Upgrade for Higher Power Density to WSK1216 and for Higher Power to WSLP2726

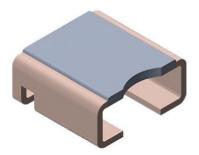


www.vishay.com

WSL2726

Vishay Dale

Power Metal Strip[®] Resistors, Low Value, High Power, Surface-Mount, 4-Terminal



LINKS TO ADDITIONAL RESOURCES



FEATURES

- 4-terminal design allows for 1 % tolerance down to 0.0002 Ω
- High power to foot print size ratio
- Ideal for all types of current sensing, voltage division and pulse applications including switching and linear power supplies, instruments, power amplifiers and shunts



COMPLIANT

HALOGEN

FREE

GREEN

- 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 extremely low resistance values, down to 0.0002 Ω
- Sulfur resistance by construction that is unaffected by high sulfur environments
- Solid metal nickel-chrome, manganese-copper-tin, or manganese-copper alloy resistive element with low TCR (< 20 ppm/°C)
- Very low inductance 0.5 nH to 5 nH
- Low thermal EMF (< 3 μV/°C)
- AEC-Q200 qualified (1)
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>

Notes

Follow link to Overview of Automotive Grade Products for more details: <u>www.vishay.com/doc?49924</u>

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

STAND/	STANDARD ELECTRICAL SPECIFICATIONS									
GLOBAL MODEL SIZE POWER RATING P70 °C W TOLERANCE ± %		$\begin{array}{c} \textbf{RESISTANCE} \\ \textbf{VALUE RANGE} \\ \Omega \end{array}$	RESISTANCE VALUES CURRENTLY AVAILABLE ⁽¹⁾ Ω	WEIGHT (typical) g/1000 pieces						
WSL2726	2726	3.0	1.0	0.2m to 5m	0.2m, 0.3m, 0.5m, 0.7m, 1m, 1.3m, 2m, 3m, 4m, 5m	420				

Notes

- Power rating depends on the max. temperature at the solder point, component placement density and the substrate material
- Part marking: model, value, tolerance, date code
- ⁽¹⁾ Other values may be available, contact factory

GLOBAL PART N	GLOBAL PART NUMBER INFORMATION									
Global Part Numbering example: WSL2726L5000FEA (visit www.vishay.net Vishay Dale parts numbering manual for all options)										
WSL	2 7 2	6 L 5 0	00 F E	A						
GLOBAL MODEL				SPECIAL ⁽³⁾						
(7 digits)	(5 digits)	(1 digit)	(2 digits)	(up to 2 digits)						
WSL2726	L = mΩ L5000 = 0.0005 Ω 1L000 = 0.0010 Ω	F = ± 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						

Notes

⁽¹⁾ WSL marking (www.vishay.com/doc?30327)

(2) Packaging code: EB (lead (Pb)-free) is a non-standard packaging code designating 1000 piece reels. This non-standard packaging code is identical to our standard EA (lead (Pb)-free), except that they have a package quantity of 1000 pieces

⁽³⁾ Follow link for customization capabilities: <u>www.vishay.com/doc?48163</u>

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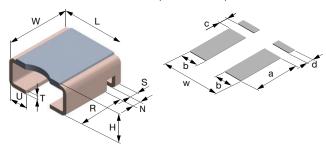
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TECHNICAL SPECIFICATIONS						
PARAMETER	UNIT	RESISTOR CHARACTERISTICS				
		-100 ppm for 0.2 m Ω and 0.3 m Ω				
Component temperature coefficient (including terminal) ⁽¹⁾	ppm/°C	\pm 75 ppm for 0.5 m Ω to 1.0 m Ω				
TCR measured from -55 °C to 150 °C		\pm 50 ppm for 1.3 m Ω				
		\pm 25 ppm for 2 m Ω to 5 m Ω				
Element TCR ⁽²⁾	ppm/°C	< 20				
Operating temperature range	°C -65 to +170					
Maximum working voltage (3)	V	(P x R) ^{1/2}				

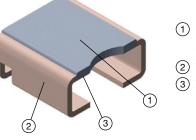
Notes

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

DIMENSIONS in inches (millimeters)



CONSTRUCTION OUTLINE



- 1 Resistive element: refer to table below for element material
 - Terminal: solid copper
 - Terminal / element weld

Notes

- 3D models available: www.vishay.com/doc?30308
- Surface mount solder profile recommendations: <u>www.vishay.com/doc?31052</u>

