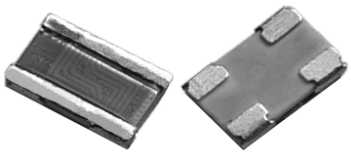
High Precision Bulk Metal® Foil Surface Mount Current Sensing Chip Resistor with TCR of ± 2 ppm/°C and Load Life Stability of ± 0.02 %



FEATURES

- Temperature coefficient of resistance (TCR): ± 2.0 ppm/°C typical (- 55 °C to + 125 °C, + 25 °C ref.) (see table 1)
- Resistance range: 0.01 Ω to 10 Ω (for higher or lower values please contact us)
- Vishay Foil resistors are not restricted to standard values, we can supply specific "as required" values at no extra cost or delivery (e.g. 1.2345 Ω vs. 1 Ω)
- Tolerance: to ± 0.1 %
- Load life stability: ± 0.02 % at 70 °C, 2000 h at rated power
- Electrostatic discharge (ESD) up to 25 000 V
- Short time overload ≤ 0.005 %
- Non inductive, non capacitive design
- Power rating: 0.5 W at + 70 °C (figure 1) or 5 A, whichever is lower
- Thermal EMF: 0.05 µV/°C typical
- Non hot spot design
- Current noise: < - 40 dB
- Rise time: 1 ns effectively no ringing
- Voltage coefficient: < 0.1 ppm/V
- Non inductive: < 0.08 µH
- For better performances please review VCS1625Z (Z-foil) datasheet

Pb-free Available

RoHS* COMPLIANT

INTRODUCTION

Model VCS1625 is a surface mount resistor designed with 4 pads for Kelvin connection. Utilizing Vishay Bulk Metal® foil as the resistance element, it provides performance capabilities far greater than other resistor technologies can supply in a product of comparable size.

This small device dissipates heat almost entirely through the pads so surface mount users are encouraged to be generous with the board's pads and traces. Gold terminations are available on special order.

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

TERMINATIONS

- Two lead (Pb)-free options are available: gold plated or tin plated
- Tin/lead plated

APPLICATIONS

- Automatic test equipment (ATE)
- Airborne (in heads-up display systems)
- High precision instrumentation
- Electron beam recording equipment
- Electron microscopes
- Current sensing applications
- Forced balance electronic scales
- Applications that require superior frequency stability
- Military
- Medical

Electrical Schematic

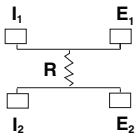
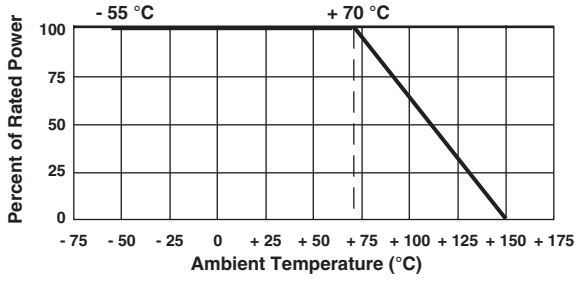


FIGURE 1 - POWER DERATING CURVE (1)



Note

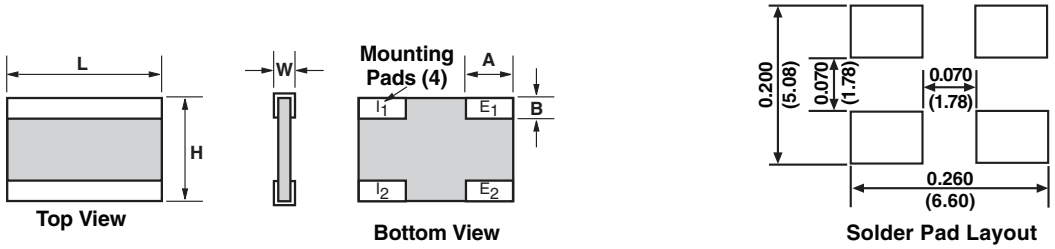
(1) Power rating at + 70 °C: 0.5 W on FR4 PCB

TABLE 1 - TOLERANCE AND TCR VS. RESISTANCE VALUE (- 55 °C to + 125 °C, + 25° Ref.)

VALUE (Ω)	TOLERANCE	TYPICAL TCR	MAXIMUM TCR
> 2R000 to 10R000	0.2 %, 0.5 %, 1 %	± 2 ppm/°C	± 5 ppm/°C
> 0R500 to 2R000	0.5 %, 1 %	± 2 ppm/°C	± 10 ppm/°C
> 0R100 to 0R500	1 %	± 2 ppm/°C	± 15 ppm/°C
> 0R050 to 0R100	1 %	± 2 ppm/°C	± 20 ppm/°C
> 0R030 to 0R050	1 %	± 2 ppm/°C	± 30 ppm/°C
> 0R010 to 0R030	1 %	± 2 ppm/°C	± 50 ppm/°C

