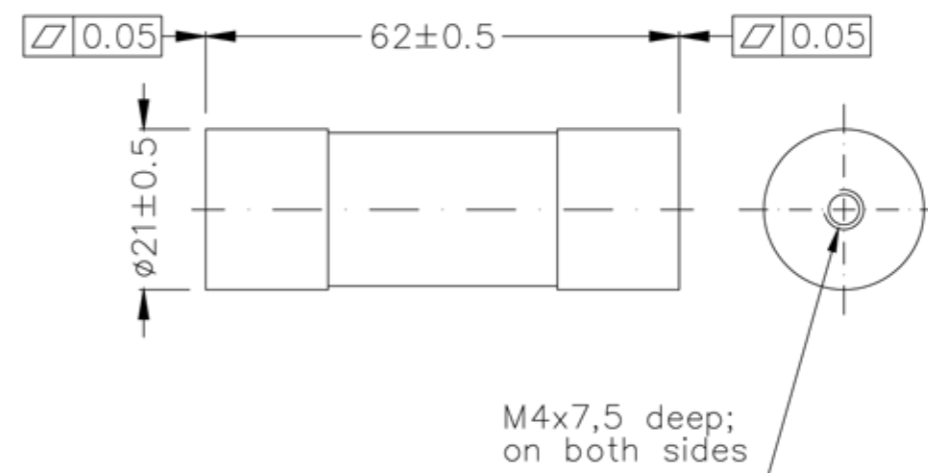
Technical Specifications

Resistance value	1 Ω to 1 kΩ
Resistance tolerance	± 5 % to ± 10 %
Temperature coefficient	± 250 ppm/°C (referenced to 25 °C, dR taken at ~ 85 °C)
Operating voltage	1000 V (higher on request)
Mounting	M4 screws, max. torque 3 Nm (static)

Typical Pulse Load (initial resistor temperatur ≤ 85 °C)

440 J for τ = 0.1 s
750 J for τ = 0.2 s
1700 J for τ = 0.5 s
2300 J for τ = 0.7 s
3300 J for τ = 1 s
4500 J for τ = 1.4 s

Dimensions in mm



Series TRM 26



The TRM 26 is the perfect passive discharge solution. Robust housing, strong heat-sink connection, and perfect for passive DIScharge applications.

Features

- 25 W rated power
- Cement filling



Technical Specifications

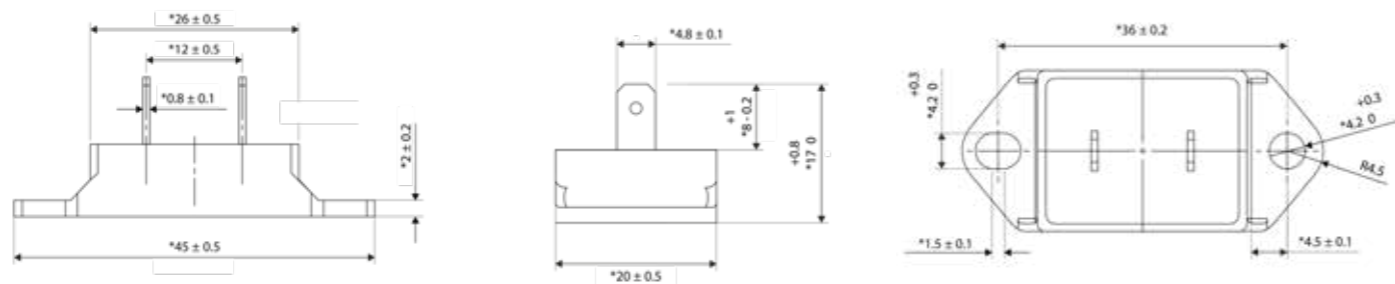
Resistance value	0.1 Ω to 1 MΩ
Resistance tolerance	± 5 % to ± 10 %
Temperature coefficient	± 150 ppm/°C (referenced to 25 °C, ΔR taken at ~ 105 °C)
Power rating	25 W at 25 °C bottom case temperature
Operating voltage	1000 V DC
Dielectric strength	3000 V AC, 60 s
Insulation resistance	>500 MΩ at 1000 V DC
Short time overload	2x rated power with applied voltage not to exceed 1.5x maximum continuous operating voltage for 5 s ΔR ≤ ±(0.3 % R + 0.001 Ω) max.
Load life	MIL-R-39009D , 2000 h at rated power, ΔR ≤ ±(1.0 % R + 0.001 Ω)
Humidity	MIL-Std-202, method 106, ΔR ≤ ±(0.5 % R + 0.001 Ω) max.
Thermal shock	MIL-Std-202, method 107, Cond F, ΔR ≤ ±(0.3 % R + 0.001 Ω) max.
Terminal strength	MIL-Std-202, method 211, Cond A (Pull Test) 2.4 N, ΔR ≤ ±(0.2 % R + 0.001 Ω) max.
Vibration high frequency	MIL-Std-202, method 204, Cond D, ΔR ≤ ±(0.2 % R + 0.001 Ω) max.
Operating temperature range	- 55 °C to + 225 °C
Mounting	M5 screw, 3 Nm
Weight	~ 12 g

Typical Pulse Load

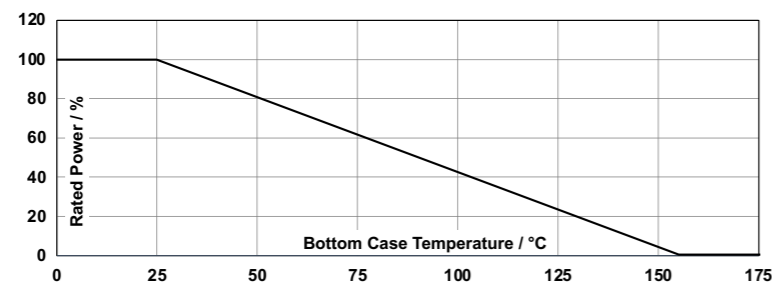
(initial resistor temperatur ≤ 85 °C)

- 30 J for τ = 0.1 s
- 45 J for τ = 0.2 s
- 65 J for τ = 0.5 s

Dimensions in mm



Derating Curve



Series EVR 150



Robust Power Resistor for direct mounting on a heat sink. The separate baseplate ensures a robust, excellent thermal interface to the heat sink. Fast-ON or press-fit terminals enable easy PCB connection. Typically used as a DIScharge resistor in inverter applications.

Features

- Baseplate for robust heat sink connection
- Different PCB connection (FAST-ON, wire, press-fit, solder pins)
- Great heat dissipation



