

Molded Metal Film High Stability (< 0.25 % After 1000 h) High Temperature (up to 175 °C) Precision Resistors



The performance of the RCMT resistors exceed the requirements of NF C 83-230 standards. They are particularly relevant to the more stringent military and industrial applications especially when high ambient temperatures such as +175 °C are to be encountered.

The RCMT resistors are manufactured according to the NF C UTE 83-230 standard styles RS56C, RS60E and C, RS65E and C, RS70E and C.

FEATURES

- 0.1 W to 2 W at 125 °C
- EN140100
- According to CECC 40 101-044
- High climatic performance -65 °C / +175 °C / 56 days
- High long term stability drift < 0.25 % after 1000 h
- Tight temperature coefficient to ± 15 ppm/°C
- Temperature coefficient tracking 5 ppm/°C
- Wide ohmic range from 1 Ω to 5 MΩ
- Tight tolerances up to ± 0.1 %
- Matching tolerance to 0.05 %
- Termination: Pure matte tin
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


**RoHS
COMPLIANT**

| DIMENSIONS in millimeters | | | | | |
|---------------------------|--------|--------|----------|-----|-------------|
| | SERIES | A max. | Ø B max. | Ø C | WEIGHT in g |
| | RCMT01 | 4.32 | 2.03 | 0.4 | 0.11 |
| | RCMT02 | 6.7 | 2.5 | 0.6 | 0.28 |
| | RCMT05 | 10.4 | 3.66 | 0.6 | 0.46 |
| | RCMT08 | 16.5 | 6.4 | 0.8 | 1.3 |
| | RCMT1 | 19.3 | 6.4 | 0.8 | 1.5 |
| | RCMT2 | 29 | 10.2 | 0.8 | 4.4 |
| | RCMT4 | 54 | 10.2 | 0.8 | 13 |

| STANDARD ELECTRICAL SPECIFICATIONS | | | | | |
|------------------------------------|-----------------------|--|-------------------------------|------------------|-------------------------------------|
| MODEL | RESISTANCE RANGE Ω | RATED POWER $P_{70\text{ °C}}$ W | LIMITING ELEMENT VOLTAGE V | TOLERANCE ± % | TEMPERATURE COEFFICIENT ± ppm/°C |
| RCMT01 | 1 to 511K | 0.063 | 200 | 0.1, 0.2, 0.5, 1 | 15, 25, 50 |
| RCMT02 | 1 to 322K | 0.125 | 300 | 0.1, 0.2, 0.5, 1 | 15, 25, 50 |
| RCMT05 | 1 to 1M | 0.250 | 350 | 0.1, 0.2, 0.5, 1 | 15, 25, 50 |
| RCMT08 | 1 to 1.5M | 0.500 | 400 | 0.1, 0.2, 0.5, 1 | 15, 25, 50 |
| RCMT1 | 1 to 2M | 1.0 | 500 | 0.1, 0.2, 0.5, 1 | 15, 25, 50 |
| RCMT2 | 1 to 2.5M | 2.0 | 600 | 0.1, 0.2, 0.5, 1 | 15, 25, 50 |
| RCMT4 | 1 to 5M | 4.0 | 800 | 0.1, 0.2, 0.5, 1 | 15, 25, 50 |



