



Mitteilung über Produktänderung / Product Change Notification

Datum: 08.05.2015

Product / Product-Family: **UXP / UPT / ULX resistor series (see datasheets attached)**

Beschreibung der Änderung: Durchführung der Vakuumlötlung mit neuer Lötanlage
Description of Change: solder process with new vacuum-solder machine

Art der Änderung: Lötprozess bleibt grundsätzlich unverändert – nur geänderte Anlage
Zusätzliche Verwendung von Lötstopp-Lack auf Kupferplatte
(ohne Auswirkung auf Funktion oder Spezifikation)
Type of Change solder process basically stays the same – just change of machinery
Additional usage of solder resist.
(no influence of performance or specification of resistor)

Grund der Änderung: Modernisierung der Lötanlage
Reason of Change: Modernization of solder machinery

Einführungsdatum: Voraussichtlich im November 2015
Implementation date: Estimated in November 2015

Ausstellende Person / Abteilung: Franz Konrad, Quality Manager
Originator:

Kundeninformation: Auf Kundenwunsch können Erstmusterprüfberichte erstellt werden.
Customer information: First Article of Inspection reports available on request.

Bitte wenden Sie sich gerne an uns, sollten Sie weitere Fragen haben!
Please feel free contacting EBG in case you have any further questions!

Franz Konrad, QM

Ultra-High-Power Resistors

Series UXP 600

600 W Resistor · US Patent-No. 5,355,281

For variable speed drives, power supplies, control devices, robotics, motor control and other power designs, the easy mounting fixture guarantees an auto-calibrated pressure to the cooling plate of about 120 to 160 N.

General Characteristics

Electric support:

- High alumina ceramic metalized with EBG ALTOX film on the bottom for better heat transfer and optimum discharge.

Encapsulation:

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

Resistance Element:

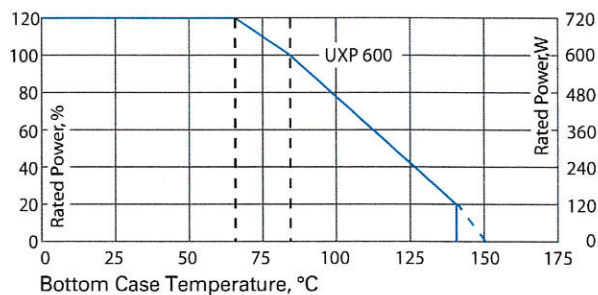
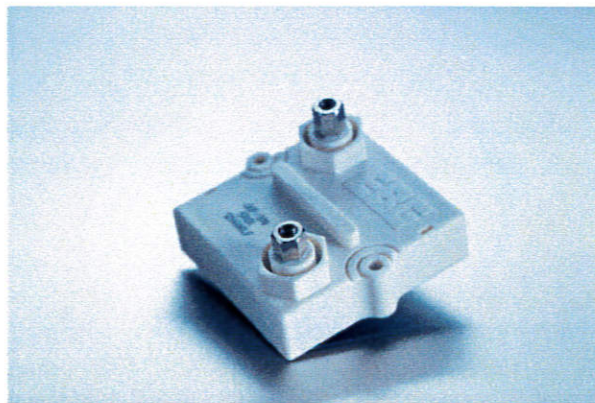
- Special design for low inductance and capacitance values. The element employs our special METOXFILM, which demonstrates stability while covering high wattage and pulse loading.

Contacts:

- Easy load connecting with M4 or M5 screws. (Inch thread terminals upon special request.)
- Connector height (M+N) available from 25 to 42 mm.
- Various sleeves for increased creeping distance up to 85 mm or potted cable connections are available upon special request
- Materials in accordance with UL94-V0

Specifications

- Resistance values: 0.5 Ω to 1 MΩ
- Resistance tolerance: ±5% to ±10% (1% on special request)
- Temperature coefficient: ±150 ppm/°C (others upon request)
- Maximum working voltage: 5,000 V DC, higher voltage upon request, not exceeding max. power
- Short time overload: 1,000 W at 70°C for 10 sec., ΔR = 0.4% max.
- Power rating: 600 W at 85°C bottom case temperature.
- Peak current: up to 1,500 A depending on pulse length and frequency. Please ask for details!
- Electric strength voltage: 6 kVrms, 50 Hz, up to 12 kVrms or up to 20 kV DC on special request.
- Single shot voltage: up to 12 kV norm wave (1.5/50 μsec)
- Partial discharge: 4 kVrms, <10pC, up to 7 kV upon special request
- Insulation resistance: 10 GΩ min. at 500 V
- Creeping distance: 42 mm min.
- Air distance: 14 mm min.
- Inductance: -80 nH (typical)
- Capacity/mass: -110 pF
- Capacity/parallel: -40 pF
- Operating temperature: -55°C to +150°C
- Mounting - max. torque for contacts: 2 Nm
- Mounting - max. torque: 1.8 Nm M4 screws
- For pulse power details, please see UXP-300 datasheet



