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Main Markets & Applications

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RESISTORS

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Industry

- Motor drives
- Power supplies (welding, melting, laser)
- Instrumentation

Energy

- Power generation, UPS
- Renewables (wind, solar, PV)
- Transmission/distribution (HVDC)
- Grid stability



Transportation / Automotive

- Marine
- Busses and CAVs (truck, mining, construction)
- Traction (inverters for trains, underground, tramway)
- Passenger cars, light commercial vehicles



Medical

- X-Ray, MRI, CT

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RESISTORS

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New Designs & Product Developments

RST5N

Wire Wound Resistor

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RESISTORS

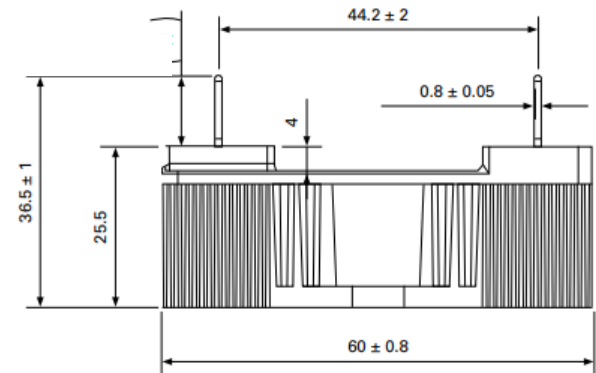
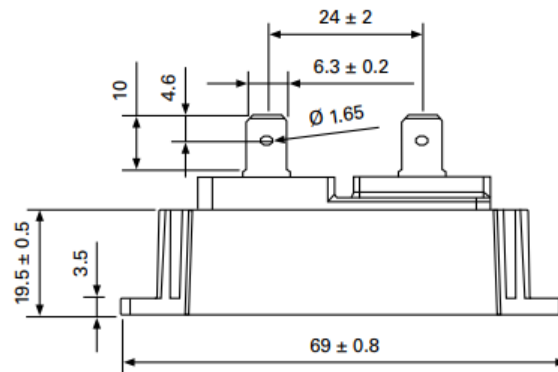
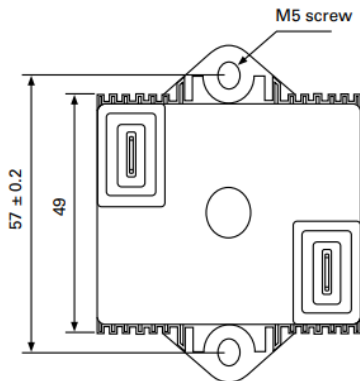
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Technical Specification:

- Ohmic value: 25 Ω - 200 Ω
- Resistance tolerance: $\pm 5\%$ to $\pm 10\%$
- Temperature coefficient: ≤ 1000 ppm/ $^{\circ}\text{C}$
- Power rating: 100 W at 85 $^{\circ}\text{C}$ bottom case temp.
- Max. operating voltage: ≤ 1000 V DC (pre-charge voltage)
- Dielectric strength: 3 kVrms, 1 min., 50 Hz
- Insulation resistance: 500 M Ω at 1000 V
- Resistor installation: M5 screw, max. torque 3Nm

AEC-Q200 compliant



Dimension in mm

RST3

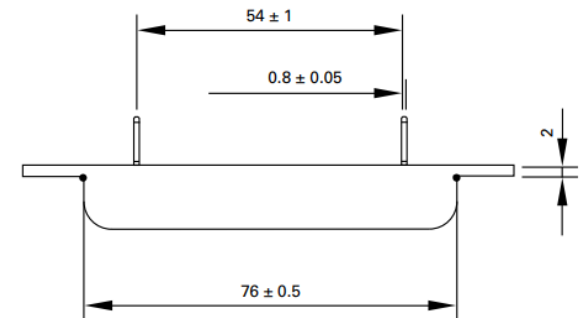
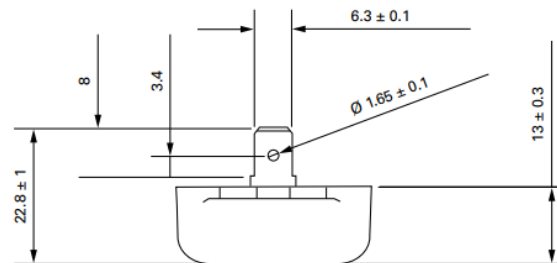
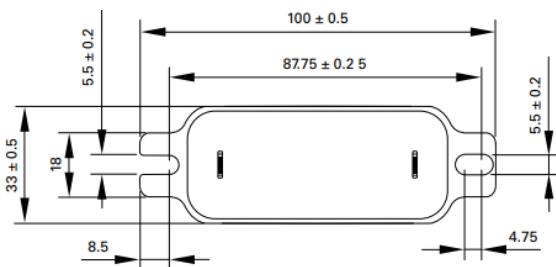
Wire Wound Resistor



AEC-Q200 compliant

Technical Specification:

- Ohmic value: $1 \Omega - 100 \Omega$
- Resistance tolerance: $\pm 5 \%$
- Temperature coefficient: $\leq 500 \text{ ppm}/^\circ\text{C}$
- Power rating: 75 W at 25°C bottom case temp.
- Max. operating voltage: 800 V DC
- Dielectric strength: 3000 V DC for 60s.
- Operating temperature range ambient: -40°C to $+150^\circ\text{C}$



