

## Molded Metal Film High Stability Resistors

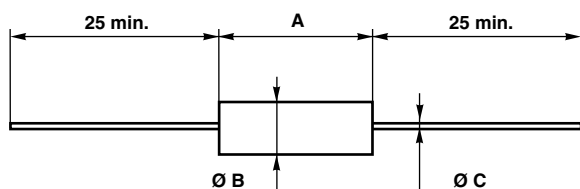


### FEATURES

- 0.125 W to 0.5 W at 70 °C
- Approval according to CECC 40 101 (002/803)
- High long term stability drift < 0.5 % after 1000 h
- Excellent temperature coefficient  $\leq \pm 30$  ppm/°C in the range - 10 °C to 70 °C
- Excellent initial precision: Up to  $\pm 1$  %
- High insulation typical values:  $10^6$  M $\Omega$
- Termination = pure matte tin
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT

### DIMENSIONS in millimeters



| SERIES | A          | Ø B                | Ø C | WEIGHT in g |
|--------|------------|--------------------|-----|-------------|
| RCMS02 | 6.5 ± 0.2  | 2.5 $^{+0}_{-0.2}$ | 0.6 | 0.26        |
| RCMS05 | 10.2 ± 0.2 | 3.65 ± 0.1         | 0.6 | 0.46        |
| RCMS1  | 16 ± 0.5   | 6.2 ± 0.2          | 0.8 | 1.30        |

### STANDARD ELECTRICAL SPECIFICATIONS

| MODEL                                                                                      | RESISTANCE RANGE $\Omega$ | RATED POWER $P_{70\text{ °C}}$ W | LIMITING ELEMENT VOLTAGE V | TOLERANCE $\pm$ % | TEMPERATURE COEFFICIENT $\pm$ ppm/°C |
|--------------------------------------------------------------------------------------------|---------------------------|----------------------------------|----------------------------|-------------------|--------------------------------------|
| RCMS02  | 1 to 332K                 | 0.125                            | 300                        | 1                 | 30, 50                               |
|                                                                                            | 1 to 332K                 | 0.250                            | 300,                       | 1                 | 30, 50                               |
|                                                                                            | 1 to 332K                 | 0.500                            | 350                        | 1                 | 30, 50                               |
| RCMS05  | 1 to 1M                   | 0.250                            | 350                        | 1                 | 30, 50                               |
|                                                                                            | 1 to 1M                   | 0.500                            | 350                        | 1                 | 30, 50                               |
| RCMS1   | 1 to 2.21M                | 0.500                            | 400                        | 1                 | 30, 50                               |

#### Note

-  Undergoes European Quality Insurance System (CECC)

### TECHNICAL SPECIFICATIONS

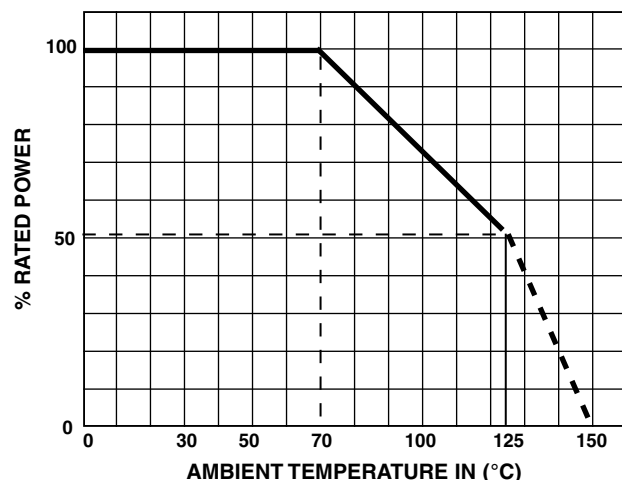
| VISHAY SFERNICE SERIES                                         |  | RCMS02  |                              |                              | RCMS05  |                            | RCMS1  |
|----------------------------------------------------------------|--|--------------------------------------------------------------------------------------------|------------------------------|------------------------------|----------------------------------------------------------------------------------------------|----------------------------|---------------------------------------------------------------------------------------------|
| Reference under CECC 40 101-002 approvals                      |  | RS58Y                                                                                      | RS64Y                        | RS71Y                        | RS63Y                                                                                        | RS69Y                      | RS68Y                                                                                       |
| Reference under CECC 40 101-803 approvals                      |  | BC                                                                                         | -                            | -                            | CC                                                                                           | -                          | DC                                                                                          |
| MIL-R-105509 F equivalent reference                            |  | RN55C                                                                                      | -                            | -                            | RN60C                                                                                        | -                          | RN65C                                                                                       |
| Power Rating at 70 °C                                          |  | 0.125 W                                                                                    | 0.250 W                      | 0.500 W                      | 0.250 W                                                                                      | 0.500 W                    | 0.500 W                                                                                     |
| Resistance Value Range in Relation to Tolerance $\pm 1$ % E96  |  | 1 $\Omega$ to 332 k $\Omega$                                                               | 1 $\Omega$ to 332 k $\Omega$ | 1 $\Omega$ to 332 k $\Omega$ | 1 $\Omega$ to 1 M $\Omega$                                                                   | 1 $\Omega$ to 1 M $\Omega$ | 1 $\Omega$ to 2.21 M $\Omega$                                                               |
| Maximum Voltage                                                |  | 300 V                                                                                      | 300 V                        | 350 V                        | 350 V                                                                                        | 350 V                      | 400 V                                                                                       |
| Critical Resistance                                            |  | -                                                                                          | -                            | -                            | 490 k $\Omega$                                                                               | 245 k $\Omega$             | 320 k $\Omega$                                                                              |
| Temperature Coefficient<br>Rated in the range - 55 °C + 155 °C |  | K3 $\leq \pm 50$ ppm/°C                                                                    |                              |                              |                                                                                              |                            |                                                                                             |
| Typical in the range - 10 °C + 70 °C                           |  | K3 $\leq \pm 30$ ppm/°C                                                                    |                              |                              |                                                                                              |                            |                                                                                             |
| Insulation Resistance (Typical)                                |  | $\geq 10^7$ M $\Omega$ (500 V <sub>DC</sub> )                                              |                              |                              |                                                                                              |                            |                                                                                             |
| Voltage Coefficient                                            |  | 10 ppm/V                                                                                   |                              |                              |                                                                                              |                            |                                                                                             |
| Environmental Specification                                    |  | - 65 °C/+ 155 °C/56 days                                                                   |                              |                              |                                                                                              |                            |                                                                                             |

