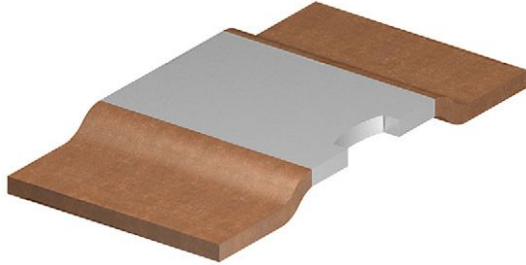


# Power Metal Strip® Resistors, High Temperature (275 °C), Low Value (down to 0.0002 Ω), Surface Mount


**DESIGN SUPPORT TOOLS**
[click logo to get started](#)

**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 0.0002 Ω
- Specially selected and stabilized materials allow for high temperature derating (to +275 °C)
- Sulfur resistance by construction that is unaffected by high sulfur environments
- All welded construction
- Solid metal iron-chrome or manganese-copper alloy resistive element with low TCR (< 20 ppm/°C)
- Very low inductance (< 5 nH)
- Low thermal EMF (< 3 μV/°C)
- AEC-Q200 qualified available <sup>(1)</sup>
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**Note**

- <sup>(1)</sup> Flame retardance test may not be applicable to some resistor technologies

**STANDARD ELECTRICAL SPECIFICATIONS**

GLOBAL MODEL	SIZE	POWER RATING $P_{70\text{ °C}}$ W	TOLERANCE %	RESISTANCE VALUE RANGE Ω	RESISTANCE VALUES CURRENTLY AVAILABLE <sup>(1)</sup> Ω	WEIGHT (typical) g/1000 pieces
WSLT3921	3921	3.0	1.0, 5.0	0.2m to 4m	0.2m, 0.5m, 1m, 2m, 3m, 4m	281
WSLT5931	5931	5.0	1.0, 5.0	0.3m to 3m	0.3m, 0.5m, 1m, 2m, 3m	398

**Note**

- <sup>(1)</sup> Other values may be available, contact factory

**GLOBAL PART NUMBER INFORMATION**

Global Part Numbering: **WSLT39212L000FEA** (WSLT3921, 0.002 Ω, ± 1 %) (visit [www.vishay.net](http://www.vishay.net) Vishay Dale parts numbering manual for all options)

W S L T 3 9 2 1 2 L 0 0 0 F E A

GLOBAL MODEL (7 digits)
<b>WSLT3921</b> <b>WSLT5931</b>

RESISTANCE VALUE <sup>(1)</sup> (5 digits)
L = mΩ 2L000 = 0.002 Ω

TOLERANCE CODE (1 digit)
F = ± 1.0 % J = ± 5.0 %

PACKAGING CODE <sup>(2)</sup> (2 digits)
EA = lead (Pb)-free, tape/reel EK = lead (Pb)-free, bulk

SPECIAL <sup>(3)</sup> (up to 2 digits)
Reserved for future specials

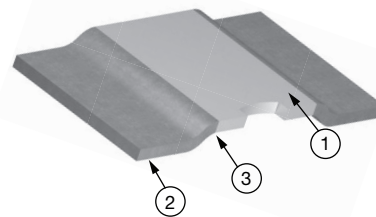
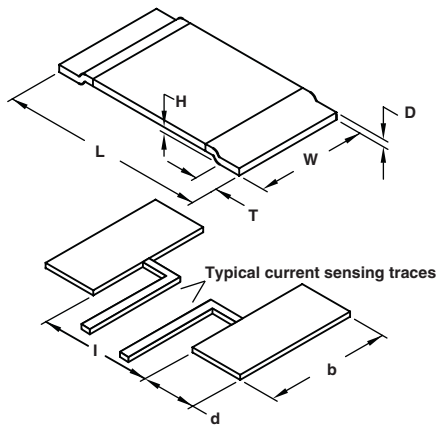
**Notes**