Technical Specifications

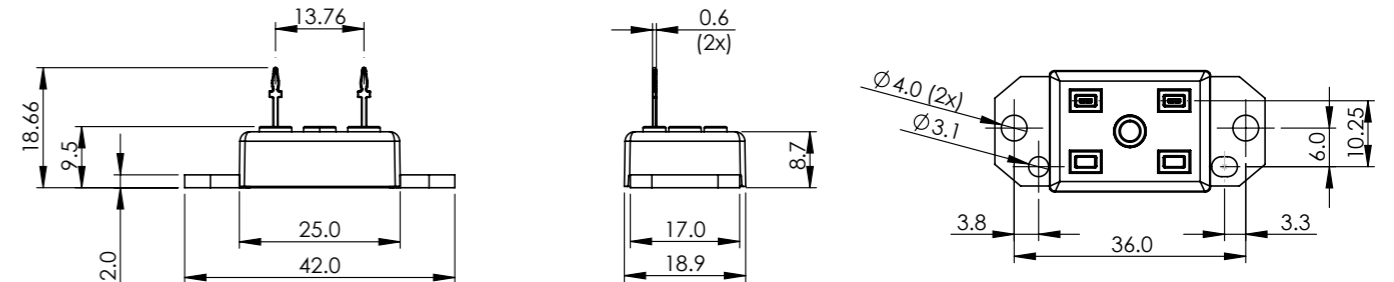
Resistance value	0.1 Ω to 1 MΩ
Resistance tolerance	± 1 % to ± 10 %
Temperature coefficient	R ≤ 10 Ω: ± 350 ppm/°C R > 10 Ω: ± 250 ppm/°C (referenced to 25 °C, dR taken at ~ 85 °C)
Power rating	150 W at 85 °C bottom case temperature
Short time overload	1.25x rated power at 85 °C bottom case for 200 ms
Operating voltage	1000 V
Dielectric strength	3000 V DC
Thermal resistance	0.45 K/W
Operating temperature range	- 55 °C to + 155 °C
Mounting	M3 screw, 1.5 Nm
Weight	~ 16 g

Typical Pulse Load

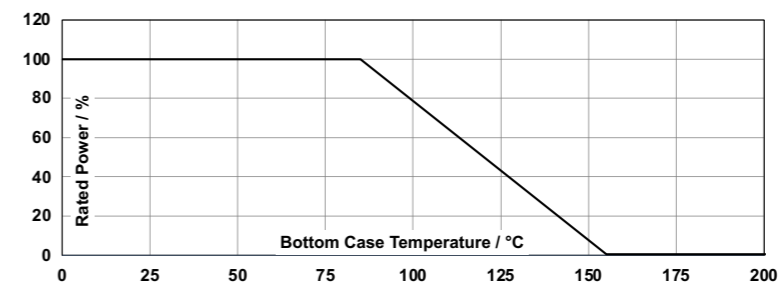
(initial resistor temperatur ≤ 85 °C)

- 50 J for τ = 0.1 s
- 70 J for τ = 0.2 s
- 120 J for τ = 0.5 s

Dimensions in mm



Derating Curve



Series EVR 250



The housing allows integration of two resistors. Ideal for active and passive DIScharge applications in automotive inverters.

Features

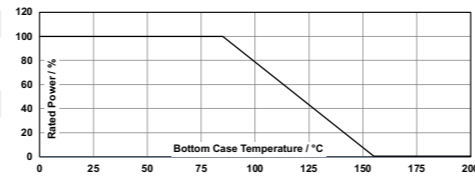
- Different PCB connection (FAST-ON, wire, press-fit, solder pins)
- Optional: active resistor, passive resistor, temperature sensor



Technical Specifications

Resistance value	0.1 Ω to 1 MΩ
Resistance tolerance	± 1 % to ± 10 %
Temperature coefficient	± 250 ppm/°C (referenced to 25 °C, ΔR taken at ~ 85 °C)
Power rating	250 W at 85 °C bottom case temperature
Short time overload	1.25x rated power at 85 °C bottom case temperature for 10 s, ΔR = 0.4 % max.
Operating voltage	1000 V DC
Partial discharge	up to 2000 Vrms / 80 pC
Dielectric strength	4000 V DC
Insulation resistance	> 10 GΩ at 1000 V DC
Isolation voltage between R1 & R2 & R3	500 V DC (1000 V DC on special request)
Thermal resistance	< 0.35 K/W
Serial inductivity	typical 40 nH, measuring frequency 10 kHz
Operating temperature	- 55 °C to + 155 °C
Mounting	1.3 Nm to 1.5 Nm M4 screws
Weight	~ 23 g

Derating Curve

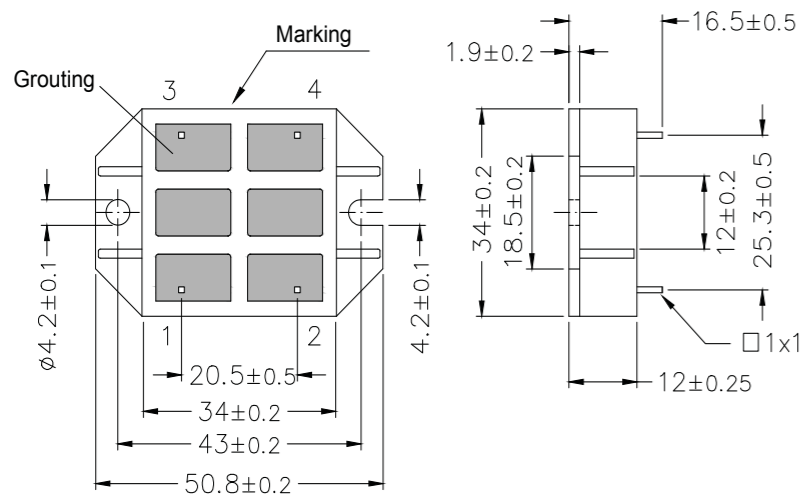


Typical Pulse Load

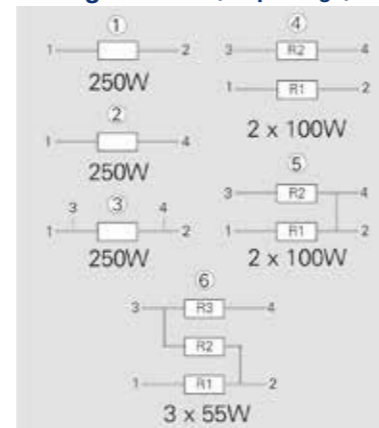
(initial resistor temperatur ≤ 85 °C)

- 110 J for τ = 0.1 s
- 150 J for τ = 0.2 s
- 240 J for τ = 0.5 s

Dimensions in mm



Configurations (P / package)



Version 5: ohmic value between contact 2 and 4 approx. 3mΩ

Series EVR V50



PCB soldered Power Resistor for continuous discharge applications such as passive discharge.

Features

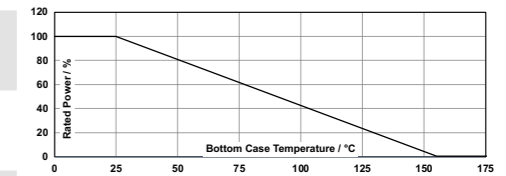
- Low profile SMD thick film resistor
- Best in class pulse energy performance
- Small size, surge capable film resistor
- TO-263 footprint



Technical Specifications

Resistance value	0.5 Ω to 1 kΩ
Resistance tolerance	± 0.5 % to ± 10 % (other values on special request) (measured at + 25 °C ± 3 °C)
Temperature coefficient	<2 Ω: ±500 ppm/°C 2 Ω to 10 Ω: ± 250 ppm/°C >10 Ω: ± 100 ppm/°C
Power rating	55 W at 25 °C bottom ceramic temperature
Operating temperature	- 55 °C to + 175 °C
Thermal resistance	< 3.0 K/W resistor to bottom solder pad
Operating voltage	900 V (not exceeding max. power)
Maximum operating current	10 A
Dielectric strength	1500 V AC (method: terminal and heat sink, 60 s 1 mA)
Capacity	13 pF, typical parallel capacity
Inductivity	50 nH, typical series inductivity
Load life	± 1 % (method: 25 °C, 90 min. ON, 30 min. OFF, 1000 h)
Humidity	± 1 % (method: 85 °C, 85 % RH, DC 0.25 W, 1000 h)
Temp. cycle	± 0.5 % (method: - 55 °C, 30 min., +125 °C, 30 min., 1000 cycle)
Solder heat	± 0.1 % (method: 260 °C ± 5 °C, 10 ± 1 s)
Lead solderability	over 95 % of surface (250 °C ± 5 °C, 3 s)
Insulation resistance	over 1000 MΩ (between terminals and heat sink)
Vibration	± 0.25 % (MIL-STD-202, Method 204)
Storage conditions	15-60 % rel. humidity (- 30 °C to + 70 °C)
Weight	< 0.4 g

