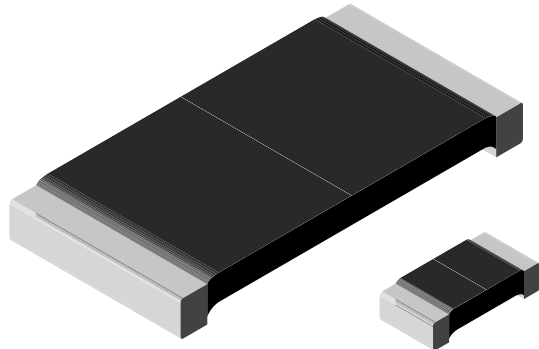




Power Metal Strip® Resistors, High Power (2 x Standard WSL), Low Value (down to 0.0005 Ω), Surface Mount



FEATURES

- 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 0.0005 Ω)
Sulfur resistance by construction that is unaffected by high sulfur environments
Very low inductance 0.5 nH to 5 nH
Low thermal EMF (< 3 μV/°C)
AEC-Q200 qualified (1)
Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



DESIGN SUPPORT TOOLS

click logo to get started



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.

Table with 6 columns: GLOBAL MODEL, SIZE, POWER RATING P70°C W, RESISTANCE VALUE RANGE Ω (Tol. ± 0.5 %, Tol. ± 1.0 %), WEIGHT (typical) g/1000 pieces. Rows include WSL0603...18, WSL0805...18, WSL1206...18, WSL2010...18, WSL2512...18.

Note

- Part marking: Value; tolerance: Due to resistor size limitations some resistors will be marked with only the resistance value.

GLOBAL PART NUMBER INFORMATION table showing part numbering example WSL25124L000FEA18 and breakdown into GLOBAL MODEL, RESISTANCE VALUE, TOLERANCE CODE, PACKAGING CODE, and SPECIAL options.

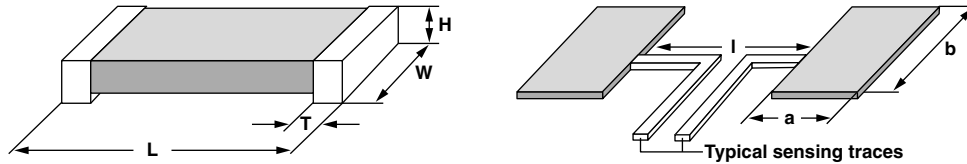
Notes

- (1) WSL Marking (www.vishay.com/doc?30327); WSL Decade Values (www.vishay.com/doc?30117)
(2) Packaging code: EB (lead (Pb)-free) and TB (tin / lead) are non-standard packaging codes that designate 1000 piece reel quantities. 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

| TECHNICAL SPECIFICATIONS  |        |                             |
|---|--------|-----------------------------|
| PARAMETER   | UNIT   | RESISTOR CHARACTERISTICS    |
| Component temperature coefficient (including terminal) <sup>(1)</sup><br>TCR measured from -55 °C to 150 °C | ppm/°C | ± 75 for 7 mΩ to 0.5 Ω      |
|   |        | ± 110 for 5 mΩ to 6.9 mΩ    |
|   |        | ± 150 for 3 mΩ to 4.9 mΩ    |
|   |        | ± 275 for 1 mΩ to 2.9 mΩ    |
|   |        | ± 400 for 0.5 mΩ to 0.99 mΩ |
| Element TCR <sup>(2)</sup>  | ppm/°C | < 20                        |
| Operating temperature range   | °C     | -65 to +170                 |
| Maximum working voltage <sup>(3)</sup>  | V      | $(P \times R)^{1/2}$        |

