

## Power Metal Strip® Resistors, Very High Power (to 3 W), Low Value (down to 0.0005 Ω), Surface Mount



### FEATURES

- Very high power to foot print size ratio (3 W in 2512, 2 W in 2010, 1 W in 1206, 0.5 W in 0805, and 0.4 W in 0603 package)
- Ideal for all types of current sensing and pulse applications including switching and linear power supplies, instruments, power amplifiers and shunts
- Proprietary processing technique produces extremely low resistance values (down to 0.0005 Ω)
- All welded construction
- 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
- Excellent frequency response to 50 MHz
- Low thermal EMF (< 3 μV/°C)
- AEC-Q200 qualified available <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**  
COMPLIANT  
HALOGEN  
**FREE**  
**GREEN**  
(5-2008)

### Note

<sup>(1)</sup> Flame retardance test may not be applicable to some resistor technologies

### STANDARD ELECTRICAL SPECIFICATIONS

| GLOBAL MODEL | SIZE | POWER RATING<br>$P_{70^{\circ}\text{C}}$<br>W | RESISTANCE VALUE RANGE<br>Ω |                | WEIGHT<br>(typical)<br>g/1000 pieces |
|--------------|------|---|-----------------------------|----------------|--------------------------------------|
|              |      |   | Tol. ± 0.5 %                | Tol. ± 1.0 %   |                                      |
| WSLP0603     | 0603 | 0.4   | 0.015 to 0.1                | 0.01 to 0.1    | 1.9                                  |
| WSLP0805     | 0805 | 0.5   | 0.01 to 0.05                | 0.005 to 0.05  | 4.8                                  |
| WSLP1206     | 1206 | 1.0   | 0.005 to 0.05               | 0.001 to 0.05  | 16.2                                 |
| WSLP2010     | 2010 | 2.0   | 0.004 to 0.01               | 0.001 to 0.01  | 38.9                                 |
| WSLP2512     | 2512 | 3.0   | 0.003 to 0.01               | 0.0005 to 0.01 | 63.6                                 |

### TECHNICAL SPECIFICATIONS

| PARAMETER                   | UNIT   | RESISTOR CHARACTERISTICS  |
|-----------------------------|--------|---|
| Temperature coefficient     | ppm/°C | ± 400 for 0.5 mΩ to 0.99 mΩ, ± 275 for 1 mΩ to 2.9 mΩ, ± 150 for 3 mΩ to 4.9 mΩ, ± 110 for 5 mΩ to 6.9 mΩ, ± 75 for 7 mΩ to 0.1 Ω |
| Element TCR                 | ppm/°C | < 20  |
| Operating temperature range | °C     | -65 to +170   |
| Maximum working voltage     | V      | $(P \times R)^{1/2}$  |

### GLOBAL PART NUMBER INFORMATION

Global Part Numbering example: WSLP1206R0100FEA

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|--|
| W | S | L | P | 1 | 2 | 0 | 6 | R | 0 | 1 | 0 | 0 | F | E | A |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|--|

|   |
|---|
| GLOBAL MODEL<br>(8 digits)  |
| <b>WSLP0603</b><br><b>WSLP0805</b><br><b>WSLP1206</b><br><b>WSLP2010</b><br><b>WSLP2512</b> |

|   |
|---|
| RESISTANCE VALUE<br>(5 digits)  |
| <b>L</b> = mΩ*<br><b>R</b> = Decimal<br><b>4L000</b> = 0.004 Ω<br><b>R0100</b> = 0.01 Ω |

\* Use "L" for resistance values < 0.01 Ω

|  |
|--|
| TOLERANCE CODE<br>(1 digit)              |
| <b>D</b> = ± 0.5 %<br><b>F</b> = ± 1.0 % |

|   |
|---|
| PACKAGING CODE<br>(2 digits)  |
| <b>EA</b> = Lead (Pb)-free, tape/reel<br><b>EK</b> = Lead (Pb)-free, bulk |

|                              |
|------------------------------|
| SPECIAL<br>(up to 2 digits)  |
| Reserved for future specials |

