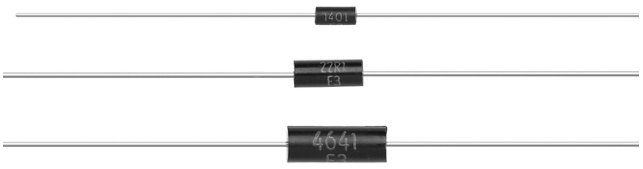
Molded Metal Film Very High Stability (< 0.25 % after 1000 h) and Precision (up to 0.1 %) Resistors

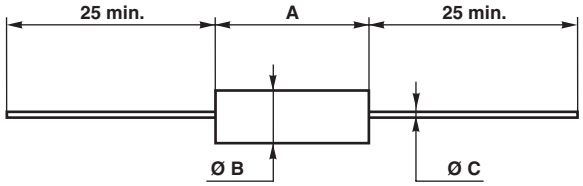


FEATURES

- 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
- Compliant to RoHS directive 2002/95/EC

Pb-free
RoHS COMPLIANT

DIMENSIONS in millimeters



SERIES	A max.	Ø B max.	Ø C	WEIGHT 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

TECHNICAL SPECIFICATIONS

VISHAY SFERNICE SERIES			RCMA02	RCMA05	RCMA08	RCMA1	RCMA2	RCMA4
NF C 83-230			RS58P K4	RS63P K4	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 Ω 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 5MΩ
	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 1 MΩ	10 Ω to 2 MΩ
		± 0.5 % ± 1 %	10 Ω to 1 MΩ	10 Ω to 1 MΩ	10 Ω to 1.5 MΩ	10 Ω to 2 MΩ	10 Ω to 2.5 MΩ	10 Ω to 2.5 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					

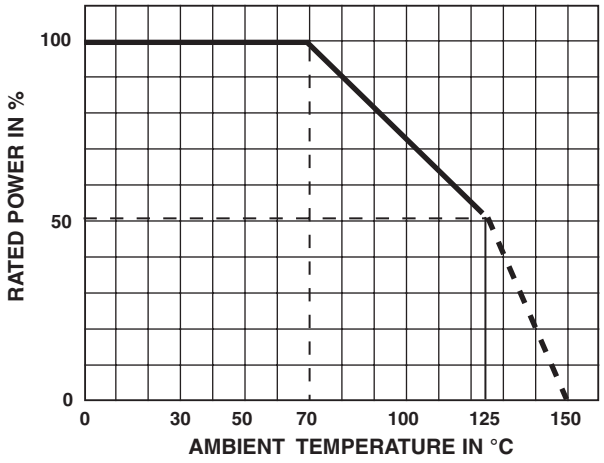
Note

• RS Undergoes European Quality Insurance System (CECC)

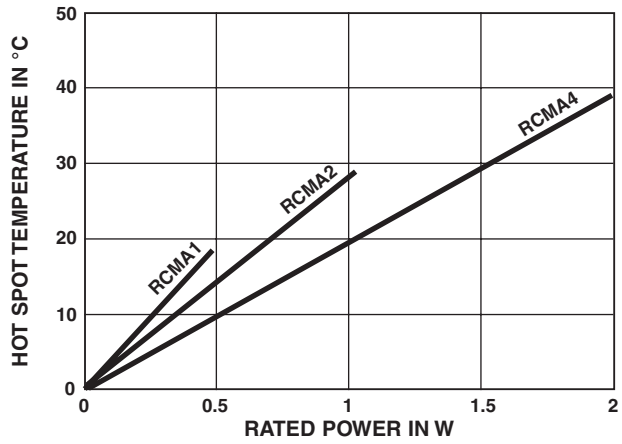
Molded Metal Film Very High Stability (< 0.25 % after 1000 h) and Precision (up to 0.1 %) Resistors

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 + 155 °C	≤ ± (0.25 % + 0.05 Ω)	± 0.1 % or 0.05 Ω
Climatic Sequence	- 65 °C + 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

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

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.

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 and agree to fully indemnify and hold Vishay and its distributors harmless from and against any and all claims, liabilities, expenses and damages arising or resulting in connection with such use or sale, including attorneys fees, even if such claim alleges that Vishay or its distributor was negligent regarding the design or manufacture of the part. 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.