

Molded Metal Film High Stability Resistors



FEATURES

- 0.125 W to 0.5 W at 70 °C
- 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 ± 1 %
- High insulation typical values: 10^6 M Ω
- Termination = pure matte tin
- Material categorization: for definitions of compliance please see 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 | |

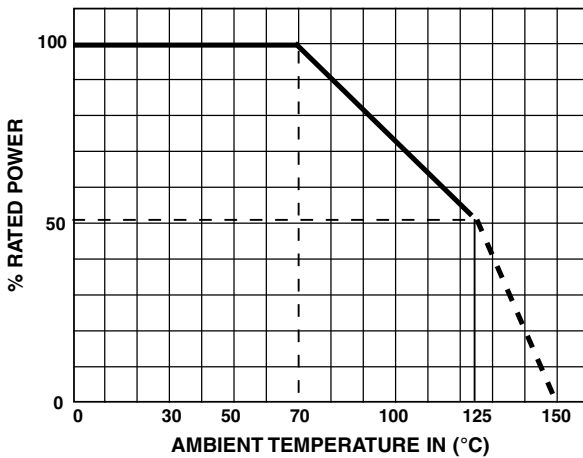
| STANDARD ELECTRICAL SPECIFICATIONS | | | | | |
|------------------------------------|---------------------------|----------------------------------|----------------------------|-------------------|--------------------------------------|
| MODEL | RESISTANCE RANGE Ω | RATED POWER $P_{70\text{ °C}}$ W | LIMITING ELEMENT VOLTAGE V | TOLERANCE \pm % | TEMPERATURE COEFFICIENT \pm ppm/°C |
| RCMS02 | 1 to 150K | 0.125 | 300 | 1 | 30, 50 |
| | 1 to 150K | 0.250 | 300 | 1 | 30, 50 |
| | 1 to 150K | 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 1M | 0.500 | 400 | 1 | 30, 50 |

| TECHNICAL AND QUALITY SPECIFICATIONS | | | | | | | |
|---|--|---|------------------------------|------------------------------|----------------------------|----------------------------|----------------------------|
| VISHAY SFERNICE SERIES | | RCMS02 | | | RCMS05 | | RCMS1 |
| Reference under CECC 40 101-002 | | RS58Y | RS64Y | RS71Y | RS63Y | RS69Y | RS68Y |
| Reference under CECC 40 101-803 | | 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 ± 1 % E96 | | 1 Ω to 150 k Ω | 1 Ω to 150 k Ω | 1 Ω to 150 k Ω | 1 Ω to 1 M Ω | 1 Ω to 1 M Ω | 1 Ω to 1 M Ω |
| Maximum voltage | | 300 V | 300 V | 350 V | 350 V | 350 V | 400 V |
| Critical resistance | | - | - | - | 490 k Ω | 245 k Ω | 320 k Ω |
| Temperature coefficient | | 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 Ω (500 V _{DC}) | | | | | |
| Voltage coefficient | | 10 ppm/V | | | | | |
| Environmental specification | | -65 °C / +155 °C / 56 days | | | | | |



| PERFORMANCE | | | |
|--|---|--|--|
| TESTS | CONDITIONS | REQUIREMENTS | TYPICAL VALUES AND DRIFTS |
| Load life at max. category temperature | 1000 h at 125 °C 50 % of P_n | $\leq \pm (1 \% + 0.05 \Omega)$ Insulation resist. > 1 G Ω | $\pm 0.5 \%$ or 0.05 Ω Insulation resist. 10 ⁶ M Ω |
| Short time overload | 2.5 U_n / 5 s Limited to 2 U_m | $\leq \pm (0.25 \% + 0.05 \Omega)$ | $\pm 0.1 \%$ or 0.05 Ω |
| Damp heat humidity (steady state) | 56 days with low load | $\leq \pm (1 \% + 0.05 \Omega)$ Insulation resist. > 1 G Ω | $\pm 0.5 \%$ or 0.05 Ω Insulation resist. 10 ⁶ M Ω |
| Rapid temperature change | -55 °C +125 °C | $\leq \pm (0.25 \% + 0.05 \Omega)$ | $\pm 0.1 \%$ or 0.05 Ω |
| Climatic sequence | -55 °C +125 °C severity 1 | $\leq \pm (0.5 \% + 0.05 \Omega)$ Insulation resist. > 1 G Ω | $\pm 0.1 \%$ or 0.05 Ω Insulation resist. 10 ⁶ M Ω |
| Terminal strength | Pull - twist - 2 bends | $\leq \pm (1 \% + 0.05 \Omega)$ | $\pm 0.05 \%$ or 0.05 Ω |
| Vibration | 10 Hz to 500 Hz | $\leq \pm (0.25 \% + 0.05 \Omega)$ | $\pm 0.05 \%$ or 0.05 Ω |
| Soldering (thermal shock) | +260 °C 10 s | $\leq \pm (0.25 \% + 0.05 \Omega)$ | $\pm 0.1 \%$ or 0.05 Ω |
| Load life | Cycle 90'/30' 1000 h at P_n at 70 °C | $\leq \pm (1 \% + 0.05 W)$ Insulation resist. > 1 G Ω | $\pm 0.2 \%$ or 0.05 Ω Insulation resist. 10 ⁶ M Ω |
| Shelf life | 1 year ambient temperature | - | $\pm 0.1 \%$ or 0.05 Ω |

POWER RATING



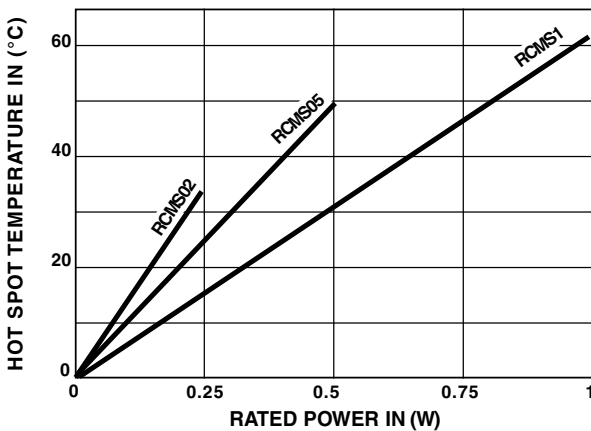
PRACTICAL OPERATING TOLERANCES

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 ≤ 30 ppm/°C | |
| LONG LIFE 90'/30' cycles 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 $\pm 0.5 \%$.

TEMPERATURE RISE



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 Ω .

MARKING

Printed: Vishay Sfernice trademark, series, ohmic value (in Ω), tolerance (in %), temperature coefficient, manufacturing data. Due to lack of space RCMS 02 is printed MS 02.



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



Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.