- <sup>(1)</sup> WSL Marking ([www.vishay.com/doc?30327](http://www.vishay.com/doc?30327))
- <sup>(2)</sup> 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
- <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
Component temperature coefficient (including terminal) <sup>(1)</sup> TCR measured from -55 °C to 150 °C	ppm/°C	± 175 for 0.2 mΩ and 0.5 mΩ
		± 75 for 1 mΩ to 4 mΩ
Element TCR <sup>(2)</sup>	ppm/°C	< 20
Operating temperature range	°C	-65 to +275
Maximum working voltage <sup>(3)</sup>	V	$(P \times R)^{1/2}$

**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 WSL is not voltage sensitive, but is limited by power / energy dissipation and is also not ESD sensitive

**DIMENSIONS**


- 1) Resistive element: Fe-Cr (element material used is dependent on resistance value)
- 2) Terminal: Solid copper
- 3) Terminal / element weld

**Notes**

- 3D models available: 3921 model [www.vishay.com/doc?30315](http://www.vishay.com/doc?30315); 5931 model [www.vishay.com/doc?30317](http://www.vishay.com/doc?30317)
- Surface mount solder profile recommendations: [www.vishay.com/doc?31052](http://www.vishay.com/doc?31052)

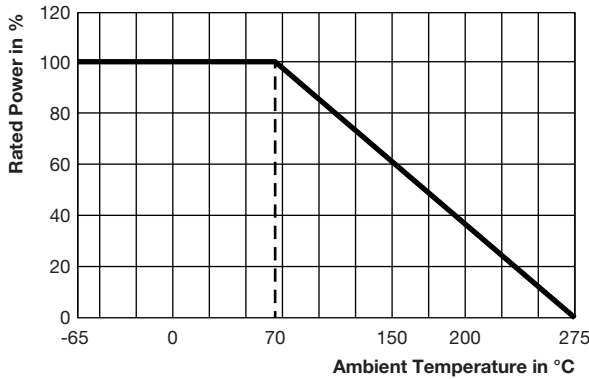
MODEL	DIMENSIONS in inches (millimeters)			
	L	W	H	T
WSLT3921	0.394 ± 0.010 (10.0 ± 0.254)	0.205 ± 0.010 (5.20 ± 0.254)	0.020 (0.5)	0.080 ± 0.010 (2.00 ± 0.254)
WSLT5931	0.591 ± 0.010 (15.0 ± 0.254)	0.305 ± 0.010 (7.75 ± 0.254)	0.020 (0.5)	0.157 ± 0.010 (4.00 ± 0.254)

MODEL	SOLDER PAD DIMENSIONS in inches (millimeters)		
	d	b	I
WSLT3921	0.106 ± 0.010 (2.70 ± 0.254)	0.244 ± 0.010 (6.20 ± 0.254)	0.220 ± 0.005 (5.60 ± 0.13)
WSLT5931	0.205 ± 0.010 (5.20 ± 0.254)	0.344 ± 0.010 (8.75 ± 0.254)	0.220 ± 0.005 (5.60 ± 0.13)

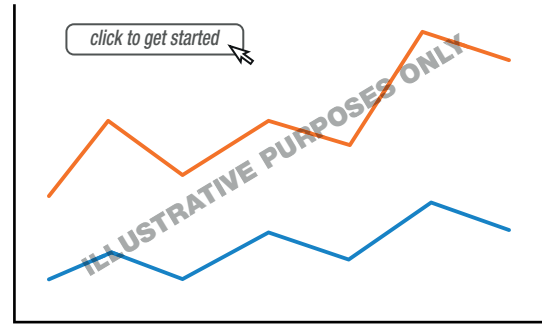
GLOBAL MODEL	RESISTANCE VALUE (mΩ)	TYPICAL THERMAL RESISTANCE (°C/W)	"D" THICKNESS (Inches)	ELEMENT MATERIAL
WSLT3921	0.2	2.7	0.0560	Mn-Cu
WSLT3921	0.5	5.8	0.0300	Mn-Cu
WSLT3921	0.7	6.3	0.0205	Mn-Cu
WSLT3921	1.0	10.9	0.0150	Mn-Cu
WSLT3921	2.0	12.0	0.0270	Fe-Cr
WSLT3921	3.0	20.7	0.0170	Fe-Cr
WSLT3921	4.0	22.8	0.0130	Fe-Cr
WSLT5931	0.3	3.5	0.0300	Mn-Cu
WSLT5931	0.5	5.7	0.0180	Mn-Cu
WSLT5931	1.0	7.2	0.0330	Fe-Cr
WSLT5931	2.0	13.2	0.0155	Fe-Cr
WSLT5931	3.0	19.3	0.0105	Fe-Cr