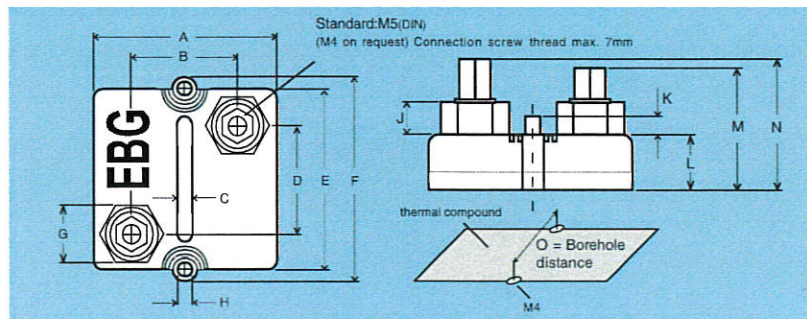
Derating (thermal resist.) UXP 600: 8.33 W/°K (0.12°K/W)

Power rating: 600 W at 85°C bottom case temp.*

Please ask for detailed mounting procedure!

* This value is only applicable when using a thermal conduction to the heat sink $R_{th-cs} < 0.025^{\circ}K/W$. This value can be obtained by using a thermal transfer compound with a heat conductivity of 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.

Test	Method	Typical results
Short time overload	1,000 W/10sec	0.4%
Humidity steady state	56 days/40°C/95%	0.25%
Temp. cycling	-55/+125/5cycles	0.20%
Shock	40g/4,000 times	0.25%
Vibrations	2-500Hz/10g	0.25%
Load life 3,000cyl	Pn 30 min. on / 30 min off	0.40%
Terminal strengths f. contacts	200N	0.05%



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	59.2	60.8	2.331	2.394
B	35.8	36.2	1.409	1.425
C	4.5	5.5	0.177	0.216
D	33.8	34.2	1.331	1.346
E	57.0	58.0	2.244	2.283
F	64.2	65.8	2.527	2.591
G	17.5	18.5	0.689	0.728
H	4.05	4.3	0.159	0.169
J	6.5	7.5	0.256	0.295
K	4.5	5.5	0.177	0.216
L	14.5	15.5	0.571	0.610
M	29.5	30.5	1.161	1.201
N	31.5	32.5	1.240	1.279
O	56.8	57.2	2.236	2.252

The above spec. sheet features our standard products. For further options, please contact our local EBG representative or contact us directly. For updated information, please visit our website!

Ultra-High-Power Resistors

Series UXP 800

800 W Resistor · US Patent-No. 5,355,281

For variable speed drives, power supplies, control devices, robotics, motor control and other power designs, the easy mounting fixture guarantees an auto-calibrated pressure to the cooling plate of about 120 to 160 N.

General Characteristics

Electric support:

- High alumina ceramic metalized with EBG ALTOX film on bottom for better heat transfer and optimum discharge.

Encapsulation:

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

Resistance Element:

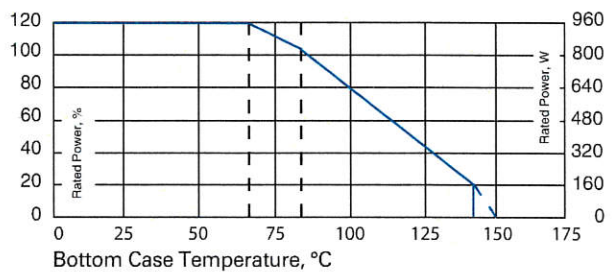
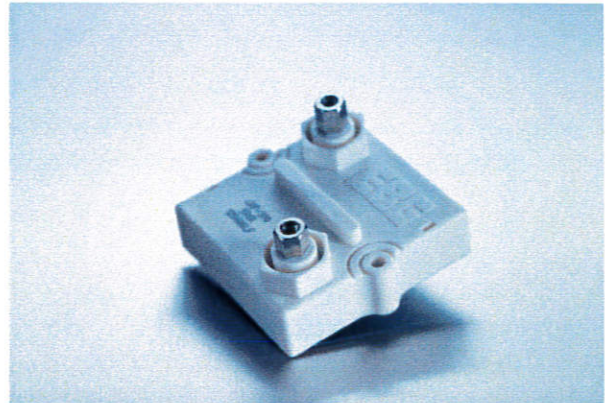
- Special design for low inductance and capacitance values. The element employs our special METOXFILM, which demonstrates stability while covering high wattage and pulse loading.