#### Note

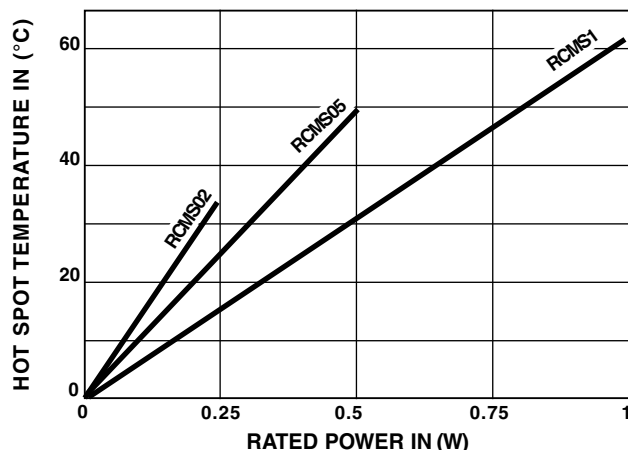
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| <b>PERFORMANCE</b>                     |                                           |                                                                        |                                                                                |
|----------------------------------------|-------------------------------------------|------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| <b>CECC 40 100 EN 140-100</b>          |                                           |                                                                        | <b>TYPICAL VALUES AND DRIFTS</b>                                               |
| <b>TESTS</b>                           | <b>CONDITIONS</b>                         | <b>REQUIREMENTS</b>                                                    |                                                                                |
| Load Life at Max. Category Temperature | 1000 h at 125 °C 50 % of $P_n$            | $\leq \pm (1 \% + 0.05 \Omega)$<br>Insulation resist. > 1 G $\Omega$   | $\pm 0.5 \%$ or 0.05 $\Omega$<br>Insulation resist. 10 <sup>6</sup> M $\Omega$ |
| Short Time Overload                    | $2.5 U_n/5$ s<br>limited to 2 $U_n$       | $\leq \pm (0.25 \% + 0.05 \Omega)$                                     | $\pm 0.1 \%$ or 0.05 $\Omega$                                                  |
| Damp Heat Humidity (Steady State)      | 56 days<br>with low load                  | $\leq \pm (1 \% + 0.05 \Omega)$<br>Insulation resist. > 1 G $\Omega$   | $\pm 0.5 \%$ or 0.05 $\Omega$<br>Insulation resist. 10 <sup>6</sup> M $\Omega$ |
| Rapid Temperature Change               | - 55 °C + 125 °C                          | $\leq \pm (0.25 \% + 0.05 \Omega)$                                     | $\pm 0.1 \%$ or 0.05 $\Omega$                                                  |
| Climatic Sequence                      | - 55 °C + 125 °C<br>severity 1            | $\leq \pm (0.5 \% + 0.05 \Omega)$<br>Insulation resist. > 1 G $\Omega$ | $\pm 0.1 \%$ or 0.05 $\Omega$<br>Insulation resist. 10 <sup>6</sup> M $\Omega$ |
| Terminal Strength                      | Pull - twist - 2 bends                    | $\leq \pm (1 \% + 0.05 \Omega)$                                        | $\pm 0.05 \%$ or 0.05 $\Omega$                                                 |
| Vibration                              | 10 Hz to 500 Hz                           | $\leq \pm (0.25 \% + 0.05 \Omega)$                                     | $\pm 0.05 \%$ or 0.05 $\Omega$                                                 |
| Soldering (Thermal Shock)              | + 260 °C 10 s                             | $\leq \pm (0.25 \% + 0.05 \Omega)$                                     | $\pm 0.1 \%$ or 0.05 $\Omega$                                                  |
| Load Life                              | Cycle 90°/30°<br>1000 h at $P_n$ at 70 °C | $\leq \pm (1 \% + 0.05 \Omega)$<br>Insulation resist. > 1 G $\Omega$   | $\pm 0.2 \%$ or 0.05 $\Omega$<br>Insulation resist. 10 <sup>6</sup> M $\Omega$ |
| Shelf Life                             | 1 year<br>ambient temperature             | -                                                                      | $\pm 0.1 \%$ or 0.05 $\Omega$                                                  |