Dimension in mm

LCR-6000

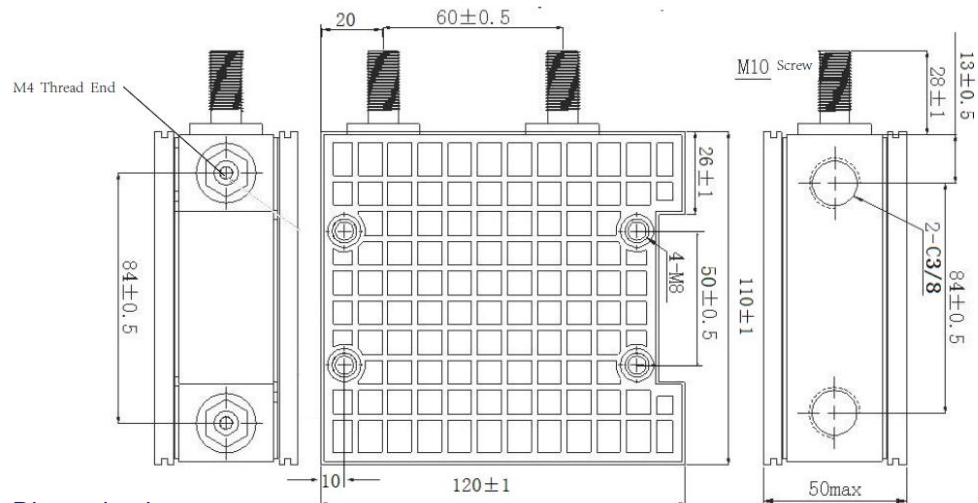
Direct water-cooled resistor



- The resistor is made of metal alloy structure
- Direct water cooling with high purity water (or 50% ethylene glycol) shows better results compared to traditional cooling method

Technical Specification:

- Ohmic value: $1 \Omega - 130 \Omega$
- Resistance tolerance: $\pm 1 \% \text{ to } \pm 5 \%$
- Temperature coefficient: $\pm 150 \text{ ppm}/^\circ\text{C}$
- Maximum peak voltage: 8.5 kV DC
- Power rating: 6000 W at 6 l/min.
(inlet $\leq 50^\circ\text{C}$, outlet $\leq 65^\circ\text{C}$)
8000 W at 8 l/min.
(inlet $\leq 50^\circ\text{C}$, outlet $\leq 65^\circ\text{C}$)
- Dielectric strength voltage: 11 kVrms / 50Hz, 1min.
- Air Distance: $> 17 \text{ mm}$
- Short time overload: 1.5 rated power, 5 s.



Dimension in mm

ACP-100

Low Power Resistor

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AEC-Q200 compliant

**Resistor is also available
with preapplied PCM
(Phase Change Material)**

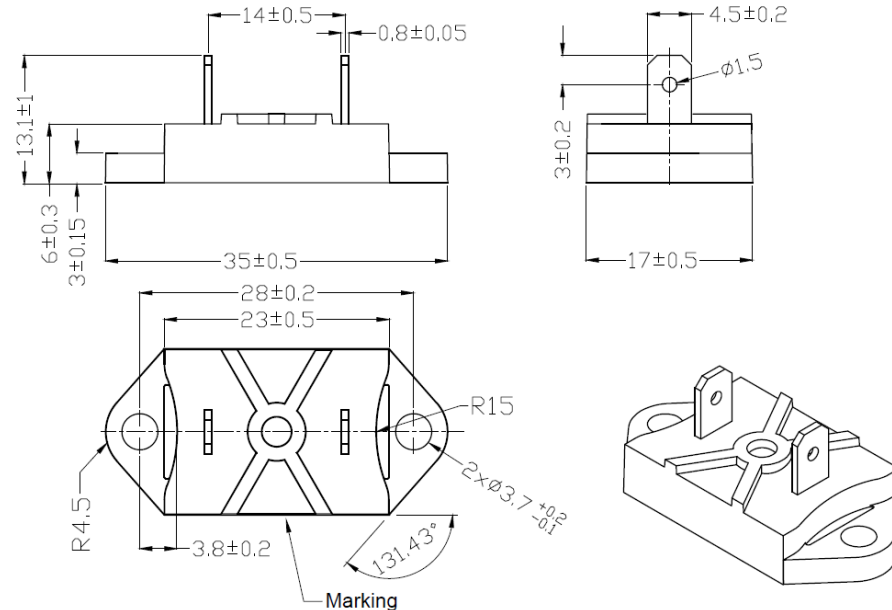
vibration & high pulse proof

typical fail safe mode

no smoking, fire, explosion

Technical Specification:

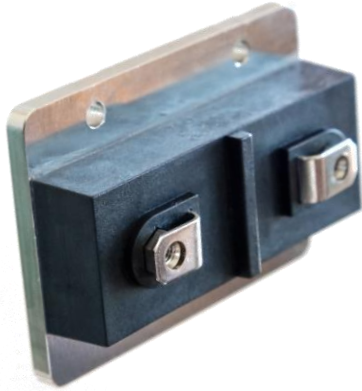
- Ohmic value: on request
- Resistance tolerance: on request
- Temperature coefficient: ± 150 ppm/ $^{\circ}$ C
- Maximum working voltage: 600 V
- Power rating: 100 W at 85 $^{\circ}$ C bottom case temp.
- Dielectric strength: 3000 V DC for 60 s.
- Discharge power: 62 W



Dimension in mm

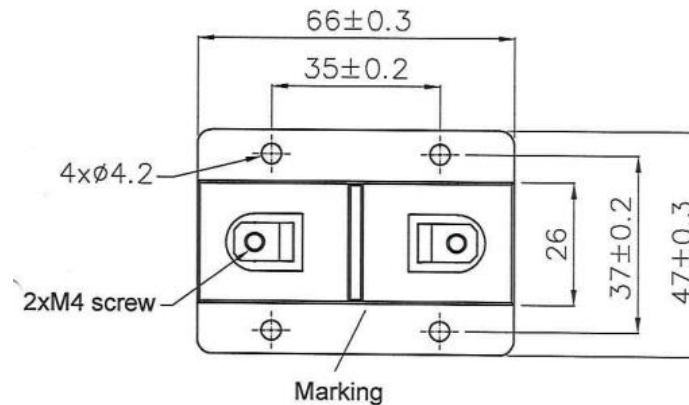
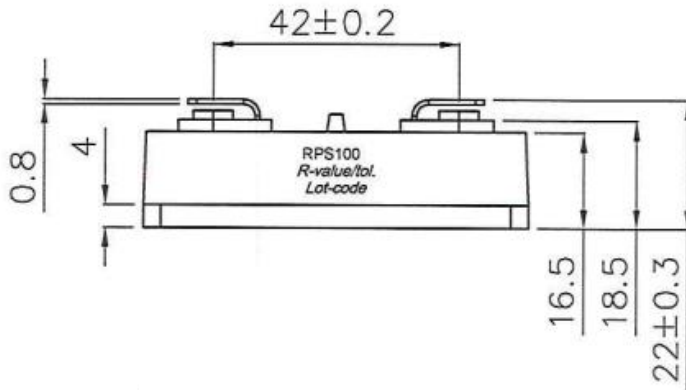
RPS-100

