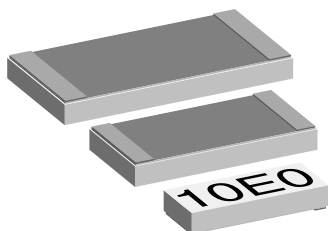


Power Metal Strip® Flip Chip (Extended Range) Patents Pending



FEATURES

- SMD alternative for low power leaded wirewound resistors
- Excellent stability in different environmental conditions (< 0.5 % change in resistance)
- Superior overload and pulse handling capability as compared to thin film (as much as 2 x better)
- Low TCR, down to ± 15 ppm/K
- Low noise: < 0.01 $\mu\text{V}_{\text{RMS}}/\text{V}$
- Very low inductance: < 0.08 μH
- Voltage coefficient: < 0.00001 %/V (< 0.1 ppm/V)
- Compliant to RoHS Directive 2002/95/EC



Notes

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

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

STANDARD ELECTRICAL SPECIFICATIONS

GLOBAL MODEL	SIZE	POWER RATING $P_{70^\circ\text{C}}$ W	LIMITING ELEMENT VOLTAGE ⁽¹⁾ V	TEMPERATURE COEFFICIENT \pm ppm/K	RESISTANCE VALUE RANGE ⁽²⁾ Ω		E-SERIES
					Tol. ± 0.5 %	Tol. ± 1.0 %	
WSL1506E	1506	0.25	63	15, 25	0.5 to 10K	0.5 to 10K	96
WSL2010E	2010	0.5	100	15, 25	0.5 to 10K	0.5 to 10K	96
WSL2512E	2512	1.0	100	15, 25	0.5 to 10K	0.5 to 10K	96

Notes

- Ask about further value ranges, tighter tolerances and TCR's.

- Power rating depends on the max. temperature at the solder point, the component placement density and the substrate material.

- 4-digit marking, according to MIL-PRF-55342 (except as noted in Ordering Information table), on top side.

⁽¹⁾ Rated voltage: $\sqrt{P \times R}$.

⁽²⁾ Contact factory using e-mail address at bottom of this page for resistance values available between 0.5 to 10 for 1506 and 0.5 to 100 for 2010 and 2512.

TECHNICAL SPECIFICATIONS

PARAMETER	UNIT	WSL1506E	WSL2010E	WSL2512E
Rated dissipation at 70 °C	W	0.25	0.5	1.0
Insulation voltage (1 min)	$V_{\text{DC/AC peak}}$	200	200	200
Thermal resistance	K/W	≤ 220 ⁽³⁾	≤ 88 ⁽³⁾	≤ 65 ⁽³⁾
Insulation resistance	M Ω	$> 10^6$		
Operating temperature range	°C	- 55 to + 150		
Weight/1000 pieces	g	12	25	35

Note

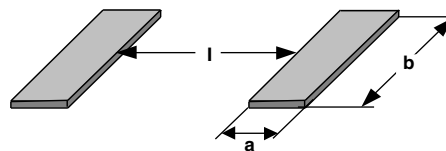
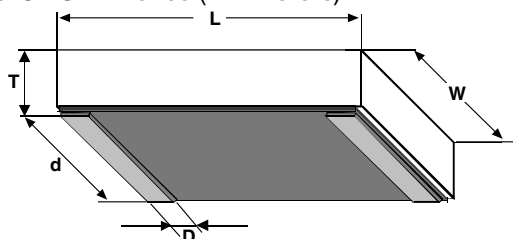
⁽³⁾ Depending on solder pad dimensions.

GLOBAL PART NUMBER INFORMATION

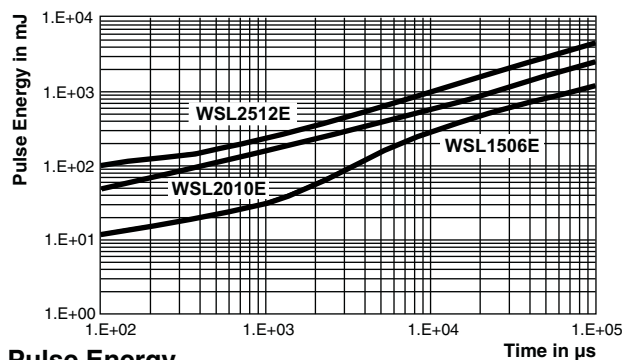
Global Part Numbering example: WSL1506E10E0XEA

