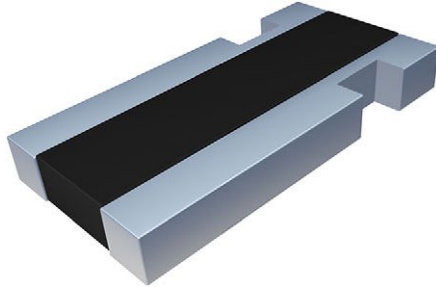


# Power Metal Strip® Resistors, High Power, Surface-Mount, 4-Terminal



## FEATURES

- 4-terminal design
- 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
- Solid metal nickel-chrome and manganese-copper alloy resistive element with low TCR (< 20 ppm/°C)
- Sulfur resistance by construction that is unaffected by high sulfur environments
- Very low inductance 0.5 nH to 5 nH
- Low thermal EMF (< 3 μV/°C)
- AEC-Q200 qualified <sup>(1)</sup>
- PATENT(S): [www.vishay.com/patents](http://www.vishay.com/patents)
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

AUTOMOTIVE GRADE


**RoHS\***  
Available


## LINKS TO ADDITIONAL RESOURCES



3D Models



Design Tools



Videos



Calculators

## 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
- <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 <sup>(1)</sup> Ω	WEIGHT (typical) g/1000 pieces
WSKW0612	0612	1.0	1.0, 5.0	0.5m to 5m	8.5

## Notes

- Qualified to AEC-Q200 rev. D
- <sup>(1)</sup> Other values may be available, contact factory

## GLOBAL PART NUMBER INFORMATION

Global Part Numbering Example: WSKW06121L000FEA (visit [www.vishay.net](http://www.vishay.net) Vishay Dale parts numbering manual for all options)

W S K W 0 6 1 2 1 L 0 0 0 F E A

GLOBAL MODEL  
(8 digits)  
**WSKW0612**

RESISTANCE VALUE <sup>(1)</sup>  
(5 digits)  
L = mΩ  
L5000 = 0.0005 Ω  
5L000 = 0.005 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)  
(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))
- <sup>(2)</sup> Packaging code: EB (lead (Pb)-free) are non-standard packaging codes designating 1000 piece reels. These non-standard packaging codes are identical to our standard EA (lead (Pb)-free), 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)

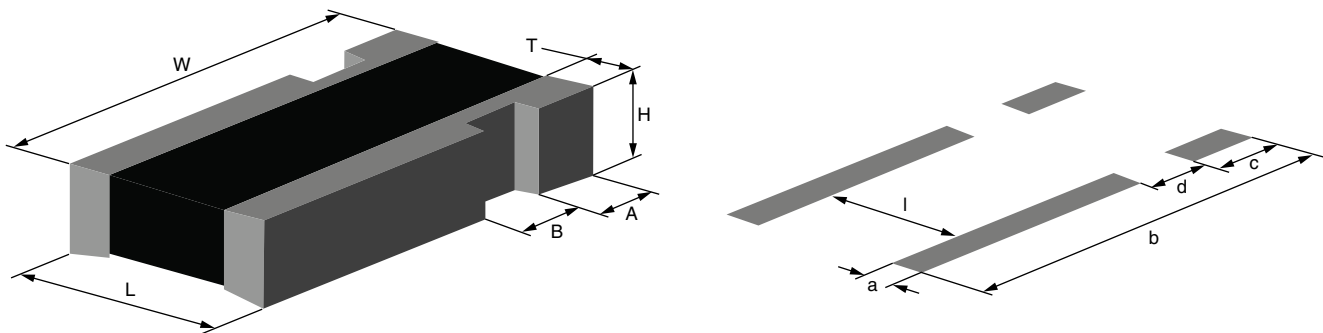
PATENT(S): [www.vishay.com/patents](http://www.vishay.com/patents)

This Vishay product is protected by one or more United States and international patents.