**Notes**

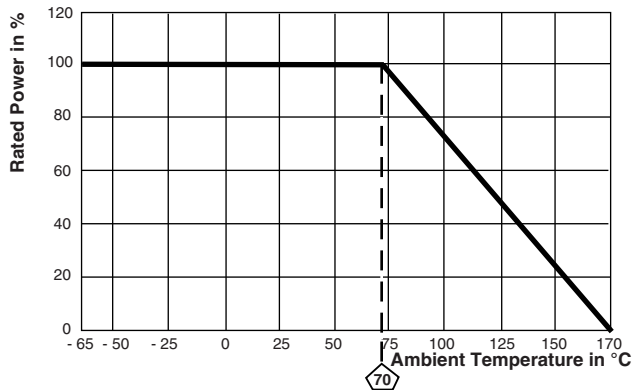
- (1) Component TCR - total TCR that includes the TCR effects of the resistor element and the copper terminal
- (2) Element TCR - only applies to the alloy used for the resistor element; refer to item 1 in the construction illustration on the following page#
- (3) Maximum working voltage - the WSL is not voltage sensitive, but is limited by power / energy dissipation and is also not ESD sensitive

**DIMENSIONS** in inches (millimeters)

**Notes**

- 3D models available: [www.vishay.com/doc?30307](http://www.vishay.com/doc?30307).
- Surface mount solder profile recommendations: [www.vishay.com/doc?31052](http://www.vishay.com/doc?31052).

| MODEL        | RESISTANCE RANGE (Ω) | DIMENSIONS                      |                                 |                                  |                                  | SOLDER PAD DIMENSIONS |                 |                 |                 |                 |
|--------------|----------------------|---------------------------------|---------------------------------|----------------------------------|----------------------------------|-----------------------|-----------------|-----------------|-----------------|-----------------|
|              |                      | L                               | W                               | H                                | T                                | a                     | b               | l               |                 |                 |
| WSL0603...18 | 0.01 to 0.1          | 0.060 ± 0.010<br>(1.52 ± 0.254) | 0.030 ± 0.010<br>(0.76 ± 0.254) | 0.013 ± 0.010<br>(0.330 ± 0.254) | 0.015 ± 0.005<br>(0.381 ± 0.127) | 0.040<br>(1.01)       | 0.040<br>(1.01) | 0.020<br>(0.50) |                 |                 |
| WSL0805...18 | 0.005 to 0.2         | 0.080 ± 0.010<br>(2.03 ± 0.254) | 0.050 ± 0.010<br>(1.27 ± 0.254) | 0.013 ± 0.010<br>(0.330 ± 0.254) | 0.015 ± 0.005<br>(0.381 ± 0.127) | 0.040<br>(1.02)       | 0.050<br>(1.27) | 0.020<br>(0.50) |                 |                 |
| WSL1206...18 | 0.001 to 0.0019      | 0.126 ± 0.010<br>(3.20 ± 0.254) | 0.063 ± 0.010<br>(1.60 ± 0.254) | 0.025 ± 0.010<br>(0.635 ± 0.254) | 0.041 ± 0.010<br>(1.04 ± 0.254)  | 0.062<br>(1.57)       | 0.070<br>(1.78) | 0.030<br>(0.76) |                 |                 |
|              | 0.002 to 0.0059      |                                 |                                 |                                  | 0.025 ± 0.010<br>(0.635 ± 0.254) |                       |                 |                 |                 |                 |
|              | 0.006 to 0.20        |                                 |                                 |                                  | 0.020 ± 0.010<br>(0.508 ± 0.254) |                       |                 |                 |                 |                 |
| WSL2010...18 | 0.001 to 0.0069      | 0.200 ± 0.010<br>(5.08 ± 0.254) | 0.100 ± 0.010<br>(2.54 ± 0.254) | 0.025 ± 0.010<br>(0.635 ± 0.254) | 0.058 ± 0.010<br>(1.47 ± 0.254)  | 0.093<br>(2.36)       | 0.120<br>(3.05) | 0.055<br>(1.40) |                 |                 |
|              | 0.007 to 0.5         |                                 |                                 |                                  | 0.020 ± 0.010<br>(0.508 ± 0.254) |                       |                 | 0.055<br>(1.40) | 0.130<br>(3.30) |                 |
| WSL2512...18 | 0.0005 to 0.00099    | 0.250 ± 0.010<br>(6.35 ± 0.254) | 0.125 ± 0.010<br>(3.18 ± 0.254) | 0.025 ± 0.010<br>(0.635 ± 0.254) | 0.107 ± 0.010<br>(2.72 ± 0.254)  | 0.120<br>(3.05)       | 0.145<br>(3.68) | 0.050<br>(1.27) |                 |                 |
|              | 0.001 to 0.0049      |                                 |                                 |                                  | 0.087 ± 0.010<br>(2.21 ± 0.254)  |                       |                 |                 |                 |                 |
|              | 0.005 to 0.0069      |                                 |                                 |                                  | 0.047 ± 0.010<br>(1.19 ± 0.254)  |                       |                 |                 | 0.083<br>(2.11) | 0.125<br>(3.18) |
|              | 0.007 to 0.04        |                                 |                                 |                                  | 0.030 ± 0.010<br>(0.762 ± 0.254) |                       |                 |                 | 0.065<br>(1.65) |                 |

