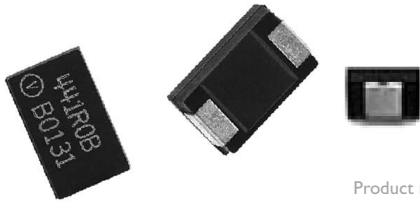


Bulk Metal® Foil Technology Precision Molded Surface Mount Resistor



Product may not
be to scale

INTRODUCTION

The **SMR_D** is a precision molded surface mountable resistor offering all the elements of precision; including lowest TCR, tight tolerances, long term stability, low noise, low thermal EMF, and non-measurable voltage coefficient. It utilizes the Bulk Metal® Foil technology for the resistive element with its inherent and legendary low predictable TCR and long term stability. This surface mountable product affords similar performance to the time tested S Series molded through-hole product.

Voltage division with tight tracking < 3ppm can be achieved with 2 randomly selected units even with a large ratio between the two values.

The molded SMR_D, while slightly larger and heavier than the Bulk Metal® Foil VSM surface mountable chip resistor, has a rugged construction capable of withstanding significant thermal cycling and allows for board installation without concern for tolerance shifts due to manufacturing processes or mechanical stresses.

FEATURES

- Very Low Temperature Coefficient of Resistance (TCR)*:
 - 2 ppm/°C (MIL Range) Nominal
 - 5 ppm/°C (MIL Range) Maximum
- Excellent Long Term Stability:
 - to ± 0.005% at + 70°C for 2000 Hours
- Tight Tolerance: to ± 0.01%
- Value Range: 5Ω to 80KΩ
- Power: 0.25 watts @ + 70°C (SMR1D)
- 0.6 watts @ + 70°C (SMR3D)
- Low Thermal EMF: 0.05 μV/°C typical
- Low Current Noise: - 40 dB
- Low Voltage Coefficient: 0.1 ppm/V
- Non Inductive: < 0.08μH
- Matched Sets Available
- Terminal Finishes Available:
 - RoHS compliant
 - Tin/Lead Alloy

* For values below 50Ω please contact our Application Engineering department

APPLICATIONS

- Precision Amplifiers
- High Precision Instrumentation
- Medical and Test equipment
- Automatic test equipment
- Industrial
- Audio (High end stereo equipment)
- EB application
- Military, Airborne and Space
- Pulse application
- Measurement instrumentation

FIGURE 1 - POWER DERATING CURVE

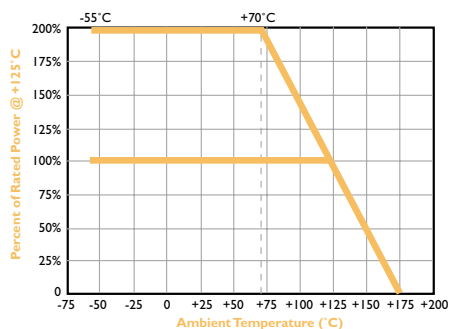
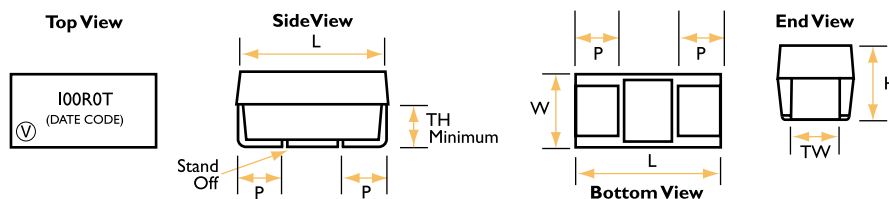


TABLE 1 - TOLERANCE VERSUS RESISTANCE VALUE

VALUE (Ω)	STANDARD TOLERANCE (%)
100Ω to 80KΩ	± 0.01%
50 Ω to < 100 Ω	± 0.02%
20Ω to < 50Ω	± 0.05%
10Ω to < 20Ω	± 0.05%
5Ω to < 10Ω	± 0.10%

FIGURE 2 - DIMENSIONS in millimeters



MODEL	L	W	H	P	TW	TH (MINIMUM)
SMR1D	6.0 ± 0.30	3.2 ± 0.30	2.5 ± 0.30	1.3 ± 0.30	2.2 ± 0.10	1.0
SMR3D	7.3 ± 0.30	4.3 ± 0.30	2.8 ± 0.30	1.3 ± 0.30	2.4 ± 0.10	1.0

