

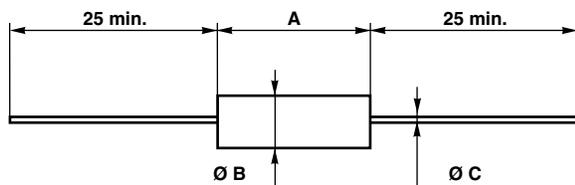
## Molded Metal Film Very High Stability (< 0.25 % After 1000 h) and Precision (up to 0.1 %) Resistors

### 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

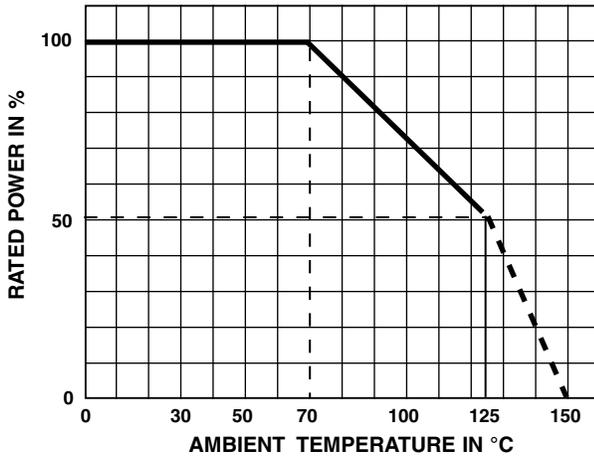
MODEL	RESISTANCE RANGE Ω	RATED POWER $P_{70\text{ °C}}$ W	LIMITING ELEMENT VOLTAGE V	TOLERANCE ± %	TEMPERATURE COEFFICIENT ± ppm/°C
RCMA02	1 to 1M	0.125	300	0.1, 0.2, 0.5, 1	15, 50
RCMA05	1 to 1M	0.250	350	0.1, 0.2, 0.5, 1	15, 50
RCMA08	1 to 1.5M	0.500	400	0.1, 0.2, 0.5, 1	15, 50
RCMA1	1 to 2M	0.75	500	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



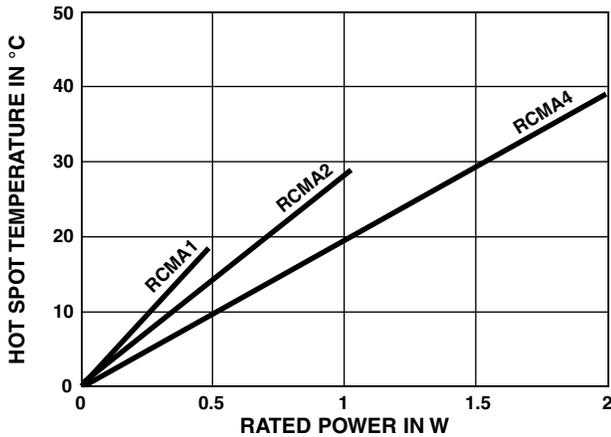
TECHNICAL SPECIFICATIONS								
VISHAY SFERNICE SERIES		RCMA02	RCMA05	RCMA08	RCMA1	RCMA2	RCMA4	
NF C 83-230 (for information)		K4 RS58P	K4 RS63P	RS68P	-	-	-	
Power rating at 70 °C		0.125 W	0.250 W	0.500 W	0.75 W	1 W	2 W	
Resistance value range in relation to - tolerance - temperature coefficient	K3	± 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 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 -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 <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 % Insulation resistance > 1 GΩ	± 0.25 % or 0.05 Ω
Short time overload	2.5 Un / 5 s Limited to 2 Um	≤ ± (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 <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' 1000 h at P <sub>n</sub> 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 <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 <b>RCMA</b>	SIZE <b>02</b> <b>05</b> <b>08</b> <b>10</b> <b>20</b> <b>40</b>	SPECIAL As applicable. Contact us.		OHMIC VALUE The first four digits are significant figures and the last digit specifies the number of zeros to follow. R designates decimal point. <b>13001</b> = 13 kΩ <b>33001</b> = 33 kΩ <b>220R0</b> = 220 Ω <b>1R220</b> = 1.22 Ω				TOLERANCE <b>B</b> = 0.1 % <b>A</b> = 0.2 % <b>D</b> = 0.5 % <b>F</b> = 1 %	TEMPERATURE COEFFICIENT <b>H</b> = K3, 50 ppm/K <b>E</b> = K4, 25 ppm/K <b>D</b> = K5, 15 ppm/K		PACKAGING AM500 = <b>A20</b> BAG100 = <b>S14</b> BAG50 = <b>S09</b> BAG10 = <b>S03</b> BO50* = <b>B25</b>  *: possible in N/A					



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