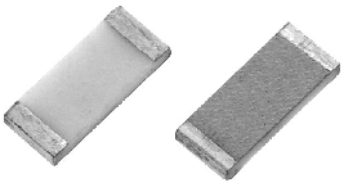
SURFACE MOUNT

Z-Based Bulk Metal® Foil Technology Discrete High Precision Surface Mount Chip Resistor High Power - Excellent Long Term Stabilty



INTRODUCTION

VSMP1206 is the industry's first device to provide higher power rating with excellent long term stability along with low nominal TCR of ± 0.5ppm/°C (-55°C to +125°C) all in one.

The VSMP1206 Precision Surface Mount Chip Resistor utilizes Ultra Precision Bulk Metal® Z Foil (BMZF) Vishay's revolutionary for the resistive element. This technology provides a significant reduction of the resistive components' sensitivity to ambient temperature variations and applied power changes. Designers now can guarantee a high degree of stability an accuracy in fixed - resistor applications using solutions based on BZMF technology.

The new technology provides inherently an extremely low and predictable Temperature Coefficient of Resistance (TCR), a remarkably improved load life stability, low noise and availability of tight tolerance.

The TCR is a process capability not a selection process and for most of the range is independent of ohmic value and lot related variations.

A voltage divider can be fashioned by using two arbitrarily selected VSMP1206s with a resultant tracking specification of < 3ppm/°C. Extremely low tracking of < 1ppm/°C can be supplied upon request.

The VSMP1206 has a conventional full wrap around robust termination which insures safe handling during manufacturing process, as well as providing stability during the multiple thermal cyclings it will see over its service life.

The availability of tight absolute tolerance provides a good cost solution for the variability of other components when compiling the total error budget. BMZF offers the best stability available; and is more than an order of magnitude better than thin film technology. The noise generated by the resistor is non measurable and its design and construction make it well suited for high frequency applications. The BMZF is the ultimate resistor component for analog applications.

Most effective in applications where high stability is required under load and extreme enviromental conditions.

Our Applications Engineering Department is prepared to advise and to make recommendations for non standard technical requirements and special applications, please contact us.

FEATURES

- **Excellent Load Life Stabilty: (70°C for 2000 hours)**
  ± 0.005% at 200mW
  ± 0.01% at 300mW
- High Rated Power at +70°C: **300mW**
- Tight Tolerance to ± 0.01% (see table 1)
- Low TCR to ± 2ppm/°C (see table 1)
- Resistance Range: 10Ω to 30KΩ (for lower and higher values please contact us)
- Shelf Life Stability: 50ppm/year (0.005%) maximum ΔR
- Maximum Weight: 11 (mg)
- Voltage Coefficient: < 0.00001%/volt (< 0.1ppm/V)
- Current Noise: - 40DB: < 0.01μV(RMS)/volt of applied voltage
- Non Inductive: < 0.08μH
- Low Thermal EMF: < 0.1μV/°C maximum
- Terminal Finishes Available:
  Lead (Pb)-free (Sn 99.3% Cu 0.7%)
  Tin/Lead Alloy (Sn 62% Pb 36% Ag 2%)

TABLE 1 TOLERANCE AND TCR VS RESISTANCE VALUE (MIL Range)

VALUE (Ω)	STANDARD TOLERANCE (%)*	MAXIMUM TCR -55°C to +125°C
250Ω to < 30K	± 0.01%	± 2 ppm/°C
100Ω to < 250Ω	± 0.02%	± 2 ppm/°C
50Ω to < 100Ω	± 0.05%	± 3 ppm/°C
25Ω to < 50Ω	± 0.1%	± 4 ppm/°C
10Ω to < 25Ω	± 0.25%	± 4 ppm/°C

*Tighter tolerances are available. Please contact Vishay Application Engineering.

APPLICATIONS

- Automatic Test Equipment (ATE)
- High Precision Instrumentation
- Laboratory, Industrial and Medical
- Audio (High End Stereo Equipment))
- EB Applications (electron beam scanning and recording equipment, electron microscopes)
- Military
- Airborne
- Down Hole

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TABLE 2 - ENVIRONMENTAL PERFORMANCE SPECIFICATIONS

TEST	MIL-PRF-55342G CHARACTERISTIC E ΔR LIMITS	VSMP1206 MAXIMUM ΔR LIMITS*
Thermal Shock	± 0.10%	± 0.01%
Low Temperature Operation	± 0.10%	± 0.01%
Short Time Overload	± 0.10%	± 0.01%
High Temperature Exposure	± 0.10%	± 0.02%
Resistance to Bonding	± 0.20%	± 0.01%
Moisture Resistance	± 0.20%	± 0.02%
Life 2000 hours @ + 70°C	± 0.50%	± 0.01%
Power @ + 70°C (mW)	300	-
Maximum Working Voltage	$(P \times R)^{1/2}$	-

*As shown + 0.01 Ohms to allow for measurement errors at low values.

FIGURE 2 - DERATING CURVE

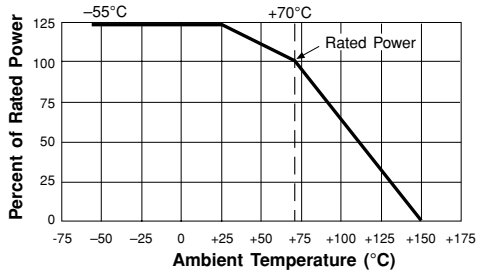
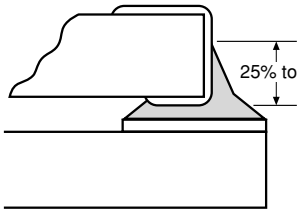


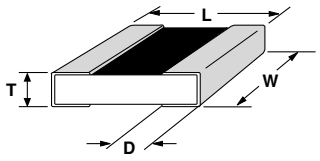
FIGURE 3 - RECOMMENDED MOUNTING



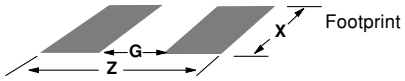
A low profile solder fillet is recommended to avoid unnecessary stresses along top edge of metallization. IR and vapor phase reflow are best. Avoid the use of cleaning agents which could attack epoxy resins, which form part of the resistor construction.

TABLE 3 - DIMENSIONS AND LAND PATTERN in inches (millimeters)

Top View



Recommended Land Pattern



L ± 0.005 [0.13]	W ± 0.005 [0.13]	T MAXIMUM	D ± 0.005 [0.13]	Z* MAXIMUM	G* MINIMUM	X* MAXIMUM
0.126 [3.2]	0.062 [1.57]	0.025 [0.64]	0.020 [0.50]	0.175 [4.4]	0.059 [1.5]	0.071 [1.806]

*Land Pattern Dimensions are per IPC-782

TABLE 4 - ORDERING INFORMATION

MODEL	CHIP SIZE	RESISTANCE VALUE			TOLERANCE	TERMINATION	PACKAGING
VSMP	1206	RESISTANCE RANGE	LETTER DESIGNATOR	MULTIPLIER FACTOR	T ± 0.01% Q ± 0.02% A ± 0.05% B ± 0.1% C ± 0.25% D ± 0.5% F ± 1.0%	**S** - Lead (Pb)-free **B** - Tin/Lead	T = Tape and Reel W = Waffle Pack
		10Ω to < 1KΩ	R	x 1.0			
		Example: 249R00 = 249Ω					
		1K to 30K	K	x 10^3			
		Example: 10K000 = 10.0KΩ					

*Example: VSMP1206 10K000 TSW, VSMP1206, Value: 10K, Tolerance: 0.01%, Lead (Pb)-free, Waffle Pack.

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