Derating Curve



Typical Pulse Load

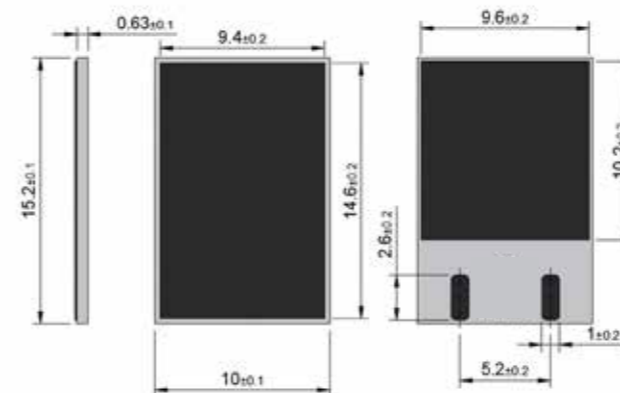
(initial resistor temperatur ≤ 85 °C)

- 20 J for τ = 0.1 s
- 25 J for τ = 0.2 s
- 35 J for τ = 0.5 s

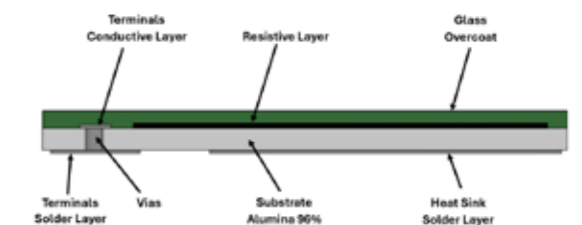
Circuit Diagram



Dimensions in mm



Construction



Series EVR S300



PCB Power Resistor for easy soldering and mounting. Compatible with SMT manufacturing lines for cost saving installation. Very low weight for good vibration behavior.

Features

- Reflow solderable
- Scalable to customer applications
- Almost no heat impact into PCB
- Additional usable space under the component



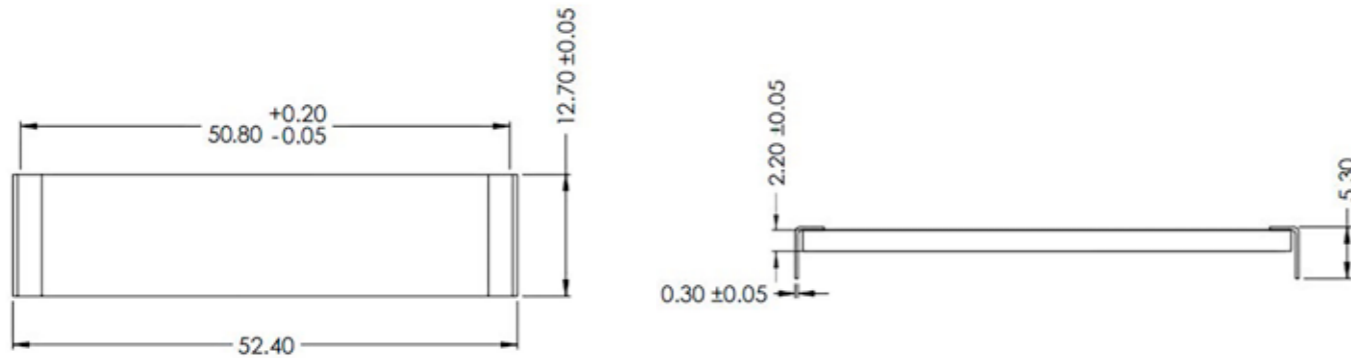
Technical Specifications

Resistance value	0.5 Ω to 1 MΩ
Resistance tolerance	± 0.5 % to ± 10 %
Temperature coefficient	± 150 ppm/°C (referenced to 25 °C, ΔR taken at ~ 105 °C)
Power rating	15 W at 25 °C Ta (120 s continuous operation)
Operating voltage	1000 V
Operating temperature	-55 °C to + 200 °C
Weight	~ 6 g

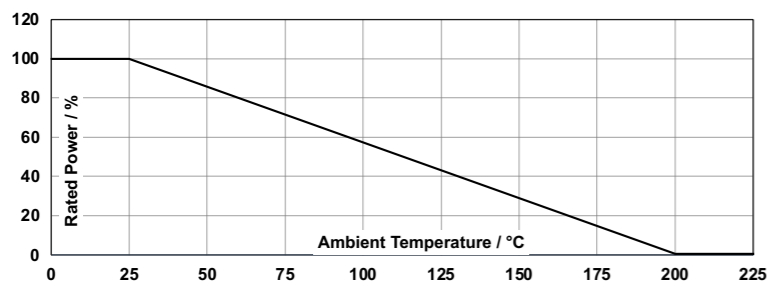
Typical Pulse Load (initial resistor temperatur ≤ 85 °C)

- 160 J for τ = 0.1 s
- 230 J for τ = 0.2 s
- 380 J for τ = 0.5 s

Dimensions in mm



Derating Curve



Series EVR S1000



PCB Power Resistor for easy soldering and mounting. Compatible with SMT manufacturing lines for cost saving installation. Very low weight for good vibration behavior.

Features

- Reflow solderable
- Scalable to customer applications
- Almost no heat impact into PCB
- Additional usable space under the component



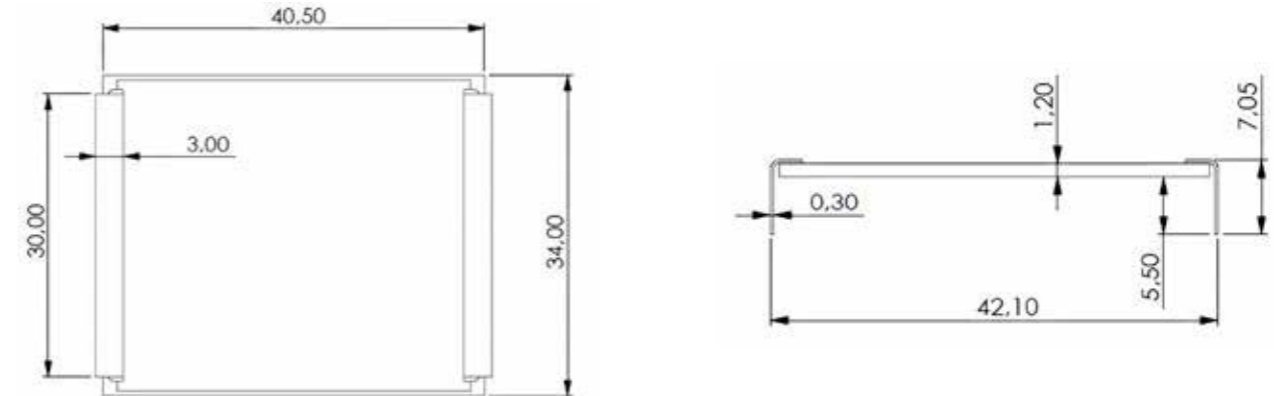
Technical Specifications

Resistance value	0.5 Ω to 1 MΩ
Resistance tolerance	± 0.5 % to ± 10 %
Temperature coefficient	± 150 ppm/°C (referenced to 25 °C, ΔR taken at ~ 105 °C)
Power rating	20 W at 25 °C Ta (150 s continuous operation)
Operating voltage	1000 V
Operating temperature range	-55 °C to + 200 °C
Weight	~ 8 g