TECHNICAL SPECIFICATIONS		
PARAMETER	UNIT	RESISTOR CHARACTERISTICS
Component temperature coefficient (including terminal) <sup>(1)</sup> TCR measured from -55 °C to 150 °C	ppm/°C	-300 / +50 for 0.5 mΩ to 0.99 mΩ
		± 150 for 1 mΩ and 2 mΩ
		± 75 for 3 mΩ to 5 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**

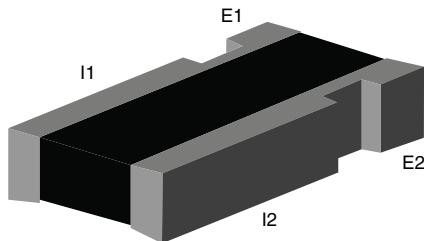
- (1) Component TCR - total TCR that includes the TCR effects of the resistor element and the copper terminal
- (2) Element TCR - only applies to the alloy used for the resistor element
- (3) Maximum working voltage - the WSL is not voltage sensitive, but is limited by power / energy dissipation and is also not ESD sensitive

**DIMENSIONS**

**Note**

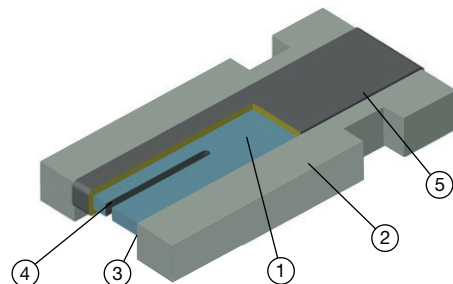
- Surface-mount solder profile recommendations: [www.vishay.com/doc?31052](http://www.vishay.com/doc?31052)

MODEL	DIMENSIONS in inches (millimeters)					
	L	W	H	T	A	B
WSKW0612	0.060 ± 0.010 (1.50 ± 0.254)	0.120 ± 0.010 (3.05 ± 0.254)	0.018 ± 0.010 (0.457 ± 0.254)	0.015 ± 0.010 (0.381 ± 0.254)	0.020 ± 0.005 (0.51 ± 0.127)	0.020 ± 0.005 (0.51 ± 0.127)

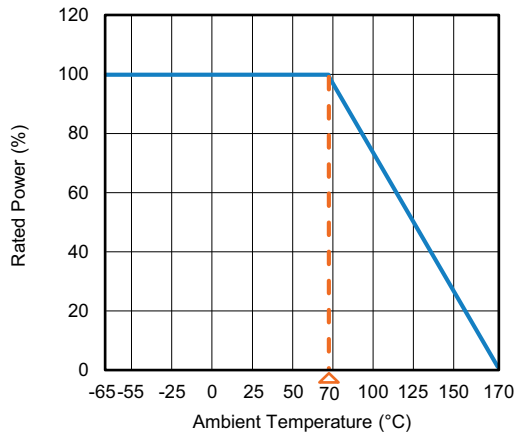
MODEL	SOLDER PAD DIMENSIONS in inches (millimeters)				
	a	b	c	d	l
WSKW0612	0.040 (1.01)	0.135 (3.43)	0.030 (0.762)	0.015 (0.381)	0.030 (0.76)

**4 TERMINAL KELVIN CONNECTIONS**

**Notes**

- E1 and E2: voltage sense connection
- I1 and I2: current connection

**CONSTRUCTION OUTLINE**

**Notes**

1. Resistive element
2. Terminal: solid copper and element with 100 % Sn finish
3. Terminal to element weld
4. Laser calibration
5. High temperature encapsulant: siliconized polyester coating material

**DERATING**

**PULSE CAPABILITY**

[www.vishay.com/en/resistors/joulewizard/](http://www.vishay.com/en/resistors/joulewizard/)

