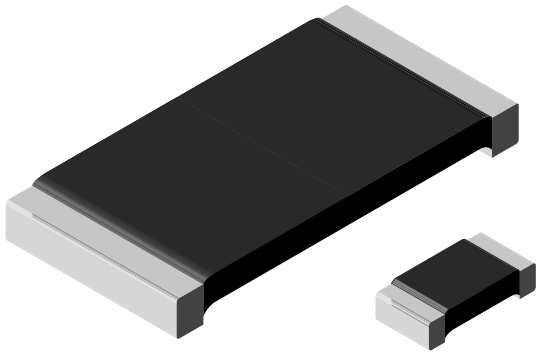
Power Metal Strip® Resistors, Low Value (Down to 0.0005 Ω), Surface Mount



FEATURES

- Ideal for all types of current sensing, voltage division and pulse applications including switching and linear power supplies, instruments, power amplifiers
- Proprietary processing technique produces extremely low resistance values (down to 0.0005 Ω)
- All welded construction
- Solderable terminations
- Very low inductance 0.5 nH to 5 nH
- Excellent frequency response to 50 MHz
- Low thermal EMF (< 3 µV/°C)
- Solid metal nickel-chrome or manganese-copper alloy resistive element with low TCR (< 20 ppm/°C)
- AEC-Q200 qualified available (1)
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE GRADE Available

Pb-free Available

e3

RoHS* COMPLIANT

GREEN (5-2008) Available

Note

(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 %	
WSL0603	0603	0.1	0.01 to 0.1	0.01 to 0.1	1.9
WSL0805	0805	0.125	0.005 to 0.2	0.005 to 0.2	4.8
WSL1206	1206	0.25	0.005 to 0.2	0.001 to 0.2	16.2
WSL2010	2010	0.5	0.004 to 0.5	0.001 to 0.5	38.9
WSL2512	2512	1.0 (2)	0.003 to 0.5	0.0005 to 0.5	63.6
WSL2816	2816	2.0	0.003 to 0.1	0.002 to 0.1	118

Notes

- Part marking: Value; tolerance: Due to resistor size limitations some resistors will be marked with only the resistance value.

(2) For values above 0.1 Ω derate linearly to 80 % rated power at 0.5 Ω.

TECHNICAL SPECIFICATIONS

PARAMETER	UNIT	WSL RESISTOR CHARACTERISTICS
Temperature coefficient	ppm/°C	± 75 for 7 mΩ to 0.5 Ω, ± 110 for 5 mΩ to 6.9 mΩ, ± 150 for 3 mΩ to 4.9 mΩ, ± 275 for 1 mΩ to 2.9 mΩ, ± 400 for 0.5 mΩ to 0.99 mΩ
Operating temperature range	°C	- 65 to + 170
Maximum working voltage	V	$(P \times R)^{1/2}$

GLOBAL PART NUMBER INFORMATION

Global Part Numbering example: WSL25124L000FTA

W	S	L	2	5	1	2	4	L	0	0	0	F	T	A		

GLOBAL MODEL	RESISTANCE VALUE	TOLERANCE CODE	PACKAGING CODE	SPECIAL
WSL0603 **WSL0805** **WSL1206** **WSL2010** **WSL2512** **WSL2816**	**L** = mΩ* **R** = Decimal **5L000** = 0.005 Ω **R0100** = 0.01 Ω * Use "**L**" for resistance values < 0.01 Ω	**D** = ± 0.5 % **F** = ± 1.0 % **J** = ± 5.0 %	**EA** = Lead (Pb)-free, tape/reel **EH** = Lead (Pb)-free, tape/reel (WSL2816) **EK** = Lead (Pb)-free, bulk **TA** = Tin/lead, tape/reel (R86) **TG** = Tin/lead, tape/reel (RT1, for WSL0603 and WSL0805) **TH** = Tin/lead, tape/reel (RJ9, WSL2816) **BA** = Tin/lead, bulk (B43)	(Dash number) (up to 2 digits) From **1 to 99** as applicable

Historical Part Numbering example: WSL2512 0.004 Ω 1 % R86

WSL2512	0.004 Ω	1 %	R86
HISTORICAL MODEL	RESISTANCE VALUE	TOLERANCE CODE	PACKAGING

For technical questions, contact: ww2bresistors@vishay.com

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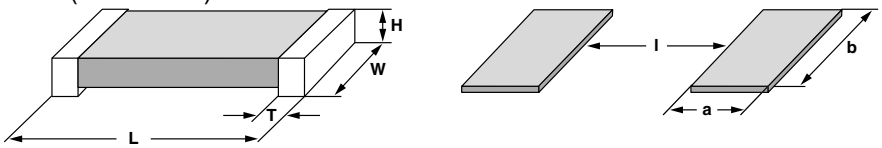
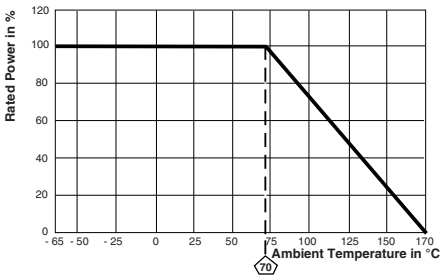
DIMENSIONS in inches (millimeters)