Flange Plate Resistor



Technical Specification:

- Ohmic value: 0.1 Ω - 1 M Ω
- Resistance tolerance: $\pm 1\%$ to $\pm 10\%$
- Temperature coefficient: ± 150 ppm/ $^{\circ}$ C
- Power rating: 150 W at 70 $^{\circ}$ C (installed on heatsink)
10 W at 25 $^{\circ}$ C (free air)
- Max. operating voltage: 2000 V AC or 4000 V DC
- Dielectric strength: 5 kV AC for 1min.
- Base plate installation: M4 screw, max. torque 2 Nm
- Contact installation: M4 screw, max. torque 1 Nm



Dimension in mm

Our Ultra-High-Power Resistors are now



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UXP[®] - 350/600/800/2000

UXC - 250/300/350/600/750/800

UPT[®] - 400/600/800

UFX - 250/300/350/580/600/750/800



UFX- Series

Ultra-High-Power Resistors



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Resistor is also available with preapplied PCM
(Phase Change Material)

Single ceramic for
high serial production



Automotive Grade

Multiple resistors in
1 package

Available in
250 W, 300 W, 350 W, 580 W, 600 W, 750 W, 800 W

UXC- Series

Ultra-High-Power Resistors



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Resistor is also available with preapplied PCM
(Phase Change Material)

Single ceramic for
high serial production



Automotive Grade

Different terminal options
available

Available in
250 W, 300 W, 350 W, 580 W, 600 W, 750 W, 800 W

UXP[®]-2000-UHC

New 150A connection & new low ohmic values ≥ 100 mR

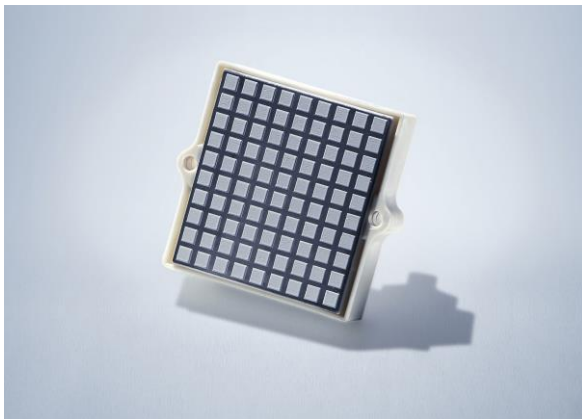


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**Resistor is also available
with preapplied PCM
(Phase Change Material)**



Technical Specification:

- Ohmic value: $\geq 0.1 \Omega - 0.31 \Omega$
- Resistance tolerance: $\pm 5 \%$ to $\pm 10 \%$
- Maximum working voltage: 5000 V DC
- Maximum continuous current: 150 A
- Power rating: 2000 W at 125°C bottom case temp.
- Electric strength voltage: 7 kVrms / 50 Hz
- Single shot voltage: up to 12 kV norm wave (1.5/50 μ sec.)

- Creeping distance: > 42 mm standard (higher on request)
- Air distance: > 14 mm standard (higher on request)

- Internal Temperature Sensor: PT-1000 / PT-100 available
- Cable variation available: HV-cable / flying leads

UXP[®]-800-UHC

New 150A connection & new low ohmic values ≥ 50 mR

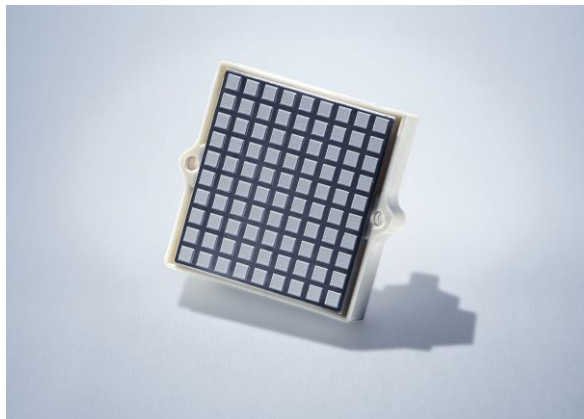


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**Resistor is also available
with preapplied PCM
(Phase Change Material)**



Technical Specification:

- Ohmic value: $\geq 0.05 \Omega - 0.1299 \Omega$
- Resistance tolerance: $\pm 5 \%$ to $\pm 10 \%$
- Maximum working voltage: 5000 V DC
- Maximum continuous current: 150 A
- Power rating: 800 W at 85°C bottom case temp.
- Electric strength voltage: 7 kVrms / 50 Hz
- Single shot voltage: up to 12 kV norm wave (1.5/50 μ sec.)