## POWER RATING



## TEMPERATURE RISE



## PRACTICAL OPERATING TOLERANCES

Tables 2 and 3 show the basic characteristics and max. values under different stresses. In fact, the values and drifts are maintained to within narrower limits.

|                                                          |                     |               |
|----------------------------------------------------------|---------------------|---------------|
| Temperature coefficient between - 10 °C and + 70 °C      | K3 $\leq 30$ ppm/°C |               |
| LONG LIFE<br>90°/30° cycles<br>ambient temperature 70 °C | 1000 h at $P_r$     | $\pm 0.25 \%$ |
|                                                          | 10 000 h at $P_r$   | $\pm 0.5 \%$  |

Thus, in operation under the specified conditions ( $P_r$  at 70 °C) the total drift (load life + TCR) of a RCMS K3 does not exceed  $\pm 0.5 \%$ .

## NOISE LEVEL

In a frequency decade, the average noise level increases with the ohmic value and can reach 0.3  $\mu$ V/V for the highest values. It is non measurable for  $R_n < 2$  k $\Omega$ .

## MARKING

Printed: Vishay Sfernice trademark, series, style NF style (if applicable), ohmic value (in  $\Omega$ ), tolerance (in %), temperature coefficient, manufacturing data. Due to lack of space RCMS 02 is printed MS 02.



## GLOBAL PART NUMBER INFORMATION

|              |                                     |                               |                                                                                                                                                                                                                                                                                                                                                             |          |          |                |          |                         |          |                                                                                        |          |          |          |          |          |          |
|--------------|-------------------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------|----------------|----------|-------------------------|----------|----------------------------------------------------------------------------------------|----------|----------|----------|----------|----------|----------|
| <b>R</b>     | <b>C</b>                            | <b>M</b>                      | <b>S</b>                                                                                                                                                                                                                                                                                                                                                    | <b>0</b> | <b>5</b> |                | <b>4</b> | <b>R</b>                | <b>6</b> | <b>4</b>                                                                               | <b>0</b> | <b>F</b> | <b>H</b> | <b>A</b> | <b>2</b> | <b>0</b> |
| GLOBAL Model | SIZE                                | SPECIAL                       | OHMIC VALUE                                                                                                                                                                                                                                                                                                                                                 |          |          | TOLERANCE      |          | TEMPERATURE COEFFICIENT |          | PACKAGING                                                                              |          |          |          |          |          |          |
| <b>RCMS</b>  | <b>02</b><br><b>05</b><br><b>10</b> | As applicable.<br>Contact us. | The first four digits are significant figures and the last digit specifies the number of zeros to follow. R designates decimal point.<br><b>4R640</b> = 4.64 $\Omega$<br><b>48701</b> = 48 700 $\Omega$<br><b>10002</b> = 100 000 $\Omega$<br><b>R0100</b> = 0.01 $\Omega$<br><b>R6800</b> = 0.68 $\Omega$<br><b>27000</b> = 2700 $\Omega$ = 2.7 k $\Omega$ |          |          | <b>F</b> = 1 % |          | <b>H</b> = K3, 50 ppm/K |          | AM500 = <b>A20</b><br>AM1000 = <b>A22</b><br>BAG50 = <b>S09</b><br>BAG100 = <b>S14</b> |          |          |          |          |          |          |



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