

High Precision Foil Wraparound Surface Mount Chip Resistor

with TCR of ±2 ppm/°C and Load Life Stability of ±0.01% (100 ppm)

FEATURES

- Temperature coefficient of resistance (TCR): ±2.0 ppm/°C typical (-55°C to +125°C,+25°C ref.) (see table 1)
- Tolerance: to ±0.01%
- Power rating: to 400 mW at +70°C
- Load life stability: to ±0.01% at 70°C, 2000 h at rated power
- Resistance range: 10 Ω to 125 k Ω (for higher and lower values, please contact us)
- Vishay Foil resistors are not restricted to standard values, we can supply specific "as required" values at no extra costor delivery (e.g. 1K2345 vs. 1K)
- Fast thermal stabilization <1 s
- Electrostatic discharge (ESD) up to 25 000 V
- Short time overload: ≤0.01%
- · Non inductive, non capacitive design
- Rise time: 1 ns effectively no ringing
- Current noise: -42 dB
- Voltage coefficient <0.1 ppm/V
- Non inductive: <0.08 µH
- Non hot spot design
- Terminal finishes available: lead (Pb)-free | tin/lead alloy
- · Matched sets are available per request
- Prototype quantities available in just 5 working days or sooner. For more information, please contact foil@vishaypg.com
- For better performances please review FRSM and FRFC Series datasheets

APPLICATIONS

- Automatic test equipment (ATE)
- High precision instrumentation
- Laboratory, industrial and medical
- Audio
- EB applications (electron beam scanning and recordinge quipment, electron microscopes)
- Down hole instrumentation
- Communication





INTRODUCTION

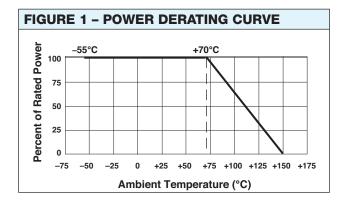
Bulk Metal® Foil (BMF) technology out-performs all other resistor technologies available today for applications that require high precision and high stability, and allows production of customer oriented products designed to satisfy challenging and specific technical requirements.

The BMF provides an inherently low and predictable Temperature Coefficient of Resistance (TCR) and excellent load life stability for high precision analog applications.

Model VSM offers low TCR, excellent load life stability, tight tolerance, excellent shelf life stability, low current noise and low voltage coefficient, all in the same resistor.

The VSM has a full wraparound termination which ensures safe handling during the manufacturing process, as well as providing stability during multiple thermal cyclings.

Our application engineering department is available to advise and make recommendations. For non-standard technical requirements and special applications, please contact us using the e-mail address in the footer below.



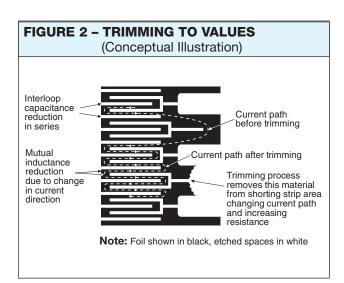
^{*} Pb containing terminations are not RoHS compliant, exemptions may apply

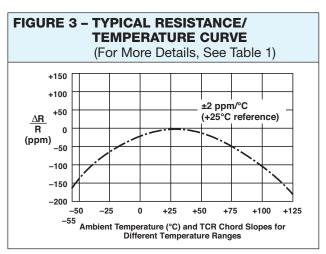


TABLE 1 - TOLERANCE AND TCR VS. RESISTANCE VALUE ⁽¹⁾ (-55°C to +125°C, +25°C Ref.)				
RESISTANCE VALUE (Ω)	TOLERANCE (%)	TYPICAL TCR AND MAX. SPREAD (ppm/°C)		
250 to 125K	±0.01	±2±2		
100 to <250	±0.02	±2±3		
50 to <100	±0.05	±2±3		
25 to <50	±0.1	±2±4		
10 to <25	±0.25	±2±6		

Note

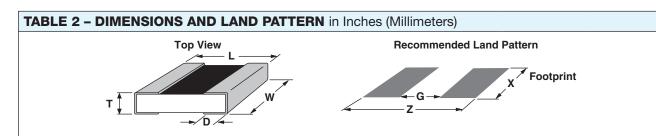
For tighter performances and non-standard values up to 150K, please contact VFR application engineering using the e-mail address in the footer below.