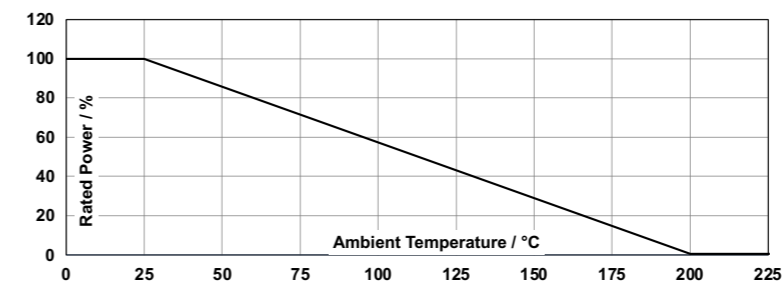
Typical Pulse Load (initial resistor temperatur ≤ 85 °C)

- 250 J for τ = 0.1 s
- 370 J for τ = 0.2 s
- 600 J for τ = 0.5 s

Dimensions in mm



Derating Curve



Series LXP 30



Miba offers the totally encapsulated and insulated TO-220 package for low ohmic value and non-inductive design for high-frequency and pulse-unloading applications. The LXP 30 series is rated at 30 W mounted to a heat sink.

Features

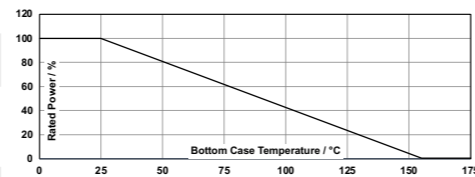
- 30 W operating power
- **TO-220 package** configuration
- Single-screw mounting simplifies attachment to heat sink
- Fully isolated heat sink



Technical Specifications

Resistance value	0.05 Ω to 1 MΩ
Resistance tolerance	± 1 % to ± 10 % ± 0.5 % on special request for limited ohmic values
Temperature coefficient	> 10 Ω ± 50 ppm/°C 1 Ω to 10 Ω ± 100 ppm/°C + 0.002 Ω (referenced to 25 °C, ΔR taken at ~ 105 °C)
Power rating	30 W at 25 °C bottom case temperature
Operation voltage	420 V
Dielectric strength	1800 V AC
Insulation resistance	> 10 GΩ at 1000 V DC
Short time overload	2x rated power with applied voltage not to exceed 1.5x maximum continuous operating voltage for 5 s ΔR ±(0.3 % + 0.001 Ω) max.
Load life	MIL -R-39009D, 2000 h 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	anti-oxidation tinned copper wire
Mounting	M3 screw, max. torque 0.9 Nm
Operating temperature	- 55 °C to + 155 °C

Derating Curve

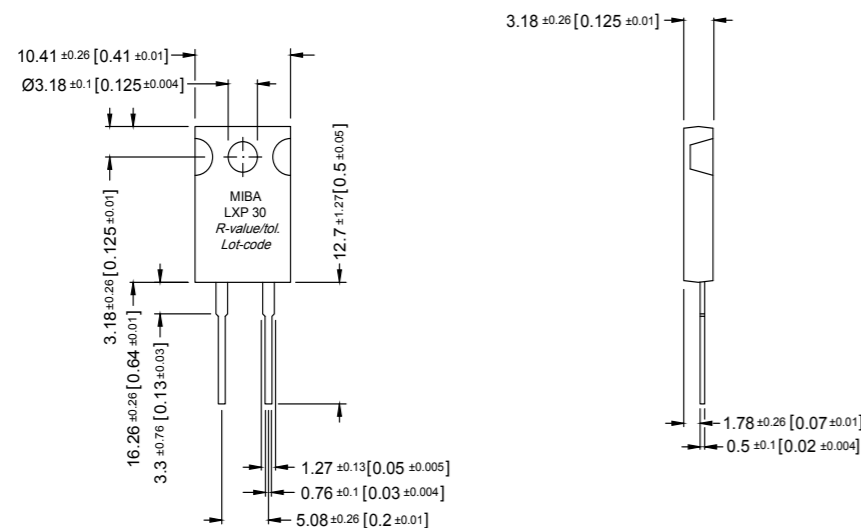


Typical Pulse Load

(initial resistor temperatur ≤ 85 °C)

- 12 J for τ = 0.1 s
- 16 J for τ = 0.2 s
- 24 J for τ = 0.5 s

Dimensions in mm [inches]



Series LXP 50



Miba offers the totally encapsulated and insulated TO-220 package for low ohmic value and non-inductive design for high-frequency and pulse-unloading applications. The LXP 50 series is rated at 50 W mounted to a heat sink.

Features

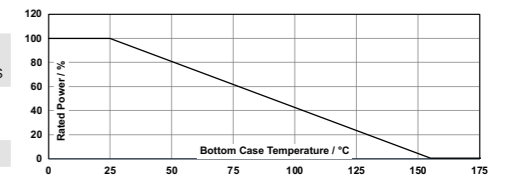
- 50 W operating power
- **TO-220 package** configuration
- Single-screw mounting simplifies attachment to heat sink
- Fully isolated heat sink



Technical Specifications

Resistance value	0.05 Ω to 1 MΩ
Resistance tolerance	± 1 % to ± 10 % ± 0.5 % on special request for limited ohmic values
Temperature coefficient	± 50 ppm/°C (referenced to 25 °C, ΔR taken at ~ 105 °C)
Power rating	50 W at 25 °C bottom case temperature
Operation voltage	420 V
Dielectric strength voltage	1800 V AC
Insulation resistance	> 10 GΩ at 1000 V DC
Short time overload	2x rated power with applied voltage not to exceed 1.5x maximum continuous operating voltage for 5 s ΔR ±(0.3 % + 0.001 Ω) max.
Load life	MIL -R-39009D, 2000 h 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	M3 screws, max. torque 0.9 Nm
Operating temperature	- 55 °C to + 155 °C

Derating Curve

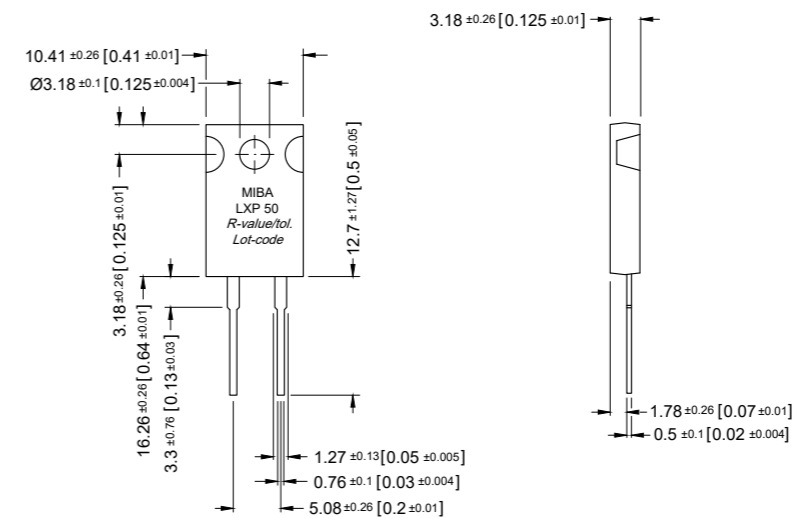


Typical Pulse Load

(initial resistor temperatur ≤ 85 °C)

- 18 J for τ = 0.1 s
- 24 J for τ = 0.2 s
- 36 J for τ = 0.5 s

Dimensions in mm [inches]



Series LXP 100



Miba offers the completely encapsulated and insulated TO-247 package for low ohmic value and non-inductive design for high-frequency and pulse-unloading applications. The LXP 100 series is rated at 100 W mounted to a heat sink.

