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



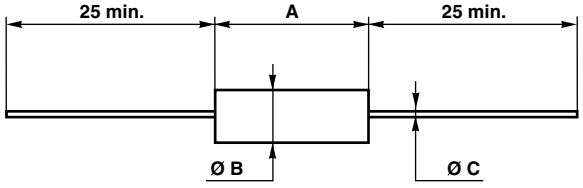
FEATURES

- 0.1 W to 2 W at 70 °C
- EN140-201
- CECC 40 100
- 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)
- The models in this series are the first ones qualified by the CNES for spatial applications (certificate N°4 dated October 22, 1972)
- 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

Pb-free

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 Ω	RATED POWER $P_{70\ °C}$ W	LIMITING ELEMENT VOLTAGE V	TOLERANCE ± %	TEMPERATURE COEFFICIENT ± 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

Note

- Undergoes European Quality Insurance System (CECC)

For technical questions, contact: sferfixedresistors@vishay.com

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TECHNICAL SPECIFICATIONS

VISHAY SFERNICE SERIES			RCMA02	RCMA05	RCMA08	RCMA1	RCMA2	RCMA4
NF C 83-230			K4 RS58P	K4 RS63P	RS68P	-	-	-
CECC 40 100-803			BE	CE	DE	-	-	-
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 - Tolerance - 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 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	1Ω 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 - 55 °C to + 155 °C		K3 ≤ ± 50 ppm/°C			K4 ≤ ± 25 ppm/°C		
	Typical in the range 0 °C to + 155 °C		K5 ≤ ± 15 ppm/°C					
Insulation Resistance			> 10^7 MΩ					
Voltage Coefficient			0.0001 %/V					
Environmental Specifications			- 65 °C/+ 155 °C/56 days					

Note

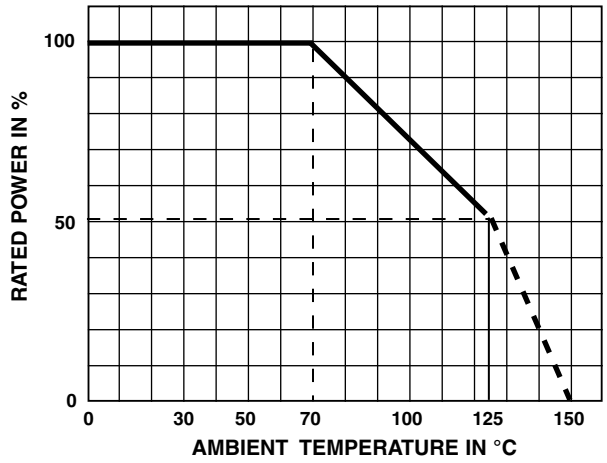
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PERFORMANCE

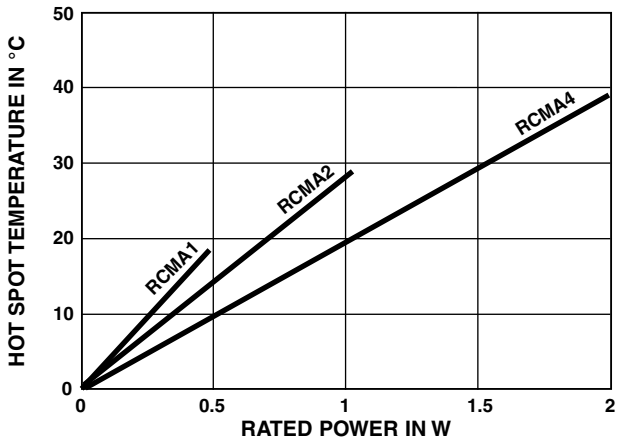
CECC 40 100 EN 140-201			TYPICAL VALUES AND DRIFTS
TESTS	CONDITIONS STD 202	REQUIREMENTS	
Load Life at Maximum Category Temperature	1000 h at 125 °C 50 % of P_n	≤ ± 1 % Insulation resistance > 1 GΩ	± 0.25 % or 0.05 Ω
Short Time Overload	2.5 U_m/5 s limited to 2 U_n	≤ ± (0.25 % + 0.05 Ω)	± 0.1 % or 0.05 Ω
Damp Heat Humidity (Steady State)	56 days with low load	≤ ± (1 % + 0.05 Ω) 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) Insulation resistance > 1 GΩ	± 0.25 % or 0.05 Ω Insulation resistance 10^6 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' 1000 h at P_n at 70 °C	≤ ± (1 % + 0.05 Ω) Insulation resistance > 1 GΩ	± 0.1 % or 0.05 Ω
Shelf Life	1 year ambient temperature	-	± 0.1 % or 0.05 Ω

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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 K4 ≤ ± 15 ppm/°C	
LONG LIFE 90'/30' cycles ambient temperature 70 °C	1000 h at P_r	± 0.05 %
	10 000 h at P_r	± 0.15 %

So, in operation under the specified conditions (P_r 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, series, 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** **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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