

High Precision Bulk Metal[®] Foil Surface Mount Voltage Divider, TCR Tracking of $< 0.5 \text{ ppm/}^{\circ}\text{C}$, Tolerance Match of 0.01 % and Stability of 0.005 % (50 ppm)





INTRODUCTION

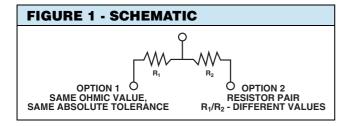
Bulk Metal[®] Foil (BMF) technology out-performs all other resistor technologies available today for applications that require high precision and high stability.

This technology has been invented, patented and pioneered by Vishay Foil Resistors (VFR). Products based on this technology are the most suitable for a wide range of applications.

BMF technology allows the production of customer oriented products designed to satisfy challenging and specific technical requirements. Model DSM offers low TCR (both absolute and tracking), excellent load life stability, tight tolerance, excellent ratio stability, and low current noise, all in one package.

The DSM surface mount divider provides a matched pair of Bulk Metal Foil resistors in a small epoxy molded package. The electrical specification of this integrated construction offers improved performance and better real estate utilization over discrete resistors and matched pairs.

VFR's application engineering department is available to advise and make recommendations. For non-standard technical requirements and special applications, please contact foil@vpgsensors.com.



FEATURES

Temperature coefficient of resistance (TCR):
 Absolute: 2 ppm/°C typical
 (- 55 °C to + 125 °C, + 25 °C ref.)
 Tracking: 0.5 ppm/°C typical



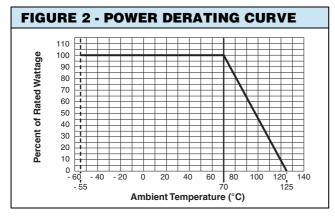
RoHS'

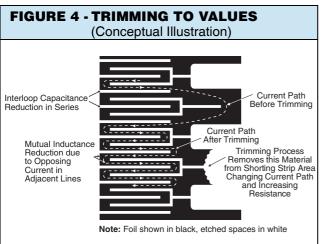
- Tolerance: absolute: ± 0.02 %: match: 0.01 %
- Power rating: at 70 °C: entire package: 0.1 W each resistor: 0.05 W
- Ratio stability: 0.005 % (0.05 W at 70 °C, 2000 h)
- Resistance range: 100 Ω to 12 k Ω per resistor
- Large variety of resistance ratios: 1:120
- Bulk Metal Foil resistors are not restricted to standard values/ratios; specific "as required" values/ratios can be supplied at no extra cost or delivery (e.g. 1K234/2K345 vs. 1K/2K)
- Thermal stabilization time < 1 s (nominal value achieved within 10 ppm of steady state value)
- · Electrostatic discharge (ESD) at least to 25kV
- Short time overload: 0.005 %
- · Non inductive, non capacitive design
- Rise time: 1 ns effectively no ringing
- Current noise: $< 0.010 \mu V_{RMS}/V$ of applied voltage (40 dB)
- Voltage coefficient: 0.1 ppm/V
- Non inductive: 0.08 µH
- Non hot spot design
- Terminals: silver coated copper alloy (see Table 5)
- Compliant to RoHS directive 2002/95/EC
- Prototype quantities available in just 5 working days or sooner. For more information, please contact foil@vpgsensors.com
- For better performances, please see DSMZ datasheet (Z-Foil)

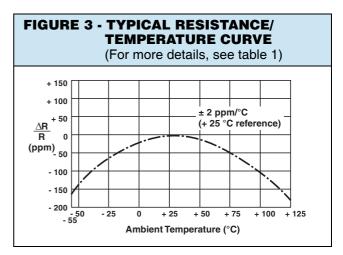
TABLE 1 - MODEL DSM SPECIFICATIONS										
MODEL	ABSOLUTE TCR (- 55 °C TO + 125 °C, + 25 °C REF.)	RESISTANCE RATIO	TCR TRACKING	TOLERANCE						
	TYPICAL + MAX. SPREAD		TCH THACKING	ABSOLUTE	MATCH					
DSM	± 2 ppm/°C ± 3 ppm/°C	R1/R2 = 1	1.0 ppm/°C	± 0.02 %	0.01 %					
		1 < R1/R2 ≤ 10	2.0 ppm/°C	± 0.05 %	0.02 %					
		10 < R1/R2 ≤ 120	3.0 ppm/°C	± 0.1 %	0.05 %					