Features

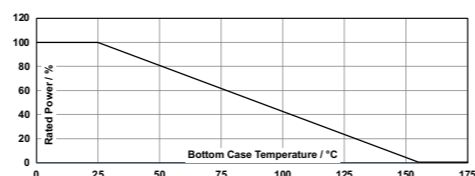
- Small and lightweight
- Easy PCB mount with solder pins possible
- Fast heat sink connection with clip or screw



Technical Specifications

Resistance value	0.05 Ω to 1 MΩ
Resistance tolerance	± 1 % to ± 10 %
Temperature coefficient	> 10 Ω: ± 50 ppm/°C (referenced to 25 °C, ΔR taken at + 105 °C)
Power rating	100 W at 25 °C bottom case temperature
Short time overload	1.5x rated power with applied voltage not to exceed 1.5x V max. for 5 s, ΔR < ±(0.50 % + 0.0005 Ω)
Operation voltage	350 V, max. 500 V on special request
Insulation resistance	> 10 GΩ at 1000 V DC
Dielectric strength voltage	1800 V AC
Load life	MIL -R-39009D 4.8.13, 2000 h at rated power, ΔR < ±(1.0 % + 0.0005 Ω)
Moisture resistance	-10 °C to +65 °C, RH > 90 % cycle 240 h, ΔR < ±(0.50 % + 0.0005 Ω)
Thermal shock	MIL -STD-202, method 107, Cond. F, ΔR < ±(0.50 % + 0.0005 Ω)
Terminal strength	MIL -STD-202, method 211, Cond. A (Pull Test) 2.4 N ΔR < ±(0.20 % + 0.0005 Ω)
Vibration, high frequency	MIL -STD-202, method 204, Cond. D, ΔR < ±(0.40 % + 0.0005 Ω)
Inductance (serial)	typical 20 nH, measuring frequency 10 kHz
Lead material	tinned copper
Mounting	0.7 Nm to 0.9 Nm M4 using a M3 screw and a compression washer mounting technique
Weight	~ 4 g

Derating Curve

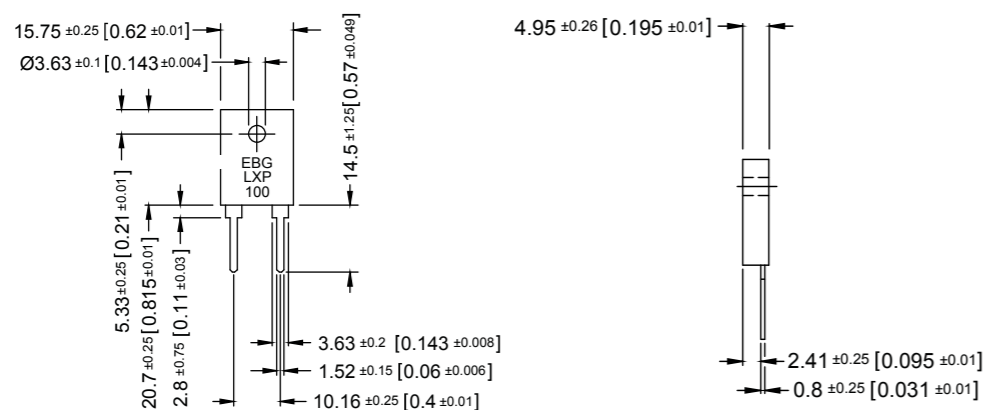


Typical Pulse Load

(initial resistor temperatur ≤ 85 °C)

- 30 J for τ = 0.1 s
- 40 J for τ = 0.2 s
- 60 J for τ = 0.5 s

Dimensions in mm [inches]



Series LXP 150



Miba offers the completely encapsulated and insulated TO-247 package for low ohmic value and non-inductive design for high-frequency and pulse-unloading applications. The LXP 150 series is rated at 150 W mounted to a heat sink.

Features

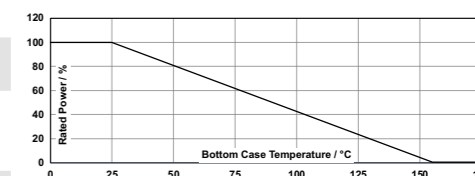
- 150 W operating power
- TO-247 package configuration
- Clip mounting simplifies attachment to heat sink



Technical Specifications

Resistance value	0.05 Ω to 1 MΩ
Resistance tolerance	± 1 % to ± 10 % ± 0.5 % on special request for limited ohmic values
Temperature coefficient	> 10 Ω: ± 50 ppm/°C referenced to 25 °C, ΔR taken at + 105 °C (other TCR on special request for limited ohmic values)
Power rating	150 W at 25 °C bottom case temperature
Operation voltage	700 V DC
Dielectric strength	1800 V AC
Insulation resistance	min. 10 GΩ
Short time overload	2 times rated power, but no more than 1.5 time max. continuous operating voltage, last 5 s, ΔR ≤ ±(0.3 %R + 0.001Ω)
Load life	2000 h at rated power, MIL-R-39009D ΔR ≤ ±(1.0 %R + 0.001Ω)
Moisture resistance	MIL-Std.-202, method 106, ΔR ≤ ±(0.5 %R + 0.001Ω)
Thermal shock	MIL-Std.-202, method 107, Cond. F ΔR ≤ ±(0.3 %R + 0.001Ω)
Terminal strength	MIL-Std.-202, method 211, Cond. A (pull test) 2.4 N ΔR ≤ ±(0.2 %R + 0.001Ω)
Vibration, high frequency	MIL-Std.-202, method 204, Cond. D ΔR ≤ ±(0.2 %R + 0.001Ω)
Operating temperature	- 55 °C to + 155 °C
Lead material	tinned copper
Weight	~ 4,2 g

Derating Curve

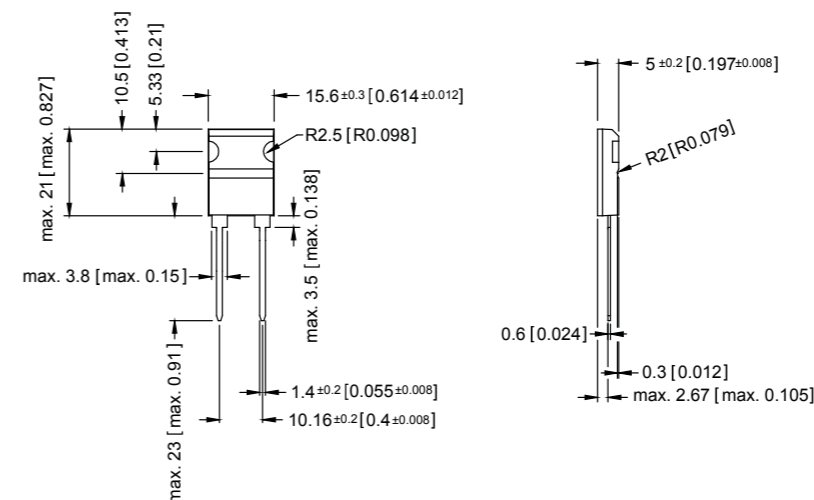


Typical Pulse Load

(initial resistor temperatur ≤ 85 °C)

- 30 J for τ = 0.1 s
- 45 J for τ = 0.2 s
- 65 J for τ = 0.5 s

Dimensions in mm [inches]



Series LHP 150



Miba offers the completely encapsulated and insulated TO-247 package for low ohmic value and non-inductive design for high-frequency and pulse-unloading applications. The LHP 150 series is rated at 150W mounted to a heat sink.

