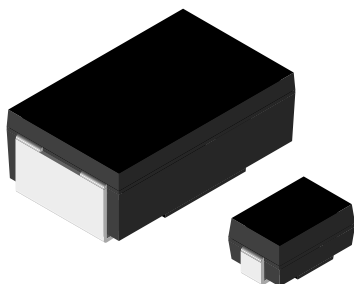


Metal Film Resistors, Power, Surface Mount



FEATURES

- Molded encapsulation
- Wraparound compliant terminations eliminate risk of solder fillet cracking
- Solderable terminations
- Excellent stability at different environmental conditions
- High power ratings (up to 2 W)
- AEC-Q200 qualified available ⁽¹⁾
- Compliant to RoHS Directive 2002/95/EC

Note

⁽¹⁾ Flame retardance test may not be applicable to some resistor technologies.

**AUTOMOTIVE
GRADE**
Available



RoHS*
COMPLIANT
GREEN
(5-2009)**
Available

STANDARD ELECTRICAL SPECIFICATIONS

GLOBAL MODEL	SIZE INCH	POWER RATING $P_{70^{\circ}\text{C}}$ W	TOLERANCE $\pm \%$	RESISTANCE RANGE Ω	ENCAPSULATION
WSF2012	2012	0.5	0.5, 1, 5	5.0 to 1.43K ⁽²⁾	Epoxy
WSF2515	2515	1.0	0.5, 1, 5	10 to 10K	Thermoplastic
WSF4527	4527	2.0 ⁽³⁾	0.5, 1, 5	10 to 100K	Thermoplastic

TECHNICAL SPECIFICATIONS

PARAMETER	UNIT	WSF2012	WSF2515	WSF4527
Temperature coefficient	ppm/ $^{\circ}\text{C}$	± 100 ⁽⁴⁾	± 100 ⁽⁴⁾	± 100 ⁽⁴⁾
Dielectric withstanding voltage	V_{AC}	> 500	> 500	> 500
Insulation resistance	Ω		> 10^9	
Operating temperature range	$^{\circ}\text{C}$	- 65/+ 175	- 65/+ 175	- 65/+ 150
Maximum working voltage	V	$(P \times R)^{1/2}$	$(P \times R)^{1/2}$	$(P \times R)^{1/2}$ ⁽³⁾
Weight/1000 pieces (typical)	g	90	165	760

Notes

• Part marking: 1/2 W - DALE, value; 1 W - model, value, tolerance, date code; 2 W - DALE, model, value, tolerance, date code.

⁽²⁾ E96 values only.

⁽³⁾ Resistance values above 31.25 k Ω are limited to 250 V maximum working voltage.

⁽⁴⁾ ± 50 ppm/ $^{\circ}\text{C}$ and ± 25 ppm/ $^{\circ}\text{C}$ available.

GLOBAL PART NUMBER INFORMATION

Global Part Numbering example: WSF25151K500JKTA (preferred numbering format)

W	S	F	2	5	1	5	1	K	5	0	0	J	K	T	A		
GLOBAL MODEL			VALUE			TOLERANCE			TCR			PACKAGING			SPECIAL		
WSF2012 WSF2515 WSF4527			R = Decimal K = Thousand 100R0 = 100 Ω 1K000 = 1 k Ω			D = $\pm 0.5 \%$ F = $\pm 1.0 \%$ G = $\pm 2.0 \%$ H = $\pm 3.0 \%$ J = $\pm 5.0 \%$ K = $\pm 10 \%$			E = ± 25 ppm/ $^{\circ}\text{C}$ H = ± 50 ppm/ $^{\circ}\text{C}$ K = ± 100 ppm/ $^{\circ}\text{C}$			EA = Lead (Pb)-free, tape/reel EK = Lead (Pb)-free, bulk TA = Tin/lead, tape/reel (R86) BA = Tin/lead, tape/reel, bulk (B43)			(Dash number) (Up to 2 digits) From 1 to 99 as applicable		

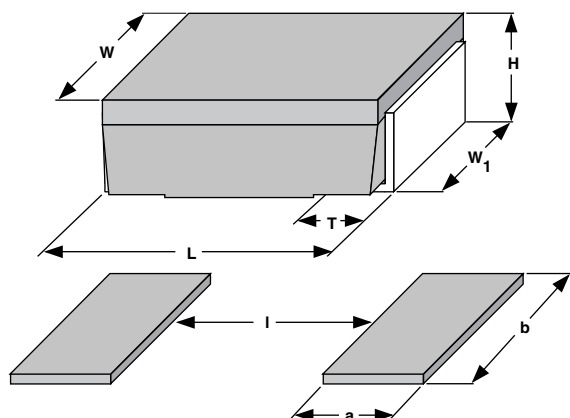
Historical Part Numbering example: WSF2515 1.5 k Ω 5 % 100 ppm/ $^{\circ}\text{C}$ R86 (will continue to be accepted for tin/lead product only)

