

## Power Resistors Cooled by Auxiliary Heatsink (Not Supplied) Thick Film Technology



### FEATURES

- System without external radiation
- High power / volume ratio
- Non-inductive
- Screw-on outputs
- Possible configuration with 2 or 3 resistors

### DESIGN SUPPORT TOOLS

[click logo to get started](#) 

**3D**  
Models  
Available

### STANDARD ELECTRICAL SPECIFICATIONS

| MODEL    | VALUE  | RESISTANCE RANGE<br>$\Omega$ | MAX. RATED POWER $P_{75^\circ\text{C}}$<br>W | TOLERANCE<br>$\pm \%$ | TEMPERATURE<br>COEFFICIENT<br>$\pm \text{ppm}/^\circ\text{C}$ | E-SERIES<br>OHMIC<br>VALUES |
|----------|--------|------------------------------|--|-----------------------|---|-----------------------------|
| RCEC 400 | Single | 1.0 to 1M                    | 400  | 10, 5 <sup>(1)</sup>  | 150 (typical)   | E 24                        |
|          | Double | 1.5 to 1M                    | 2 x 180                                      | 10, 5 <sup>(1)</sup>  | 150 (typical)   | E 24                        |

#### Note

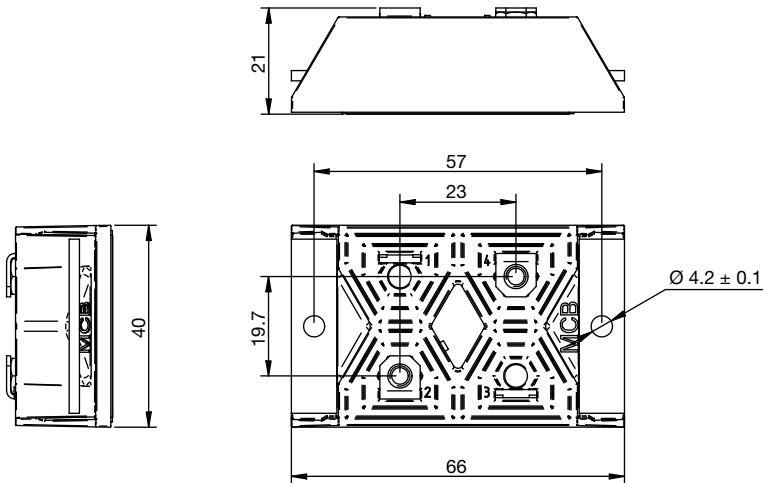
<sup>(1)</sup> On request

### MECHANICAL SPECIFICATIONS

|                             |                                       |
|-----------------------------|---------------------------------------|
| UL 94 flame classifications | Material in accordance with UL 94 V-0 |
| Resistive element           | Thick film                            |
| Substrate                   | Alumina                               |
| Encapsulation               | Resin filled in housing               |

### TECHNICAL SPECIFICATIONS

| PARAMETER  | SINGLE VALUE                                  | DOUBLE VALUE |
|--|---|--------------|
| Operating temperature range                          | -55 °C to +150 °C                             |              |
| Maximum operating voltage                            | 4000 V  |              |
| Dielectric strength $V_{\text{RMS}}$ (50 Hz / 1 min) | 6000 V  |              |
| Creepage distance                                    | > 42 mm                                       |              |
| Clearance distance                                   | > 12 mm                                       | > 10 mm      |
| CTI index  | > 600   |              |
| Partial discharge                                    | < 20 pC at 5000 $V_{\text{eff}}$              |              |
| Inductance   | < 40 nH                                       |              |
| Insulation resistance                                | $10^5 \text{ M}\Omega$ at 500 $V_{\text{DC}}$ |              |
| Weight (max.)  | 75 g  |              |