| TECHNICAL SPECIFICATIONS | | | | | | | | | | | |
|--------------------------|---|------------------------|-------------------------|---|---------------|-----------------|---------------|-----------------|---------------|-----------------|---------------------|
| VISHAY SFERNICE SERIES | NF C 83-230 CECC 40 101-044 (FOR INFO.) | POWER RATING AT +70 °C | POWER RATING AT +125 °C | RESISTANCE VALUE RANGE IN RELATION TO - TEMPERATURE COEFFICIENT - TOLERANCE | | | | | | MAXIMUM VOLTAGE | CRITICAL RESISTANCE |
| | | | | K3 | | K4 | | K5 | | | |
| | | | | ± 0.2 % | ± 0.5 % ± 1 % | ± 0.1 % ± 0.2 % | ± 0.5 % ± 1 % | ± 0.1 % ± 0.2 % | ± 0.5 % ± 1 % | | |
| RCMT01 K3 | - | 0.063 W | 0.05 W | 10 Ω | 1 Ω | 49.9 Ω | 49.9 Ω | 100 Ω | 100 Ω | 200 V | - |
| RCMT01 K4 | - | | | 511 kΩ | 511 kΩ | 100 kΩ | 511 kΩ | 100 kΩ | 100 kΩ | | |
| RCMT02 K3 | RS 56C | 0.125 W | 0.1 W | 10 Ω | 1 Ω | 10 Ω | 1 Ω | 10 Ω | 10 Ω | 300 V | - |
| RCMT02 K4 | RS 56E | | | 332 kΩ | 332 kΩ | 332 kΩ | 332 kΩ | 100 kΩ | 332 kΩ | | |
| RCMT05 K3 | RS 60C | 0.25 W | 0.125 W | 10 Ω | 1 Ω | 10 Ω | 1 Ω | 10 Ω | 10 Ω | 350 V | 980 kΩ |
| RCMT05 K4 | RS 60E | | | 332 kΩ | 1 MΩ | 332 kΩ | 1 MΩ | 332 kΩ | 1 MΩ | | |
| RCMT08 K3 | RS 65C | 0.5 W | 0.25 W | 10 Ω | 1 Ω | 10 Ω | 1 Ω | 10 Ω | 10 Ω | 400 V | 640 kΩ |
| RCMT08 K4 | RS 65E | | | 1 MΩ | 1.5 MΩ | 1 MΩ | 1.5 MΩ | 750 kΩ | 1.5 MΩ | | |
| RCMT1 K3 | RS 70C | 1 W | 0.5 W | 10 Ω | 1 Ω | 10 Ω | 1 Ω | 10 Ω | 10 Ω | 500 V | 500 kΩ |
| RCMT1 K4 | RS 70E | | | 1 MΩ | 2 MΩ | 1 MΩ | 2 MΩ | 750 kΩ | 2 MΩ | | |
| RCMT2 K3 | - | 2 W | 1 W | 10 Ω | 1 Ω | 10 Ω | 1 Ω | 10 Ω | 10 Ω | 600 V | 360 kΩ |
| RCMT2 K4 | - | | | 1 MΩ | 2.5 MΩ | 1 MΩ | 2.5 MΩ | 100 kΩ | 100 kΩ | | |
| RCMT4 K3 | - | 4 W | 2 W | 10 Ω | 1 Ω | 10 Ω | 1 Ω | 10 Ω | 10 Ω | 800 V | 320 kΩ |
| RCMT4 K4 | - | | | 2.5 MΩ | 5 MΩ | 2.5 MΩ | 5 MΩ | 100 kΩ | 100 kΩ | | |

| PERFORMANCE | | | |
|---|---|---|---|
| TESTS | CONDITIONS | REQUIREMENTS | TYPICAL VALUES AND DRIFTS |
| Dielectric voltage | 2 U _n / 1 min | ± 0.25 % | < ± 0.05 % or 0.05 Ω |
| Short time overload | 2.5 U _n / 5 s Limited to 2 U _m | ± 0.25 % | ± 0.05 % or 0.05 Ω |
| Load life at maximum category temperature | 1000 h at +155 °C 0 % of P _r | ± 0.5 % | ± 0.25 % or 0.05 Ω |
| Damp heat humidity (steady state) | 56 days with low load | ± 0.5 % | ± 0.2 % or 0.05 Ω Insulation resistance > 10 ⁶ MΩ |
| Rapid temperature change | -55 °C +175 °C | ± 0.1 % | ± 0.05 % or 0.05 Ω |
| Climatic sequence | -65 °C +175 °C severity 1 | ± 0.5 % Insulation resistance > 10 ³ MΩ | ± 0.2 % or 0.05 Ω Insulation resistance > 10 ⁶ MΩ |
| Terminal strength | Pull - twist - 2 bends | ± 0.1 % | ± 0.05 % or 0.05 Ω |
| Vibration | Severity 55 B | ± 0.1 % | ± 0.05 % or 0.05 Ω |
| Soldering (thermal shock) | +260 °C 10 s | ± 0.1 % | ± 0.05 % or 0.05 Ω |
| Load life | Cycle 90'/30' | ± 0.5 % | ± 0.15 % or 0.05 Ω |
| | 70 °C ambient | | |
| Shelf life | 1000 h at P _n | - | ± 0.25 % or 0.05 Ω |
| | 10 000 h at P _n | | |
| Shelf life | 1 year ambient temperature | - | < ± 0.05 % |

| TEMPERATURE COEFFICIENT | | | | |
|-------------------------|-------------------|---------------------------------|-------------------|---------------------------------|
| TCR CODE | TEMPERATURE RANGE | NOMINAL TEMPERATURE COEFFICIENT | TEMPERATURE RANGE | TYPICAL TEMPERATURE COEFFICIENT |
| K5 | 0 °C to +155 °C | ± 15 ppm/°C | 0 °C to +70 °C | ± 10 ppm/°C |
| K4 | -55 °C to +175 °C | ± 25 ppm/°C | -10 °C to +70 °C | ± 15 ppm/°C |
| K3 | -55 °C to +175 °C | ± 50 ppm/°C | -10 °C to +70 °C | ± 30 ppm/°C |

