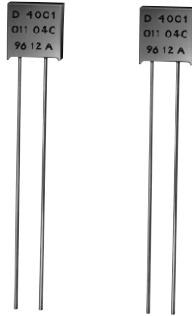


## High Precision Bulk Metal<sup>®</sup> Foil with Tolerance of $\pm 0.005\%$ and Qualified to ESA Specification 4001/011



Due to the unique performance of the Bulk Metal<sup>®</sup> foil resistive elements, these resistors are very well adapted to high reliability applications.

Our application engineering department is available to advise and to make recommendations. For non-standard technical requirements and special applications, please contact us.

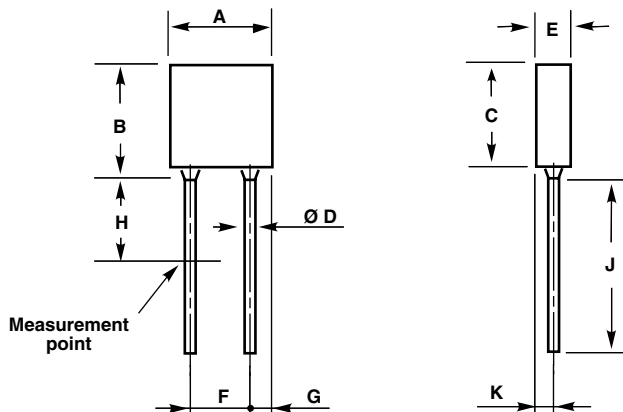
### FEATURES

- Temperature coefficient of resistance (TCR):  $\pm 5 \text{ ppm/}^\circ\text{C}$  typical (- 55 °C to + 125 °C, + 25 °C ref.)
- Rated power: to 0.5 W at + 70 °C
- Tolerance:  $\pm 0.005\%$
- Load life stability: to  $\pm 0.005\%$  at 70 °C, 2000 h at rated power
- Resistance range: 33  $\Omega$  to 100 k $\Omega$
- Vishay Foil resistors are not restricted to standard values, we can supply specific "as required" values at no extra cost or delivery (e.g. 100K1234 vs 100K)
- Electrostatic discharge up to 25 kV
- Non inductive, non capacitive design
- Rise time: 1 ns effectively no ringing
- Current noise: < - 40 dB
- Thermal EMF: 0.05  $\mu\text{V/}^\circ\text{C}$  typical
- Voltage coefficient: < 0.1 ppm/V
- Low inductance: < 0.08  $\mu\text{H}$  typical
- Non hot spot design
- Terminal finishes available: tin/lead alloy
- Matched sets are available per request (TCR Tracking: to 0.5 ppm/°C)
- For better TCR and PCR performances please review the **RNC90Z** and **Z555** datasheets

Four variants are available, two reliability levels are proposed:

- Level B: part individualization and test measurements provided
- Level C: not part individualization and no test measurements provided
- ESA/SCC 4001
- Lot acceptance test level 3 (LAT3): 10 additional parts needed
- Lot acceptance test level 2 (LAT2): 25 additional parts needed
- Lot acceptance test level 1 (LAT1): 31 additional parts needed

### DIMENSIONS in millimeters



DIM.	SERIES	RCK HR 02	
		VARIANTS	DIM. IN mm
			MIN.
A		-	7.5
B		-	8
C		-	7.5
Ø D		03 - 04 - 07 - 08	0.55 0.65
E		-	2.5
F		03 - 07	4.8 5.35
		04 - 08	3.55 4.1
G		03 - 07	1 1.5
		04 - 08	1.6 2.1
H		-	4 6
J		03 - 04	6 -
		07 - 08	20 -
K		-	- 1.5

# RCK HR 02, 02A

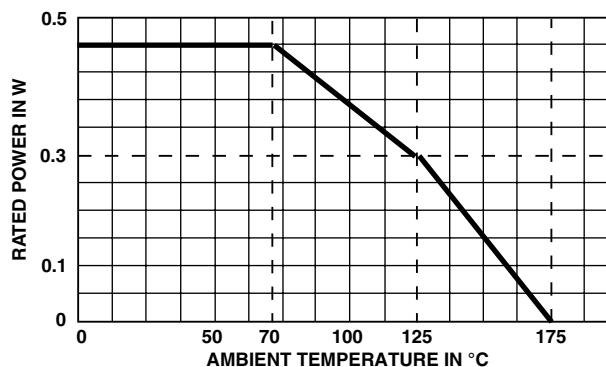


Vishay Foil Resistors High Precision Bulk Metal® Foil with Tolerance of  $\pm 0.005\%$  and Qualified to ESA Specification 4001/011