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TABLE 2 - MODEL SMR_D SPECIFICATIONS

TEST	CONDITIONS		MAXIMUM LIMIT*	
	SMRID	SMR3D	SMRID	SMR3D
Resistance Range			5Ω to 33KΩ	5Ω to 80KΩ
Rated Power	0.250 watts @ 70°C 0.125 watts @ 125°C	5Ω to 30K above 30K 0.6 watts @ 70°C 0.4 watts 0.3 watts @ 125°C 0.2 watts	See Figure 1, previous page	
Maximum Working Voltage			54 V	300 V
Maximum Operating Temperature	+ 175°C			
Working Temperature Range	- 55 to + 125°C			
Thermal Shock	- 65°C to + 175°C; 30 minutes.; 5 cycles		± 0.01%	± 0.01%
Overload	2.5 x Rated Voltage; 5 Seconds		± 0.01%	± 0.01%
Low Temperature Operation	-65°C, 24 hours (no load); 45 minutes @ Rated Power		± 0.01%	± 0.01%
Dielectric Withstanding Voltage	Atmospheric Pressure; AC 200 V; 1 minute		± 0.01%	± 0.01%
Insulation Resistance (MΩ)	DC 100 V; 1 minute		over 10,000	over 10,000
Resistance to Soldering Heat (%)	260°C; 10 seconds		± 0.01%	± 0.01%
Moisture Resistance	+65°C to - 10°C; 90 to 98% RH; Rated Power; 240 hours		± 0.05%	± 0.05%
Shock	100 G; Sawtooth		± 0.01%	± 0.01%
Vibration, High Frequency	10~2,000~10 Hz; 20 G; X,Y, Z each 2.5 hours		± 0.01%	± 0.01%
Load Life Stability (2000 hours)	0.125 watts @ + 125°C 0.25 watts @ + 70°C 0.04 watts @ + 70°C	0.3 watts @ + 125°C 0.6 watts @ + 70°C 0.1 watts @ + 70°C	± 0.02% ± 0.02% ± 0.005%	± 0.015% ± 0.015% ± 0.005%
High Temperature Exposure	+175°C; No Load 2,000 hours		± 0.05%	± 0.05%
Shelf Life	15 to 35°C; 15 to 75% RH; No Load; 10,000 hours		± 0.0025% (1 year) ± 0.005% (3 years)	
Weight			0.1143 grams	0.244 grams
Packaging	Bulk (Loose) or Tape & Reel, per EIA-481-I			

*As shown +0.01Ω to allow for measurement error at low values

FIGURE 3 - RECOMMENDED MOUNTING PAD GEOMETRIES in millimeters



MODEL	METHOD	A MINIMUM	B REF	C REF	D ± 1.0	E REF	METHOD	A MINIMUM	B REF	C REF	D ± 1.0	E REF
SMRID	Wave	1.55	2.70	3.15	8.55	1.28	Reflow	2.79	2.70	3.15	8.55	1.28
SMR3D	Wave	1.68	2.70	4.45	9.85	1.28	Reflow	3.00	2.70	4.45	9.85	1.28

Per IPC-SM-782 Rev A

TABLE 3 - ORDERING INFORMATION

MODEL RANGE	RESISTANCE	RESISTANCE VALUE		TOLERANCE	TERMINATION	PACKAGING
		LETTER DESIGNATOR	MULTIPLIER FACTOR			
SMRID	5Ω to < 1KΩ Example: 249R00 - 249Ω	R	x 1.0	V = ± 0.005% T = ± 0.01% Q = ± 0.02% A = ± 0.05% B = ± 0.1% C = ± 0.25% D = ± 0.5% F = ± 1.0%	S = RoHS compliant B = Tin/Lead alloy	T = Tape and Reel B = Bulk Pack
SMR3D	33KΩ Example: 33K000 = 33.0KΩ	K	x 10 ³			

For example: SMR3D33K000TSB - Model; SMR3D, Value; 33KΩ, Tolerance; ± 0.01%, Termination; RoHS compliant Packaging; Bulk Pack