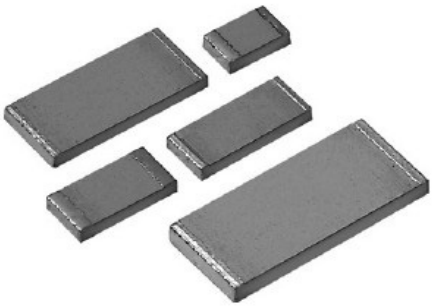
VSMP Series (0805, 1206, 1506, 2010, 2512)
Ultra High Precision Foil wraparound SMD Chip Resistor with TCR of ± 0.2 ppm/°C (0.05 ppm/°C for 0°C to 60°C)



INTRODUCTION

One of the most important parameters influencing stability is the Temperature Coefficient of Resistance (TCR). Although the TCR of foil resistors is considered extremely low, this characteristic has been further refined over the years. The VSMP Series utilizes ultra high precision Bulk Metal® Z-Foil from Vishay Precision Group. The Z-Foil technology provides a significant reduction of the resistive element's sensitivity to ambient temperature variations (TCR) and to self heating when power is applied (Power Coefficient of Resistance, or PCR). Along with the inherently low PCR and TCR, Z-Foil technology also provides remarkably improved load life stability, low noise and tight tolerances.

FEATURES

- Temperature coefficient of resistance (TCR): 0.05 ppm/°C typical (0 °C to + 60 °C)
  0.2 ppm/°C (- 55 °C to + 125 °C, + 25 °C ref.)
- Resistance tolerance: to ±0.01 %
- Power coefficient " ΔR due to self heating":
  5 ppm at rated power
- Power rating: to 750 mW at + 70 °C
- **Load life stability: to ±0.005 % at 70 °C, 2000 h at rated power**
- Resistance range: 5 Ω to 125 kΩ (for lower and higher values, please contact us)
- Fast thermal stabilization < 1 s
- **Electrostatic discharge (ESD) at least to 25 kV**
- Short time overload: < 0.005 %
- Rise time: 1 ns effectively no ringing
- Current noise: 0.010 µVrms/V of applied voltage (< -40 dB)
- Voltage coefficient < 0.1 ppm/V
- Non inductive: < 0.08 µH
- Terminal finishes available: lead (Pb) free, tin/lead alloy
- Matched sets are available per request

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

RESISTANCE VALUE (Ω)	TOLERANCE (%)	TYPICAL TCR AND MAX. SPREAD (ppm/°C)
250 to 125K	± 0.01	± 0.2 ± 1.8
100 to < 250	± 0.02	± 0.2 ± 1.8
50 to < 100	± 0.05	± 0.2 ± 2.8
25 to < 50	± 0.1	± 0.2 ± 3.8
10 to < 25	± 0.25	± 0.2 ± 3.8
5 to < 10	± 0.5	± 0.2 ± 7.8

FIGURE 1 - POWER DERATING CURVE

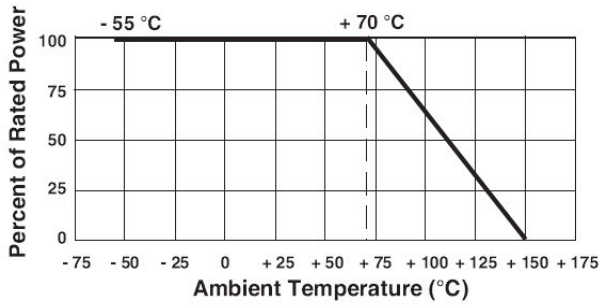
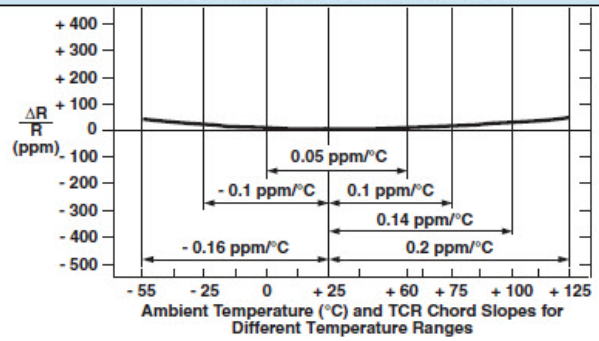
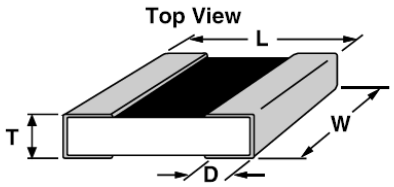