Note

• The TCR values for $< 100 \Omega$ are influenced by the termination composition and result in deviation from this curve.



Note: Recommended stencil thickness 0.2 mm/0.00787 inch minimum

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

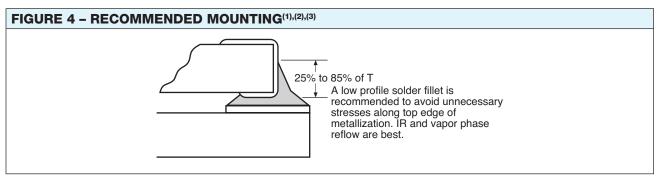


TABLE 3 - SPECIFICATIONS						
CHIP SIZE	RATED POWER (mW) at +70°C	MAX. WORKING VOLTAGE ≤√P×R	RESISTANCE RANGE (Ω)	MAXIMUM WEIGHT (mg)		
0805	100	28 V	10 to 8K	6		
1206	150	61 V	10 to 25K	11		
1506	200	78 V	10 to 30K	12		
2010	300	145 V	10 to 70K	27		
2512	400	220 V	10 to 125K	40		

TABLE 4 - PERFORMANCES					
TEST OR CONDITIONS	MIL-PRF-55342 CHARACTERISTIC E ΔR LIMITS	TYPICAL ΔR LIMITS	MAXIMUM ΔR LIMITS ⁽¹⁾		
Thermal Shock, 100×(-65°C to +150°C)	±0.1%	±0.005% (50 ppm)	±0.02% (200 ppm)		
Low Temperature Operation, -65°C, 45 min at P _{nom}	±0.1%	±0.01% (100 ppm)	±0.02% (200 ppm)		
Short Time Overload, 6.25×Rated Power, 5 s	±0.1%	±0.01% (100 ppm)	±0.02% (200 ppm)		
High Temperature Exposure, +150°C, 100 h	±0.1%	±0.01% (100 ppm)	±0.03% (300 ppm)		
Resistance to Soldering Heat	±0.2%	±0.005% (50 ppm)	±0.01% (100 ppm)		
Moisture Resistance	±0.2%	±0.005% (50 ppm)	±0.03% (300 ppm)		
Load Life Stability +70°C for 2000 h at Rated Power	±0.5%	±0.005% (50 ppm)	±0.01% (100 ppm)		

Note

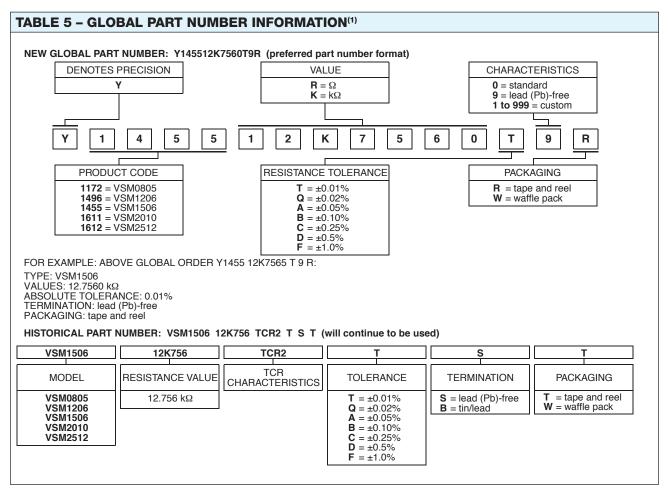
 $^{^{(1)}}$ As shown +0.01 Ω to allow for measurement errors at low values.



Notes

- (1) Avoid the use of cleaning agents which could attack epoxy resins, which form part of the resistor construction
- ⁽²⁾ Vacuum pick up is recommended for handling
- (3) Soldering iron may damage the resistor





Note

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



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