

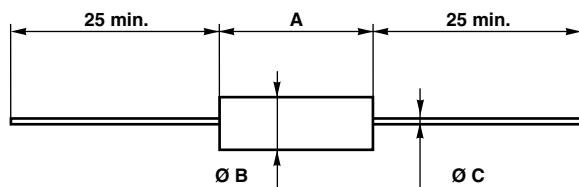
## Molded Metal Film Very High Stability (< 0.25 % After 1000 h) and Precision (up to 0.1 %) Resistors

### FEATURES

- 0.1 W to 2 W at 70 °C
- EN140-201
- According to CECC 4101-803
- Very high stability: drift < 0.25 % after 1000 h
- Reduced total excursion: high initial precision (to ± 0.1 %) with low temperature coefficient (down to ± 15 ppm/°C)
- Wide range ohmic values 1 Ω to 5 MΩ
- Accurate dimensions, high insulation and great mechanical strength
- High climatic performances: -65 °C / +155 °C / 56 days
- Matching tolerance: 0.1 %
- Tracking TCR: 5 ppm/°C
- 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 max. | Ø B max. | Ø C | WEIGHT in g |
|--------|--------|----------|-----|-------------|
| RCMA02 | 6.7    | 2.5      | 0.6 | 0.26        |
| RCMA05 | 10.4   | 4.2      | 0.6 | 0.46        |
| RCMA08 | 16.5   | 6.4      | 0.8 | 1.3         |
| RCMA1  | 19.3   | 6.4      | 0.8 | 1.5         |
| RCMA2  | 29     | 10.2     | 0.8 | 4.4         |
| RCMA4  | 54     | 10.2     | 0.8 | 13          |

### STANDARD ELECTRICAL SPECIFICATIONS

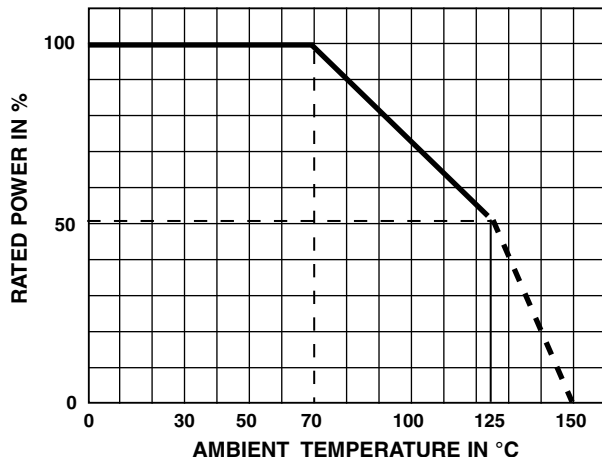
| MODEL  | RESISTANCE RANGE<br>Ω | RATED POWER<br>$P_{70\text{ °C}}$<br>W | LIMITING ELEMENT VOLTAGE<br>V | TOLERANCE<br>± % | TEMPERATURE COEFFICIENT<br>± ppm/°C |
|--------|-----------------------|--|-------------------------------|------------------|-------------------------------------|
| RCMA02 | 1 to 1M               | 0.125                                  | 300                           | 0.1, 0.2, 0.5, 1 | 15, 50                              |
| RCMA05 | 1 to 1M               | 0.250                                  | 350                           | 0.1, 0.2, 0.5, 1 | 15, 50                              |
| RCMA08 | 1 to 1.5M             | 0.500                                  | 400                           | 0.1, 0.2, 0.5, 1 | 15, 50                              |
| RCMA1  | 1 to 2M               | 0.75                                   | 500                           | 0.1, 0.2, 0.5, 1 | 15, 25                              |
| RCMA2  | 1 to 2.5M             | 1.0                                    | 600                           | 0.1, 0.2, 0.5, 1 | 15, 25                              |
| RCMA4  | 1 to 5M               | 2.0                                    | 800                           | 0.1, 0.2, 0.5, 1 | 15, 25                              |