MODEL	RESISTANCE RANGE (Ω)	DIMENSIONS				SOLDER PAD DIMENSIONS		
		L	W	H	T	a	b	l
WSL0603	0.01 to 0.1	0.060 ± 0.010 (1.52 ± 0.254)	0.030 ± 0.010 (0.76 ± 0.254)	0.013 ± 0.005 (0.330 ± 0.127)	0.015 ± 0.010 (0.381 ± 0.254)	0.040 (1.01)	0.040 (1.01)	0.020 (0.50)
WSL0805	0.005 to 0.2	0.080 ± 0.010 (2.03 ± 0.254)	0.050 ± 0.010 (1.27 ± 0.254)	0.013 ± 0.005 (0.330 ± 0.127)	0.015 ± 0.010 (0.381 ± 0.254)	0.040 (1.02)	0.050 (1.27)	0.020 (0.50)
WSL1206	0.001 to 0.0019	0.126 ± 0.010 (3.20 ± 0.254)	0.063 ± 0.010 (1.60 ± 0.254)	0.025 ± 0.010 (0.635 ± 0.254)	0.041 ± 0.010 (1.04 ± 0.254)	0.062 (1.57)	0.070 (1.78)	0.030 (0.76)
	0.002 to 0.0059				0.025 ± 0.010 (0.635 ± 0.254)			
	0.006 to 0.20				0.020 ± 0.010 (0.508 ± 0.254)			
WSL2010	0.001 to 0.0069	0.200 ± 0.010 (5.08 ± 0.254)	0.100 ± 0.010 (2.54 ± 0.254)	0.025 ± 0.010 (0.635 ± 0.254)	0.058 ± 0.010 (1.47 ± 0.254)	0.093 (2.36)	0.120 (3.05)	0.055 (1.40)
	0.007 to 0.5				0.020 ± 0.010 (0.508 ± 0.254)	0.055 (1.40)	0.120 (3.05)	0.130 (3.30)
WSL2512	0.0005 to 0.00099	0.250 ± 0.010 (6.35 ± 0.254)	0.125 ± 0.010 (3.18 ± 0.254)	0.025 ± 0.010 (0.635 ± 0.254)	0.107 ± 0.010 (2.72 ± 0.254)	0.120 (3.05)	0.145 (3.68)	0.050 (1.27)
	0.001 to 0.0049				0.087 ± 0.010 (2.21 ± 0.254)			
	0.005 to 0.0069				0.047 ± 0.010 (1.19 ± 0.254)	0.083 (2.11)		0.125 (3.18)
	0.007 to 0.5				0.030 ± 0.010 (0.762 ± 0.254)	0.065 (1.65)		0.160 (4.06)
WSL2816	0.002 to 0.00399	0.280 ± 0.010 (7.1 ± 0.254)	0.165 ± 0.010 (4.2 ± 0.254)	0.025 ± 0.010 (0.635 ± 0.254)	0.098 ± 0.010 (2.49 ± 0.254)	0.096 (2.45)	0.185 (4.7)	0.125 (3.20)
	0.004 to 0.1				0.062 ± 0.010 (1.57 ± 0.254)			

DERATING



PERFORMANCE

TEST	CONDITIONS OF TEST	TEST LIMITS
Thermal shock	- 55 °C to + 150 °C, 1000 cycles, 15 min at each extreme	± (0.5 % + 0.0005 Ω) Δ*R*
Short time overload	5 x rated power for 5 s	± (0.5 % + 0.0005 Ω) Δ*R*
Low temperature operation	- 65 °C for 24 h	± (0.5 % + 0.0005 Ω) Δ*R*
High temperature exposure	1000 h at + 170 °C	± (1.0 % + 0.0005 Ω) Δ*R*
Bias humidity	+ 85 °C, 85 % RH, 10 % bias, 1000 h	± (0.5 % + 0.0005 Ω) Δ*R*
Mechanical shock	100 *g*'s for 6 ms, 5 pulses	± (0.5 % + 0.0005 Ω) Δ*R*
Vibration	Frequency varied 10 Hz to 2000 Hz in 1 min, 3 directions, 12 h	± (0.5 % + 0.0005 Ω) Δ*R*
Load life	1000 h at rated power, + 70 °C, 1.5 h "ON", 0.5 h "OFF"	± (1.0 % + 0.0005 Ω) Δ*R*
Resistance to solder heat	+ 260 °C solder, 10 s to 12 s dwell, 25 mm/s emergence	± (0.5 % + 0.0005 Ω) Δ*R*
Moisture resistance	MIL-STD-202, method 106, 0 % power, 7a and 7b not required	± (0.5 % + 0.0005 Ω) Δ*R*

PACKAGING

MODEL	REEL			
	TAPE WIDTH	DIAMETER	PIECES/REEL	CODE
WSL0603	8 mm/punched paper	178 mm/7"	5000	EA
WSL0805	8 mm/punched paper	178 mm/7"	5000	EA
WSL1206	8 mm/embossed plastic	178 mm/7"	4000	EA
WSL2010	12 mm/embossed plastic	178 mm/7"	4000	EA
WSL2512	12 mm/embossed plastic	178 mm/7"	2000	EA
WSL2816	12 mm/embossed plastic	178 mm/7"	2000	EH

Note

- Embossed Carrier Tape per EIA-481.

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