ENVIRONMENTAL SPECIFICATIONS

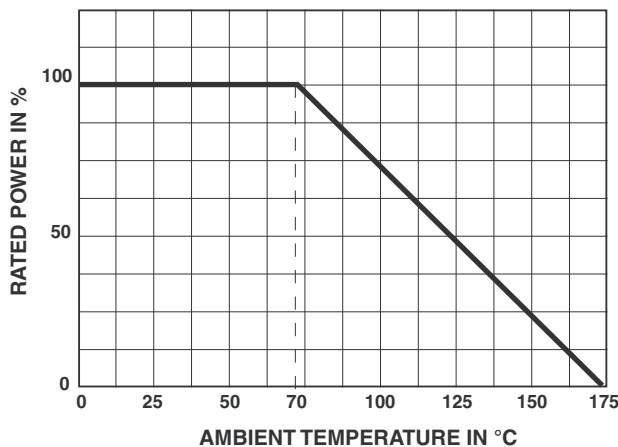
Insulation Resistance > 10⁷ MΩ
Voltage Coefficient 10 ppm/V
Environmental Specifications -65 °C / +175 °C / 56 days

PRACTICAL OPERATING TOLERANCES

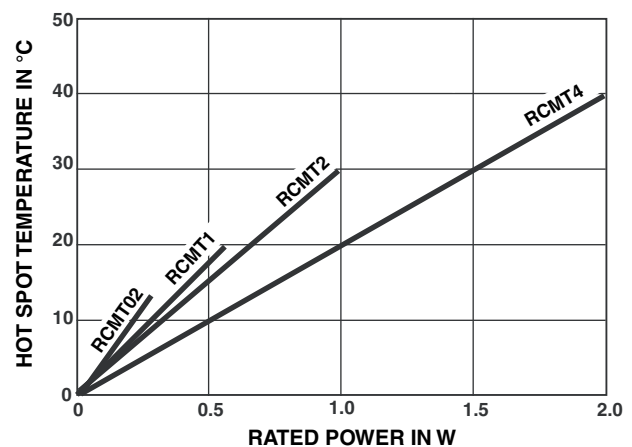
After the 10 000 h load life test, at nominal power rating, 90'/30' cycles, +125 °C ambient temperature, the total actual drifts measured at +125 °C are the following:

| | | |
|--|----------|----------|
| Manufacturing tolerance | ± 0.1 % | ± 1 % |
| Drift due to TCR (K4) + life drift | ± 0.25 % | ± 0.35 % |
| Max. total deviation from nominal ohmic value, including the manufacturing tolerance | ± 0.35 % | ± 1.35 % |

POWER RATING



TEMPERATURE RISE



NOISE LEVEL

In a frequency decade, the average noise level is 0.1 μV/V for models RCMT08, RCMT1, RCMT2, and RCMT4 in all ohmic values. It progressively increases as a function of the ohmic value and can reach 0.2 μV/V for the highest values of models RCMT02 and RCMT05 (0.1 μV/V for R < 10 kΩ).

SPECIAL APPLICATIONS

Temperature coefficient tracking to 5 ppm.
 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.

RECOMMENDATION

The lower the ohmic value, the more important the influence of lead resistance is on measurements. The nominal resistance value is therefore measured at a distance of 5 mm from resistor body.

MARKING

Printed: Series, style, ohmic value (in Ω), tolerance (in %), temperature coefficient, manufacturing date. Due to lack of space, RCMT02 is referenced as MT02.



| GLOBAL PART NUMBER INFORMATION | | | | | | | | | | | | | | | | |
|--------------------------------|--|-------------------------------|---|----------|----------|--|--|--|----------|---|----------|----------|----------|----------|----------|----------|
| R | C | M | T | 0 | 2 | | 1 | 3 | 0 | 0 | 1 | F | H | S | 1 | 4 |
| GLOBAL MODEL | SIZE | SPECIAL | OHMIC VALUE | | | | TOLERANCE | TEMPERATURE COEFFICIENT | | PACKAGING | | | | | | |
| RCMT | 01 02 05 08 10 20 40 | As applicable. Contact us. | The first four digits are significant figures and the last digit specifies the number of zeros to follow. R designates decimal point. 13001 = 13 kΩ 33001 = 33 kΩ 220R0 = 220 Ω 1R220 = 1.22 Ω | | | | B = 0.1 % A = 0.2 % D = 0.5 % F = 1 % | H = K3, 50 ppm/K E = K4, 25 ppm/K D = K5, 15 ppm/K | | AM500 = A20 BAG100 = S14 BAG50 = S09 BAG10 = S03 BO50* = B25 *: possible in N/A | | | | | | |



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