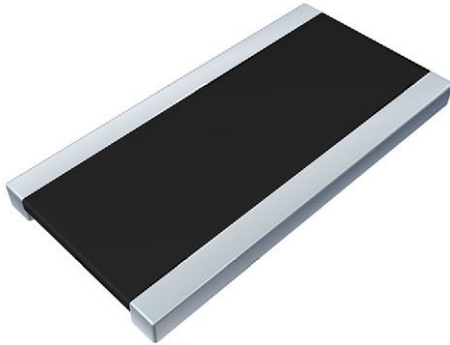


## Power Metal Strip® Resistors, Wide Terminal, Low Inductance (< 1 nH), Surface-Mount



### LINKS TO ADDITIONAL RESOURCES



### FEATURES

- Wide side terminal construction that yields high power to foot print size ratio (2 W in 1020 and 1 W in 0612 package)
- 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 low resistance values (down to 0.00075 Ω)
- Sulfur resistance by construction that is unaffected by high sulfur environments
- Very low inductance < 1 nH
- Low thermal EMF (< 3 μV/°C)
- AEC-Q200 qualified <sup>(1)</sup>
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



### Notes

- \* This datasheet provides information about parts that are RoHS-compliant and / or parts that are non-RoHS-compliant. For example, parts with lead (Pb) terminations are not RoHS-compliant. Please see the information / tables in this datasheet for details
- Follow link to Overview of Automotive Grade Products for more details: [www.vishay.com/doc?49924](http://www.vishay.com/doc?49924)
- “SMD Current Sense: AEC-Q200 vs. Vishay Qualification” technical note: [www.vishay.com/doc?30416](http://www.vishay.com/doc?30416)
- <sup>(1)</sup> 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	TOLERANCE ± %	RESISTANCE VALUE RANGE Ω	WEIGHT (typical) g/1000 pieces
WSL0612	0612	1.0	1.0, 5.0	0.75m to 5m	8.5
WSL1020	1020	2.0	0.5, 1.0, 5.0	1m to 6m	38.74

### Note

- “Thermal Management for Surface-Mount Devices” white paper: [www.vishay.com/doc?30380](http://www.vishay.com/doc?30380)

GLOBAL PART NUMBER INFORMATION																
Global Part Numbering Example: <b>WSL10206L000FEA</b> (visit <a href="http://www.vishay.net">www.vishay.net</a> Vishay Dale parts numbering manual for all options)																
<b>W</b>	<b>S</b>	<b>L</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>6</b>	<b>L</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>F</b>	<b>E</b>	<b>A</b>		
GLOBAL MODEL (7 digits)			RESISTANCE VALUE <sup>(1)</sup> (5 digits)			TOLERANCE CODE (1 digit)		PACKAGING CODE <sup>(2)</sup> (2 digits)			SPECIAL <sup>(3)</sup> (up to 2 digits)					
WSL0612 WSL1020			L = mΩ* 1L000 = 0.001 Ω 2L000 = 0.002 Ω 3L000 = 0.003 Ω 4L000 = 0.004 Ω 5L000 = 0.005 Ω 6L000 = 0.006 Ω * Use “L” for resistance values < 0.01 Ω			D = ± 0.5 % F = ± 1.0 % J = ± 5.0 %		EA = lead (Pb)-free, tape / reel			(dash number) From 1 to 99 as applicable					

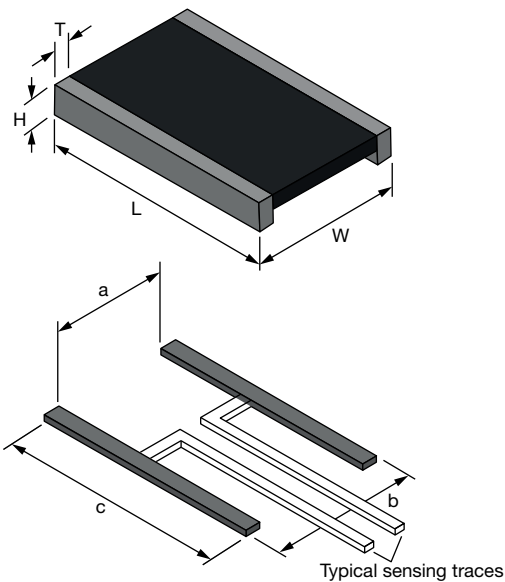
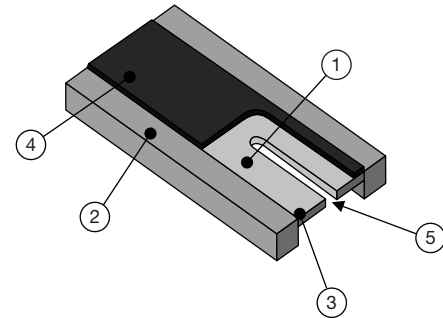
### Notes

- Per PCN-DR-00009-2022-REV-0, WSL marking will be removed effective March 1st, 2023
- <sup>(1)</sup> WSL marking ([www.vishay.com/doc?30327](http://www.vishay.com/doc?30327)); WSL decade values ([www.vishay.com/doc?30117](http://www.vishay.com/doc?30117))
- <sup>(2)</sup> EB (lead (Pb)-free) is a non-standard packaging code designated for 1000 piece reels. The non-standard packaging code is identical to our standard EA (lead (Pb)-free), except that it has a package quantity of 1000 pieces
- <sup>(3)</sup> Follow link for customization capabilities: [www.vishay.com/doc?48163](http://www.vishay.com/doc?48163)