	DIMENSIONS								
MODEL	L	w	н	R (REF.)	S	т	U	Ν	
WSL2726	0.272 ± 0.008 (6.9 ± 0.2)	0.260 + 0.012/- 0.008 (6.6 + 0.3/- 0.2)	Please see table below	0.195 (5.0)	0.028 ± 0.004 (0.7 ± 0.1)	$\begin{array}{c} 0.016 \pm 0.002 \\ (0.4 \pm 0.05) \end{array}$	0.078 ± 0.004 (2.0 ± 0.1)	0.039 ± 0.006 (0.99 ± 0.15)	

MODEL	SOLDER PAD DIMENSIONS					
	а	b	С	d	w	
WSL2726	0.220 (5.6)	0.096 (2.44)	0.035 (0.89)	0.035 (0.89)	0.290 (7.4)	

MODEL	RESISTANCE VALUE (mΩ)	THERMAL RESISTANCE ⁽¹⁾ (°C/W)	ELEMENT MATERIAL	HEIGHT H
	0.2	3	Mn-Cu-Sn	0.150 ± 0.008 (3.81 ± 0.2)
	0.3	4	Mn-Cu	0.141 ± 0.008 (3.58 ± 0.2)
	0.5	6	Mn-Cu	0.116 ± 0.008 (2.95 ± 0.2)
	0.7	8	Mn-Cu	0.111 ± 0.008 (2.82 ± 0.2)
WSL2726	1.0	10	Mn-Cu	0.1055 ± 0.008 (2.68 ± 0.2)
WSL2720	1.3	11	Ni-Cr	0.119 ± 0.008 (3.02 ± 0.2)
	2.0	16	Ni-Cr	0.114 ± 0.008 (2.9 ± 0.2)
	3.0	19	Ni-Cr	0.110 ± 0.008 (2.79 ± 0.2)
	4.0	22	Ni-Cr	0.110 ± 0.008 (2.79 ± 0.2)
	5.0	38	Ni-Cr	0.110 ± 0.008 (2.79 ± 0.2)

Note

(1) The full power rating of Power Metal Strip resistors are dependent upon the ability of the circuit board to dissipate the heat energy created in the resistance element. It is recommended to follow common design practices for power semiconductors that ensure the junction temperature is maintained with in thermal limits by using large pad surfaces, thermal vias, heavier copper weights, internal layers as well as other thermal spreading features. The thermal resistance values provided function in the same manner as junction to terminal temperature Upgrade for <u>Higher Power Density</u> to WSK1216 and for <u>Higher Power</u> to WSLP2726

WSL2726

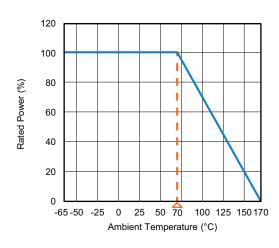
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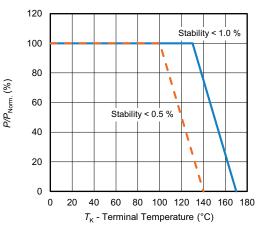


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DERATING - AMBIENT TEMPERATURE

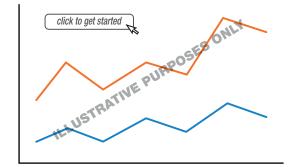
DERATING - TERMINAL TEMPERATURE





Example: WSL2726 0.0005 $\Omega,$ 0.001 Ω

PULSE CAPABILITY



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 %				
Short time overload	Refer to link for short time overload performance and pulse capability; www.vishay.com/resistors/power-metal-strip-calculator/	± 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	3 x at 250 °C ± 5 °C for 30 s ± 5 s	± 0.5 %				
Moisture resistance	MIL-STD-202, method 106, 0 % power, 7b not required	± 0.5 %				

Revision: 06-Nov-2020

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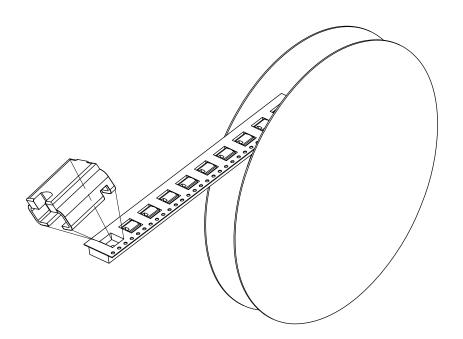
PACKAGING ⁽¹⁾							
MODEL	REEL						
MODEL	TAPE WIDTH	DIAMETER	PIECES/REEL	CODE			
WSL2726	16 mm / embossed plastic	330 mm / 13"	1500	EA			

Notes

• Embossed carrier tape per EIA-481

(1) Additional packaging details at <u>www.vishay.com/doc?20051</u>

REEL ORIENTATION



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