Contacts:

- Easy load connecting with M4 or M5 screws. (Inch thread terminals on special request.)
- Connector height (M+N) available from 25 to 42 mm.
- Various sleeves for increased creeping distance up to 85 mm or potted cable connections are available upon special request
- Materials in accordance with UL94-V0

Specifications

- Resistance values: 0.5 Ω to 1 MΩ
- Resistance tolerance: ±5% to ±10%
- Temperature coefficient: ±150 ppm/°C (others upon request)
- Maximum working voltage: 5,000 V DC, higher voltage upon request, not exceeding max. power
- Short time overload: 1,200 W at 70°C for 10 sec., ΔR = 0.4% max.
- Power rating: 800 W at 85°C bottom case temperature.
- Peak current: up to 1,500 A depending on pulse length and frequency. Please ask for details!
- Electric strength voltage: 6 kVrms, 50 Hz, up to 12 kVrms or up to 20kV DC on special request.
- Single shot voltage: up to 12 kV norm wave (1.5/50 μsec)
- Partial discharge: 4 kVrms, <10 pC, up to 7 kV upon special request
- Insulation resistance: 10 GΩ min. at 500 V
- Creeping distance: 42 mm min.
- Air distance: 14 mm min.
- Inductance: -80 nH (typical)
- Capacity/mass: -140 pF
- Capacity/parallel: -40 pF
- Operating temperature: -55°C to +150°C
- Mounting - max. torque for contacts: 2 Nm
- Mounting - max. torque: 1.8 Nm M4 screws



Derating (thermal resist.) UXP 800: 9.09 W/°K (0.11°K/W)

Power rating: 800 W at 85°C bottom case temp.*

Please ask for detailed mounting procedure!

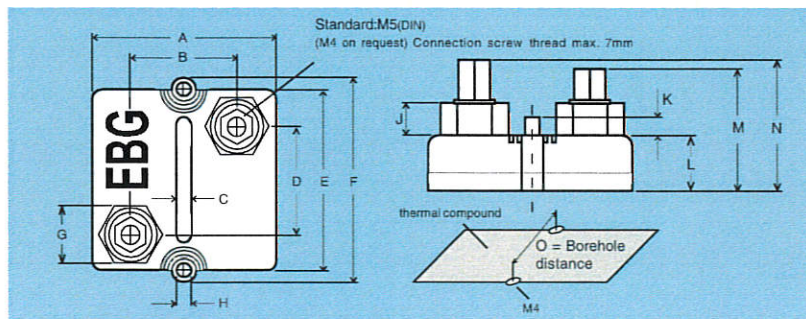
* This value is only applicable when using a thermal conduction to the heat sink. Rth-cs < 0.025°K/W. This value can be obtained by using a thermal transfer compound with a heat conductivity of 1 W/mK. The flatness of the cooling plate must be better than 0.05 mm overall. Surface roughness should not exceed 6.4 μm.

Pulse load capability:

See datasheet UXP-300 for pulse power capability!

Add 15% to UXP-300 for pulse curve.

Test	Method	Typical results
Short time overload	1,000 W/10sec	0.4%
Humidity steady state	56 days/40°C/95%	0.25%
Temp. cycling	-55/+125/5cycles	0.20%
Shock	40g/4,000 times	0.25%
Vibrations	2-500Hz/10g	0.25%
Load life 3,000cyl	Pn 30 min. on / 30 min off	0.40%
Terminal strengths f. Contacts	200N	0.05%



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	59.2	60.8	2.331	2.394
B	35.8	36.2	1.409	1.425
C	4.5	5.5	0.177	0.216
D	33.8	34.2	1.331	1.346
E	57.0	58.0	2.244	2.283
F	64.2	65.8	2.527	2.591
G	17.5	18.5	0.689	0.728
H	4.05	4.3	0.159	0.169
J	6.5	7.5	0.256	0.295
K	4.5	5.5	0.177	0.216
L	14.5	15.5	0.571	0.610
M	29.5	30.5	1.161	1.201
N	31.5	32.5	1.240	1.279
O	56.8	57.2	2.236	2.252

The above spec. sheet features our standard products. For further options, please contact our local EBG representative or contact us directly. For updated information, please visit our website!

Ultra-High-Power Resistors

Series UPT 400

400 W Resistor · US Patent-No. 5,355,281

For variable speed drives, power supplies, control devices, robotics, motor control and other power devices, the easy mounting fixture guarantees an auto-calibrated pressure to the cooling plate of about 120 to 160 N.