TECHNICAL SPECIFICATIONS			
PARAMETER	UNIT	RESISTOR CHARACTERISTICS	
		WSL0612	WSL1020
Component temperature coefficient (including terminal) <sup>(1)</sup>	ppm/°C	+250 <sup>(4)</sup> for 0.75 mΩ and 1.9 mΩ	< 50
		+150 <sup>(4)</sup> for 2 mΩ to 6 mΩ	
Element TCR <sup>(2)</sup>	ppm/°C	< 20	
Operating temperature range	°C	-65 to +170	
Maximum working voltage <sup>(3)</sup>	V	$(P \times R)^{1/2}$	

**Notes**

- “Temperature Coefficient of Resistance for Current Sensing” white paper: [www.vishay.com/doc?30405](http://www.vishay.com/doc?30405)
- (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 WSL is not voltage sensitive, but is limited by power / energy dissipation and is also not ESD sensitive
- (4) Typical TCR is positive, for more details contact factory

**DIMENSIONS**

**WELDED CONSTRUCTION**


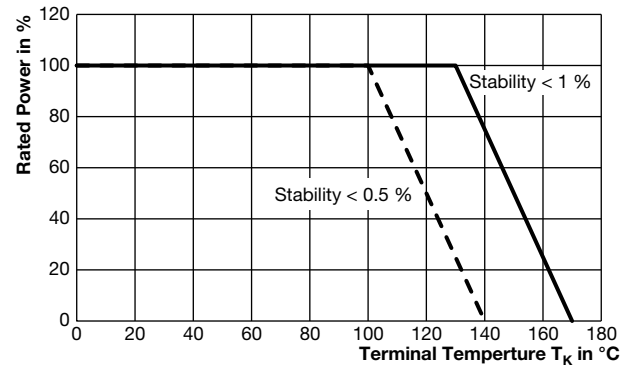
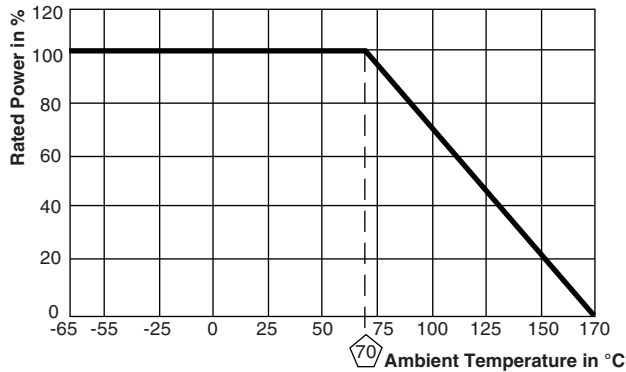
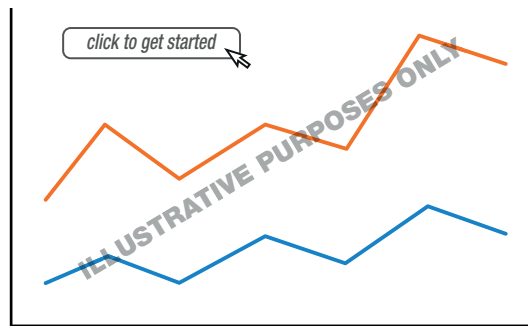
- ① Resistive element: nickel-chrome or manganese-copper alloy with low TCR (< 20 ppm/°C)
- ② Terminal: solid copper with 100 % Sn finish  
100 % Sn (100 μ" min.) with 100 % Ni (20 μ" min.)  
under layer finish
- ③ Terminal / element weld (electron beam weld)
- ④ High temperature encapsulant:  
"siliconized polyester"  
coating material
- ⑤ Laser calibration

**Notes**

- 3D models available: [www.vishay.com/doc?30348](http://www.vishay.com/doc?30348)
- Surface-mount solder profile recommendations: [www.vishay.com/doc?31052](http://www.vishay.com/doc?31052)

MODEL	DIMENSIONS in inches (millimeters)			
	L	W	H	T
WSL0612	0.120 ± 0.005 (3.05 ± 0.127)	0.060 ± 0.005 (1.50 ± 0.127)	0.018 ± 0.010 (0.457 ± 0.254)	0.015 ± 0.010 (0.381 ± 0.254)
WSL1020	0.200 ± 0.005 (5.08 ± 0.127)	0.100 ± 0.005 (2.54 ± 0.127)	0.025 ± 0.005 (0.635 ± 0.127)	0.022 ± 0.008 (0.558 ± 0.203)

MODEL	SOLDER PAD DIMENSIONS in inches (millimeters)		
	a	b	c
WSL0612	0.030 (0.76)	0.078 (1.98)	0.134 (3.40)
WSL1020	0.039 (1.00)	0.138 (3.50)	0.222 (5.65)

**DERATING**

**PULSE CAPABILITY**


[www.vishay.com/resistors/power-metal-strip-calculator](http://www.vishay.com/resistors/power-metal-strip-calculator)

PERFORMANCE		
TEST	CONDITIONS OF TEST	TEST LIMITS
Thermal shock	-55 °C to +150 °C, 1000 cycles, 15 min at each extreme	± 0.5 %
Low temperature operation	-65 °C for 24 h	± 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
WSL0612	8 mm / embossed plastic	178 mm / 7"	4000	EA
WSL1020	12 mm / embossed plastic	178 mm / 7"	4000	EA

**Notes**

- Embossed carrier tape per EIA-481-2
- (1) Additional packaging details at [www.vishay.com/doc?20051](http://www.vishay.com/doc?20051)



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