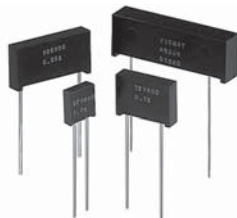


High Precision Foil Resistor with TCR of ± 2.0 ppm/°C, Tolerance of ± 0.005 % and Load Life Stability of ± 0.005 %



INTRODUCTION

Bulk Metal® Foil (BMF) technology outperforms all other resistor technologies available today for applications that require high precision and high stability.

This technology has been pioneered and developed by Vishay Foil Resistors (VFR), and products based on this technology are the most suitable for a wide range of applications. BMF technology allows the production of customer-oriented products, designed to satisfy specific challenging technical requirements.

The RCK series of BMF resistors offers low TCR, excellent load life stability, tight tolerance, fast response time, low current noise, low thermal EMF and low voltage coefficient, all in one resistor.

The RCK series is virtually insensitive to destabilizing factors. The resistor element is a solid alloy that displays the desirable bulk properties of its parent material, thus it is inherently stable and noise free. The standard design of these resistors provides a unique combination of characteristics found in no other single resistor.

VFR's application engineering department is available to advise and to make recommendations. For non-standard technical requirements and special applications, please contact foil@vishaypg.com.

TABLE 1 - RESISTANCE VERSUS TCR
(- 55 °C to + 125 °C, + 25 °C ref.)

RESISTOR ⁽¹⁾	RESISTANCE VALUE (Ω)	TYPICAL TCR AND MAX SPREAD (ppm/°C)
RCK0X	80 to < 1M	$\pm 2 \pm 2.5$
RCK0X	50 to < 80	$\pm 2 \pm 3.5$
RCK0X	0.5 to < 50	$\pm 2 \pm 4.5$

⁽¹⁾ X refers to RCK Series model number - see Table 2

* Pb containing terminations are not RoHS compliant, exemptions may apply

FEATURES

- Temperature coefficient of resistance (TCR): - 55 °C to + 125 °C, 25 °C ref.
- RCK0X series: ± 2 ppm/°C typical (see table 1)
- Power rating: to 1 W at + 125 °C
- Resistance tolerance: to ± 0.005 % (50 ppm)
- Load life stability: ± 0.005 % at 70 °C, 2000 h at rated power
- Resistance range: 0.5 Ω to 1 MΩ (for higher or lower values, please contact Application Engineering)
- Vishay Foil resistors are not restricted to standard values; specific "as required" values can be supplied at no extra cost or delivery (e.g. 1K2345 vs. 1K)
- Electrostatic discharge (ESD) at least to 25 kV
- Non inductive, non capacitive design
- Rise time: 1 ns effectively no ringing
- Current noise: 0.010 $\mu\text{V}_{\text{RMS}}/\text{V}$ of applied voltage (< - 40 dB)
- Thermal EMF: 0.05 $\mu\text{V}/\text{°C}$
- Voltage coefficient: < 0.1 ppm/V
- Low inductance: < 0.08 μH
- Non hot-spot design
- Terminal finishes available: lead (Pb)-free, tin/lead alloy
- Matched sets are available on request (TCR tracking: to 0.5 ppm/°C)
- Prototype quantities available in just 5 working days or sooner. For more information, please contact foil@vishaypg.com
- For better TCR performances please review the datasheets for the **Z Series** and **Z203**