General Characteristics

Encapsulation:

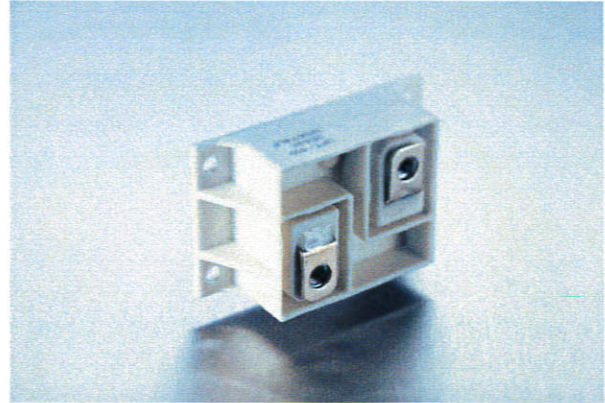
- Special resin-filled epoxy casing with large creeping distance to mass, large air distance between the terminals and high insulation resistance.

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.

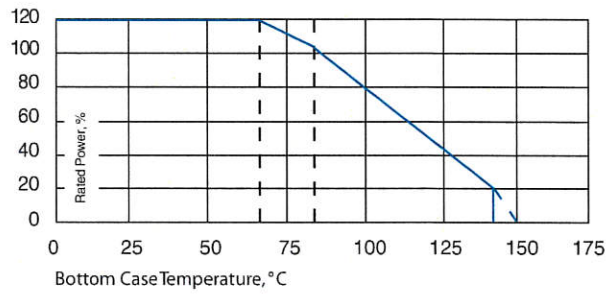
Contacts:

- Easy load connecting with M5 screws (others upon special request). Materials in accordance with UL94-V0



Specifications

- Resistance values: 0.5 Ω to 1 MΩ
- Resistance tolerance: ±5% to ±10%, tighter tolerances are available upon request, with reduction of max. power/pulse rating. Please ask our local representative!
- Temperature coefficient: ±150 ppm/°C (others upon request)
- Maximum working voltage: 5,000 V DC, higher voltage upon request, not exceeding max. power
- Short time overload: 700 W at 70°C for 10 sec., ΔR = 0.4% max.
- Power rating: up to 400 W at 85°C bottom case temperature
- Electric strength voltage: 6 kVrms, 50 Hz, upto 12 kVrms or 23 kV DC upon special request.
- Single shot voltage: up to 12 kV norm wave (1.5/50 μsec)
- Partial discharge: 4 kVrms, <10 pC, up to 7kV upon special request
- Insulation resistance: 10 GΩ min. at 500 V
- Inductance: -80 nH (typical)
- Capacity/mass: -110 pF
- Capacity/parallel: -40 pF
- Operating temperature: -55°C to +150°C
- Mounting - max. torque for contacts: 2 Nm
- Mounting - Max. torque : 1.8 Nm M4 screws



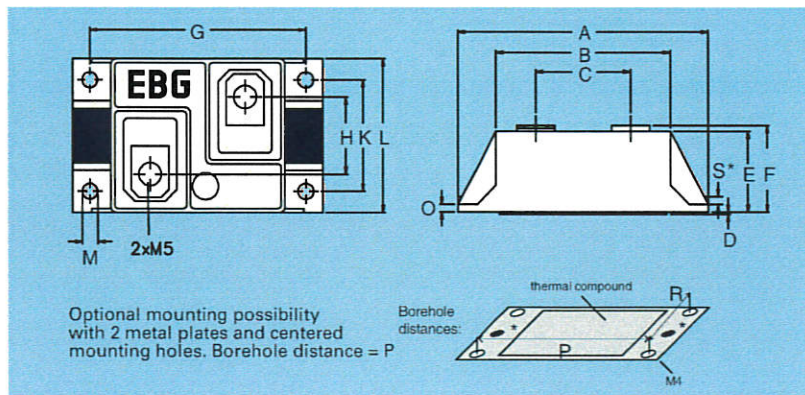
Derating (thermal resist.) UPT 400: 5.55W/°K (0.18°K/W)

Power rating: 400W at 85°C bottom case temp.*

Please ask for detailed mounting procedure!

* This value is only applicable if using thermal conduction to heat sink Rth-cs<0.025°K/W. This value can be obtained by using a thermal transfer compound with a heat conductivity of 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.

For other configurations, please contact EBG.



