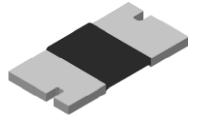
# WSK2512



Vishay Dale

# **Power Metal Strip<sup>®</sup> Resistors,** Low Value (Down to 0.0005 $\Omega$ ), Surface-Mount, 4-Terminal



### LINKS TO ADDITIONAL RESOURCES



### FEATURES

- 4-terminal design allows for 1 % tolerance down to 0.0005  $\,\Omega\,$  and 0.5 % tolerance down to 0.001  $\Omega\,$
- All welded construction of the Power Metal Strip<sup>®</sup> resistors are ideal for all types of current sensing, voltage division, and pulse applications
- Proprietary processing technique produces extremely low resistance values (down to 0.0005 Ω)
- Sulfur resistance by construction that is unaffected by high sulfur environments
- Solid metal nickel-chrome or manganesecopper alloy resistive element with low TCR (< 20 ppm/°C)</li>

Pb-free Available Available HALOGEN FREE Available MALOGEN FREE Available Available

- Very low inductance 0.5 nH to 5 nH
- AEC-Q200 qualified <sup>(1)</sup>
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>

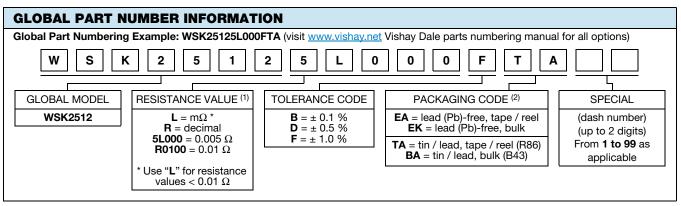
### Notes

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

STANDARD ELECTRICAL SPECIFICATIONS						
GLOBAL MODEL	SIZE	POWER RATING P70 ℃	RES	WEIGHT (typical)		
MODEL		W	TOL. ± 0.1 %	TOL. ± 0.5 %	TOL. ± 1.0 %	g/1000 pieces
WSK2512	2512	1.0	0.01 to 0.2	0.001 to 0.2	0.0005 to 0.2	63.6

Notes

- · Part marking: value, tolerance; due to resistor size limitations some resistance values will be marked with only the resistance value
- Qualified to AEC-Q200 rev. D



### Notes

- Per PCN-DR-00009-2022-REV-0, WSL marking will be removed effective March 1st, 2023
- <sup>(1)</sup> WSL marking (<u>www.vishay.com/doc?30327</u>)
- (2) 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

Revision: 11-Dec-2023

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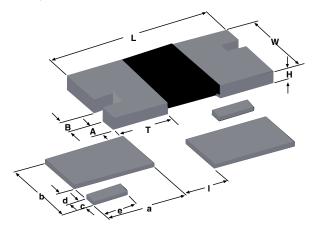


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TECHNICAL SPECIFICATIONS					
PARAMETER	UNIT	RESISTOR CHARACTERISTICS			
Temperature coefficient	ppm/°C	$\begin{array}{l} \pm 350 \text{ for } 0.5 \text{ m}\Omega \text{ to } 0.99 \text{ m}\Omega, \\ \pm 250 \text{ for } 0.001 \Omega \text{ to } 0.0029 \Omega, \\ \pm 75 \text{ for } 0.003 \Omega \text{ to } 0.0049 \Omega, \\ \pm 35 \text{ for } 0.005 \Omega \text{ to } 0.2 \Omega \end{array}$			
Operating temperature range	°C	-65 to +170			
Maximum working voltage	V	(P x R) <sup>1/2</sup>			

## **DIMENSIONS** in inches (millimeters)



### Notes

• 3D models available: www.vishay.com/doc?30323

Surface-mount solder profile recommendations: <u>www.vishay.com/doc?31052</u>

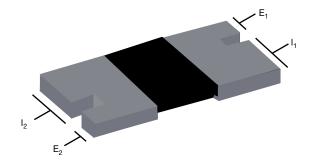
	DIMENSIONS							
MODEL	RESISTANCE RANGE Ω	L	w	н	т	Α	В	
	0.0005 to 0.00099				0.105 ± 0.010 [2.66 ± 0.254]			
WSK2512	0.001 to 0.0049	$\begin{array}{c} 0.250 \pm 0.010 \\ (6.35 \pm 0.254) \end{array}$	0.125 ± 0.010 (3.18 ± 0.254)	$\begin{array}{c} 0.025 \pm 0.010 \\ (0.635 \pm 0.254) \end{array}$	0.087 ± 0.010 (2.21 ± 0.254)	$\begin{array}{c} 0.030 \pm 0.010 \\ (0.762 \pm 0.254) \end{array}$	0.020 ± 0.010 (0.508 ± 0.254)	
	0.005 to 0.2				0.047 ± 0.010 (1.19 ± 0.254)			

	SOLDER PAD DIMENSIONS							
MODEL	RESISTANCE RANGE Ω	а	b	С	d	e	I	
WSK2512	0.0005 to 0.0049	0.130 (3.30)	0.130 (3.30)	0.030 (0.76) 0.020	0.020 (0.51)	0.067 (1.70)	0.065 (1.65)	
WORZJ IZ	0.005 to 0.2	0.090 (2.29)	0.130 (3.30)		0.020 (0.51)		0.145 (3.68)	



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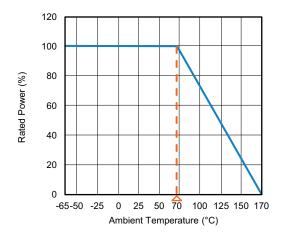
## **ELECTRICAL CONNECTION**



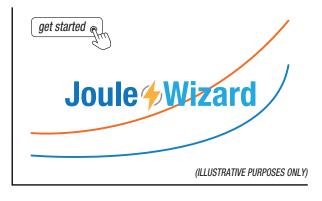
### Notes

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

## DERATING



### **PULSE CAPABILITY**



www.vishay.com/en/resistors/joulewizard/

PERFORMANCE					
TEST	CONDITIONS OF TEST	TEST LIMITS			
Thermal shock	-55 °C to +150 °C, 1000 cycles, 15 min at each extreme	$\pm$ 0.5 % + 0.0005 $\Omega$			
Short time overload	Refer to link for short time overload performance and pulse capability; www.vishay.com/en/resistors/power-metal-strip-calculator/	$\pm$ 0.5 % + 0.0005 $\Omega$			
Low temperature operation	-65 °C for 24 h	$\pm$ 0.5 % + 0.0005 $\Omega$			
High temperature exposure	1000 h at +170 °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 rated power, +70 °C, 1.5 h "ON", 0.5 h "OFF"	$\pm$ 1.0 % + 0.0005 $\Omega$			
Resistance to solder heat	+260 °C solder, 10 s to 12 s dwell, 25 mm/s emergence	$\pm$ 0.5 % + 0.0005 $\Omega$			
Moisture resistance	MIL-STD-202, method 106, 0 % power, 7a and 7b not required	$\pm$ 0.5 % + 0.0005 $\Omega$			

#### Note

 Contact <u>ww2bresistors@vishay.com</u> for application specific performance requirements or qualification data. Typical performance is better than stated test limits



WSK2512

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## PACKAGING<sup>(1)</sup>

MODEL	REEL					
MODEL	TAPE WIDTH	DIAMETER	PIECES / REEL	CODE		
WSK2512	12 mm / embossed plastic	178 mm / 7"	2000	EA		

Notes

• Embossed carrier tape per EIA-481

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

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



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