Power Metal Strip® Resistors, High Power (7 W), Low Value (down to 0.001 Ω), Surface Mount

DESIGN TOOLS (click logo to get started)

3D Models Available

FEATURES

- Improved thermal management incorporated into design
- All welded construction of the Power Metal Strip resistors are ideal for all types of current sensing, voltage division, and pulse applications
- Proprietary processing technique produces extremely low resistance values
- Very low inductance (< 5 nH)
- Solid metal nickel-chrome or manganese-copper alloy resistive element with low TCR (< 20 ppm/°C)
- Excellent frequency response to 50 MHz
- Low thermal EMF (< 3 µV/°C)
- AEC-Q200 qualified (1)
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE GRADE

Pb-free

e3

RoHS COMPLIANT

HALOGEN FREE GREEN (5-2008)

Notes

- Follow link to Overview of Automotive Grade Products for more details: www.vishay.com/doc?49924.

(1) Flame retardance test may not be applicable to some resistor technologies.

STANDARD ELECTRICAL SPECIFICATIONS

GLOBAL MODEL	SIZE	POWER RATING $P_{70\,°C}$ W	RESISTANCE VALUE RANGE Ω		WEIGHT (typical) g/1000 pieces
			Tol. ± 0.5 %	Tol. ± 1.0 %	
WSHM2818	2818	7 (1)	0.010 to 0.1	0.001 to 0.1	167.8

Note

(1) The WSHM2818 is rated at 7 W with maximum surface temperature of 180 °C.

GLOBAL PART NUMBER INFORMATION

Global Part Numbering: WSHM2818R1000FEA (visit www.vishay.net Vishay Dale parts numbering manual for all options)

W	S	H	M	2	8	1	8	R	1	0	0	0	F	E	A		

GLOBAL MODEL	RESISTANCE VALUE	TOLERANCE CODE	PACKAGING CODE (1)	SPECIAL
WSHM2818	**L** = mΩ* **R** = decimal **4L000** = 0.004 Ω **R0100** = 0.01 Ω * Use "**L**" for resistance values < 0.01 Ω	**D** = ± 0.5 % **F** = ± 1.0 %	**EA** = lead (Pb)-free, tape/reel **EK** = lead (Pb)-free, bulk	(Dash number) (up to 2 digits) From **1** to **99** as applicable

Note

(1) Packaging code: EB (lead (Pb)-free) and TB (tin / lead) are non-standard packaging codes designating 1000 piece reels. These non-standard packaging codes are identical to our standard EA (lead (Pb)-free) and TA (tin / lead), except that they have a package quantity of 1000 pieces.

TECHNICAL SPECIFICATIONS		
PARAMETER	**UNIT**	**RESISTOR CHARACTERISTICS**
Component temperature coefficient (including terminal) (1)	ppm/°C	± 200 for 1 mΩ to 5.99 mΩ, ± 75 for 6 mΩ to 100 mΩ
Element TCR (2)	ppm/°C	< 20
Inductance	nH	< 5
Operating temperature range	°C	-65 to +170
Maximum working voltage (3)	V	$(P/R)^{1/2}$

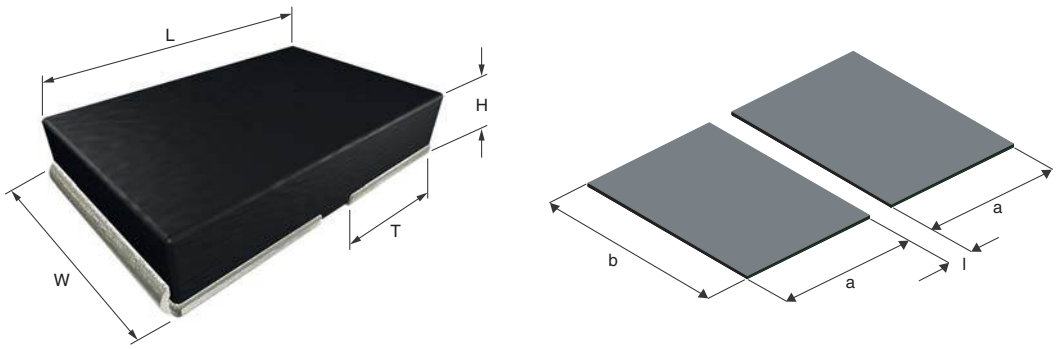
Notes

(1) Component TCR - total TCR that includes the TCR effects of the resistor element and the copper terminal.

(2) Element TCR - only applies to the alloy used for the resistor element; refer to item 1 in the construction illustration on the following page.