Features

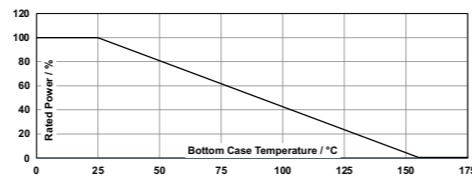
- 150 W operating power
- TO-247 package configuration
- Resistor package completely insulated from heat sink



Technical Specifications

Resistance value	0.05 Ω to 1 MΩ
Resistance tolerance	± 5 % to ± 10 % ± 0.5 % on special request for limited ohmic values
Temperature coefficient	± 150 ppm/°C (referenced to 25 °C, ΔR taken at ~ 105 °C)
Power rating	150 W at 25 °C bottom case temperature
Operation voltage	700 V
Dielectric strength	1800 V AC
Insulation resistance	min. 10 GΩ
Short time overload	2 times rated power, but no more than 1.5 time max. continuous operating voltage, last 5 s, ΔR ≤ ±(0.5 %R + 0.001 Ω)
Load life	2000 h at rated power, MIL-R-39009D ΔR ≤ ±(1.0 %R + 0.001 Ω)
Moisture resistance	MIL-Std.-202, method 106, ΔR ≤ ±(0.5 %R + 0.001 Ω)
Thermal shock	MIL-Std.-202, method 107, Cond. F ΔR ≤ ±(0.3 %R + 0.001 Ω)
Terminal strength	MIL-Std.-202, method 211, Cond. A (pull test) 2.4 N ΔR ≤ ±(0.2 %R + 0.001 Ω)
Vibration, high frequency	MIL-Std.-202, method 204, Cond. D ΔR ≤ ±(0.2 %R + 0.001 Ω)
Operating temperature	-55 °C to + 155 °C
Lead material	tinned copper
Weight	~ 4 g

Derating Curve

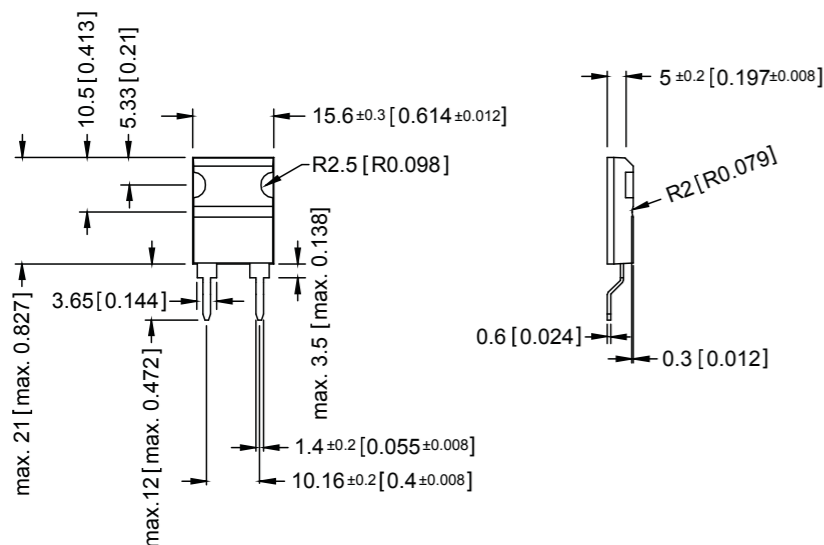


Typical Pulse Load

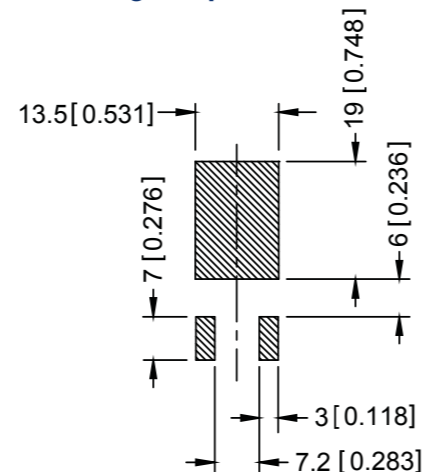
(initial resistor temperatur ≤ 85 °C)

- 30 J for τ = 0.1 s
- 45 J for τ = 0.2 s
- 65 J for τ = 0.5 s

Dimensions in mm [inches]



Soldering Template



Series PXP 200



Robust power resistor for pulse power as well as continuous-load applications. Wire leads or solder pin connections provide high flexibility for system integration.

Features

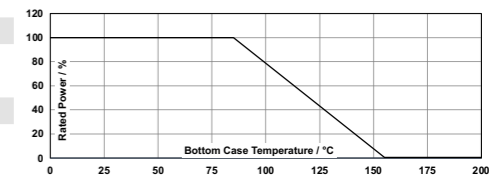
- All-round 200 W power resistor
- Different PCB connection (FAST-ON, wire, press-fit, solder pins, screws)
- Optional: active resistor, passive resistor, temperature sensor



Technical Specifications

Resistance value	0.1 Ω to 1 MΩ
Resistance tolerance	± 1 % to ± 10 %
Temperature coefficient	> 1 Ω: ±250 ppm/°C (referenced to 25 °C, ΔR taken at ~ 105 °C)
Power rating	200 W at 85 °C bottom case temperature
Short time overload	1.25x rated power at 85 °C bottom case temperature for 10 s, ΔR = 0.4 % max. (for conf. 1, 2 and 3)
Operating voltage	500 V DC up to 1500 V = "S"-version up to 1500 V + higher pulse capability = "U"-version on special request
Partial discharge	up to 2000 Vrms / 80 pC
Dielectric strength	4000 V DC
Insulation resistance	> 10 GΩ at 1000 V DC
Isolation voltage between R1 & R2 & R3	500 V DC (1000 V DC on special request)
Thermal resistance	< 0.35 K/W
Capacitance/mass	45 pF (typical), measuring frequency 10 kHz
Serial inductivity	PXP-1 typical 40 nH, measuring frequency 10 kHz
Operating temperature	- 55 °C to + 155 °C
Mounting	1.3 Nm to 1.5 Nm M4 screws
Weight	~ 20 g

Derating Curve

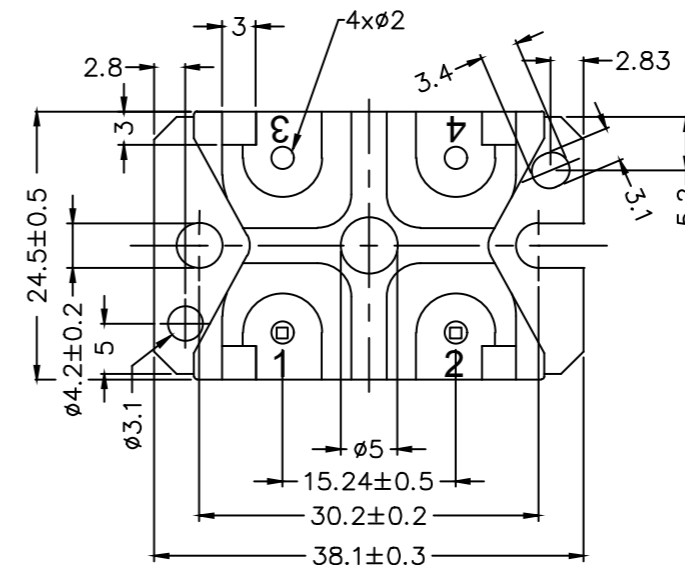


Typical Pulse Load

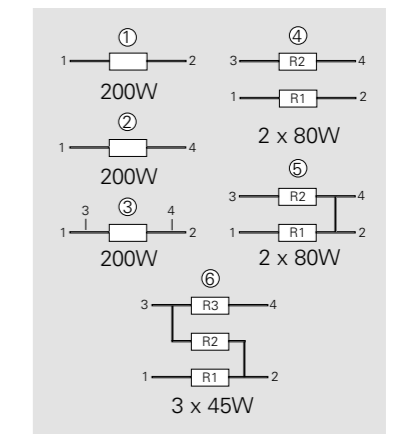
(initial resistor temperatur ≤ 85 °C)