WSF2515	1.5 k Ω	5 %	100 ppm/ $^{\circ}\text{C}$	R86
HISTORICAL MODEL	RESISTANCE VALUE	TOLERANCE CODE	TEMPERATURE COEFFICIENT	PACKAGING

* Pb containing terminations are not RoHS compliant, exemptions may apply

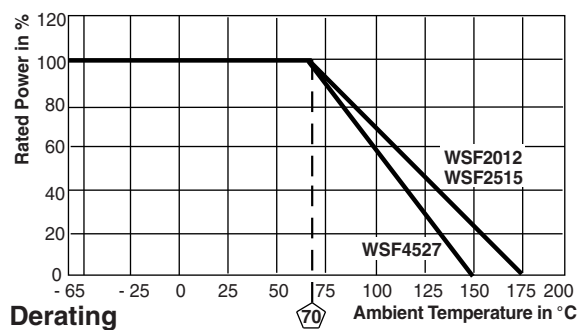
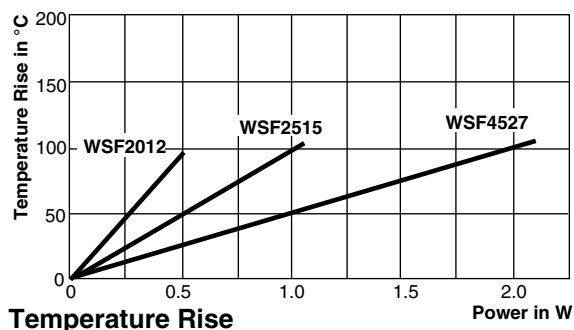
** Please see document "Vishay Material Category Policy": www.vishay.com/doc?99902

DIMENSIONS



MODEL	DIMENSIONS in inches (millimeters)				
	L	H	T	W	W ₁
WSF2012	0.200 ± 0.020 (5.08 ± 0.508)	0.096 ± 0.015 (2.44 ± 0.381)	0.040 ± 0.010 (1.02 ± 0.254)	0.125 ± 0.005 (3.18 ± 0.127)	0.050 ± 0.005 (1.27 ± 0.127)
WSF2515	0.250 ± 0.020 (6.35 ± 0.508)	0.110 ± 0.015 (2.79 ± 0.381)	0.045 ± 0.010 (1.14 ± 0.254)	0.150 ± 0.005 (3.81 ± 0.127)	0.098 ± 0.005 (2.49 ± 0.127)
WSF4527	0.455 ± 0.020 (11.56 ± 0.508)	0.167 ± 0.010 (4.24 ± 0.254)	0.100 ± 0.010 (2.54 ± 0.254)	0.275 ± 0.005 (6.98 ± 0.127)	0.215 ± 0.005 (5.46 ± 0.127)

MODEL	SOLDER PAD DIMENSIONS in inches (millimeters)		
	a	b	l
WSF2012	0.085 (2.16)	0.070 (1.78)	0.080 (2.03)
WSF2515	0.090 (2.29)	0.115 (2.92)	0.120 (3.05)
WSF4527	0.155 (3.94)	0.230 (5.94)	0.205 (5.21)



PERFORMANCE

TEST	CONDITIONS OF TEST	TEST LIMITS
Thermal shock	- 55 °C to + 150 °C, 1000 cycles, 15 min at each extreme	± (1.0 % + 0.05 Ω) ΔR
Short time overload	5 x rated power for 5 s	± (0.5 % + 0.05 Ω) ΔR
Low temperature storage	- 65 °C for 24 h	± (0.5 % + 0.05 Ω) ΔR
High temperature exposure	1000 h at + 175 °C (150 °C for WSF4527)	± (1.0 % + 0.05 Ω) ΔR
Bias humidity	+ 85 °C, 85 % RH, 10 % Bias, 1000 h	± (0.5 % + 0.05 Ω) ΔR
Moisture resistance	MIL-STD-202 method 106, 0 % power, 7a and 7b not required	± (0.5 % + 0.05 Ω) ΔR
Mechanical shock	100 g's for 11 ms, 5 pulses	± (0.5 % + 0.05 Ω) ΔR
Vibration	Frequency varied 10 Hz to 500 Hz in one min, 3 directions, 9 h	± (0.5 % + 0.05 Ω) ΔR
Load life	1000 h at rated power, + 70 °C, 1.5 h "ON", 0.5 h "OFF"	± (1.0 % + 0.05 Ω) ΔR
Resistance to solder heat	+ 260 °C solder, 10 s to 12 s dwell, 25 mm/s emergence	± (0.5 % + 0.05 Ω) ΔR

PACKAGING

MODEL	REEL			
	TAPE WIDTH	DIAMETER	PIECES/REEL	CODE
WSF2012	12 mm/embossed plastic	330 mm/13"	2000	EA/TA
WSF2515	16 mm/embossed plastic	330 mm/13"	2000	EA/TA
WSF4527	24 mm/embossed plastic	330 mm/13"	1200	EA/TA

Note

- Embossed Carrier Tape per EIA-481.



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