Pb-free
Available
RoHS*
COMPLIANT

FIGURE 1 - TYPICAL RESISTANCE CHANGE VERSUS TEMPERATURE CURVES AND CHORD SLOPES (TCR) OF TWO ALLOYS IN MILITARY RANGE

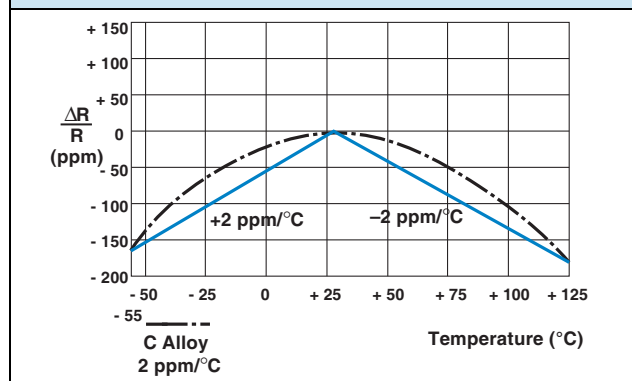
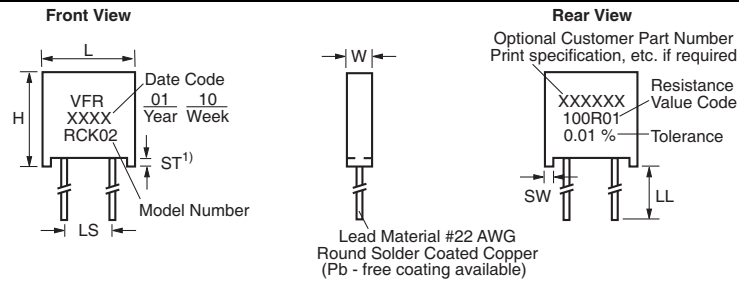


FIGURE 2 - STANDARD IMPRINTING AND DIMENSIONS



Note

- Standoffs provided to allow proper flushing of flux, debris, and contaminants from under resistor after all solder operations.
- The standoffs shall be so located as to give a lead clearance of 0.010" minimum between the resistor body and the printed circuit board when the standoffs are seated on the printed circuit board.

TABLE 2 - MODEL SELECTION

MODEL NUMBER	RESISTANCE RANGE (Ω)	MAXIMUM WORKING VOLTAGE	AMBIENT POWER RATING		AVERAGE WEIGHT IN GRAMS	DIMENSIONS		TIGHTEST TOLERANCE VS. LOWEST RESISTANCE VALUE
			at + 70 °C	at + 125 °C		INCHES	mm	
RCK02A (RCK02) ⁽¹⁾	1 to 150K	300	0.6 W up to 100K 0.4 W over 100K	0.3 W 0.2 W	0.6	W: 0.0984 max. L: 0.300 ± 0.010 H: 0.326 ± 0.010 ST: 0.010 min. SW: 0.040 ± 0.010 LL: 1.000 ± 0.125 LS: 0.150 ± 0.0054 ⁽¹⁾	2.5 max. 7.62 ± 0.25 8.28 ± 0.25 0.254 min. 1.02 ± 0.13 25.4 ± 3.18 3.81 ± 0.13	0.005 %/50 Ω 0.01 %/25 Ω 0.02 %/12 Ω 0.05 %/5 Ω 0.1 %/2 Ω 0.50 %/1 Ω 1 %/0.5 Ω
RCK04	1 to 500K	350	1.0 W up to 200K 0.6 W over 200K	0.5 W 0.3 W	1.4	W: 0.138 max. L: 0.575 max. H: 0.413 max. ST: 0.035 ± 0.005 SW: 0.050 ± 0.005 LL: 1.000 ± 0.125 LS: 0.400 ± 0.020	3.50 max. 14.61 max. 10.49 max. 0.889 ± 0.13 1.27 ± 0.13 25.4 ± 3.18 10.16 ± 0.51	
RCK05A	1 to 750K	350	1.5 W up to 300K 0.8 W over 300K	0.75 W 0.4 W	1.9	W: 0.160 max. L: 0.820 max. H: 0.413 max. ST: 0.035 ± 0.005 SW: 0.050 ± 0.005 LL: 1.000 ± 0.125 LS: 0.650 ± 0.020	4.06 max. 20.83 max. 10.49 max. 0.889 ± 0.13 1.27 ± 0.13 25.4 ± 3.18 16.51 ± 0.51	
RCK05	1 to 750K	350	1.5 W up to 300K 0.8 W over 300K	0.75 W 0.4 W	1.9	W: 0.138 max. L: 0.890 max. H: 0.413 max. ST: 0.035 ± 0.005 SW: 0.050 ± 0.005 LL: 1.000 ± 0.125 LS: 0.7 ± 0.05	3.505 max. 22.606 max. 10.49 max. 0.889 ± 0.13 1.27 ± 0.13 25.4 ± 3.18 17.78 ± 1.27	
RCK06	0.5 to 1M	500	2.0 W up to 400K 1.0 W over 400K	1.0 W 0.5 W	4.0	W: 0.260 max. L: 1.200 max. H: 0.413 max. ST: 0.035 ± 0.005 SW: 0.050 ± 0.005 LL: 1.000 ± 0.125 LS: 0.900 ± 0.020	6.60 max. 30.48 max. 10.49 max. 0.889 ± 0.13 1.27 ± 0.13 25.4 ± 3.18 22.86 ± 0.51	

Notes

- ⁽¹⁾ For RCK02, L.S. = 5.08 mm (0.200 " inches).