(3) Maximum working voltage - the WSHM is not voltage sensitive, but is limited by power / energy dissipation and is also not ESD sensitive.

DIMENSIONS in inches (millimeters)

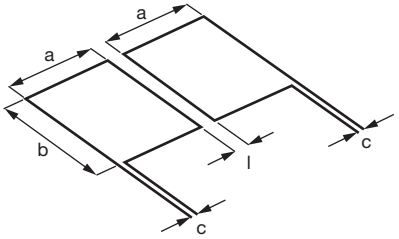


Notes

- 3D models available: www.vishay.com/doc?30324.
- Surface mount solder profile recommendations: www.vishay.com/doc?31052

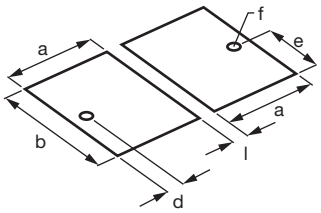
MODEL	RESISTANCE RANGE Ω	DIMENSIONS				SOLDER PAD DIMENSIONS		
		L	W	H	T	a	b	l
WSHM2818	0.001 to 0.1	0.280 ± 0.010 (7.1 ± 0.25)	0.180 ± 0.010 (4.6 ± 0.25)	0.059 ± 0.010 (1.50 ± 0.25)	0.125 ± 0.010 (3.18 ± 0.25)	0.138 (3.5)	0.200 (5.1)	0.024 (0.61)

TYPICAL SENSING LAYOUT



a	b	c	l
0.138 (3.51)	0.210 (5.33)	0.020 (0.51)	0.024 (0.61)

SENSING WITH VIA LAYOUT (best performance)

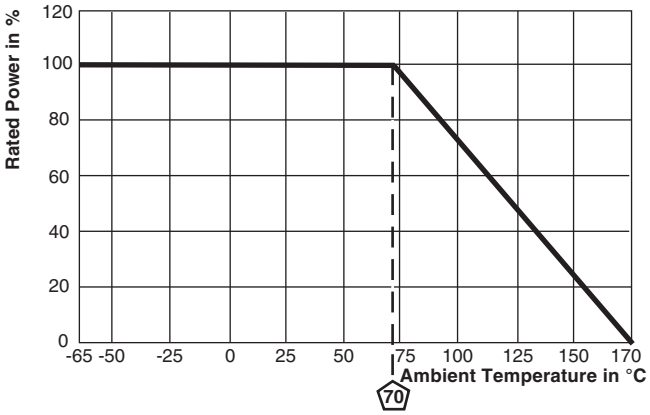


a	b	d	e	f	l
0.143 (3.63)	0.210 (5.33)	0.026 (0.66)	0.105 (2.67)	Ø 0.020 (0.50)	0.024 (0.61)

Note

- Sensing locations are based on the construction of the part; terminals are wrapped from the outside to underneath. These options place the sensing location nearest the temperature stable resistance element, which minimizes contact resistance and optimizes TCR.

DERATING



PERFORMANCE		
TEST	**CONDITIONS OF TEST**	**TEST LIMITS**
Thermal shock	-55 °C to +150 °C, 1000 cycles, 15 min at each extreme	± 0.5 %
Short time overload	4x rated power for 5 s	± 1.0 %
Low temperature operation	-65 °C for 45 min	± 0.5 %
High temperature exposure	1000 h at +170 °C	± 1.0 %
Bias humidity	+85 °C, 85 % RH, 10 % bias, 1000 h	± 0.5 %
Mechanical shock	100 *g*'s for 6 ms, 5 pulses	± 0.5 %
Vibration	Frequency varied 10 Hz to 2000 Hz in 1 min, 3 directions, 12 h	± 0.5 %
Load life	1000 h at 70 °C, 1.5 h "ON", 0.5 h "OFF"	± 1.0 %
Resistance to solder heat	+260 °C solder, 10 s to 12 s dwell, 25 mm/s emergence	± 0.5 %
Moisture resistance	MIL-STD-202, method 106, 0 % power, 7b not required	± 0.5 %

PACKAGING				
MODEL	**REEL**			
	TAPE WIDTH	**DIAMETER**	**PIECES/REEL**	**CODE**
WSHM2818	16 mm/embossed plastic	330 mm / 13"	3500	EA

Notes

- Embossed carrier tape per EIA-481.
- Additional packaging details at www.vishay.com/doc?20051.

ADDITIONAL RESOURCES	
Video: Power Metal Strip Short Time Overload	www.vishay.com/videos/resistors/power-metal-strip174-resistor-short-time-overload-product-demo

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