- Creeping distance: > 42 mm standard (higher on request)
- Air distance: > 14 mm standard (higher on request)

- Internal Temperature Sensor: PT-1000 / PT-100 available
- Cable variation available: HV-cable / flying leads

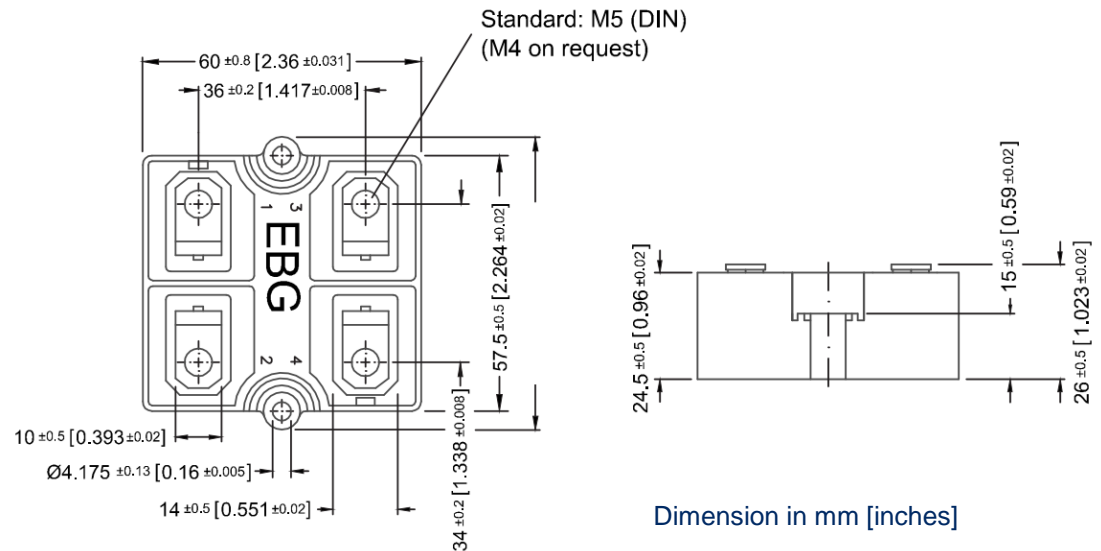
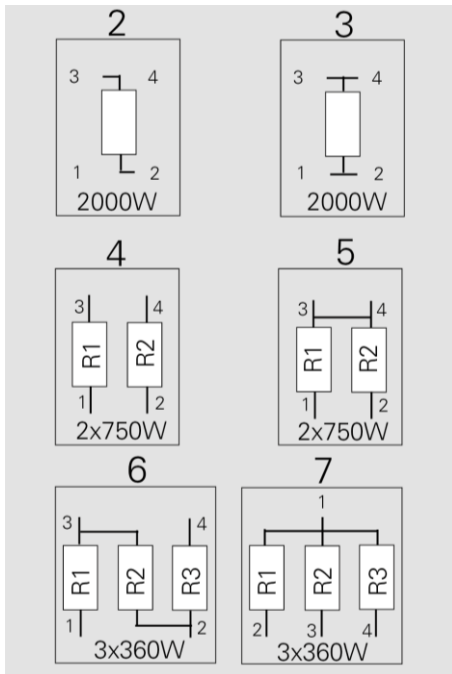
UPT[®]-2000

2000 W at 125°C bottom case

Resistor is also available with preapplied PCM (Phase Change Material)

Technical Specification:

- Ohmic value: 0.15 Ω - 1 KΩ
- Resistance tolerance: ±5 % to ±10 %
- Temperature coefficient: ±150 ppm/°C
- Maximum working voltage: 5000 V DC
- Power rating: 2000 W at 125°C bottom case temp.
- Electric strength voltage: 7 kVrms / 50 Hz
- Single shot voltage: up to 12 kV norm wave (1.5/50 μsec.)
- Partial discharge: 4 kVrms < 10 pC
- Dielectric strength between R1 & R2: > 5 kV DC



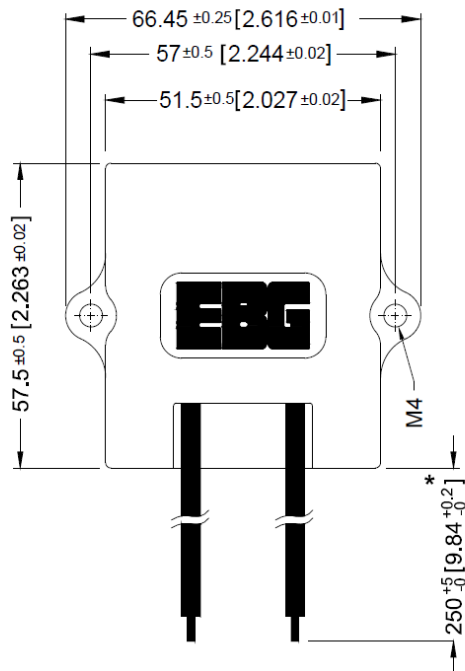
ULX[®]-2000

2000 W at 125°C bottom case

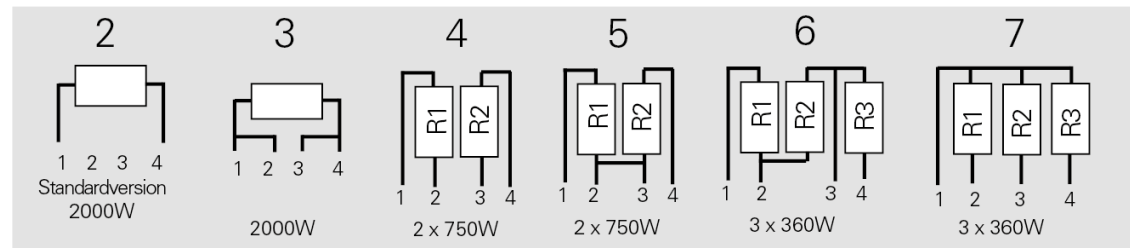
*Resistor is also available
with preapplied PCM
(Phase Change Material)*

Technical Specification:

- Ohmic value: 0.15 Ω - 1 KΩ
- Resistance tolerance: ±5 % to ±10 %
- Temperature coefficient: ±150 ppm/°C
- Maximum working voltage: 5000 V DC
- Power rating: 2000 W at 125°C bottom case temp.
- Electric strength voltage: 6 kVrms / 50 Hz
- Single shot voltage: up to 12 kV norm wave (1.5/50 μsec.)
- Partial discharge: 4 kVrms < 10 pC
- Dielectric strength between R1 & R2: > 5 kV DC



Dimension in mm [inches]



PXP-200 (solder pin)