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	65.2	66.8	2.567	2.630
B	45.2	46.8	1.780	1.843
C	24.5	25.5	0.965	1.004
D	0.1	0.2	0.004	0.008
E	20.5	21.5	0.807	0.846
F	22.0	23.0	0.866	0.906
G	56.2	57.8	2.213	2.276
H	19.5	20.5	0.768	0.807
K	28.5	29.5	1.122	1.161
L	39.2	40.8	1.543	1.606
M	4.1	4.3	0.161	0.169
O	1.85	2.15	0.073	0.085
P	56.8	57.2	2.236	2.252
R	28.8	29.2	1.134	1.150
S*	1.3	1.7	0.051	0.067

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Ultra-High-Power Resistors

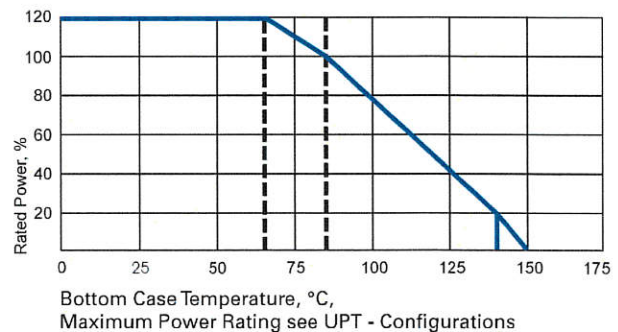
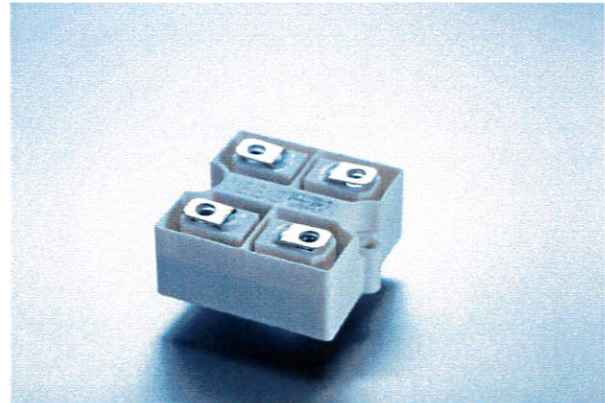
Series UPT 600

600 W Resistor · US Patent-No. 5,355,281

For variable speed drives, power supplies, control devices, robotics, motor control and other power devices, the easy mounting fixture guarantees an auto-calibrated pressure to the cooling plate of about 120 to 160 N. Materials in accordance with UL94-V0

Specifications

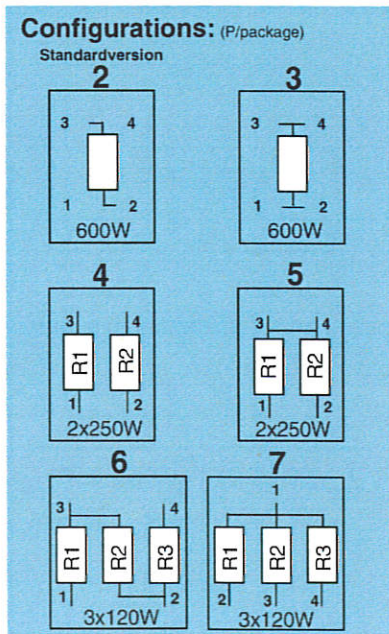
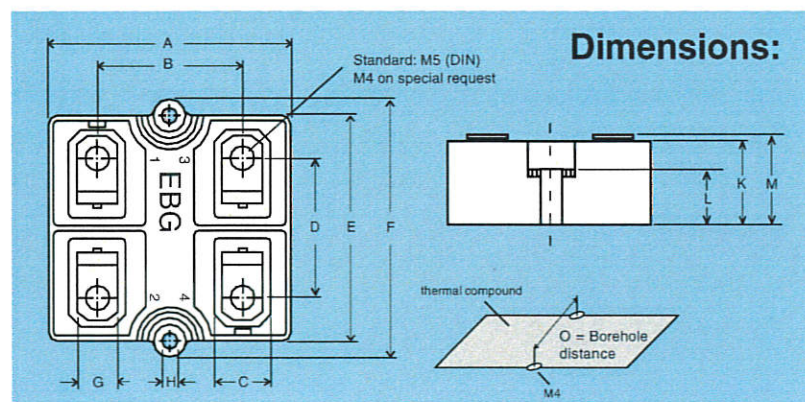
- Resistance values: 0.5 Ω to 1 MΩ
- Resistance tolerance: ±5% to ±10%, tighter tolerances are available upon request, with the reduction of the max. power/pulse rating. Please ask your local representative!
- Temperature coefficient: ±150 ppm/°C (others upon request)
- Maximum working voltage: 5,000 V DC, higher voltage upon request, not exceeding max. power
- Short time overload: 1,000 W at 70°C for 10sec., ΔR = 0,4% max. (for conf. 2 and 3)
- Power rating: up to 600 W at 85°C bottom case temperature, see configurations
- Electric strength voltage: 6 kVrms, 50 Hz, up to 12 kVrms or 23 kV DC upon special request.
- Dielectric strength between R1-R2: >5kV DC
- Single shot voltage: up to 12 kV norm wave (1.5/50 μsec)
- Partial discharge: 4 kVrms, <10 pC, up to 7 kV upon special request
- Insulation resistance: 10 GΩ min. at 500 V
- Inductance: -80 nH
- Capacity/mass: -110 pF
- Capacity/parallel: -40 pF
- Operating temperature: -55°C to +150°C
- Mounting - max. torque for contacts: 2 Nm
- Mounting - max. torque: 1.8 Nm, M4 screws
- For pulse power details, please see datasheet UXP-300, same as UXP-600, valid for configuration 2 and 3.
- For other configurations, please contact EBG.



