AUTOMOTIVE

HALOGEN

FREE

GREEN

(5-2008)

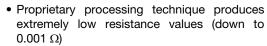


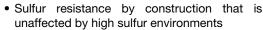
Power Metal Strip® Resistors, Low Value (down to 0.001 Ω), Surface Mount



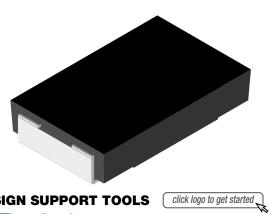
FEATURES

- Molded high temperature encapsulation
- · All welded construction of the Power Metal Strip® resistors are ideal for all types of current sensing, voltage division and applications





- · Solid metal nickel-chrome or manganesecopper alloy resistive element with low TCR (< 20 ppm/°C)
- Very low inductance 0.5 nH to 5 nH
- Excellent frequency response to 50 MHz
- Low thermal EMF (< 3 μV/°C)
- AEC-Q200 qualified (1)
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



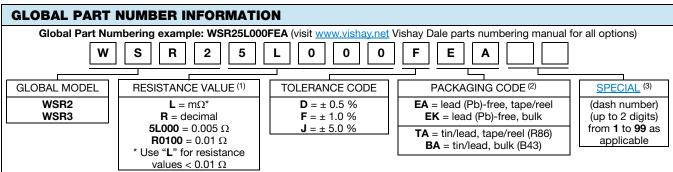
Notes

Models

- 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
- Follow link to Overview of Automotive Grade Products for more details: www.vishay.com/doc?49924
- (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	WEIGHT (typical)	
MODEL			Tol. ± 0.5 %	Tol. ± 1.0 %	g/1000 pieces
WSR2	4527	2.0	0.005 to 1.0	0.001 to 1.0	440
WSR3	4527	3.0 (1)	0.005 to 0.2	0.001 to 0.2	440

- Part marking: DALE, model, value, tolerance, date code
- (1) The WSR3 requires a minimum of 1050 sq. mil. circuit traces connecting to the recommended solder pad



Notes

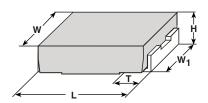
Revision: 09-Jan-2019

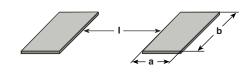
- (1) WSR Marking (<u>www.vishay.com/doc?30327</u>)
- Packaging code: EB (lead (Pb)-free) and TB (tin / lead) are non-standard packaging codes designating 1000 piece reels. These non-standard packaging codes are identical to our standard EA (lead (Pb)-free) and TA (tin / lead), except that they have a package quantity of 1000 pieces
- Follow link for customization capabilities: www.vishay.com/doc?48163



TECHNICAL SPECIFICATIONS				
PARAMETER	UNIT	WSR2 AND WSR3 RESISTOR CHARACTERISTICS		
		\pm 75 for 0.010 Ω to 1.0 Ω		
	ppm/°C	\pm 110 for 0.005 Ω to 0.0099 Ω		
Temperature coefficient TCR measured from -55 °C to		\pm 300 for 0.004 Ω to 0.0049 Ω		
150 °C		\pm 450 for 0.003 Ω to 0.0039 Ω		
		\pm 600 for 0.002 Ω to 0.0029 Ω		
		\pm 750 for 0.001 Ω to 0.0019 Ω		
Element TCR	ppm/°C	< 20		
Dielectric withstanding voltage	V_{AC}	> 500		
Insulation resistance	Ω	> 10 ⁹		
Operating temperature range	°C	-65 to +275		
Maximum working voltage	V	$(P \times R)^{1/2}$		

DIMENSIONS in inches (millimeters)





Notes

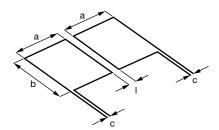
- 3D models available: www.vishay.com/doc?30336
- Surface mount solder profile recommendations: www.vishay.com/doc?31052

MODEL	DIMENSIONS				SOLDER PAD DIMENSIONS			
MODEL	L	н	Т	w	W ₁	а	b	I
WSR2, WSR3	0.455 ± 0.032 (11.56 ± 0.813)	0.095 ± 0.005 (2.41 ± 0.127)		0.275 ± 0.005 (6.98 ± 0.127)		0.155 (3.94)	0.230 (5.84)	0.205 (5.21)

Note

 Sensing locations are based on the construction of the part; terminals are wrapped from the outside to underneath. These options place the sensing location nearest the temperature stable resistance element, which minimizes contact resistance and optimizes TCR

TYPICAL SENSING LAYOUT



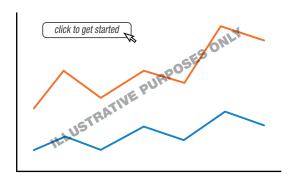
а	b	С	l
0.155	0.230	0.020	0.205
(3.94)	(5.84)	(0.51)	(5.21)



DERATING

Rated Power in % 120 100 80 60 40 20 0 l - 65 - 25 25 75 125 175 225 275 Ambient Temperature °C (70)

PULSE CAPABILITY



www.vishay.com/resistors/power-metal-strip-calculator

PERFORMANCE					
TEST	CONDITIONS OF TEST	TEST LIMITS			
1531	CONDITIONS OF TEST	WSR2	WSR3		
Thermal shock	-55 °C to +150 °C, 1000 cycles, 15 min at each extreme	± 0.5 % + 0.0005 Ω	± 0.5 % + 0.0005 Ω		
Short time overload	WSR2: 5x rated power for 5 s WSR3: 4x rated power for 5 s	± 0.5 % + 0.0005 Ω	± 2.0 % + 0.0005 Ω		
Low temperature storage	-65 °C for 24 h	± 0.5 % + 0.0005 Ω	± 0.5 % + 0.0005 Ω		
High temperature exposure	1000 h at +275 °C	± 1.0 % + 0.0005 Ω	± 1.0 % + 0.0005 Ω		
Bias humidity	+85 °C, 85 % RH, 10 % bias, 1000 h	\pm 0.5 % + 0.0005 Ω	± 0.5 % + 0.0005 Ω		
Mechanical shock	100 g's for 6 ms, 5 pulses	± 0.5 % + 0.0005 Ω	± 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	± 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	± 2.0 % + 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	± 0.5 % + 0.0005 Ω		
Moisture resistance	Moisture resistance MIL-STD-202, method 106, 0 % power, 7a and 7b not required		± 0.5 % + 0.0005 Ω		

PACKAGING (1)					
MODEL	REEL				
	TAPE WIDTH	DIAMETER	PIECES/REEL	CODE	
WSR2 and WSR3	24 mm/embossed plastic	330 mm/13"	1500	EA	

Notes

- Embossed Carrier Tape per EIA-481
- (1) Additional packaging details at www.vishay.com/doc?20051



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