W S L 1 5 0 6 E 1 0 E 0 X E A

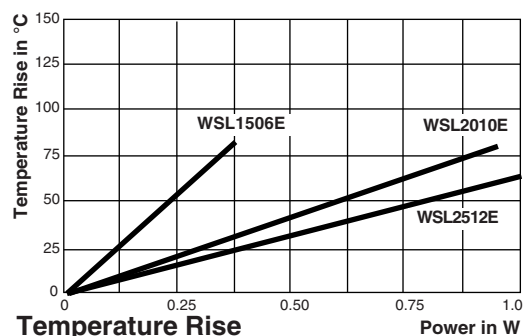
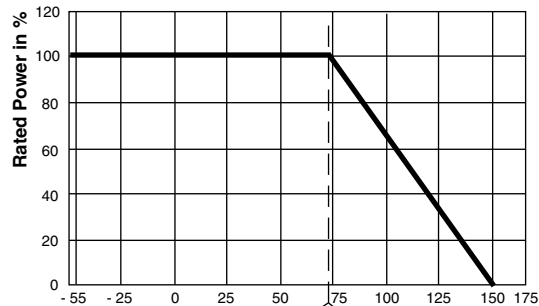
GLOBAL MODEL	RESISTANCE VALUE AND TOLERANCE			TCR CODE	PACKAGING CODE	SPECIAL
WSL1506E	Resistance Tolerance (\pm)	Multiplier	Symbol	E = ± 25 ppm/K X = ± 15 ppm/K	EA = Lead (Pb)-free, tape/reel TA = Tape/reel (R86)	(Dash number) (up to 2 digits) From 1 to 99 as applicable
	0.5	X1	W			
	0.5	X1000	X			
	0.5	X1 000 000	Y			
	1.0	X1	D			
	1.0	X1000	E			
	1.0	X1 000 000	F			

DIMENSIONS in inches (millimeters)


MODEL	DIMENSIONS					SOLDER PAD DIMENSIONS		
	L	W	T _{max.}	D	d	a	b	l
WSL1506	0.15 ± 0.005 (3.81 ± 0.13)	0.062 ± 0.003 (1.57 ± 0.08)	0.025 (0.64)	0.012 ± 0.003 (0.30 ± 0.08)	0.059 ± 0.003 (1.50 ± 0.08)	0.015 (0.38)	0.062 (1.57)	0.118 (3.00)
WSL2010	0.200 ± 0.005 (5.08 ± 0.13)	0.100 ± 0.003 (2.54 ± 0.08)	0.025 (0.64)	0.020 ± 0.003 (0.51 ± 0.08)	0.097 ± 0.003 (2.46 ± 0.08)	0.023 (0.58)	0.100 (2.54)	0.153 (3.89)
WSL2512	0.250 ± 0.005 (6.35 ± 0.13)	0.126 ± 0.003 (3.20 ± 0.08)	0.025 (0.64)	0.024 ± 0.003 (0.61 ± 0.08)	0.123 ± 0.003 (3.12 ± 0.08)	0.027 (0.69)	0.126 (3.20)	0.196 (4.98)


Pulse Energy
Pulse Energy Plot:

This represents the energy in each of 50 pulses, with a 1 s rest between pulses, that it takes to shift the WSL....E resistance ± (0.50 % + 0.01 Ω).


Temperature Rise

Derating

PERFORMANCE		
TEST	CINDITIONS OF TEST	TEST LIMITS
Thermal shock	- 55 °C to + 150 °C, 100 cycles, 15 min at each extreme	± (0.20 % + 0.01 Ω)
Short time overload	5 x rated power for 5 s	± (0.20 % + 0.01 Ω)
Low temperature operation	- 65 °C for 24 h	± (0.20 % + 0.01 Ω)
High temperature exposure	1000 h at +150 °C	± (0.50 % + 0.01 Ω)
Moisture resistance	MIL-STD-202, method 106, 0 % power, 7a and 7b not required	± (0.50 % + 0.01 Ω)
Load life	1000 h at rated power, + 70 °C, 1.5 h "ON", 0.5 h "OFF"	± (0.50 % + 0.01 Ω)
Vibration	MIL-STD-202, method 204D	± (0.10 % + 0.01 Ω)
Mechanical shock	100 g's for 6 ms, 5 pulses	± (0.10 % + 0.01 Ω)
Resistance to solder heat	+ 260 °C solder, 10 s to 12 s dwell, 25 mm/s emergence	± (0.50 % + 0.01 Ω)

PACKAGING				
MODEL	REEL			
	TAPE WIDTH	DIAMETER	PIECES/REEL	CODE
WSL1506E	12 mm/embossed plastic	178 mm/7"	4000	EA
WSL2010E	12 mm/embossed plastic	178 mm/7"	4000	EA
WSL2512E	12 mm/embossed plastic	178 mm/7"	2000	EA

Note

- Embossed Carrier Tape per EIA-481.



Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.