

## Power Metal Strip® Resistors, Very High Power (to 12 W), Low Value (Down to 0.15 mΩ), Surface-Mount



### FEATURES

- Ideal for all types of current sensing and pulse applications including switching and linear power supplies, instruments, power amplifiers and shunts
- Proprietary processing technique produces low resistance values (down to 0.15 mΩ)
- Solid metal manganese-copper and nickel-chromium-aluminum alloy resistive element with low TCR (< 20 ppm/°C)
- Very low inductance 0.5 nH to 2.5 nH
- Low thermal EMF (< 3 µV/°C)
- AEC-Q200 qualified
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
**HALOGEN**  
**FREE**  
**GREEN**  
(5-2008)

### STANDARD ELECTRICAL SPECIFICATIONS

GLOBAL MODEL	SIZE	POWER RATING <sup>(1)</sup> $P_{100\text{ °C}}$ W	POWER RATING <sup>(1)</sup> $P_{120\text{ °C}}$ W	TOLERANCE %	RESISTANCE VALUE RANGE Ω	RESISTANCE VALUES CURRENTLY AVAILABLE <sup>(2)</sup> Ω	WEIGHT (typical) g/1000 pieces
WSLF3222	3222	12.0	9.0	± 1.0	0.15m to 0.27m	0.15m, 0.2m, 0.27m	173
	3222	10.0	7.0	± 1.0	0.4m to 0.5m	0.4m, 0.5m	173

#### Note

(1) Terminal temperature

(2) Other values may be available, contact factory

### GLOBAL PART NUMBER INFORMATION

Global Part Numbering: WSLF3222L2000FE6 (WSLF3222, 0.2 mΩ, ± 1 %)

W	S	L	F	3	2	2	2	L	2	0	0	0	F	E	6		
GLOBAL MODEL (8 digits)				RESISTANCE VALUE (5 digits)				TOLERANCE CODE (1 digit)				PACKAGING CODE (2 digits)				SPECIAL (up to 2 digits)	
WSLF3222				L = decimal L2000 = 0.2 mΩ				F = ± 1.0 % J = ± 5.0 %				E6 = lead (Pb)-free, 13" tape / reel				Dash #'s 1 thru 99 as applicable	

### TECHNICAL SPECIFICATIONS

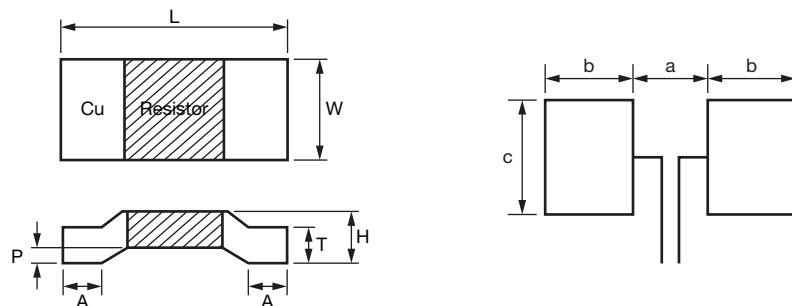
PARAMETER	UNIT	WSLF RESISTOR CHARACTERISTICS
Temperature coefficient	ppm/°C	± 250 for 0.15 mΩ
		± 200 for 0.2 mΩ, 0.27 mΩ, 0.4 mΩ and 0.5 mΩ
Operating temperature range	°C	-65 to +175
Maximum working voltage	V	(P x R) <sup>1/2</sup>

#### 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

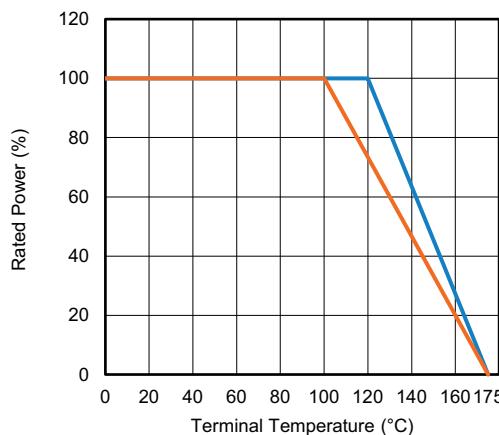
(3) Maximum working voltage - the WSLF is not voltage sensitive, but is limited by power / energy dissipation and is also not ESD sensitive

**DIMENSIONS** in inches (millimeters)

**Note**

- Surface mount solder profile recommendations: [www.vishay.com/doc?31052](http://www.vishay.com/doc?31052)

MODEL	RESISTANCE ( $\mu\Omega$ )	DIMENSIONS						SOLDER PAD DIMENSIONS		
		L	W	H	T	A	P	a	b	c
WSLF3222	150	0.311 $\pm$ 0.015 (7.9 $\pm$ 0.38)	0.220 $\pm$ 0.015 (5.6 $\pm$ 0.38)	0.043 $\pm$ 0.006 (1.10 $\pm$ 0.15)	0.030 $\pm$ 0.006 (0.75 $\pm$ 0.15)	0.079 $\pm$ 0.008 (2.0 $\pm$ 0.2)	0.014 $\pm$ 0.006 (0.35 $\pm$ 0.15)	0.138 (3.5)	0.102 (2.6)	0.228 (5.8)
	200			0.035 $\pm$ 0.006 (0.90 $\pm$ 0.15)	0.024 $\pm$ 0.006 (0.6 $\pm$ 0.15)					
	270			0.033 $\pm$ 0.006 (0.85 $\pm$ 0.15)	0.020 $\pm$ 0.006 (0.50 $\pm$ 0.15)					
	400			0.030 $\pm$ 0.006 (0.75 $\pm$ 0.15)	0.018 $\pm$ 0.006 (0.45 $\pm$ 0.15)					
	500									