- 60 J for τ = 0.1 s
- 80 J for τ = 0.2 s
- 140 J for τ = 0.5 s

Dimensions in mm



Configurations (P / package)



Version 5: ohmic value between contact 2 and 4 approx. 3mΩ

Series HXP 200



Robust power resistor with screw terminal PCB. The connection remains secure regardless of vibration profile. Ideal for harsh commercial or automotive inverter and on-board charger applications.

Features

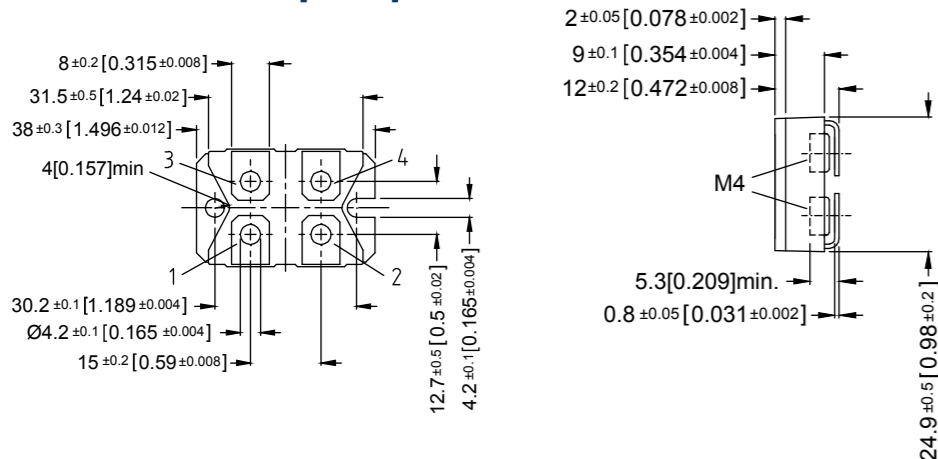
- All-round 200 W continuous power resistor
- Optional: active resistor, passive resistor, temperature sensor



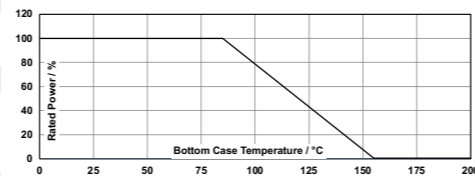
Technical Specifications

Resistance value	0.1 Ω to 1 MΩ
Resistance tolerance	± 1 % to ± 10 %
Temperature coefficient	> 1 Ω: ± 250 ppm/°C (referenced to 25 °C, ΔR taken at ~ 105 °C)
Power rating	200 W at 85 °C bottom case temperature
Short time overload	1.25x rated power at 85 °C bottom case temperature for 10 s, ΔR = 0.4 % max. (for conf. 1, 2 and 3)
Operating voltage	500 V up to 1500 V = "S"-version up to 1500 V + higher pulse capability = "U"-version on special request
Partial discharge	up to 2000 Vrms / 80 pC (Tests only on special request)
Dielectric strength	4000 V DC
Insulation resistance	> 10 GΩ at 1000 V DC
Isolation voltage between R1 & R2 & R3	500 V DC (1000 V DC on special request)
Protection class	acc. to IEC 950/CSA22.2 950/M-89 and EN 60950.88:2
Comparative Tracking Index (CTI)	standard > 200 V (> 600 V on special request = "H"-version)
Thermal resistance	< 0.35 KW
Capacitance/mass	45 pF (typical), measuring frequency 10 kHz
Serial inductivity	HXP-1 typical 40 nH, measuring frequency 10 kHz
Operating temperature	- 55 °C to + 155 °C
Mounting - torque for base plate (static)	1.3 Nm to 1.5 Nm M4 screws
Mounting - torque for contacts (static)	1.1 Nm to 1.3 Nm M4 screws, screw-in depth max. 5 mm
Weight	~ 26 g

Dimensions in mm [inches]



Derating Curve

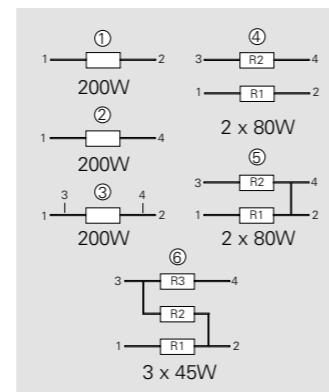


Typical Pulse Load

(initial resistor temperatur ≤ 85 °C)

- 60 J for τ = 0.1 s
- 80 J for τ = 0.2 s
- 140 J for τ = 0.5 s

Configurations (P / package)



Version 5: resistance between contact 2 and 4 approx. 3 mΩ

Series UXC 800



The UXC 800 is the most powerful discharge resistor. The easy mounting concept secures an auto-calibrated pressure to the heat sink for the highest performance.

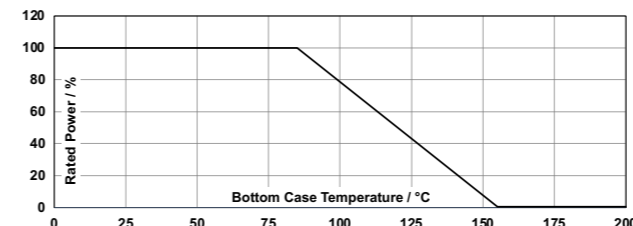
Features

- 800 W operating power
- Non-Inductive design
- ROHS compliant
- High insulation & partial discharge performance
- Materials in accordance with UL 94 V-0
- Thermal interface management available (ask for details)



Technical Specifications

Resistance value	0.03 Ω to 1 MΩ
Resistance tolerance	± 5 % to ± 10 % ± 1 % to ± 2 % on special request for limited ohmic values with the reduction of the max. power / pulse rating (ask for details)
Temperature coefficient	± 500 ppm/°C (0.1 Ω to 0.25 Ω) standard ± 150 ppm/°C (> 0.25 Ω to 1 MΩ) standard (referenced to 25 °C, ΔR taken at ~ 105 °C)
Power rating	800 W at 85 °C bottom case temperature
Short time overload	1000 W at 70 °C for 10 s, ΔR = 0.4 % max.
Operating working voltage	5000 V DC = 3500 V AC RMS (50 Hz) higher voltage on request, not exceeding max. power
Maximum continuous current	150 A (HC or UHC version)
Dielectric strength	7 kVrms / 50 Hz / 500 VA, test time 1 min. between terminal and case (up to 12 kVrms on request) voltages above 10 kVrms are tested at DC equivalent to avoid pre damage of component
Partial discharge	4 kVrms < 10 pC (up to 7 kVrms < 10 pC on request) acc. to IEC 60270
Peak current	up to 1500 A depending on pulse width and frequency (ask for details)
Insulation resistance	> 10 GΩ at 1000 V
Single shot voltage	up to 12 kV norm wave (1.5/50 μs)
Creeping distance	> 42 mm (standard, higher on request)
Air distance	> 14 mm (standard, higher on request)
Inductance	≤ 80 nH (typical), measuring frequency 10 kHz
Capacity/mass	≤ 140 pF (typical), measuring frequency 10 kHz
Capacity/parallel	≤ 40 pF (typical), measuring frequency 10 kHz
Operating temperature	- 55 °C to + 155 °C
Mounting - torque for contacts	1.8 Nm to 2 Nm
Mounting - torque	1.6 Nm to 1.8 Nm M4 screws
Internal temperature sensor available on request	PT-1000 / PT-100 / Type K / Type J (ask for details)
Cable variation available on request	HV-cable / Flying leads (ask for details)
Standard cable type	H&S Radox 9 GKW AX 1.5 mm ² (other cable types on special request)
Weight	~ 120 g