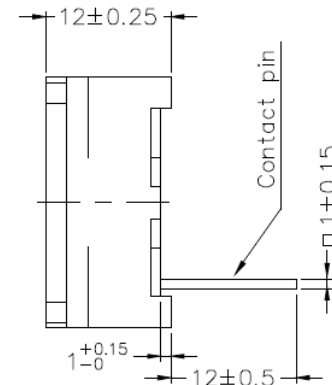
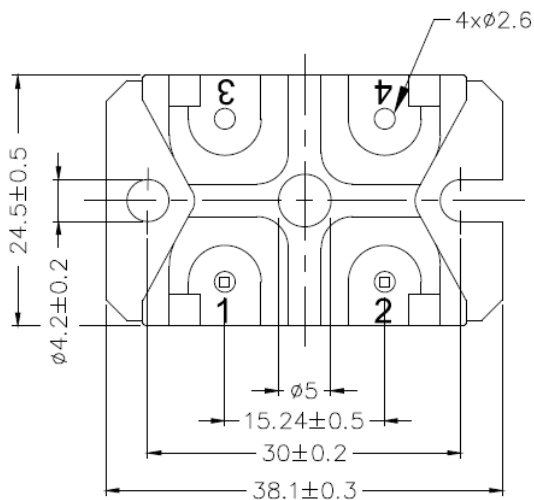
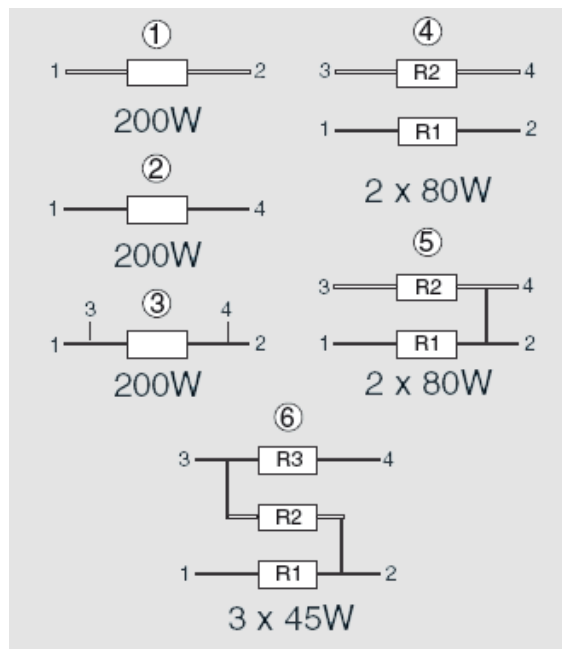
200 W at 85°C bottom case

Resistor is also available with preapplied PCM (Phase Change Material)



Technical Specification:

- Ohmic value: 0.1 Ω - 1 MΩ
- Resistance tolerance: ±1 % to ±10 %
- Temperature coefficient: ±250 ppm/°C
- Maximum working voltage: 500 V DC (up to 1.500 V on request)
- Power rating: 200 W at 85°C bottom case temp.
- Electric strength voltage: up to 4000 V DC gainst ground
- Isolation voltage between R1 & R2 500 V
- Partial discharge: up to 2 kVrms / 80 pC



Dimension in mm

LPP-250 (press pin)

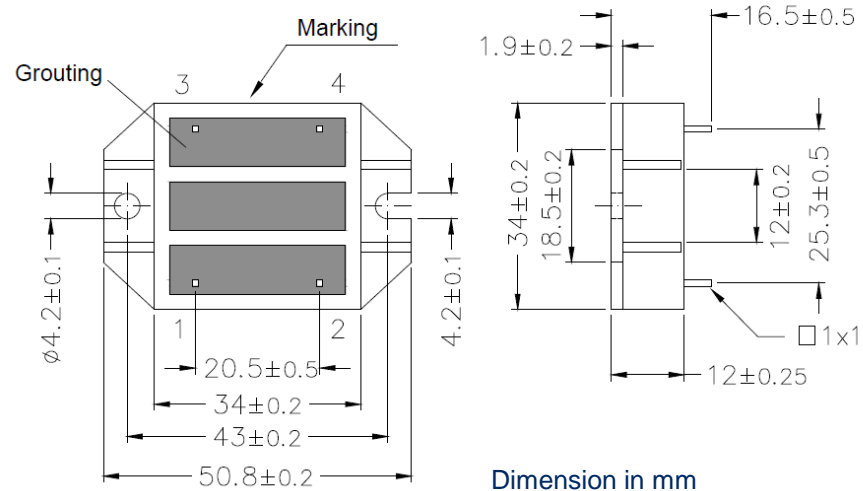
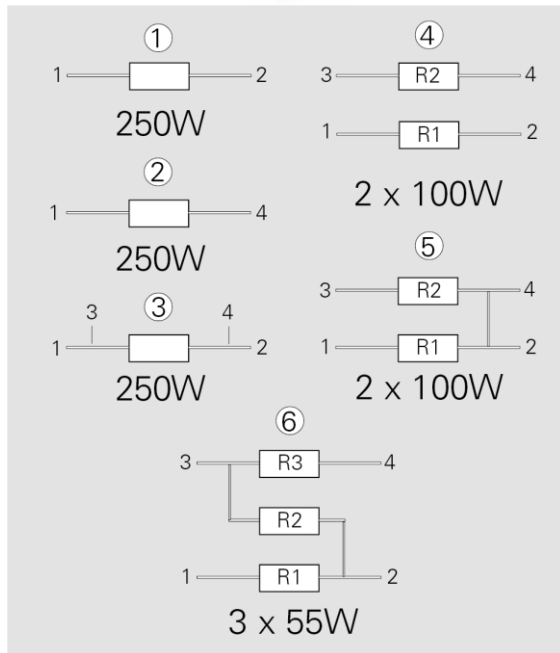
250 W at 85°C bottom case



Technical Specification:

- Ohmic value: on request
- Resistance tolerance: $\pm 1\%$ to $\pm 10\%$
- Temperature coefficient: $< \pm 250$ ppm/°C
- Maximum working voltage: 500 V (up to 2000 V on request)
- Electric strength voltage: dielectric strength up to 4000 V DC against ground

