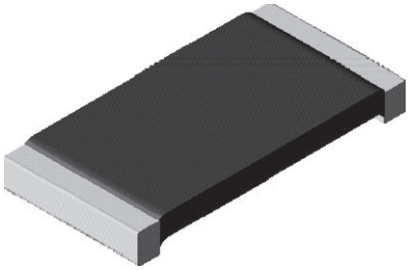
Power Metal Strip® Resistors, Improved Stability (0.25 % and 0.5 %), Low Value, Surface-Mount



LINKS TO ADDITIONAL RESOURCES

3D Models | Design Tools | Videos | Infographics | Calculators

FEATURES

- Current sensing in high-temperature (+125 °C) applications
- Greater stability with maximum resistance change of 0.25 % or 0.5 % through 2000 h workload
- 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 (0.01 Ω to 0.1 Ω)
- Solid metal nickel-chrome 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 2 nH
- Low thermal EMF (< 3 µV/°C)
- AEC-Q200 qualified (1)
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE GRADE

Pb-free

e3

RoHS* Available

HALOGEN FREE 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	TOLERANCE ± %	RESISTANCE VALUE RANGE Ω	WEIGHT (typical) g/1000 pieces
WSLS2512	2512	1.0	0.5, 1.0, 5.0	0.01 to 0.1	63.6

Notes

- Part marking: value, RTC / stability code
- Qualified to AEC-Q200 rev. D

GLOBAL PART NUMBER INFORMATION

Global Part Numbering Example: WSLS2512R0100FHEA (visit www.vishay.net Vishay Dale parts numbering manual for all options)

W	S	L	S	2	5	1	2	R	0	1	0	0	F	H	E	A	

GLOBAL MODEL	RESISTANCE VALUE (1)	TOLERANCE CODE	RTC / STABILITY	PACKAGING CODE (2)	SPECIAL
WSLS2512	**R** = decimal **R0100** = 0.01 Ω	**D** = ± 0.5 % **F** = ± 1.0 % **J** = ± 5.0 %	**G** = 75 ppm, 0.25 % stability **H** = 75 ppm, 0.5 % stability	**EA** = lead (Pb)-free, tape / reel **EK** = lead (Pb)-free, bulk	(dash number) (single digit) from **1** to **9**

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); WSL Decade Values (www.vishay.com/doc?30117)

(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

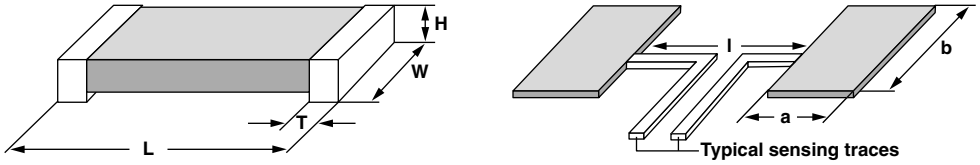
TECHNICAL SPECIFICATIONS

PARAMETER	UNIT	RESISTOR CHARACTERISTICS
Component temperature coefficient (including terminal) (1)	ppm/°C	± 75
Element TCR (2)	ppm/°C	< 20
Operating temperature range	°C	-65 to +170
Maximum working voltage (3)	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 in inches (millimeters)

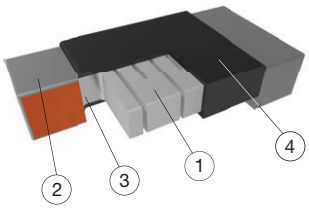


Notes

- 3D models available: www.vishay.com/doc?30306
- Surface-mount solder profile recommendations: www.vishay.com/doc?31052

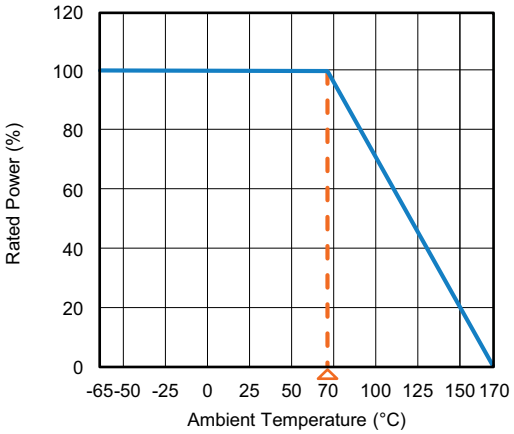
MODEL	DIMENSIONS				SOLDER PAD DIMENSIONS		
	L	W	H	T	a	b	l
WSLS2512	0.250 ± 0.010 (6.35 ± 0.254)	0.125 ± 0.010 (3.18 ± 0.254)	0.025 ± 0.010 (0.635 ± 0.254)	0.030 ± 0.010 (0.762 ± 0.254)	0.065 (1.65)	0.145 (3.68)	0.160 (4.06)

WELDED CONSTRUCTION



1. Resistive element: solid metal nickel-chrome or manganese-copper alloy resistive element with low TCR (< 20 ppm/°C)
2. Plated terminal: solid copper, 100 % Sn (100 µ" min.) with 100 % Ni (20 µ" min.) under layer finish
3. Terminal / element weld
4. Silicone coating with ink print

DERATING



PERFORMANCE

TEST	CONDITIONS OF TEST	TEST LIMITS	
		0.25 %	0.5 %
Thermal shock	-55 °C to +150 °C, 1000 cycles, 15 min at each extreme	± 0.5 % + 0.005 Ω	
Short time overload	5 x rated power for 5 s for WSL2512 size or smaller	± 0.5 % + 0.005 Ω	
Low temperature operation	-65 °C for 24h	± 0.5 % + 0.005 Ω	
High temperature exposure	1000 h at +170 °C	± 1.0 % + 0.005 Ω	
Bias humidity	+85 °C, 85 % RH, 10 % bias, 1000 h	± 0.5 % + 0.005 Ω	
Mechanical shock	100 *g*'s for 6 ms, 5 pulses	± 0.5 % + 0.005 Ω	
Vibration	Frequency varied 10 Hz to 2000 Hz in 1 min, 3 directions, 12 h	± 0.5 % + 0.005 Ω	
Load life	2000 h at 70 °C, 1.5 h "ON", 0.5 h "OFF"	± 0.25 %	± 0.5 %
Resistance to solder heat	+260 °C solder, 10 s to 12 s dwell, 25 mm/s emergence	± 0.5 % + 0.005 Ω	
Moisture resistance	MIL-STD-202, method 106, 0 % power, 7b not required	± 0.5 % + 0.005 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
WSLS2512	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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