**DIMENSIONS** in millimeters

**PERFORMANCES**

| TESTS                   |              | CONDITIONS                                 | REQUIREMENTS                   | TYPICAL VALUES |
|-------------------------|--------------|--|--------------------------------|----------------|
| Momentary overload      | Single value | 800 W / 10 s                               | 2 %                            | 0.2 %          |
|                         | Double value | 2 x 360 W / 10 s                           |                                |                |
| Humidity (steady state) |              | 56 days, 40 °C, 95 % HR                    | 2 % or 0.05 Ω <sup>(1)</sup>   | 0.2 %          |
| VRT                     |              | -55 °C to +125 °C 5 cycles                 | 2 % or 0.05 Ω <sup>(1)</sup>   | 0.2 %          |
| Mechanical shock        |              | IEC 60115-4 clause 2-3-6                   | 0.5 % or 0.05 Ω <sup>(1)</sup> | 0.25 %         |
| Vibration               |              | IEC 60115-4 clause 2-3-2                   | 0.5 % or 0.05 Ω <sup>(1)</sup> | 0.25 %         |
| Terminals strength      |              | 130 Ncm / 100 N                            | 1 % or 0.05 Ω <sup>(1)</sup>   | 0.1 %          |
| Endurance               |              | 2000 cycles P <sub>n</sub> 30 min / 30 min | 5 %                            | 0.2 %          |

**Note**
<sup>(1)</sup> The higher of either value

**ENERGY ABSORPTION**
**Single Value**

Repetitive operation: 2 J/t = 50 μs

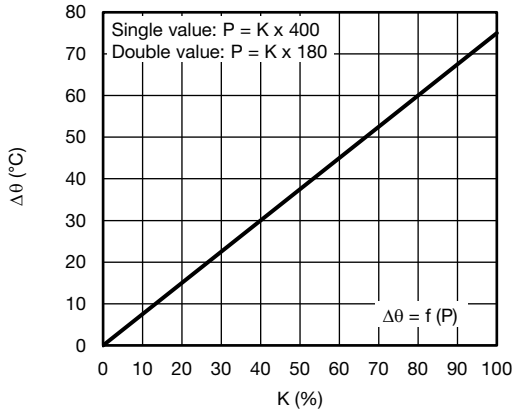
Other t values: consult us

**Double Value**

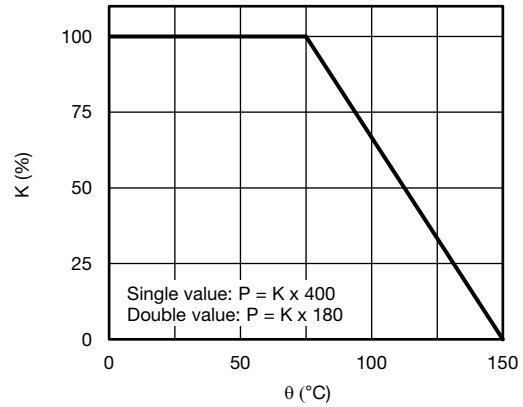
Repetitive operation: 2 J/t = 50 μs

Other t values: consult us

**DISSIPATION**

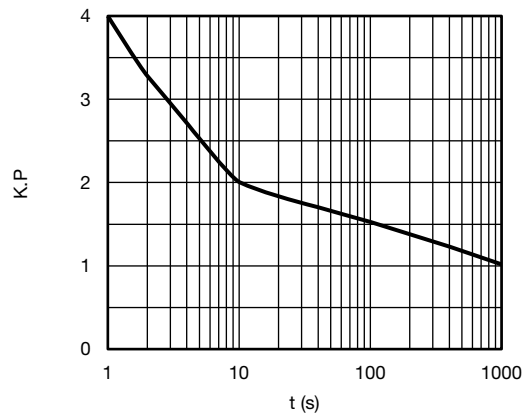


Temperature Rise as a Function of the Power Applied  
 Overall Thermal Resistance 0.1875 °C/W  
 (Double Value: 0.2083 °C/W)