- Isolation voltage between R1 & R2: 500 V
- Partial discharge: up to 2 kVrms / 80 pC



AXS-450-NTC

450 W at 85°C bottom case

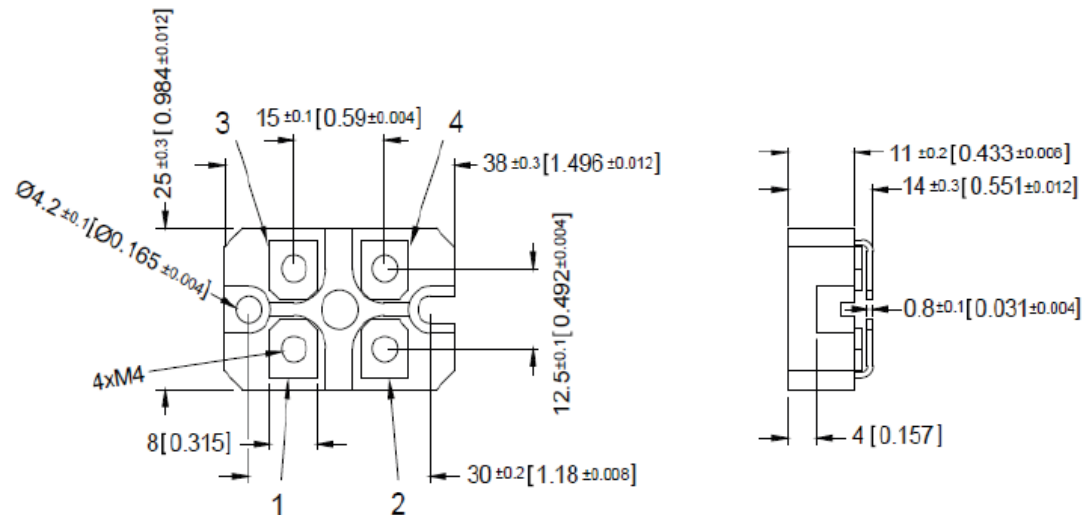
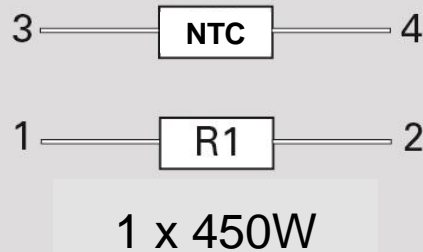
Technical Specification:



- Ohmic value: 0.15 Ω - 5 KΩ
- Resistance tolerance: ±5 % to ±10 %
- Temperature coefficient: ±150 ppm/°C
- Maximum working voltage: 1000 V DC (up to 2000 V on request)
- Power rating: 450 W at 85°C bottom case temp.
- Electric strength voltage: dielectric strength up to 4000 V DC against ground

- Isolation voltage between R1 & R2 & R3: 1000 V (2000 V on request)
- Partial discharge: up to 2 kVrms / 80 pC

Resistor is also available with preapplied PCM (Phase Change Material)



Dimension in mm [inches]

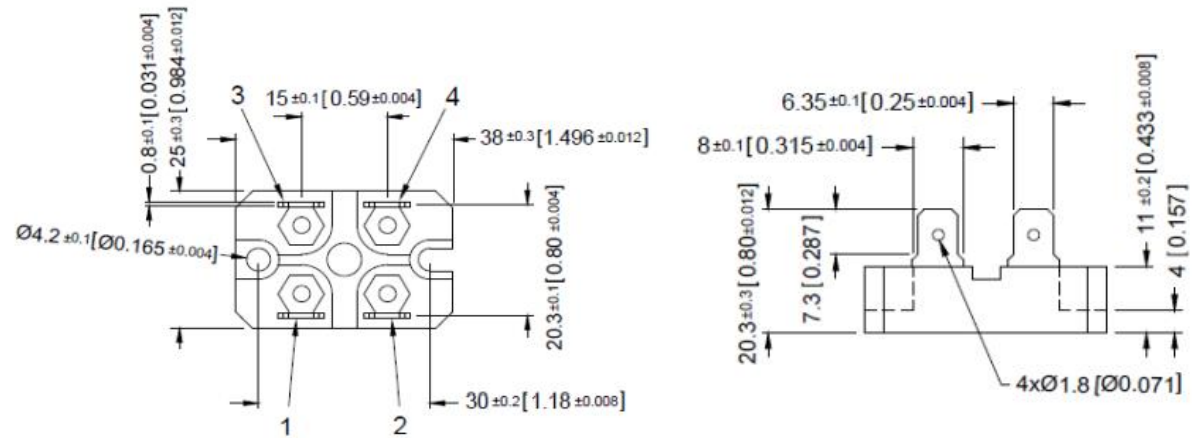
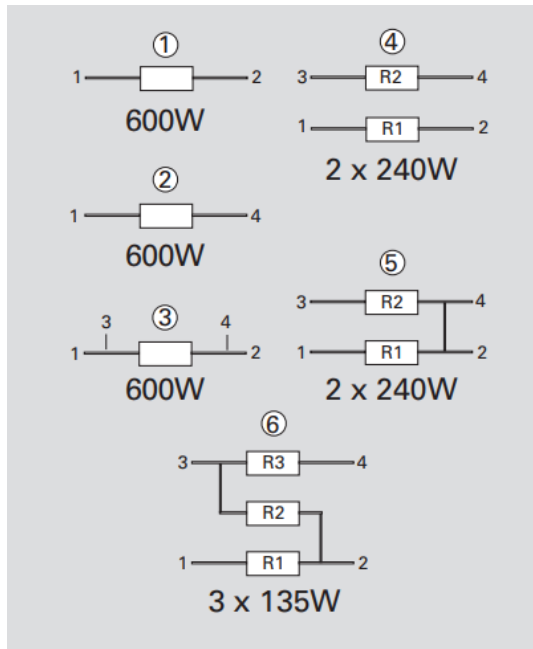
AXS-600 (screw connection) & AXF-600 (fast on connection)