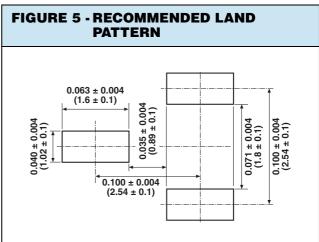
^{*} Pb containing terminations are not RoHS compliant, exemptions may apply

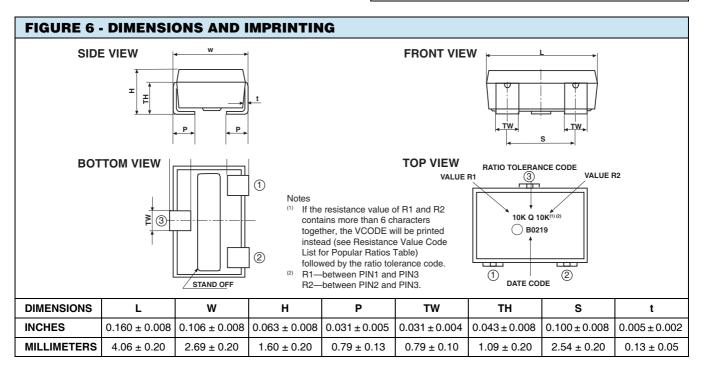






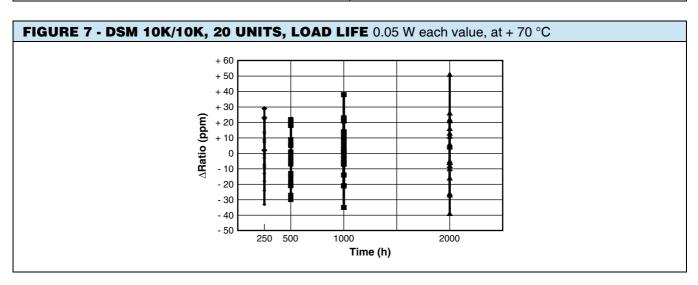








SPECIFICATIONS	TYPICAL LIMITS			
Bernar Better at 70 00	Entire package: 0.1 W			
Power Rating at 70 °C	Each resistor: 0.05 W			
Maximum Working Voltage (each resistor)	25 V			
Working Temperature Range	- 65 °C to + 125 °C			
Thermal Shock	ΔR = 0.01 % (100 ppm)			
25 x (- 65 °C to + 125 °C)	Δ Ratio = 0.005 % (50 ppm)			
Thermal Shock				
5 x (- 65 °C to + 125 °C) and	$\Delta R = 0.015 \% (150 \text{ ppm})$			
Power Conditioning	ΔRatio = 0.01 % (100 ppm)			
1.5 rated power at 25 °C, 100 h				
DWV atmospheric pressure, 200 V (A.C.), 1 min	Successfully passed			
Insulation Resistance 100 V (D.C.), 1 min	$> 10^4 \mathrm{M}\Omega$			
Desistance to Coldenium Heat	ΔR = 0.01 % (100 ppm)			
Resistance to Soldering Heat	Δ Ratio = 0.005 % (50 ppm)			
Moisture Resistance	$\Delta R = 0.02 \% (200 \text{ ppm})$			
+ 65 °C to - 10 °C; 90 % to 98 % RH; 0.1 x rated power, 240 h	Δ Ratio = 0.005 % (50 ppm)			
Shock (Specified Pulse)	ΔR = 0.005 % (50 ppm)			
100 G	Δ Ratio = 0.0025 % (25 ppm)			
Vibration, High Frequency	$\Delta R = 0.01 \% (100 \text{ ppm})$			
(10 Hz to 2000 Hz), 20 G	Δ Ratio = 0.005 % (50 ppm)			
High Temperature Exposure	$\Delta R = 0.01 \% (100 \text{ ppm})$			
100 h at 125 °C	ΔRatio = 0.005 % (50 ppm)			
Low Temperature Storage	$\Delta R = 0.005 \% (50 \text{ ppm})$			
24 h at - 65 °C	ΔRatio = 0.005 % (50 ppm)			
Load Life Stability	$\Delta R = 0.005 \% (50 \text{ ppm})$			
2000 h at + 70 °C; rated power	Δ Ratio = 0.005 % (50 ppm)			
Short Time Overload	$\Delta R = 0.005 \% (50 \text{ ppm})$			
6.25 x rated power; 5 s	ΔRatio = 0.0025 % (25 ppm)			
Law Tampayative Operation	$\Delta R = 0.005 \% (50 \text{ ppm})$			
Low Temperature Operation	ΔRatio = 0.0025 % (25 ppm)			
Weight	0.04 g			