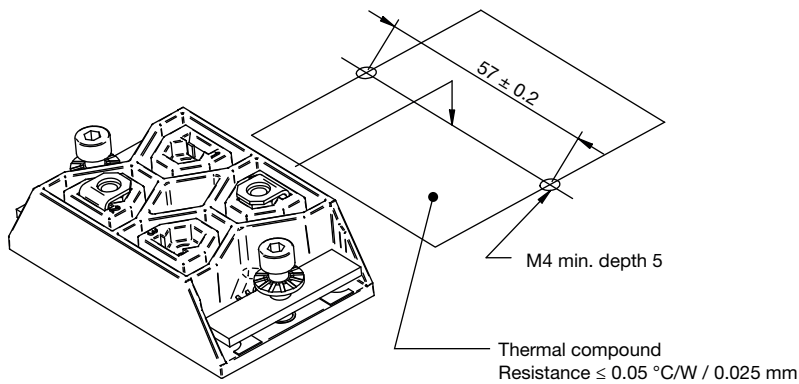
Permanent Applicable Power as a Function  
 of Heatsink Temperature

**OVERLOAD**



Intermittent Overload (Exceptional Operation)

**ASSEMBLY**



Maximum tightening torque:  
 150 Ncm, mechanical mounting  
 130 Ncm, electrical mounting



**COOLING**

The temperature of the heatsink may be maintained at the specified values with:

- Forced air ventilation
- Internal circulation of a cooling liquid
- Heatsink contact surface: Ra 6.3 μm
- Evenness defect: 0.05 mm max.
- Surface temperature gradient (isotherm): 20 °C max.
- Thermal compound not supplied (resistance ≤ 0.05 °C/W / 0.025 mm)

The user must select the thermal resistance of the heatsink according to the power applied.

| ORDERING INFORMATION |       |                            |                               |  |                                     |                         |                                     |        |           |
|----------------------|-------|----------------------------|-------------------------------|--|-------------------------------------|-------------------------|-------------------------------------|--------|-----------|
| RCEC                 | 400   | GD                         | MP                            | 100K                                       | 5 %                                 | 100K                    | 5 %                                 | XXX    | BO20      |
| MODEL                | STYLE |                            | OPTION                        | RESISTANCE VALUE                           | TOLERANCE                           | RESISTANCE VALUE        | TOLERANCE                           | CUSTOM | PACKAGING |
|                      |       | Single<br>Double<br>Triple | Common point for double value | Value for single<br>First value for double | ± 5 %<br>± 10 %<br>Other on request | Second value for double | ± 5 %<br>± 10 %<br>Other on request |        |           |

| GLOBAL PART NUMBER INFORMATION |   |   |   |   |  |   |   |                     |   |           |   |                                   |   |   |   |   |   |
|--------------------------------|---|---|---|---|--|---|---|---------------------|---|-----------|---|-----------------------------------|---|---|---|---|---|
| R                              | C | E   | C | 4 | 0  | 0 | G | S                   | 2 | R         | 7 | 0                                 | J | B | □ | □ | □ |
| 1                              |   |   |   |   |  | 2 |   | 3                   |   |           | 4 | 5                                 | 6 |   |   |   |   |
| 1                              |   | 2   |   |   | 3  |   |   | 4                   |   | 5         |   | 6                                 |   |   |   |   |   |
| GLOBAL MODEL                   |   | LEAD                                      |   |   | OHMIC VALUE  |   |   | TOLERANCE           |   | PACKAGING |   | INDUSTRIALIZATION NUMBER          |   |   |   |   |   |
| RCEC 400                       |   | Simple = GS<br>Double = GD<br>Triple = GT |   |   | The first three digits are significant figures and the last specifies the number of zeros to follow, R designates decimal point.<br>4702 = 47 kΩ<br>48R7 = 48.7 Ω<br>In case of double or triple value => value = sum of the 2 or 3 values |   |   | J = 5 %<br>K = 10 % |   | B = box   |   | 3 specific digits (if applicable) |   |   |   |   |   |

| EXAMPLES |   |                    |
|----------|---|--------------------|
| MODEL    | DESCRIPTION                               | PART NUMBER        |
| RCEC 400 | RCEC 400 GS 2U7 5 % BO20                  | RCEC400GS2R70JB    |
| RCEC 400 | RCEC 400 GD MP 12K 10 % 12K 10 % 998 BO20 | RCEC400GD2402KB998 |



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