Derating (thermal resist.) UPT 600: 8.33W/*K (0.12°K/W) (for conf. 2 and 3)
Power rating: 600W at 85°C bottom case temp.*
Please ask for detailed mounting procedure!

* This value is only applicable if using thermal conduction to heat sink. Rth-cs<0.025°K/W.
This value can be obtained by using a thermal transfer compound with a heat conductivity of 1 W/m·K. The flatness of the cooling plate must be better than 0.05 mm overall. Surface roughness should not exceed 6.4 μm.

Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	59.2	60.8	2.331	2.394
B	35.8	36.2	1.409	1.425
C	13.5	14.5	0.531	0.571
D	33.8	34.2	1.331	1.346
E	57.0	58.0	2.244	2.283
F	64.2	65.8	2.527	2.591
G	9.5	10.5	0.374	0.413
H	4.05	4.3	0.159	0.169
K	24.0	25.0	0.945	0.984
L	14.5	15.5	0.571	0.610
M	25.5	26.5	1.004	1.043
O	56.8	57.2	2.236	2.252



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Ultra High Power Resistors

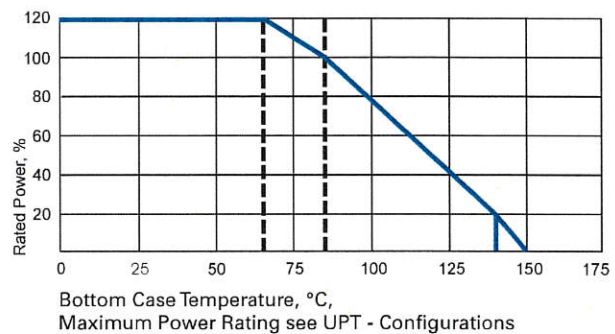
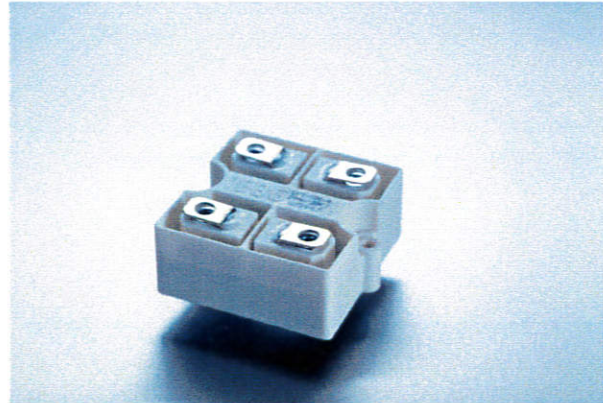
Series UPT 800

800 W Resistor · US Patent-No. 5,355,281

For variable speed drives, power supplies, control devices, robotics, motor control and other power designs, the easy mounting fixture guarantees an auto-calibrated pressure to the cooling plate of about 120 to 160 N. Materials in accordance with UL94-V0