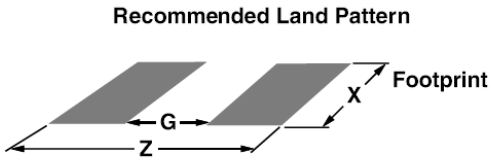
FIGURE 3 - TYPICAL RESISTANCE/ TEMPERATURE CURVE



Note
- The TCR values for < 100 Ω are influenced by the termination composition and result in deviation from this curve

TABLE 2 - DIMENSIONS AND LAND PATTERN in Inches (Millimeters)





CHIP SIZE	L ± 0.005 (0.13)	W ± 0.005 (0.13)	THICKNESS MAXIMUM	D ± 0.005 (0.13)	Z (1)	G (1)	X (1)
0805	0.080 (2.03)	0.050 (1.27)	0.025 (0.64)	0.015 (0.38)	0.122 (3.10)	0.028 (0.71)	0.050 (1.27)
1206	0.126 (3.20)	0.062 (1.57)	0.025 (0.64)	0.020 (0.51)	0.175 (4.45)	0.059 (1.50)	0.071 (1.80)
1506	0.150 (3.81)	0.062 (1.57)	0.025 (0.64)	0.020 (0.51)	0.199 (5.05)	0.083 (2.11)	0.071 (1.80)
2010	0.198 (5.03)	0.097 (2.46)	0.025 (0.64)	0.025 (0.64)	0.247 (6.27)	0.115 (2.92)	0.103 (2.62)
2512	0.249 (6.32)	0.127 (3.23)	0.025 (0.64)	0.032 (0.81)	0.291 (7.39)	0.150 (3.81)	0.127 (3.23)

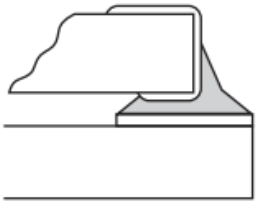
Note
(1) Land pattern dimensions are per IPC-7351A

TABLE 3 - SPECIFICATIONS

CHIP SIZE	RATED POWER (mW) at + 70 °C	MAX. WORKING VOLTAGE ($\leq \sqrt{P \times R}$)	RESISTANCE RANGE (Ω)	MAXIMUM WEIGHT (mg)
0805	200	40 V	5 to 8K	6
1206	300	87 V	5 to 25K	11
1506	300	95 V	5 to 30K	12
2010	500	187 V	5 to 70K	27
2512	750	220 V	5 to 125K	40

FIGURE 4 - RECOMMENDED MOUNTING

Notes
(1) IR and vapor phase reflow are recommended.
(2) Avoid the use of cleaning agents which could attack epoxy resins, which form part of the resistor construction
(3) Vacuum pick up is recommended for handling
(4) In case of using soldering iron, precaution measures should be taken to avoid damaging the resistor



HOW TO ORDER

VSMP 1506	12K756	T	S	W
MODEL	RESISTANCE VALUE	TOLERANCE	TERMINATION	PACKAGING
VSMP 0805	12.756 kΩ	**T** = ± 0.01 %	**S** = lead (Pb)-free	**T** = tape and reel
VSMP 1206		**Q** = ± 0.02 %	**B** = tin/lead	**W** = waffle pack
VSMP 1506		**A** = ± 0.05 %		
VSMP 2010		**B** = ± 0.10 %		
VSMP 2512		**C** = ± 0.25 %		
		D = ± 0.5 %		
		F = ± 1.0 %		

Wilbrecht LEDCO Inc. is a Vishay Precision Group approved Precision Center with a QPL certified manufacturing Facility in Huron, SD