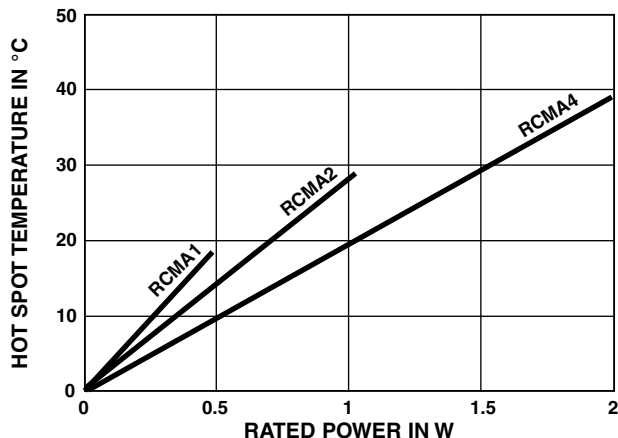
| TECHNICAL SPECIFICATIONS  |   |                            |                |                |                  |                |                |                |
|---|---|----------------------------|----------------|----------------|------------------|----------------|----------------|----------------|
| VISHAY SFERNICE SERIES  |   | RCMA02                     | RCMA05         | RCMA08         | RCMA1            | RCMA2          | RCMA4          |                |
| NF C 83-230 (for information)   |   | K4<br>RS58P                | K4<br>RS63P    | RS68P          | -                | -              | -              |                |
| Power rating at 70 °C   |   | 0.125 W                    | 0.250 W        | 0.500 W        | 0.75 W           | 1 W            | 2 W            |                |
| Resistance value range in relation to<br>- tolerance<br>- temperature coefficient | K3                                      | ± 0.2 %                    | 10 Ω to 332 kΩ | 10 Ω to 332 kΩ | 10 Ω to 1 MΩ     | 10 Ω to 1 MΩ   | 10 Ω to 2.5 MΩ |                |
|   |   | ± 0.5 % ± 1 %              | 1 Ω to 1 MΩ    | 1 Ω to 1 MΩ    | 1 Ω to 1.5 MΩ    | 1 Ω to 2 MΩ    | 1 Ω to 2.5 MΩ  | 1 W to 5 MΩ    |
|   | K4                                      | ± 0.1 % ± 0.2 %            | 10 Ω to 332 kΩ | 10 Ω to 332 kΩ | 10 Ω to 1 MΩ     | 10 Ω to 1 MΩ   | 10 Ω to 1 MΩ   | 10 Ω to 2.5 MΩ |
|   |   | ± 0.5 % ± 1 %              | 1 Ω to 1 MΩ    | 1 Ω to 1 MΩ    | 1 Ω to 1.5 MΩ    | 1 Ω to 2 MΩ    | 1 Ω to 2.5 MΩ  | 1 Ω to 5 MΩ    |
|   | K5                                      | ± 0.1 % ± 0.2 %            | 10 Ω to 332 kΩ | 10 Ω to 332 kΩ | 10 Ω to 750 kΩ   | 10 Ω to 750 kΩ | 10 Ω to 100 kΩ | 10 Ω to 100 kΩ |
|   |   | ± 0.5 % ± 1 %              | 10 Ω to 1 MΩ   | 10 Ω to 1 MΩ   | 10 Ω to 1.5 MΩ   | 10 Ω to 2 MΩ   |                |                |
| Maximum voltage   |   | 300 V                      | 350 V          | 400 V          | 500 V            | 600 V          | 800 V          |                |
| Critical resistance   |   | 720 kΩ                     | 490 kΩ         | 320 kΩ         | 333 kΩ           | 360 kΩ         | 320 kΩ         |                |
| Temperature coefficient   | Rated in the range<br>-55 °C to +155 °C | K3 ≤ ± 50 ppm/°C           |                |                | K4 ≤ ± 25 ppm/°C |                |                |                |
|   | Typical in the range<br>0 °C to +155 °C | K5 ≤ ± 15 ppm/°C           |                |                |                  |                |                |                |
| Insulation resistance   |   | > 10 <sup>7</sup> MΩ       |                |                |                  |                |                |                |
| Voltage coefficient   |   | 0.0001 %/V                 |                |                |                  |                |                |                |
| Environmental specifications  |   | -65 °C / +155 °C / 56 days |                |                |                  |                |                |                |