Specifications

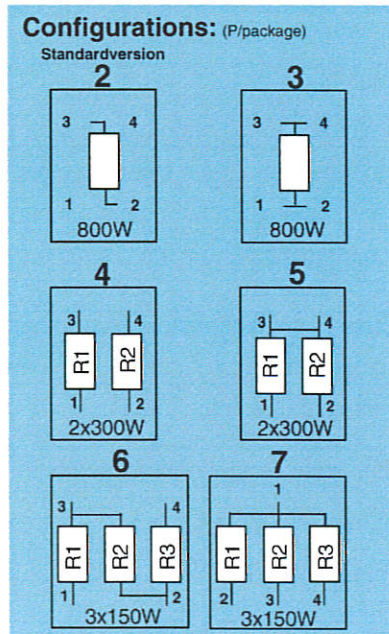
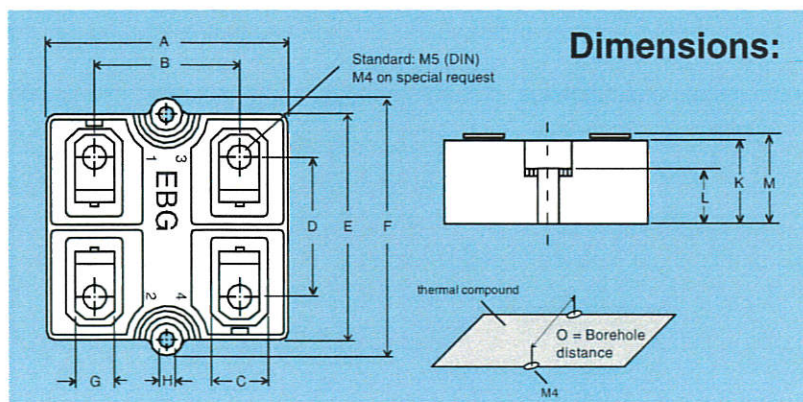
- Resistance values: 0.5 Ω to 1 MΩ
- Resistance tolerance: ±5% to ±10%, tighter tolerances are available upon request, with reduction of max. power/pulse rating. Please ask our local representative!
- Temperature coefficient: ±150 ppm/°C (others upon request)
- Maximum working voltage: 5,000 V DC, higher voltage upon request, not exceeding max. power
- Short time overload: 1,000 W at 70°C for 10sec., R = 0.4% max. (for conf. 2 and 3)
- Power rating: up to 800 W at 85°C bottom case temperature, see configurations
- Electric strength voltage: 6 kVrms, 50 Hz, up to 12 kVrms or 23 kV DC upon special request.
- Dielectric strength between R1-R2 : >5 kV DC
- Single shot voltage: up to 12 kV norm wave (1.5/50 µsec)
- Partial discharge: 4 kVrms, <10 pC, up to 7 kV upon special request
- Insulation resistance: 10 GΩ min. at 500 V
- Inductance: -80 nH
- Capacity/mass: -140 pF
- Capacity/parallel: -40 pF
- Operating temperature: -55°C to +150°C
- Mounting - max. torque for contacts: 2 Nm
- Mounting - max. torque: 1.8 Nm, M4 screws
- For pulse power details, please see datasheet UXP-300, same as UXP-600, valid for configuration 2 and 3. For other configurations, please contact EBG.



Derating (thermal resist.) UPT 800: 9.09W/°K (0.11°K/W) for conf. 2 and 3
Power rating: 800W at 85°C bottom case temp.*
Please ask for detailed mounting procedure!

* This value is only applicable if using thermal conduction to heat sink Rth-cs<0.025°K/W. This value can be obtained by using a thermal transfer compound with a heat conductivity of 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.

Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	59.2	60.8	2.331	2.394
B	35.8	36.2	1.409	1.425
C	13.5	14.5	0.531	0.571
D	33.8	34.2	1.331	1.346
E	57.0	58.0	2.244	2.283
F	64.2	65.8	2.527	2.591
G	9.5	10.5	0.374	0.413
H	4.05	4.3	0.159	0.169
K	24.0	25.0	0.945	0.984
L	14.5	15.5	0.571	0.610
M	25.5	26.5	1.004	1.043
O	56.8	57.2	2.236	2.252



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Ultra-High-Power Resistors

Series ULX 600 (Very low component height)

600 W Resistor · US Patent-No. 5,355,281

For variable speed drives, power supplies, control devices, robotics, motor control and other power designs.

General Characteristics

Electric Support:

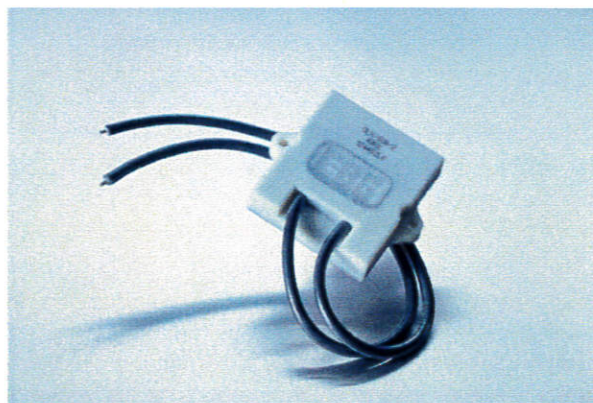
- High-purity ceramic metalized with EBG ALTOX film on bottom for better heat transfer and optimum discharge.

Encapsulation:

- Special resin-filled epoxy casing. High insulation resistance (CTI 600), high dielectric strength and partial discharge capability.

