Bulk Metal® Foil Technology Conformally Coated Precision Current Sensing Resistors with Temperature Coefficient of Resistance (TCR) of 10 ppm/°C and values down to to 5 mΩ

INTRODUCTION

The VCS201 and VCS202 offer resistance values as low as 5 mΩ and TCR's as low as 10 ppm/°C typical with excellent long term stability. The resistors are conformally coated. The 4 terminal current sensing resistors can sustain 2 W continuously without an appreciable change in resistance (0.5 % maximum). **The typical 50 % derating of the power specification associated with other technologies is not necessary.**

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

FEATURES

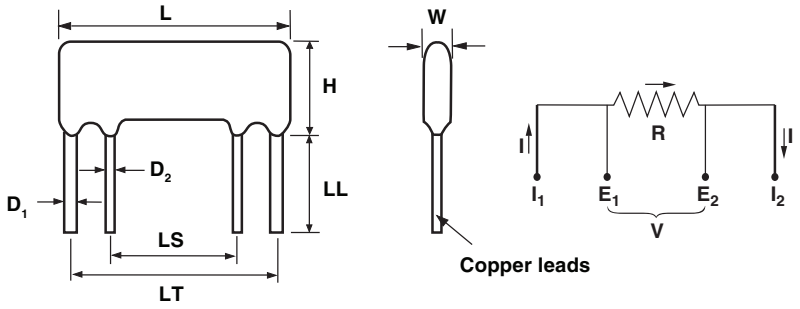
Pb-free Available

RoHS* COMPLIANT

- Temperature coefficient of resistance (TCR): ± 10 ppm/°C typical (0 °C to 60 °C) (see table 1)
- Tolerance: to ± 0.1 % (see table 1)
- Power rating: 2 W at 25 °C
- Load life stability: ± 0.02 % at 25 °C, 2000 h at rated power
- Resistance range: 0.005 Ω to 0.2 Ω
- Vishay Foil resistors are not restricted to standard values; specific "as required" values can be supplied at no extra cost or delivery (e.g. 0R123 vs. 0R1)
- Thermal stabilization time < 1 s
- Thermal EMF: 0.05 µV/°C typical
- Terminal finish: lead (Pb)-free or tin/lead alloy
- Compliant to RoHS directive 2002/95/EC
- Prototype quantities available in just 5 working days or sooner. For more information, please contact foil@vishaypg.com
- For better performances, please contact us

FIGURE 1 - DIMENSIONS AND SCHEMATIC in inches (millimeters)

Models VCS201 and VCS202



MODEL	L (Maximum)	H (Maximum)	W (Maximum)	LL (Minimum)	LS ± 0.020 (± 0.51)	LT ± 0.020 (± 0.51)	D_1 (Nominal)	D_2 (Nominal)
VCS201	1.060 (26.92)	0.374 (9.50)	0.177 (4.50)	0.500 (12.7)	0.530 (13.46)	0.925 (23.5)	0.032 (0.81)	0.025 (0.64)
VCS202	1.240 (31.5)	0.512 (13.0)	0.177 (4.50)	0.500 (12.7)	0.689 (17.5)	1.083 (27.51)	0.040 (1.02)	0.032 (0.81)

TABLE 1 - CHARACTERISTICS

MODEL NUMBER	RESISTANCE RANGE	TIGHTEST RESISTANCE TOLERANCE (%)	TCR (ppm/°C) 0 °C to + 60 °C	MAXIMUM CURRENT (A)	POWER RATING at + 25 °C (W)
VCS201	0.005 Ω to 0.01 Ω	± 1	± 30	10	1.5
	> 0.01 Ω to 0.05 Ω	± 0.5 (± 0.1)	± 25		
VCS202	> 0.05 Ω to 0.2 Ω	± 0.1	± 15	15	2

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

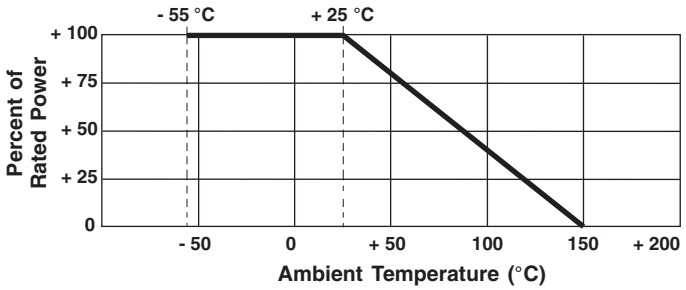
TABLE 2 - VCS201, VCS202 PERFORMANCE SPECIFICATIONS

