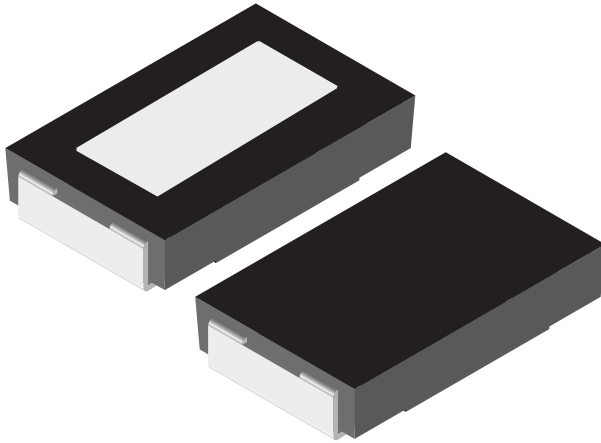


## Power Metal Strip® Resistors, Low Value (down to 0.001 Ω), Surface Mount


**DESIGN SUPPORT TOOLS**
[click logo to get started](#)

**FEATURES**

- Molded high temperature encapsulation
- Improved thermal management incorporated into design
- 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 0.001 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
- Low thermal EMF (< 3 μV/°C)
- Integral heat sink not utilized for resistance values less than 0.0075 Ω
- AEC-Q200 qualified <sup>(1)</sup>
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

AUTOMOTIVE GRADE



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
- Follow link to Overview of Automotive Grade Products for more details: [www.vishay.com/doc?49924](http://www.vishay.com/doc?49924)
- <sup>(1)</sup> Flame retardance test may not be applicable to some resistor technologies

**STANDARD ELECTRICAL SPECIFICATIONS**

GLOBAL MODEL	SIZE	POWER RATING $P_{70\text{ }^{\circ}\text{C}}$ W	RESISTANCE VALUE RANGE Ω		WEIGHT (typical) g/1000 pieces
			Tol. ± 0.5 %	Tol. ± 1.0 %	
WSR5	4527	5.0 <sup>(1)</sup>	0.01 to 0.3	0.001 to 0.3	476

**Notes**

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

**GLOBAL PART NUMBER INFORMATION**

Global Part Numbering example: WSR5R0100FEA (preferred part numbering format)

 (visit [www.vishay.net](http://www.vishay.net) Vishay Dale parts numbering manual for all options)

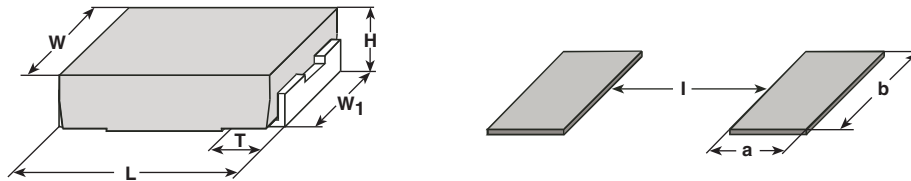
W	S	R	5	R	0	1	0	0	F	E	A		
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GLOBAL MODEL <b>WSR5</b>	RESISTANCE VALUE <sup>(1)</sup> $L = m\Omega^*$ $R = \text{decimal}$ $5L000 = 0.005 \Omega$ $R0100 = 0.01 \Omega$ $* \text{ use "L" for resistance values } < 0.01 \Omega$	TOLERANCE CODE $D = \pm 0.5 \%$ $F = \pm 1.0 \%$ $J = \pm 5.0 \%$	PACKAGING CODE <sup>(2)</sup> $EA = \text{lead (Pb)-free, tape / reel}$ $EK = \text{lead (Pb)-free, bulk}$ $TA = \text{tin / lead, tape / reel (R86)}$ $BA = \text{tin / lead, bulk (B43)}$	SPECIAL <sup>(3)</sup> (dash number) (up to 2 digits) from 1 to 99 as applicable
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**Notes**