Resistor is also available with preapplied PCM (Phase Change Material)

Technical Specification:

- Ohmic value: 0.15 Ω - 5 KΩ
- Resistance tolerance: ±5 % to ±10 %
- Temperature coefficient: ±150 ppm/°C
- Maximum working voltage: 1000 V DC (up to 2000 V on request)
- Power rating: up to 600 W at 85°C bottom case temp.
- Electric strength voltage: dielectric strength up to 4000 V DC against ground
- Isolation voltage between R1 & R2 & R3: 1000 V (2000 V on request)
- Partial discharge: up to 2 kVrms / 80 pC



Dimension in mm [inches]

AXP-600

600 W at 85°C bottom case

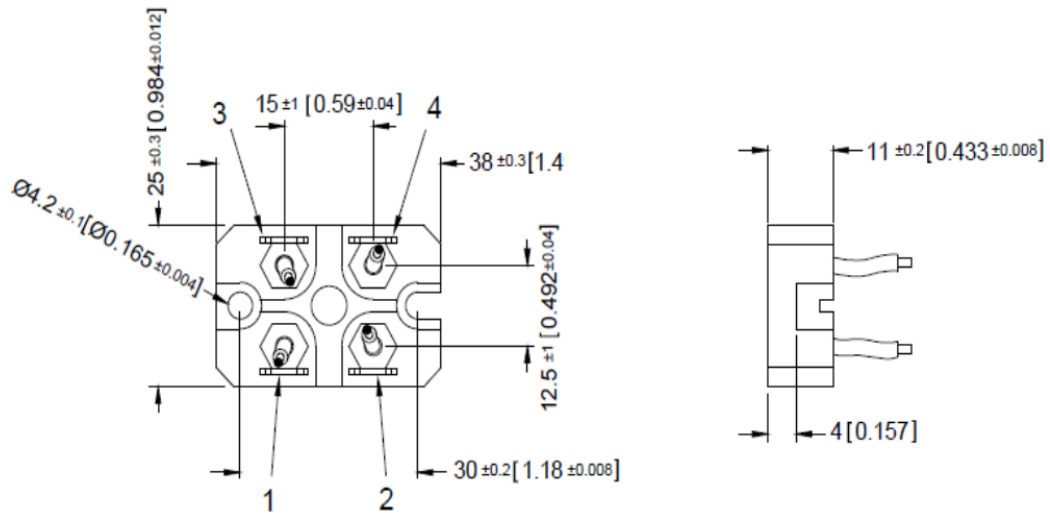
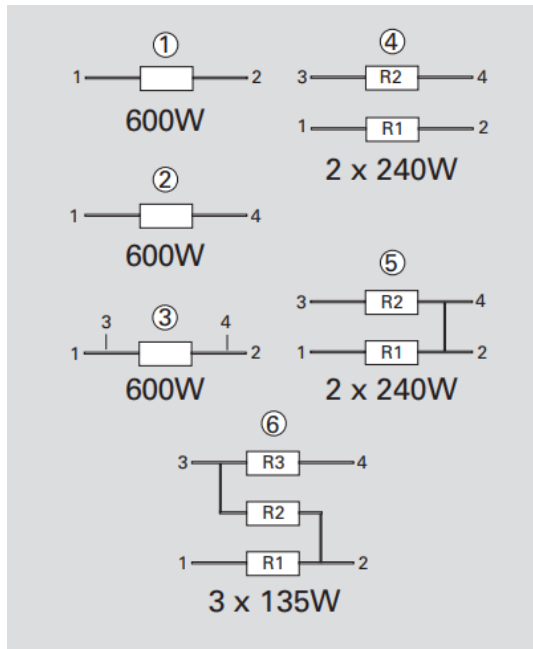


Resistor is also available with preapplied PCM (Phase Change Material)

Technical Specification:

- Ohmic value: 0.15 Ω - 5 KΩ
- Resistance tolerance: ±5 % to ±10 %
- Temperature coefficient: ±150 ppm/°C
- Maximum working voltage: 1000 V DC (up to 2000 V on request)
- Power rating: up to 600 W at 85°C bottom case temp.
- Electric strength voltage: dielectric strength up to 4000 V DC against ground

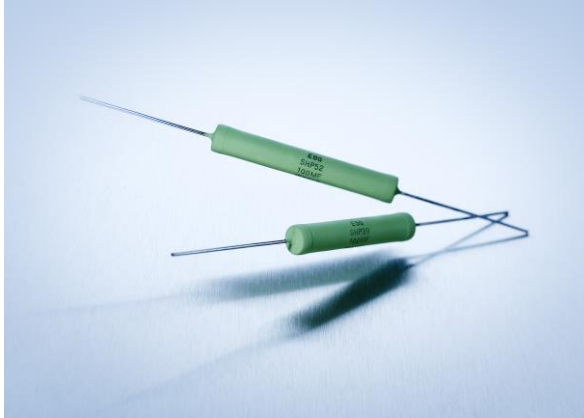
- Isolation voltage between R1 & R2 & R3: 1000 V (2000 V on request)
- Partial discharge: up to 2 kVrms / 80 pC



Dimension in mm [inches]

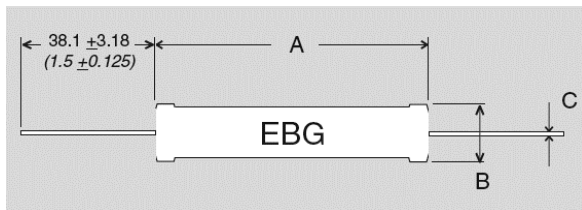
SHP- Series

Overall stability ± 5 ppm/ $^{\circ}\text{C}$ (incl. VCR & TCR)



Technical Specification:

- Ohmic value: 100 M Ω - 250 M Ω
- Resistance tolerance: ± 1 % standard
- Temperature coefficient: ± 5 ppm/ $^{\circ}\text{C}$ from $+25^{\circ}\text{C}$ to $+65^{\circ}\text{C}$ in 10 degree steps (incl. VCR & TCR)
- Maximum working voltage: 10 kV DC
- Dielectric strength: 1000 V DC based on the coating
- Insulation resistance: 10 G Ω min. at 1 kV DC
- Encapsulation: silicone conformal (2xpolyimide for use in oil)
- Lead material: OFHC copper, nickel-plated



Model No.	Wattage	Max. KV	Dimensions in mm		
			A ± 0.50	B ± 0.50	C ± 0.05
SHP-39	0.6	8	39.50	8.20	1.00
SHP-52	1	10	52.10	8.20	1.00
SHP-78	2.25	15	77.60	8.20	1.00

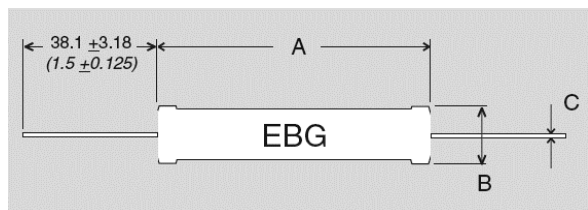
PHV- Series

Surge tests up to 325 kV (1.2/50 μ s)



Technical Specification:

- Ohmic value: 500 Ω - 1 G Ω
- Resistance tolerance: $\pm 1\%$ to $\pm 10\%$
- Temperature coefficient: ± 15 ppm/ $^{\circ}$ C from $+25^{\circ}$ C to $+85^{\circ}$ C
- Maximum working voltage: 32 kV DC in air
- Dielectric strength: 1000 V DC based on the coating
- Encapsulation: 2xpolyimide
(for use in oil and potted applications)
- Lead material: OFHC copper, nickel-plated



Model No.	Wattage	Max. KV	Dimensions in mm		
			A ± 0.50	B ± 0.50	C ± 0.05
PHV-39	5.2	12.80	39.50	8.20	1.00
PHV-52	7.5	16	52.10	8.20	1.00
PHV-78	11	24	77.70	8.20	1.00
PHV-103	12	32	102.90	8.20	1.00
PHV-200	25	60	192.00	8.20	1.00

MTX 970.105

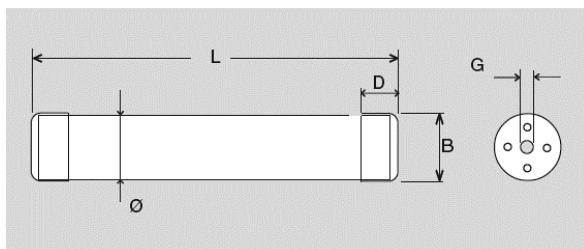
High stability resistor for wide temperature range



Technical Specification:

- Ohmic value: 30 MΩ - 250 MΩ
- Resistance tolerance: ±0.1 % to ±1 %
- Temperature coefficient:
 - ±15 ppm/°C measured at -40°C
 - ±15 ppm/°C measured at -30°C
 - ±10 ppm/°C measured at -20°C
 - ±10 ppm/°C measured at -10°C
 - ±10 ppm/°C measured at 0°C
 - ±10 ppm/°C measured at +40°C
 - ±10 ppm/°C measured at +60°C
- Dielectric strength: > 1000 V (25°C, 75 % relative humidity)
- Encapsulation: silicone conformal, 2xpolyimide
- Torque:
 - 1.8 Nm to 2 Nm for M4,
 - 3.8 Nm to 4 Nm for M8
- Lead material: caps, nickel-plated
- Operating temperature: -55°C to +225°C

Type	40°C Watt	KV DC
970.105	105	96



Specifications					
Type	L	B	Ø	D	G
970.105	308 ± 3.5	31.5 ± 0.2	30.5 ± 0.5	18 ± 0.2	M8

CSR-29

Max. energy 3000 Ws at +25°C

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RESISTORS

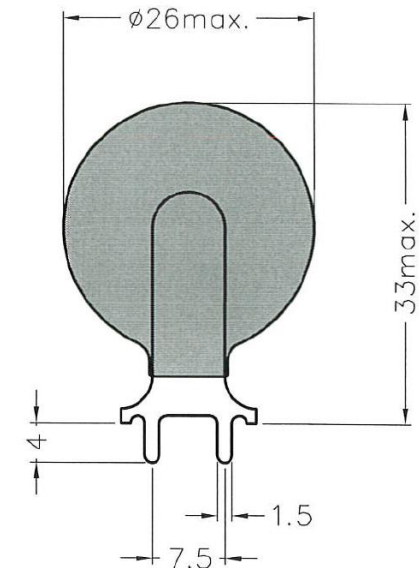
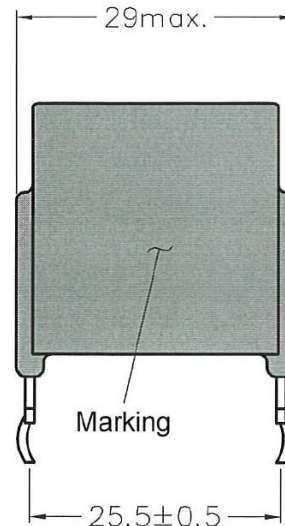
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Technical Specification:

- | | |
|--------------------------|--|
| ▪ Ohmic value: | 1 Ω - 500 Ω |
| ▪ Resistance tolerance: | ±5 % to ±20 % (others on request) |
| ▪ Max. energy: | 3000 Ws at +25°C |
| ▪ Max. power: | 6.5 W at +25°C |
| ▪ Encapsulation: | epoxy, silicone conformal, 2xpolyimide |
| ▪ Lead material: | nickel-plated |
| ▪ Operating temperature: | up to 200°C |



- 100% active Material
- High surge energy rating
- High voltage withstand
- Non-inductive
- Wide range of geometries
- Custom solutions available
- Suitable for PCB assembly
- Free design service



Dimension in mm

Customized Resistors

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RESISTORS

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Our engineers and sales people help you in the development of your individual needs