TEST (Conditions per MIL-PRF-49465)	CONDITIONS	MIL-PRF-49465B ΔR LIMITS	TYPICAL ΔR LIMITS	MAXIMUM ΔR LIMITS
Thermal Shock	- 55 °C to + 125 °C, 5 cycles	± (0.5 % + 0.0005R)	± 0.01 %	± 0.02 %
Short Time Overload	5 x rated power for 5 s	± (0.5 % + 0.0005R)	± 0.01 %	± 0.02 %
Resistance to Soldering Heat	10 s to 12 s at + 260 °C	± (0.25 % + 0.0005R)	± 0.01 %	± 0.02 %
Terminal Strength	Pull test at 5 lb	± (1.0 % + 0.0005R)	± 0.005 %	± 0.01 %
High Temperature Exposure	2000 h, + 150 °C	± (1.0 % + 0.0005R)	± 0.05 %	± 0.1 %
Low Temperature Storage	MIL-PRF-49465	± (0.5 % + 0.0005R)	± 0.01 %	± 0.02 %
Moisture Resistance	MIL-STD-202, method 106	± (0.5 % + 0.0005R)	± 0.01 %	± 0.02 %
Shock (Specified Pulse)	100 g, 6 ms	± (0.1 % + 0.0005R)	± 0.05 %	± 0.1 %
Vibration (High Frequency)	(10 Hz to 2000 Hz) 20 g	± (0.1 % + 0.0005R)	± 0.05 %	± 0.1 %
Load Life Stability	2000 h, + 25 °C at rated power	± (1.0 % + 0.0005R)	± 0.02 %	± 0.05 %
Solderability	MIL-STD-202	95 % coverage	-	-
Thermal EMF (Lead to Lead) (E Terminals)	-	-	± 0.05 µV/°C	± 0.2 µV/°C

Note

- ΔR's plus additional 0.0005 Ω for measurement error

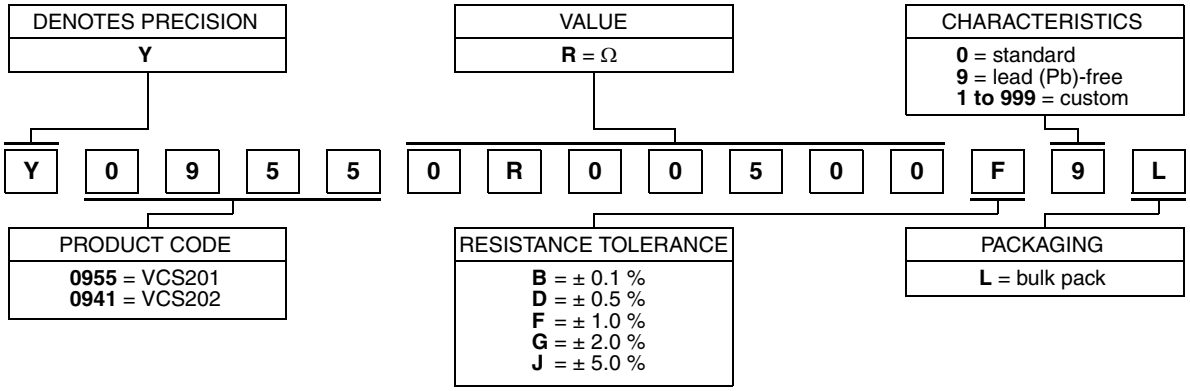
FIGURE 2 - POWER DERATING CURVE



(Further Derating Not Necessary)

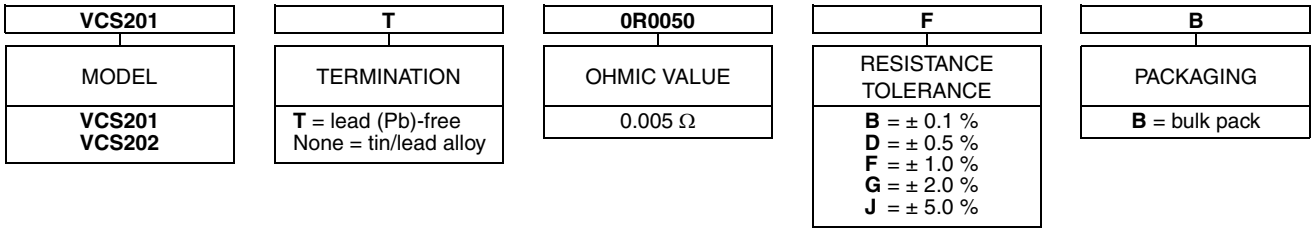
TABLE 3 - GLOBAL PART NUMBER INFORMATION (1)

NEW GLOBAL PART NUMBER: Y09550R00500F9L (preferred part number format)



FOR EXAMPLE: ABOVE GLOBAL ORDER Y0955 0R00500 F 9 L:
TYPE: VCS201
VALUE: 0.005 Ω
ABSOLUTE TOLERANCE: ± 1.0 %
TERMINATION: lead (Pb)-free
PACKAGING: bulk pack

HISTORICAL PART NUMBER: VCS201T 0R0050 F B (will continue to be used)



Note

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

Disclaimer

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

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