ELECTRICAL SPECIFICATIONS	
VISHAY SFERNICE DESIGNATION	RCK HR
Qualified Designation	RNC 90
ESA Specification	4001/011
Power Rating at + 70 °C	0.5 W
Limiting Element Voltage	300 V
Temperature Coefficient	$\pm 5$ ppm/°C (- 55 °C + 125 °C, + 25 °C ref.) $\pm 10$ ppm/°C (+ 125 °C to + 175 °C)
Ohmic Value Range	33 $\Omega$ to 100 k $\Omega$ available range 50 $\Omega$ to 100 k $\Omega$ qualified range
Tolerance	$\pm 0.005\%$ to $\pm 1\%$ available range $\pm 0.02\%$ to $\pm 1\%$ qualified range
Temperature Limits	- 55 °C to + 175 °C
Dielectric Voltage	425 V <sub>RMS</sub>
Soldering Temperature	260 °C, immersion 10 s at a distance of no less than 1.6 mm from the device body

TYPICAL PERFORMANCE SPECIFICATIONS			
TESTS	CONDITIONS	REQUIREMENTS ESA/SCC 4001/11	TYPICAL VALUES AND DRIFTS
Short Time Overload	$U = \sqrt{2 \cdot R_n} / 5$ s U max. < 450 V	$\pm (0.05 + (0.01 \Omega \times 100)) \% R_n$	$\pm 0.002\%$
Rapid Temperature Change	- 55 °C/+ 175 °C 5 cycles IEC 60068-2-14 test Na	$\pm (0.05 + (0.01 \Omega \times 100)) \% R_n$	$\pm 0.002\%$
Terminal Strength	IEC 60068-2-21 test Ua, test U21 (tensile)	$\pm (0.002 + (0.01 \Omega \times 100)) \% R_n$	$\pm 0.001\%$
Soldering (Thermal Shock)	260 °C/10 s IEC 60068-2-20 A test Tb (met. 1A)	$\pm (0.002 + (0.01 \Omega \times 100)) \% R_n$	$\pm 0.002\%$
Vibration	10 Hz to 2000 Hz 1.5 mm or 20 g 6 h (met. B4) IEC 60068-2-6 test Fc	$\pm (0.002 + (0.01 \Omega \times 100)) \% R_n$	$\pm 0.002\%$
Humidity (Steady State)	56 days 95 % H.R. 40 °C IEC 60068-2-3	N/a	$\pm 0.003\%$ Insulation resistance > 10 <sup>4</sup> M $\Omega$
Climatic Sequence	IEC 60068-2-2/IEC 60068-2-30 IEC 60068-2-1/IEC 60068-2-13	$\pm (0.05 + (0.01 \Omega \times 100)) \% R_n$	$\pm 0.003\%$ Insulation resistance > 10 <sup>4</sup> M $\Omega$
Load Life	1000 h P <sub>n</sub> at + 70 °C 90'/30' cycle	$\pm (0.05 + (0.01 \Omega \times 100)) \% R_n$	$\pm 0.005\%$
High Temperature Exposure	1000 h at + 175 °C IEC 60068-2-20A Test B	$\pm (0.05 + (0.01 \Omega \times 100)) \% R_n$	$\pm 0.01\%$

## POWER RATING CHART





High Precision Bulk Metal® Foil with Tolerance of  $\pm 0.005\%$  and Qualified to ESA Specification 4001/011 Vishay Foil Resistors

TOLERANCE CODE								
Tolerance $\pm$ %	0.005	0.01	0.02	0.05	0.1	0.2	0.5	1
Code SCC	E	L	P	W	B	C	D	F

PACKAGING
Resistors are packed in sealed blisters, up to 10 resistors per blister pack. The following information is printed on the blister pack: - order reference - date code - ESA specification reference - quality level - review number

**MARKING**

Ohmic value is printed on the top side, 3 to 6 digits are used, R stands for  $\Omega$  and K for  $k\Omega$ .

The front side is printed as follows:

- tolerance (letter code)
- ESA specification reference
- quality level
- variant
- manufacturing date (2 digits for the year, 2 digits for the week)
- a letter to differentiate manufacturing sequence.

ESA logo and serialization number are printed on the back side.

ORDERING INFORMATION				
RCK HR	02 - 03	10 $k\Omega$	$\pm 1\%$	B1
MODEL	VERSION - VARIANT	OHMIC VALUE	TOLERANCE	QUALITY LEVEL
	02 - 03		$\pm 0.005\%$	B1 C1
	02 - 07		$\pm 0.01\%$	B2 C2
	02A - 04		$\pm 0.02\%$	B3 C3
	02A - 08		$\pm 0.05\%$	
			$\pm 0.1\%$	
			$\pm 0.2\%$	
			$\pm 0.5\%$	
			$\pm 1\%$	



## Disclaimer

All product specifications and data are subject to change without notice.

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