**DERATING - AMBIENT TEMPERATURE**

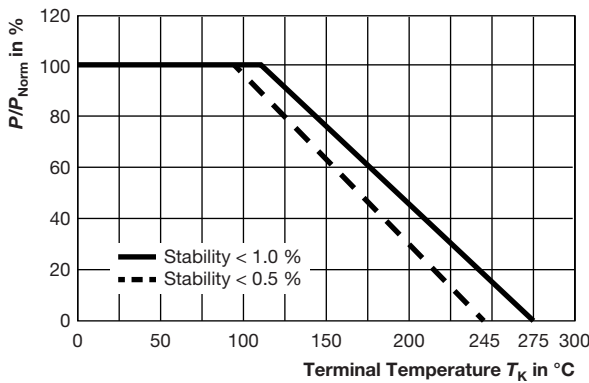


**PULSE CAPABILITY**

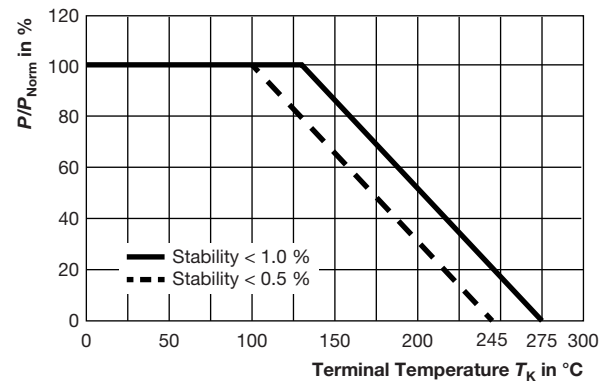


[www.vishay.com/resistors/power-metal-strip-calculator](http://www.vishay.com/resistors/power-metal-strip-calculator)

**DERATING - TERMINAL TEMPERATURE**



Example: WSLT3921 0.0005  $\Omega$



Example: WSLT5931 0.0005  $\Omega$

PERFORMANCE		
TEST	CONDITIONS OF TEST	TEST LIMITS
Thermal shock	-55 °C to +150 °C, 1000 cycles, 15 min at each extreme	$\pm 1.0\% + 0.0005\ \Omega$
Short time overload	5x rated power for 5 s	$\pm 0.5\% + 0.0005\ \Omega$
Low temperature storage	-65 °C for 24 h	$\pm 0.5\% + 0.0005\ \Omega$
High temperature exposure	1000 h at +275 °C	$\pm 1.0\% + 0.0005\ \Omega$
Bias humidity	+85 °C, 85 % RH, 10 % bias, 1000 h	$\pm 0.5\% + 0.0005\ \Omega$
Mechanical shock	100 g's for 6 ms, 5 pulses	$\pm 0.5\% + 0.0005\ \Omega$
Vibration	Frequency varied 10 Hz to 2000 Hz in 1 min, 3 directions, 12 h	$\pm 0.5\% + 0.0005\ \Omega$
Load life	1000 h at +70 °C, 1.5 h "ON", 0.5 h "OFF"	$\pm 1.0\% + 0.0005\ \Omega$
Resistance to solder heat	3x at 250 °C $\pm 5\ ^\circ\text{C}$ for 30 s $\pm 5\ \text{s}$	$\pm 0.5\% + 0.0005\ \Omega$
Moisture resistance	MIL-STD-202, method 106, 0 % power, 7a and 7b not required	$\pm 0.5\% + 0.0005\ \Omega$

PACKAGING				
MODEL	REEL			
	TAPE WIDTH	DIAMETER	PIECES/REEL	CODE
WSLT3921	16 mm/embossed plastic	330 mm/13"	3000	EA
WSLT5931	24 mm/embossed plastic	330 mm/13"	1500	EA

**Note**

- Embossed carrier tape per EIA-481



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