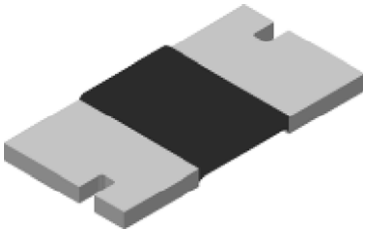
Power Metal Strip® Resistors, Low Value (Down to 0.0005 Ω), Surface-Mount, 4-Terminal



LINKS TO ADDITIONAL RESOURCES

3D Models | Design Tools | Videos | Calculators

FEATURES

- 4-terminal design allows for 1 % tolerance down to 0.0005 Ω and 0.5 % tolerance down to 0.001 Ω
- 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 0.0005 Ω)
- Sulfur resistance by construction that is unaffected by high sulfur environments
- Solid metal nickel-chrome or manganese-copper alloy resistive element with low TCR (< 20 ppm/°C)
- Very low inductance 0.5 nH to 5 nH
- AEC-Q200 qualified (1)
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE GRADE

Pb-free Available

e3

RoHS* Available

HALOGEN FREE Available

GREEN (5-2008) Available

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

STANDARD ELECTRICAL SPECIFICATIONS

GLOBAL MODEL	SIZE	POWER RATING $P_{70\,°C}$ W	RESISTANCE VALUE RANGE Ω			WEIGHT (typical) g/1000 pieces
			TOL. ± 0.1 %	TOL. ± 0.5 %	TOL. ± 1.0 %	
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

GLOBAL PART NUMBER INFORMATION

Global Part Numbering Example: WSK25125L000FTA (visit www.vishay.net Vishay Dale parts numbering manual for all options)

W	S	K	2	5	1	2	5	L	0	0	0	F	T	A		

GLOBAL MODEL	RESISTANCE VALUE (1)	TOLERANCE CODE	PACKAGING CODE (2)	SPECIAL
WSK2512	**L** = mΩ * **R** = decimal **5L000** = 0.005 Ω **R0100** = 0.01 Ω * Use "**L**" for resistance values < 0.01 Ω	**B** = ± 0.1 % **D** = ± 0.5 % **F** = ± 1.0 %	**EA** = lead (Pb)-free, tape / reel **EK** = lead (Pb)-free, bulk **TA** = tin / lead, tape / reel (R86) **BA** = tin / lead, bulk (B43)	(dash number) (up to 2 digits) From **1 to 99** as applicable

Notes

- Per PCN-DR-00009-2022-REV-0, WSL marking will be removed effective March 1st, 2023

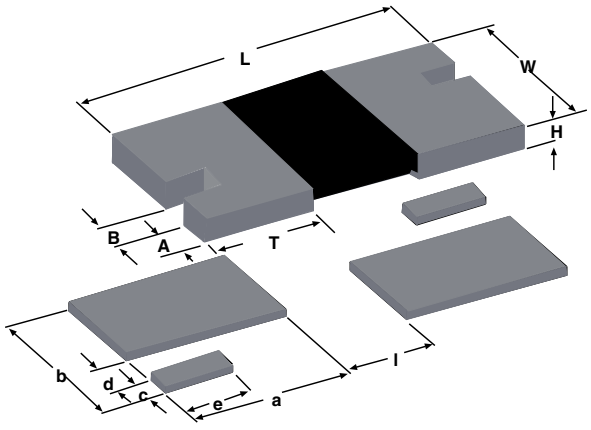
(1) WSL marking (www.vishay.com/doc?30327)

(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

For technical questions, contact: ww2bresistors@vishay.com

TECHNICAL SPECIFICATIONS		
PARAMETER	**UNIT**	**RESISTOR CHARACTERISTICS**
Temperature coefficient	ppm/°C	± 350 for 0.5 mΩ to 0.99 mΩ, ± 250 for 0.001 Ω to 0.0029 Ω, ± 75 for 0.003 Ω to 0.0049 Ω, ± 35 for 0.005 Ω to 0.2 Ω
Operating temperature range	°C	-65 to +170
Maximum working voltage	V	$(P \times R)^{1/2}$

DIMENSIONS in inches (millimeters)