Typical Pulse Load

(initial resistor temperatur ≤ 85 °C)

- 450 J for τ = 0.1 s
- 660 J for τ = 0.2 s
- 1100 J for τ = 0.5 s

General Specifications

Electric support

Alumina metalized with Miba ALTOX film on the bottom for improved heat transfer and optimum discharge.

Encapsulation

Resin-filled epoxy casing with large creeping distance to mass, large air distance between the terminals and high insulation resistance (CTI 600).

Resistance element

Special design for low inductance and capacitance values. The element employs our special METOXFILM, which demonstrates stability while covering high wattage and pulse loading.

Housing

Housings are made without color additives. The color definition is natural and can vary in different pigmentation.

Contacts

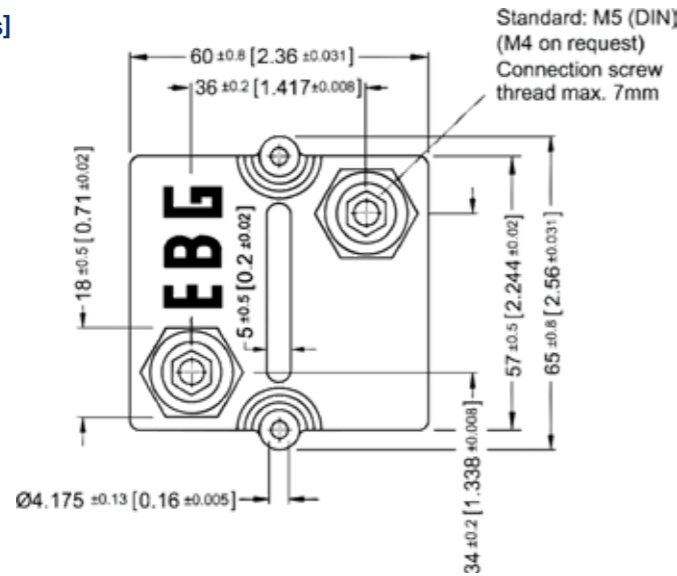
Easy load connection with M4 and M5 screws (inch thread terminals on request)
Connector height available from 25 mm to 42 mm.

Various sleeves for increasing creeping distance up to 85 mm or potted cable connections are available on request
Contacts standard M5 (M4 on special request - connection screw thread max. 7 mm.)

Series UXC 800



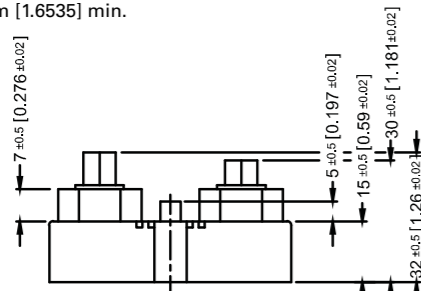
Dimensions in mm [inches]



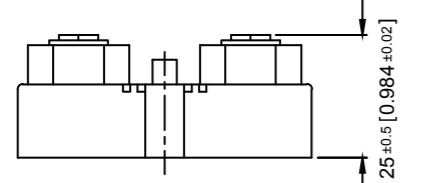
Standard Terminals

Air distance: 14 mm [0.5512] min.
Creeping distance: 42 mm [1.6535] min.

Terminal height 30/32
Standard



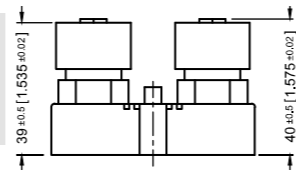
Terminal height 25/25
Optional



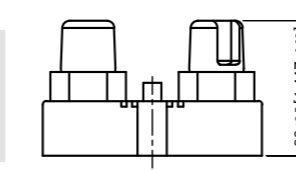
Terminal Options (for increased air & creeping distances)

Other terminal dimensions available, contact for more information

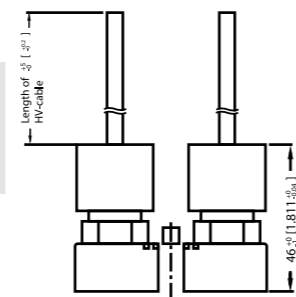
UXC 800-9
Air distance: 25 mm [0.984] min.
Creeping distance: 83 mm [3.267] min.



UXC 800-7
Air distance: 26.7 mm [1.0512] min.
Creeping distance: 50 mm [1.968] min.



UXC 800-16
Air and creeping distance depends on length of HV-cable



Test Specifications*

Test	Method	Resistance Drift**
Short time overload	1000 W / 10 s	0.40 %
Humidity steady state	56 days / 40 °C / 95 %	0.25 %
Temp. Cycling	- 55 °C / + 125 °C / 5 cycles	0.20 %
Shock	40 g / 4000 times	0.25 %
Vibrations	2 Hz to 500 Hz / 10 g	0.25 %
Load life 3000 cycles	PN 30 min. on / 30 min off	0.40 %
Terminal strengths	200 N for hexa. thread contacts	0.05 %

* The test methods are according to IEC 60068-2.

** The resistance drift is the possible change of the resistance value because of the certain test.

Series FDR



Fast DIScharge Resistor with a low-ohmic value ensures discharge of all capacities in a crash event. The unique functionality of this resistor provides safe disconnection after full discharge in the beginning of a possible new pulse.

Features

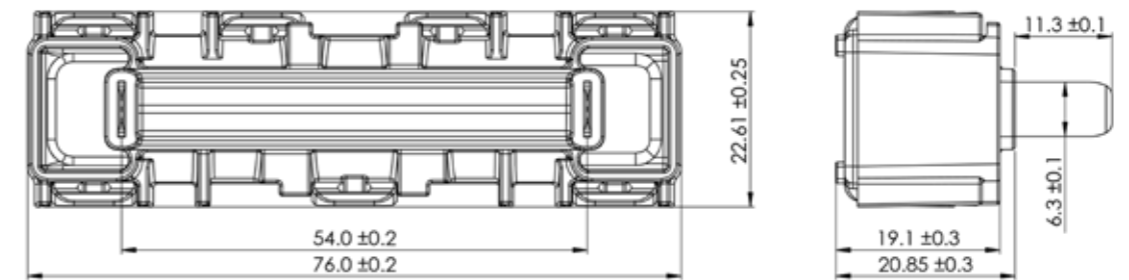
- Safe opening functionality
- Low resistance
- Fast opening time



Technical Specifications

Resistance value	0.1 Ω to 1 Ω
Resistance tolerance	± 5 % to ± 10 %
Operating voltage	1000 V
Typical pulse load capability	1000 J
Weight	~ 40 g

Dimensions in mm



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