- <sup>(1)</sup> WSR Marking ([www.vishay.com/doc?30327](http://www.vishay.com/doc?30327))
- <sup>(2)</sup> 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
- <sup>(3)</sup> Follow link for customization capabilities: [www.vishay.com/doc?48163](http://www.vishay.com/doc?48163)

TECHNICAL SPECIFICATIONS		
PARAMETER	UNIT	WSR5 RESISTOR CHARACTERISTICS
Temperature coefficient	ppm/°C	± 75 for 0.01 Ω to 0.3 Ω; ± 110 for 0.005 Ω to 0.0099 Ω; ± 300 for 0.004 Ω to 0.0049 Ω; ± 450 for 0.003 Ω to 0.0039 Ω; ± 600 for 0.002 Ω to 0.0029 Ω; ± 750 for 0.001 Ω to 0.0019 Ω
Element TCR	ppm/°C	< 20
Dielectric withstanding voltage	V <sub>AC</sub>	> 500
Insulation resistance	Ω	> 10 <sup>9</sup>
Operating temperature range	°C	-65 to +275
Maximum working voltage	V	(P × R) <sup>1/2</sup>

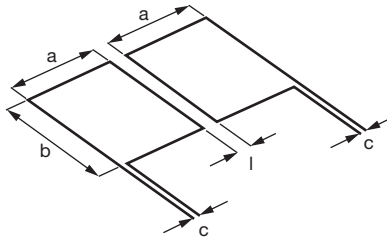
**DIMENSIONS** in inches (millimeters)

**Notes**

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

MODEL	DIMENSIONS					SOLDER PAD DIMENSIONS		
	L	H	T	W	W <sub>1</sub>	a	b	l
WSR5	0.455 ± 0.032 (11.56 ± 0.813)	0.095 ± 0.005 (2.41 ± 0.127)	0.100 ± 0.010 (2.54 ± 0.254)	0.275 ± 0.005 (6.98 ± 0.127)	0.215 ± 0.005 (5.46 ± 0.127)	0.155 (3.94)	0.230 (5.84)	0.205 (5.21)

**Note**

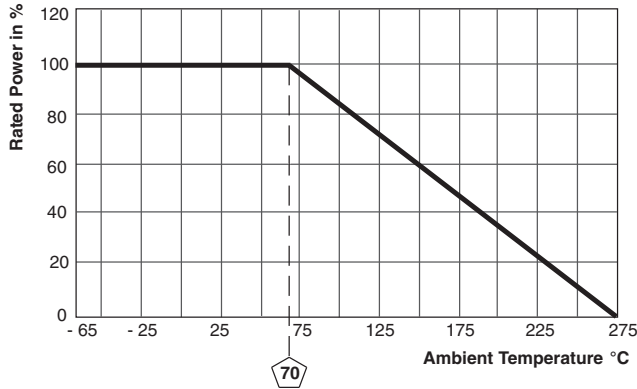
- Sensing locations are based on the construction of the part; terminals are wrapped from the outside to underneath. These options place the sensing location nearest the temperature stable resistance element, which minimizes contact resistance and optimizes TCR

**TYPICAL SENSING LAYOUT**


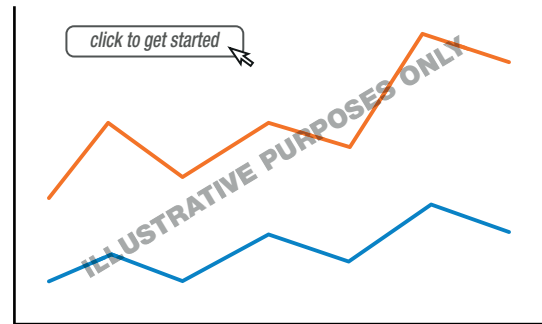
a	b	c	l
0.155 (3.94)	0.230 (5.84)	0.020 (0.51)	0.205 (5.21)



DERATING



PULSE CAPABILITY



[www.vishay.com/resistors/power-metal-strip-calculator](http://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	3x 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](http://www.vishay.com/doc?20051)



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