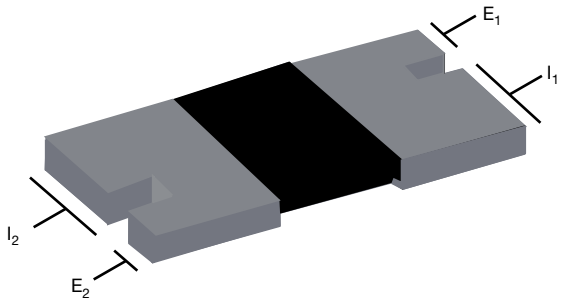
Notes

- 3D models available: www.vishay.com/doc?30323
- Surface-mount solder profile recommendations: www.vishay.com/doc?31052

MODEL	DIMENSIONS						
	RESISTANCE RANGE Ω	**L**	**W**	**H**	**T**	**A**	**B**
WSK2512	0.0005 to 0.00099	0.250 ± 0.010 (6.35 ± 0.254)	0.125 ± 0.010 (3.18 ± 0.254)	0.025 ± 0.010 (0.635 ± 0.254)	0.105 ± 0.010 [2.66 ± 0.254]	0.030 ± 0.010 (0.762 ± 0.254)	0.020 ± 0.010 (0.508 ± 0.254)
	0.001 to 0.0049				0.087 ± 0.010 (2.21 ± 0.254)		
	0.005 to 0.2				0.047 ± 0.010 (1.19 ± 0.254)		

MODEL	SOLDER PAD DIMENSIONS						
	RESISTANCE RANGE Ω	**a**	**b**	**c**	**d**	**e**	**l**
WSK2512	0.0005 to 0.0049	0.130 (3.30)	0.130 (3.30)	0.030 (0.76)	0.020 (0.51)	0.067 (1.70)	0.065 (1.65)
	0.005 to 0.2	0.090 (2.29)					0.145 (3.68)

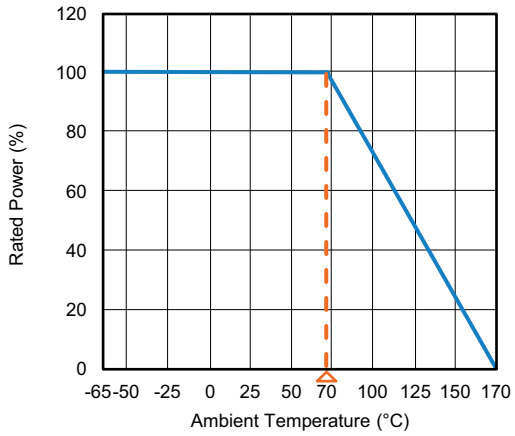
ELECTRICAL CONNECTION



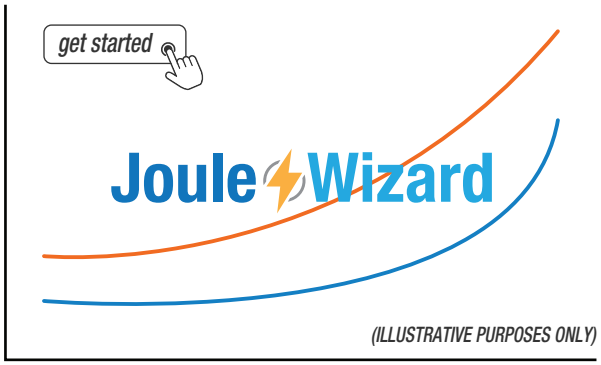
Notes

- 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	± 0.5 % + 0.0005 Ω
Short time overload	Refer to link for short time overload performance and pulse capability; www.vishay.com/en/resistors/power-metal-strip-calculator/	± 0.5 % + 0.0005 Ω
Low temperature operation	-65 °C for 24 h	± 0.5 % + 0.0005 Ω
High temperature exposure	1000 h at +170 °C	± 1.0 % + 0.0005 Ω
Bias humidity	+85 °C, 85 % RH, 10 % bias, 1000 h	± 0.5 % + 0.0005 Ω
Mechanical shock	100 *g*'s for 6 ms, 5 pulses	± 0.5 % + 0.0005 Ω
Vibration	Frequency varied 10 Hz to 2000 Hz in 1 min, 3 directions, 12 h	± 0.5 % + 0.0005 Ω
Load life	1000 h at rated power, +70 °C, 1.5 h "ON", 0.5 h "OFF"	± 1.0 % + 0.0005 Ω
Resistance to solder heat	+260 °C solder, 10 s to 12 s dwell, 25 mm/s emergence	± 0.5 % + 0.0005 Ω
Moisture resistance	MIL-STD-202, method 106, 0 % power, 7a and 7b not required	± 0.5 % + 0.0005 Ω

Note

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

PACKAGING (1)				
MODEL	REEL			
	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 www.vishay.com/doc?20051

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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