FIGURE 3 - POWER DERATING CURVE

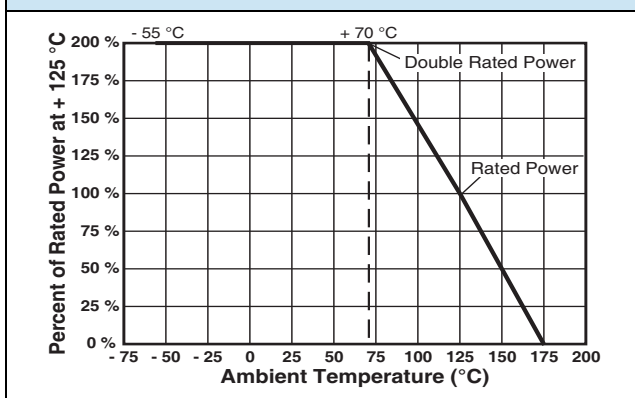


FIGURE 4 - TRIMMING TO VALUES
(conceptual illustration)

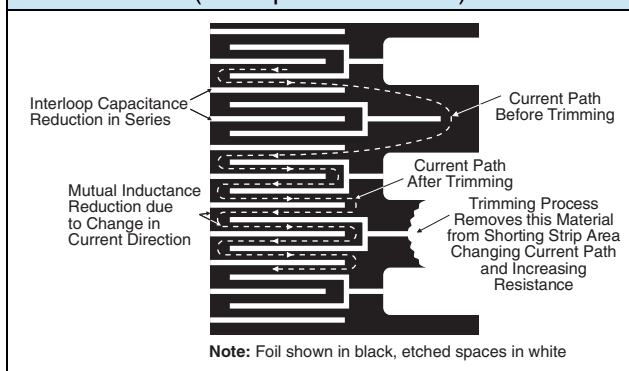


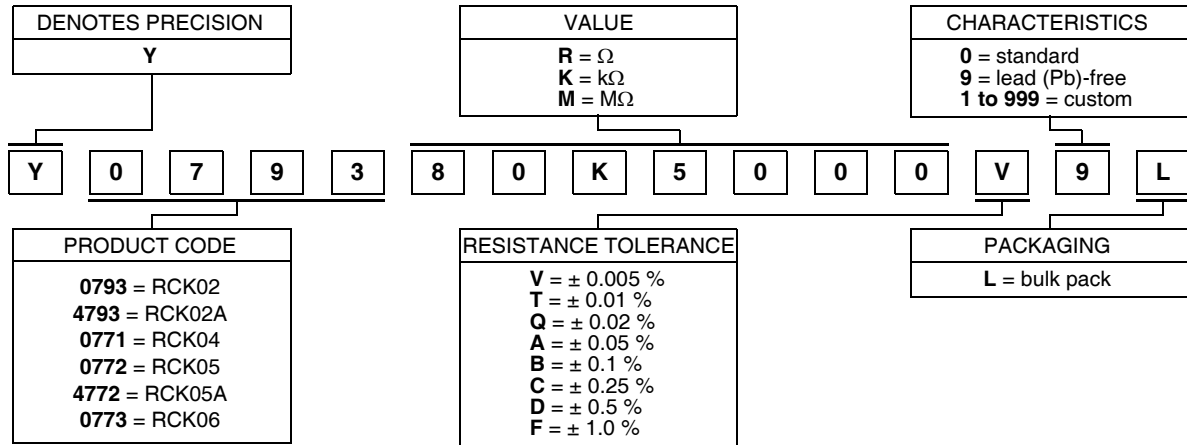
TABLE 3 - ENVIRONMENTAL PERFORMANCE COMPARISON

