

Vishay Dale

AUTOMOTIVE GRADE

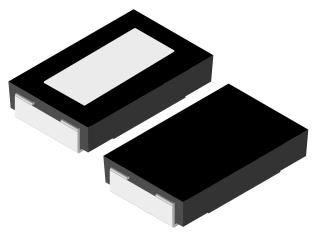
RoHS

HALOGEN FREE

GREEN

(5-2008)

Power Metal Strip[®] Resistors, Low Value (Down to 0.001 Ω), Surface Mount



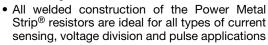
LINKS TO ADDITIONAL RESOURCES

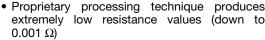


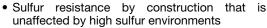


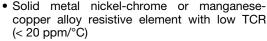
FEATURES

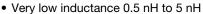
- Molded high temperature encapsulation
- Improved thermal management incorporated into design











- Low thermal EMF (< 3 μV/°C)
- Integral heat sink not utilized for resistance values less than 0.0075 Ω
- AEC-Q200 qualified (1)
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>

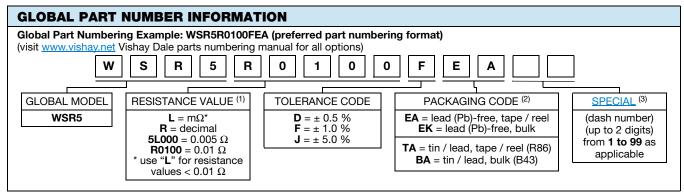
Notes

- * 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
- 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}	RESISTANCE VALUE RANGE Ω		WEIGHT (typical)	
MODEL		W	TOL. ± 0.5 %	TOL. ± 1.0 %	g/1000 pieces	
WSR5	4527	5.0 ⁽¹⁾	0.01 to 0.3	0.001 to 0.3	476	

Notes

- Part marking: DALE, model, value, tolerance, date code
- (1) The WSR5 is rated at 5 W with terminal temperature maintained ≤ 120 °C



Notes

Revision: 29-Jun-2021

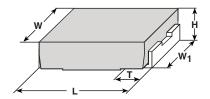
- (1) WSR marking (<u>www.vishay.com/doc?30327</u>)
- (2) Packaging code: EB (lead (Pb)-free) and TB (tin / lead) are non-standard packaging codes designating 1000 piece reels. These non-standard packaging codes are identical to our standard EA (lead (Pb)-free) and TA (tin / lead), except that they have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

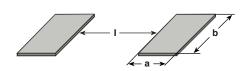
Document Number: 31059

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TECHNICAL SPECIFICATIONS				
PARAMETER UNIT		WSR5 RESISTOR CHARACTERISTICS		
		\pm 75 for 0.01 Ω to 0.3 Ω		
		\pm 110 for 0.005 Ω to 0.0099 Ω		
Temperature coefficient	20,000	\pm 300 for 0.004 Ω to 0.0049 Ω		
measured from -55 °C to +150 °C	ppm/°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	> 109		
Operating temperature range	°C	-65 to +275		
Maximum working voltage	V	$(P \times R)^{1/2}$		

DIMENSIONS in inches (millimeters)





Notes

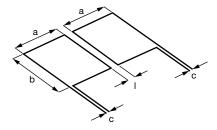
- 3D models available: www.vishay.com/doc?30342
- Surface mount solder profile recommendations: www.vishay.com/doc?31052

MODEL	DIMENSIONS				SOLDER PAD DIMENSIONS			
MODEL	L	Н	Т	W	W ₁	а	b	I
WSR5	0.455 ± 0.032 (11.56 ± 0.813)	0.095 ± 0.005 (2.41 ± 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

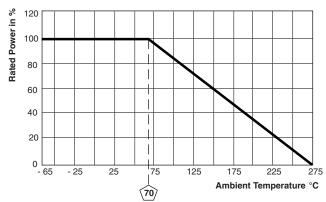


а	b	С	I
0.155	0.230	0.020	0.205
(3.94)	(5.84)	(0.51)	(5.21)

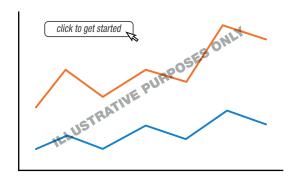
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DERATING



PULSE CAPABILITY



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

PERFORMANCES				
TEST	CONDITIONS OF TEST	TEST LIMITS		
Thermal shock	-55 °C to +150 °C, 1000 cycles, 15 min at each extreme	± 0.5 %		
Short time overload	3 x rated power for 5 s	± 2.0 %		
Low temperature storage	-65 °C for 24 h	± 0.5 %		
High temperature exposure	1000 h at + 275 °C	± 1.0 %		
Bias humidity	+85 °C, 85 % RH, 10 % bias, 1000 h	± 0.5 %		
Mechanical shock	100 g's for 6 ms, 5 pulses	± 0.5 %		
Vibration	Frequency varied 10 Hz to 2000 Hz in 1 min, 3 directions, 12 h	± 0.5 %		
Load life	1000 h at 70 °C	± 2.0 %		
Resistance to solder heat	260 ± 3 °C 10 s to 12 s dwell, 25 mm/s emergence	± 0.5 %		
Moisture resistance	MIL-STD-202, method 106, 0 % power, 7a and 7b not required	± 0.5 %		

PACKAGING (1)					
MODEL	REEL				
	TAPE WIDTH	DIAMETER	PIECES/REEL	CODE	
WSR5	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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