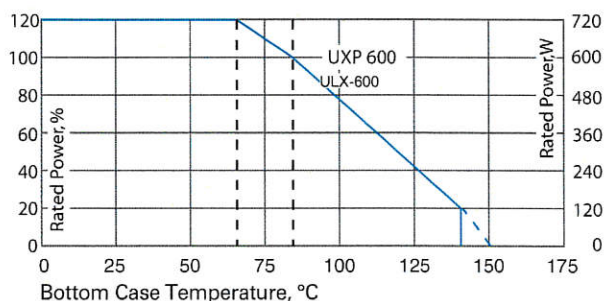
Resistance Element:

- Special design for low inductance and capacitance values. The element employs our special METOXFILM, which demonstrates stability while covering high wattage and pulse loading.
- Materials in accordance with UL94-V0



Specifications

- Resistance values: 0.5 Ω to 1 MΩ (others upon request)
- Resistance tolerance: ±5% to ±10%
- Temperature coefficient: ±150 ppm/°C (others upon request)
- Maximum working voltage: 5,000 V DC, higher voltage upon request, not exceeding max. power
- Short time overload: 1,000 W at 70°C for 10sec., ΔR = 0.4% max. (for conf. 2 and 3)
- Power rating: 600 W at 85°C bottom case temperature (others upon request)
- Peak current: up to 1,500 A depending on pulse length and frequency. Please ask for details!
- Electric strength voltage: 6 kVrms, 50 Hz, up to 12 kVrms upon special request.
- Single shot voltage: up to 12 kV norm wave (1.5/50 μsec)
- Partial discharge: 4 kVrms, <10 pC, up to 7 kV upon special request
- Insulation resistance: 10 GΩ min. at 500 V
- Inductance: ~80 nH (typical)
- Capacity/mass: ~110 pF
- Capacity/parallel: ~40 pF
- Operating temperature: res. body: -55°C to +150°C
std. cables: -40°C to +120°C (other cables upon request)
- Mounting- max. torque: 1.8 Nm, M4 screws
- For pulse power details, please see datasheet UXP-600

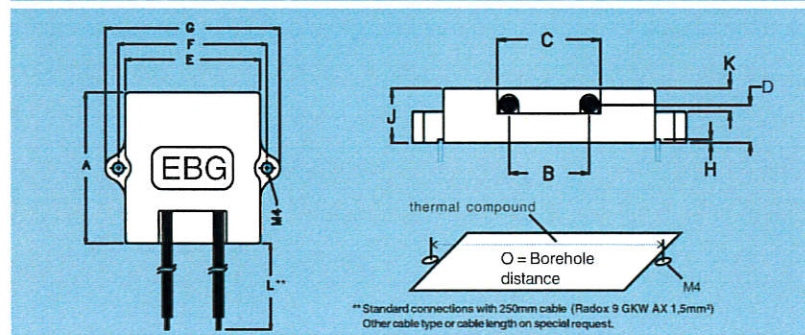
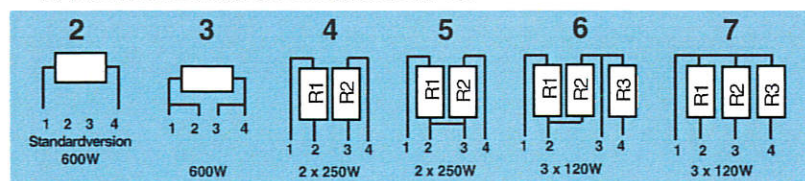


Derating (thermal resist.) ULX 600: 8.33W/°K (0.12°K/W)

Power rating: 600W at 85°C bottom case temp. *

Please ask for detailed mounting procedure!

* This value is only applicable if using thermal conduction to the heat sink $R_{th-cs} < 0.025^{\circ}K/W$. This value can be obtained by using a thermal transfer compound with a heat conductivity of 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.



Test	Method	Typical results
Short time overload	1,000 W/10sec (for 600 W Element)	0.4%
Humidity steady state	56 days/40°C/95%	0.25%
Temp. cycling	-55/+125/5cycles	0.20%
Shock	40g/4,000 times	0.25%
Vibrations	2-500Hz/10g	0.25%
Load life 3,000cyl	Pn 30 min. on / 30 min off	0.40%

Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	57.0	58.0	2.244	2.283
B	19.5	20.5	0.767	0.807
C	25.5	26.5	1.004	1.043
D	8.0	9.5	0.315	0.374
E	51.0	52.0	2.007	2.047
F	56.5	57.5	2.224	2.264
G	66.2	66.7	2.606	2.626
H	0.5	0.8	0.019	0.032
J	12.5	13.5	0.492	0.532
K	5.3	5.8	0.208	0.228
L	250	255	9.843	10.039
O	56.8	57.2	2.236	2.252

The above spec. sheet features our standard products. For further options, please contact our local EBG representative or contact us directly. For updated information, please visit our website!