## DERATING

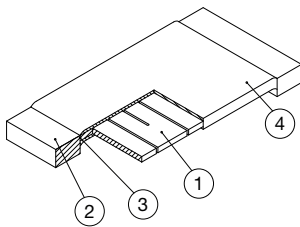


## PULSE CAPABILITY



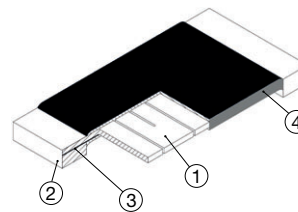
[www.vishay.com/resistors/power-metal-strip-calculator](http://www.vishay.com/resistors/power-metal-strip-calculator)

## WELDED CONSTRUCTION 2512, 2010, 1206



- 1) Resistive element: solid metal nickel-chrome or manganese-copper alloy resistive element with low TCR (< 20 ppm/°C)
- 2) Plated terminal
- 3) Terminal / element weld
- 4) Silicone coating with ink print

## CLAD CONSTRUCTION 0805 and 0603



- 1) Resistive element: Ni-Cr
- 2) Terminal: Solid copper, 100 % Sn (100 μ" min.) with 100 % Ni (20 μ" min.) under layer finish
- 3) Terminal to element weld
- 4) High temperature encapsulant: "siliconized polyester" coating material

| PERFORMANCE               |  |                    |
|---------------------------|--|--------------------|
| TEST                      | CONDITIONS OF TEST   | TEST LIMITS        |
| Thermal shock             | -55 °C to +150 °C, 1000 cycles, 15 min at each extreme         | ± 0.5 % + 0.0005 Ω |
| Short time overload       | 5 x rated power for 5 s  | ± 0.5 % + 0.0005 Ω |
| Low temperature storage   | -65 °C for 24 h  | ± 0.5 % + 0.0005 Ω |
| High temperature exposure | 1000 h at + 170 °C   | ± 1.0 % + 0.0005 Ω |
| Bias humidity             | +85 °C, 85 % RH, 10 % bias, 1000 h                             | ± 0.5 % + 0.0005 Ω |
| Mechanical shock          | 100 g's for 6 ms, 5 pulses                                     | ± 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 |
| Load life                 | 1000 h at rated power, + 70 °C, 1.5 h "ON", 0.5 h "OFF"        | ± 1.0 % + 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 |
| 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 |
| WSL0603...18  | 8 mm/punched paper     | 178 mm/7" | 5000        | EA   |
| WSL0805...18  | 8 mm/punched paper     | 178 mm/7" | 5000        | EA   |
| WSL1206...18  | 8 mm/embossed plastic  | 178 mm/7" | 4000        | EA   |
| WSL2010...18  | 12 mm/embossed plastic | 178 mm/7" | 4000        | EA   |
| WSL2512...18  | 12 mm/embossed plastic | 178 mm/7" | 2000        | EA   |

### Notes

- Embossed Carrier Tape per EIA-481.
- (1) Additional packaging details at [www.vishay.com/doc?220051](http://www.vishay.com/doc?220051).



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