| PERFORMANCE                               |  |  |  |
|---|--|--|--|
| TESTS                                     | CONDITIONS   | REQUIREMENTS                                       | TYPICAL VALUES AND DRIFTS                                      |
| Load life at maximum category temperature | 1000 h at 125 °C 50 % of P <sub>n</sub>            | ≤ ± 1 %<br>Insulation resistance > 1 GΩ            | ± 0.25 % or 0.05 Ω   |
| Short time overload                       | 2.5 Un / 5 s<br>Limited to 2 Um                    | ≤ ± (0.25 % + 0.05 Ω)                              | ± 0.1 % or 0.05 Ω  |
| Damp heat humidity (steady state)         | 56 days<br>with low load                           | ≤ ± (1 % + 0.05 Ω)<br>Insulation resistance > 1 GΩ | ± 0.2 % or 0.05 Ω  |
| Rapid temperature change                  | -55 °C to +155 °C                                  | ≤ ± (0.25 % + 0.05 Ω)                              | ± 0.1 % or 0.05 Ω  |
| Climatic sequence                         | -65 °C to +155 °C                                  | ≤ ± (1 % + 0.05 Ω)<br>Insulation resistance > 1 GΩ | ± 0.25 % or 0.05 Ω<br>Insulation resistance 10 <sup>6</sup> MΩ |
| Terminal strength                         | Pull - twist - 2 bends                             | ≤ ± (0.25 % + 0.05 Ω)                              | ± 0.05 % or 0.05 Ω   |
| Vibration                                 | 10 Hz to 500 Hz                                    | ≤ ± (0.25 % + 0.05 Ω)                              | ± 0.05 % or 0.05 Ω   |
| Soldering (thermal shock)                 | +260 °C 10 s                                       | ≤ ± (0.25 % + 0.05 Ω)                              | ± 0.05 % or 0.05 Ω   |
| Load life                                 | Cycle 90'/30'<br>1000 h at P <sub>n</sub> at 70 °C | ≤ ± (1 % + 0.05 Ω)<br>Insulation resistance > 1 GΩ | ± 0.1 % or 0.05 Ω  |
| Shelf life                                | 1 year<br>ambient temperature                      | -  | ± 0.1 % or 0.05 Ω  |

**POWER RATING**



**TEMPERATURE RISE**



**PRACTICAL OPERATING TOLERANCES**

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

|  |                                      |          |
|--|--------------------------------------|----------|
| Temperature coefficient between -10 °C and +70 °C        | K5 ≤ ± 10 ppm/°C<br>K4 ≤ ± 15 ppm/°C |          |
| LONG LIFE<br>90'/30' cycles<br>ambient temperature 70 °C | 1000 h at P <sub>r</sub>             | ± 0.05 % |
|  | 10 000 h at P <sub>r</sub>           | ± 0.15 % |

So, in operation under the specified conditions (P<sub>r</sub> at 70 °C) the total drift (load life + TCR) of a RCMA K4 does not exceed ± 0.25 %.

**SPECIAL APPLICATIONS**

Temperature coefficient tracking to 5 ppm/°C.  
Tolerance matching to 0.05 %.  
Selection of positive or negative TCR in temperature range of -20 °C to +125 °C.  
For these applications and other requirements consult Vishay Sfernice.

**MARKING**

Printed: Vishay Sfernice trademark, style (due to lack of space RCMA02 is printed MA02), ohmic value (in Ω), tolerance (in %), temperature coefficient, manufacturing date.

| GLOBAL PART NUMBER INFORMATION |                                  |                               |  |   |   |  |  |   |   |  |   |  |   |   |   |   |
|--------------------------------|----------------------------------|-------------------------------|--|---|---|--|--|---|---|--|---|--|---|---|---|---|
| R                              | C                                | M                             | A  | 0 | 2 |  | 1  | 3 | 0 | 0  | 1 | F  | H | S | 1 | 4 |
| GLOBAL MODEL                   | SIZE                             | SPECIAL                       | OHMIC VALUE  |   |   |  | TOLERANCE                                      |   |   | TEMPERATURE COEFFICIENT                                  |   | PACKAGING  |   |   |   |   |
| RCMA                           | 02<br>05<br>08<br>10<br>20<br>40 | 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>13001 = 13 kΩ<br>33001 = 33 kΩ<br>220R0 = 220 Ω<br>1R220 = 1.22 Ω |   |   |  | B = 0.1 %<br>A = 0.2 %<br>D = 0.5 %<br>F = 1 % |   |   | H = K3, 50 ppm/K<br>E = K4, 25 ppm/K<br>D = K5, 15 ppm/K |   | AM500 = A20<br>BAG100 = S14<br>BAG50 = S09<br>BAG10 = S03<br>BO50* = B25<br><br>*: possible in N/A |   |   |   |   |



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