<b>PERFORMANCE</b>			
TEST	CONDITIONS OF TEST	TEST LIMITS	TYPICAL
Thermal shock	-55 °C to +150 °C, 1000 cycles, 15 min at each extreme	± 1.0 %	0.20 %
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 %	0.20 %
Low temperature storage	-65 °C for 24 h	± 0.5 %	0.1 % (24 h)
High temperature exposure	2000 h at +170 °C	± 1.0 %	± 0.2 %
Bias humidity	+85 °C, 85 % RH, 10 % bias, 1000 h	± 0.5 %	0.20 %
Mechanical shock	100 g's for 6 ms, 5 pulses	± 0.5 %	0.01 %
Vibration	Frequency varied 10 Hz to 2000 Hz in 1 min, 3 directions, 12 h	± 0.5 %	0.01 %
Load life	2000 h at +70 °C, 1.5 h "ON", 0.5 h "OFF"	± 1.0 %	-0.20 %
Resistance to solder heat	+260 °C solder, 10 s to 12 s dwell, 25 mm/s emergence	± 0.5 %	0.05 %
Moisture resistance	MIL-STD-202, method 106, 0 % power, 7b not required	± 1.0 %	0.01 %

**Note**

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

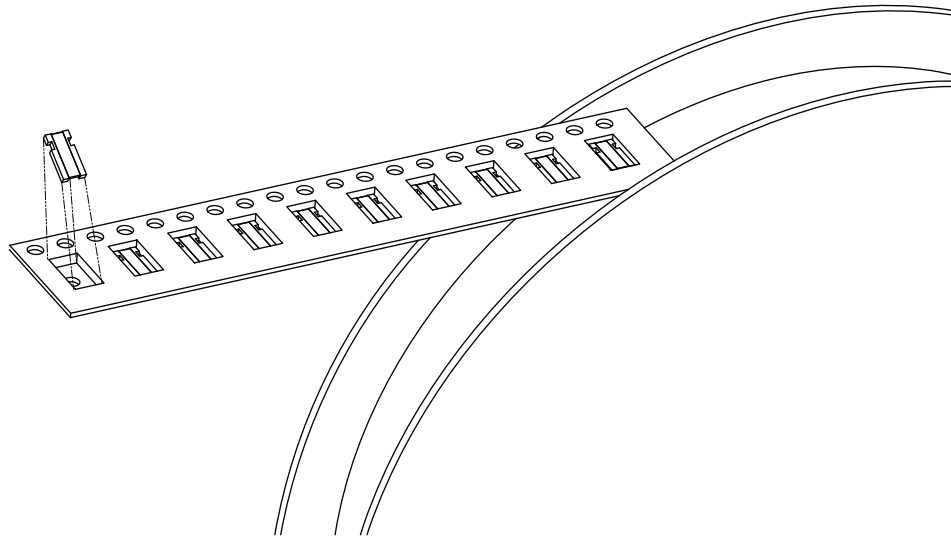
<b>PACKAGING (1)</b>				
MODEL	REEL			
	TAPE WIDTH	DIAMETER	PIECES/REEL	CODE
WSKW0612	8 mm / embossed plastic	178 mm / 7"	4000	EA

**Notes**

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



REEL ORIENTATION



LINKS TO RELATED DOCUMENTS	
<b>SELECTOR GUIDE</b>	
Overview of Automotive Grade Products	<a href="http://www.vishay.com/doc?49924">www.vishay.com/doc?49924</a>
<b>TECHNICAL NOTES</b>	
SMD Current Sense: AEC-Q200 vs. Vishay Qualification	<a href="http://www.vishay.com/doc?30416">www.vishay.com/doc?30416</a>
MIL-PRF vs. AEC-Q200: Do You Know What You Are Getting?	<a href="http://www.vishay.com/doc?11000">www.vishay.com/doc?11000</a>
<b>WHITE PAPER</b>	
Thermal Management for Surface-Mount Devices	<a href="http://www.vishay.com/doc?30380">www.vishay.com/doc?30380</a>
Temperature Coefficient of Resistance for Current Sensing	<a href="http://www.vishay.com/doc?30405">www.vishay.com/doc?30405</a>



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