RESISTANCE VALUE ( $\mu\Omega$ )	ELEMENT MATERIAL	THERMAL RESISTANCE ( $^{\circ}\text{C}/\text{W}$ )
150	MnCuSn	2.2
200	MnCuSn	2.8
270	MnCuSn	3.2
400	MnCu	5
500	MnCu	6.2

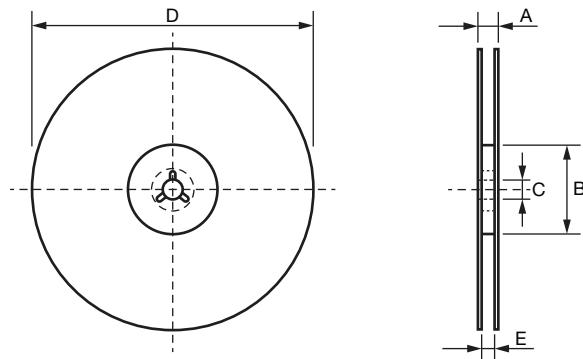
**DERATING - TERMINAL TEMPERATURE**


**PERFORMANCE**

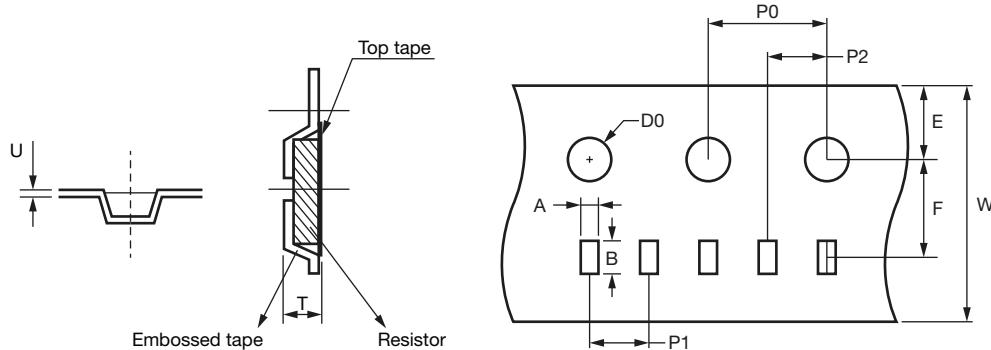
TEST	CONDITIONS OF TEST	TEST LIMITS
Thermal shock	-55 °C to +155 °C, 2000 cycles, 15 min at each extreme	± 1.0 %
Short time overload	Refer to link for short time overload performance and pulse capability; <a href="http://www.vishay.com/en/resistors/power-metal-strip-calculator/">www.vishay.com/en/resistors/power-metal-strip-calculator/</a>	± 1.0 %
Low temperature operation	-65 °C for 24 h	± 1.0 %
High temperature storage	2000 h at +175 °C	± 1.0 %
Bias humidity	+85 °C, 85 % RH, 10 % bias, 1000 h	± 1.0 %
Mechanical shock	100 g's for 6 ms, 5 pulses	± 1.0 %
Vibration	Frequency varied 10 Hz to 2000 Hz, 3 directions, 12 h	± 1.0 %
Operational life	2000 h, 1.5 h "ON", 0.5 h "OFF"; terminal temperature +100 °C at rated power	± 1.0 %
Resistance to solder heat	3 x at 250 °C ± 5 °C for 30 s ± 5 s	± 1.0 %
Moisture resistance	MIL-STD-202, method 106, 0 % power, 7b not required	± 1.0 %

**Note**

- Contact [ww2bresistors@vishay.com](mailto:ww2bresistors@vishay.com) for application specific performance requirements. Typical performance is better than stated test limits

**TAPE PACKAGING SPECIFICATIONS**
**REEL DIMENSIONS** in millimeters


MODEL	PIECES/REEL	A	B	C	D	E
WSLF3222	3000	20.7 ± 1.0	99 ± 0.5	13 ± 0.5	330 ± 1.0 / 13"	16.7 ± 1.0

**EMBOSSING PLASTIC TAPE SPECIFICATIONS**


MODEL	CARRIER DIMENSIONS in millimeters											
	A	B	E	F	W	P0	P1	P2	D0	T (REF.)	U (REF.)	
WSLF3222	6.1 ± 0.10	8.2 ± 0.15	1.75 ± 0.1	7.5 ± 0.05	16.0 ± 0.2	4.0 ± 0.05	8.0 ± 0.1	2.0 ± 0.1	1.5 ± 0.1	1.65 ± 0.3	0.35 ± 0.2	

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