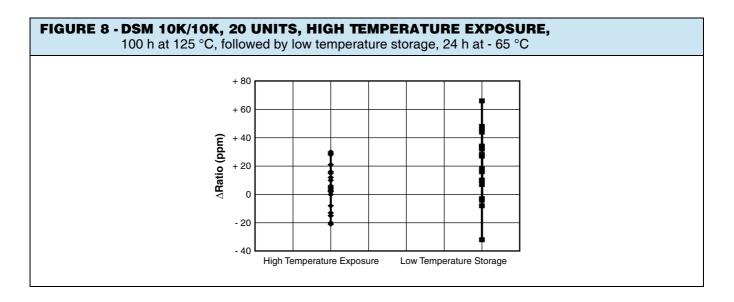
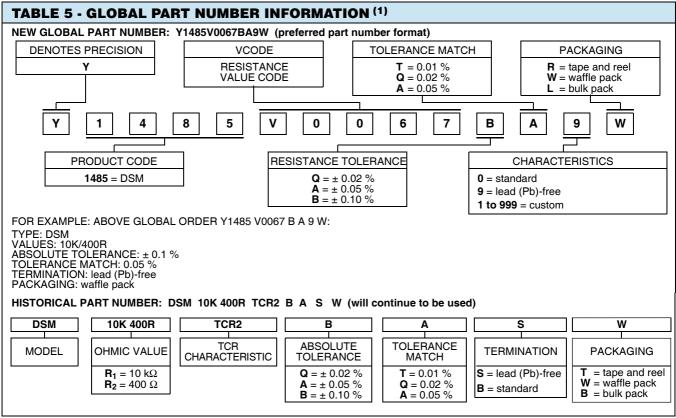


TABLE 4 - RESISTANCE VALUE CODE LIST FOR POPULAR RATIOS (other values available upon request)										
VCODES	R1/R2 RATIO	R1	R2	VCODES	R1/R2 RATIO	R1	R2			
V0052	100	10K	100R	V0080	0.5	1K	400R			
V0065	50	10K	200R	V0081	2.5	500R	200R			
V0066		5K	100R	V0082		10K	5K			
	25	10K 5K		V0083		2K	1K			
V0067 V0068			400R 200R	V0084	2	1K	500R			
70000			20011	V0085		400R	200R			
V0069	20	10K	500R	V0086		200R	100R			
V0070		2K	100R	V0087	1.25	500R	400R			
V0071	10	10K	1K	V0001 V0002 V0059 V0004 V0091 V0090 V0089						
V0072		2K	200R							
V0073		1K	100R		1	10K	10K			
V0074	5	5K	1K			5K 2K	5K 2K			
V0075		2K	400R			2K 1K	2K 1K			
V0076		1K	200R			500R	500R			
V0077		500R	100R			400R 200R	400R 200R			
V0246		10K	2K5	V0088		100R	100R			
V0078	4	2K	500R							
V0079		400R	100R							





Note

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



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