

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



FEATURES

- Improved thermal management incorporated into design
- Ideal for all types of current sensing, voltage division and pulse applications including switching and linear power supplies, instruments, power amplifier
- Proprietary processing technique produces extremely low resistance values
- All welded construction
- 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 μ V/°C)
- AEC-Q200 qualified ⁽¹⁾
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE
GRADE

RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

Note

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

STANDARD ELECTRICAL SPECIFICATIONS

GLOBAL MODEL	SIZE	POWER RATING $P_{70^{\circ}\text{C}}$ W	RESISTANCE VALUE RANGE Ω		WEIGHT (typical) g/1000 pieces
			Tol. $\pm 0.5\%$	Tol. $\pm 1.0\%$	
WSHM2818	2818	7 ⁽²⁾	0.010 to 0.1	0.001 to 0.1	167.8

Note

- ⁽²⁾ The WSHM2818 is rated at 7 W with maximum surface temperature of 180 °C.

GLOBAL PART NUMBER INFORMATION

Global Part Numbering: WSHM2818R1000FEA

W	S	H	M	2	8	1	8	R	1	0	0	0	F	E	A		
GLOBAL MODEL				RESISTANCE VALUE				TOLERANCE CODE		PACKAGING CODE ⁽³⁾				SPECIAL			
WSHM2818				L = m Ω * R = Decimal 4L000 = 0.004 Ω R0100 = 0.01 Ω * Use "L" for resistance values < 0.01 Ω				D = $\pm 0.5\%$ F = $\pm 1.0\%$		EA = Lead (Pb)-free, tape/reel EK = Lead (Pb)-free, bulk				(Dash number) (up to 2 digits) From 1 to 99 as applicable			

Note

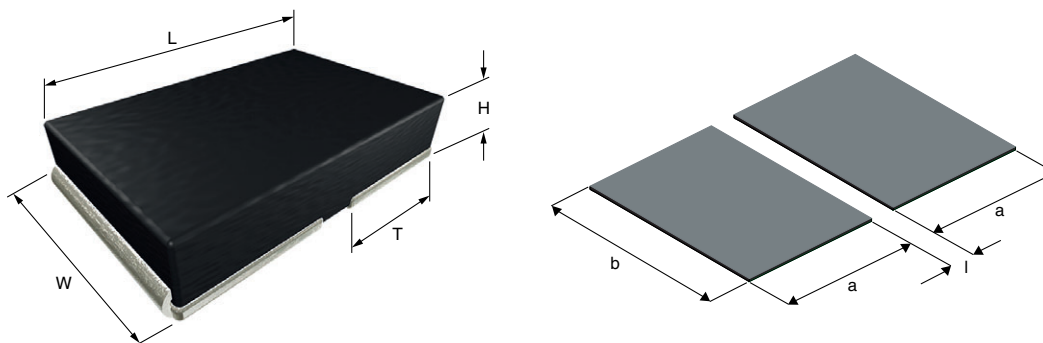
- ⁽³⁾ Packaging code: EB (lead (Pb)-free) and TB (tin / lead) are non-standard packaging codes designating 1000 piece reels. These non-standard packaging codes are identical to our standard EA (lead (Pb)-free) and TA (tin / lead), except that they have a package quantity of 1000 pieces.

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}

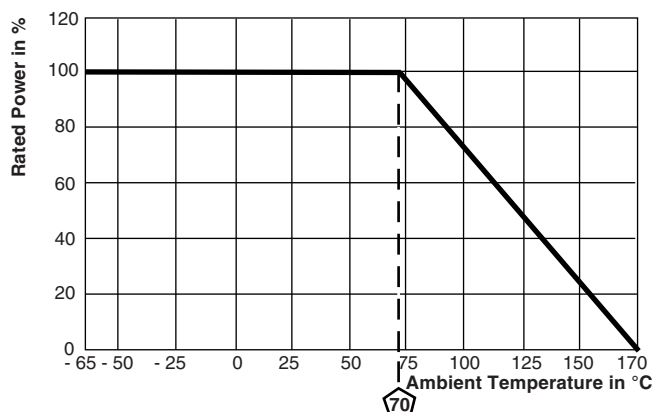
Notes

- (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)

Note

- 3D models available: www.vishay.com/ppg?30188.

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)

DERATING


**PERFORMANCE**

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

PACKAGING

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

Note

- Embossed Carrier Tape per EIA-481.

ADDITIONAL RESOURCES

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