	MIL-PRF-55182 CHAR J	RCK-SERIES MAXIMUM ΔR	RCK-SERIES TYPICAL ΔR
Test Group I			
Thermal shock, 5 x (- 65 °C to + 150 °C)	± 0.2 %	± 0.01 % (100 ppm)	± 0.002 % (20 ppm)
Short time overload, 6.25 x rated power	± 0.2 %	± 0.01 % (100 ppm)	± 0.003 % (30 ppm)
Test Group II			
Resistance temperature characteristics ⁽¹⁾	± 25 ppm/°C	± 6.5 ppm/°C	± 2.0 ppm/°C
Low temperature storage (24 h at - 65 °C)	± 0.15 %	± 0.01 % (100 ppm)	± 0.002 % (20 ppm)
Low temperature operation (45 min, rated power at - 65 °C)	± 0.15 %	± 0.01 % (100 ppm)	± 0.002 % (20 ppm)
Terminal strength	± 0.2 %	± 0.01 % (100 ppm)	± 0.002 % (20 ppm)
Test Group III			
Dielectric Withstanding Voltage (DWV)	± 0.15 %	± 0.01 % (100 ppm)	± 0.002 % (20 ppm)
Resistance to solder heat	± 0.1 %	± 0.01 % (100 ppm)	± 0.005 % (50 ppm)
Moisture resistance	± 0.4 %	± 0.05 % (500 ppm)	± 0.01 % (100 ppm)
Test Group IV			
Shock	± 0.2 %	± 0.01 % (100 ppm)	± 0.002 % (20 ppm)
Vibration	± 0.2 %	± 0.01 % (100 ppm)	± 0.002 % (20 ppm)
Test Group V			
Life test at 0.3 W/+ 125 °C			
2000 h	± 0.5 %	± 0.015 % (150 ppm)	± 0.01 % (100 ppm)
10 000 h	± 2.0 %	± 0.05 % (500 ppm)	± 0.03 % (300 ppm)
Test Group Va			
Life test at 0.6 W (2 x rated power)/+ 70 °C, 2000 h	± 0.5 %	± 0.015 % (150 ppm)	± 0.01 % (100 ppm)
Test Group VI			
High temperature exposure (2000 h at + 175 °C)	± 2.0 %	± 0.1 % (1000 ppm)	± 0.05 % (500 ppm)
Test Group VII			
Voltage coefficient	5 ppm/V	< 0.1 ppm/V	< 0.1 ppm/V

⁽¹⁾ See Table 1.

TABLE 5 - GLOBAL PART NUMBER INFORMATION (1)

NEW GLOBAL PART NUMBER: Y079380K5000V9L (preferred part number format)



FOR EXAMPLE: ABOVE GLOBAL ORDER Y0793 80K5000 V 9 L:

TYPE: RCK02

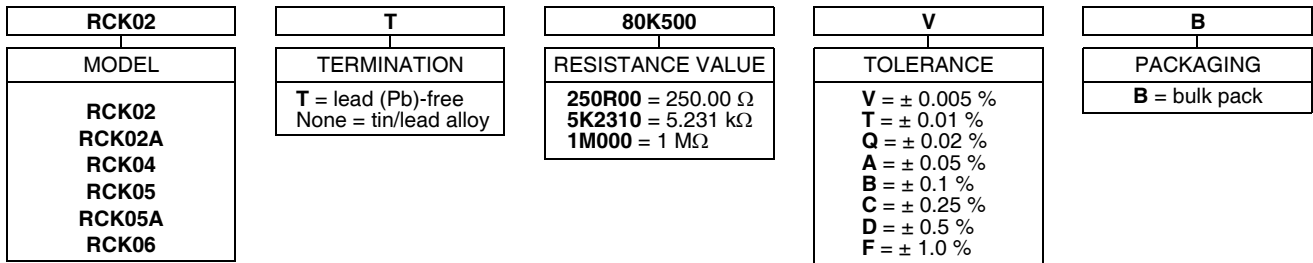
VALUE: 80.5 kΩ

ABSOLUTE TOLERANCE: ± 0.005 %

TERMINATION: lead (Pb)-free

PACKAGING: bulk pack

HISTORICAL PART NUMBER: RCK02 T 80K500 V B (will continue to be used)



Note

(1) For non-standard requests, please contact application engineering.

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