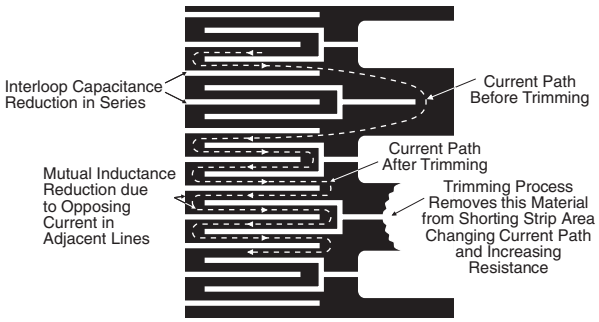
* Pb containing materials are not RoHS compliant, exemptions may apply

FIGURE 2 - DIMENSIONS in Inches (Millimeters)



	INCHES	MILLIMETERS
L	0.250 ± 0.010	6.35 ± 0.25
H	0.160 ± 0.010	4.06 ± 0.25
W	0.040 maximum	1.02 maximum
A	0.080 ± 0.005	2.03 ± 0.13
B	0.040 ± 0.010	1.02 ± 0.25

FIGURE 1 - TRIMMING TO VALUES
(Conceptual Illustration)



Note: Foil shown in black, etched spaces in white

FIGURE 4 - TYPICAL TCR CURVE

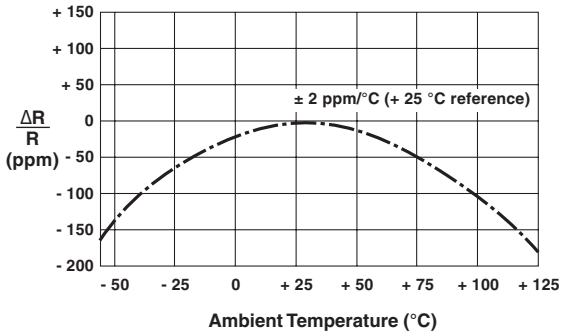


TABLE 2 - PERFORMANCE SPECIFICATIONS

TEST	MIL-PRF-55342 ΔR LIMITS	TYPICAL ΔR LIMITS	MAXIMUM ΔR LIMITS
Thermal Shock 5 x (- 65 °C to + 150 °C)	± 0.10 %	± 0.005 % (50 ppm)	± 0.01 % (100 ppm)
Low Temperature Operation	± 0.10 %	± 0.005 % (50 ppm)	± 0.01 % (100 ppm)
Short Time Overload	± 0.10 %	± 0.005 % (50 ppm)	± 0.02 % (200 ppm)
High Temperature Exposure	± 0.10 %	± 0.01 % (100 ppm)	± 0.02 % (200 ppm)
Resistance to Soldering Heat	± 0.2 %	± 0.01 % (100 ppm)	± 0.03 % (300 ppm)
Moisture Resistance	± 0.20 %	± 0.01 % (100 ppm)	± 0.03 % (300 ppm)
Load Life 2000 h at 70 °C: Rated Power On Ceramic PCB	± 0.5 %	± 0.02 % (200 ppm)	± 0.04 % (400 ppm)

Note
- Measurement error 0.001R

TABLE 3 - GLOBAL PART NUMBER INFORMATION

NEW GLOBAL PART NUMBER: Y08501R50500D9L (preferred part number format)

DENOTES PRECISION	VALUE	AER (1)
Y	**R** = Ω	**0** = standard part, tin/lead termination **9** = standard part, lead (Pb)-free termination **129** = gold plated **1 to 999** = custom

Y	0	8	5	0	1	R	5	0	5	0	0	D	9	W

PRODUCT CODE	RESISTANCE TOLERANCE	PACKAGING
0850 = VCS1625	**B** = ± 0.1 % **E** = ± 0.2 % **D** = ± 0.5 % **F** = ± 1.0 % **G** = ± 2.0 % **J** = ± 5.0 % **K** = ± 10.0 %	**W** = waffle pack **R** = tape and reel

FOR EXAMPLE: ABOVE GLOBAL ORDER Y0850 1R50500 D 9 W:
TYPE: VCS1625
VALUES: 1.505 Ω
ABSOLUTE TOLERANCE: ± 0.5 %
TERMINATION: tin plated (lead (Pb)-free)
PACKAGING: bulk pack

HISTORICAL PART NUMBER: VCS1625 1R5050 TCR2 D S W (will continue to be used)

VCS1625	1R50500	TCR2	D	S	W
MODEL	OHMIC VALUE	TEMPERATURE COEFFICIENT CHARACTERISTIC	RESISTANCE TOLERANCE	TERMINATION	PACKAGING
VCS1625	1.505 Ω		**B** = ± 0.1 % **E** = ± 0.2 % **D** = ± 0.5 % **F** = ± 1.0 % **G** = ± 2.0 % **J** = ± 5.0 % **K** = ± 10.0 %	**S** = lead (Pb)-free **B** = tin/lead **G** = gold plated	**W** = waffle pack **T** = tape and reel

Note

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

Disclaimer

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

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