**DIMENSIONS**


| MODEL    | RESISTANCE RANGE ( $\Omega$ ) | DIMENSIONS in inches (millimeters)      |   |  |  | SOLDER PAD DIMENSIONS in inches (millimeters) |                 |                 |                 |
|----------|-------------------------------|---|---|--|--|---|-----------------|-----------------|-----------------|
|          |                               | L                                       | W                                       | H  | T  | a   | b               | l               |                 |
| WSLP0603 | 0.01 to 0.1                   | 0.060 $\pm$ 0.010<br>(1.52 $\pm$ 0.254) | 0.030 $\pm$ 0.010<br>(0.76 $\pm$ 0.254) | 0.013 $\pm$ 0.010<br>(0.330 $\pm$ 0.254) | 0.015 $\pm$ 0.010<br>(0.381 $\pm$ 0.254) | 0.040<br>(1.02)                               | 0.040<br>(1.02) | 0.020<br>(0.50) |                 |
| WSLP0805 | 0.01 to 0.05                  | 0.080 $\pm$ 0.010<br>(2.03 $\pm$ 0.254) | 0.050 $\pm$ 0.010<br>(1.27 $\pm$ 0.254) | 0.013 $\pm$ 0.010<br>(0.330 $\pm$ 0.254) | 0.015 $\pm$ 0.010<br>(0.381 $\pm$ 0.254) | 0.040<br>(1.02)                               | 0.050<br>(1.27) | 0.020<br>(0.50) |                 |
| WSLP1206 | 0.001 to 0.0019               | 0.126 $\pm$ 0.010<br>(3.20 $\pm$ 0.254) | 0.063 $\pm$ 0.010<br>(1.60 $\pm$ 0.254) | 0.025 $\pm$ 0.010<br>(0.635 $\pm$ 0.254) | 0.041 $\pm$ 0.010<br>(1.04 $\pm$ 0.254)  | 0.062<br>(1.57)                               | 0.070<br>(1.78) | 0.030<br>(0.76) |                 |
|          | 0.002 to 0.0059               |   |   |  | 0.025 $\pm$ 0.010<br>(0.635 $\pm$ 0.254) |   |                 |                 |                 |
|          | 0.006 to 0.050                |   |   |  | 0.020 $\pm$ 0.010<br>(0.508 $\pm$ 0.254) |   |                 |                 |                 |
| WSLP2010 | 0.001 to 0.0069               | 0.200 $\pm$ 0.010<br>(5.08 $\pm$ 0.254) | 0.100 $\pm$ 0.010<br>(2.54 $\pm$ 0.254) | 0.025 $\pm$ 0.010<br>(0.635 $\pm$ 0.254) | 0.058 $\pm$ 0.010<br>(1.47 $\pm$ 0.254)  | 0.093<br>(2.36)                               | 0.120<br>(3.05) | 0.055<br>(1.40) |                 |
|          | 0.007 to 0.010                |   |   |  | 0.020 $\pm$ 0.010<br>(0.508 $\pm$ 0.254) |   |                 | 0.055<br>(1.40) | 0.130<br>(3.30) |
| WSLP2512 | 0.0005 to 0.00099             | 0.250 $\pm$ 0.010<br>(6.35 $\pm$ 0.254) | 0.125 $\pm$ 0.010<br>(3.18 $\pm$ 0.254) | 0.025 $\pm$ 0.010<br>(0.635 $\pm$ 0.254) | 0.107 $\pm$ 0.010<br>(2.72 $\pm$ 0.254)  | 0.120<br>(3.05)                               | 0.145<br>(3.68) | 0.050<br>(1.27) |                 |
|          | 0.001 to 0.0049               |   |   |  | 0.087 $\pm$ 0.010<br>(2.21 $\pm$ 0.254)  |   |                 | 0.125<br>(3.18) |                 |
|          | 0.005 to 0.0069               |   |   |  | 0.047 $\pm$ 0.010<br>(1.19 $\pm$ 0.254)  |   |                 | 0.083<br>(2.11) | 0.160<br>(4.06) |
|          | 0.006 to 0.01                 |   |   |  | 0.030 $\pm$ 0.010<br>(0.762 $\pm$ 0.254) |   |                 | 0.065<br>(1.65) |                 |

**DERATING**


| PERFORMANCE               |  |   |
|---------------------------|--|---|
| TEST                      | CONDITIONS OF TEST   | TEST LIMITS                                 |
| Thermal shock             | -55 °C to +150 °C, 1000 cycles, 15 min at each extreme         | $\pm$ (0.5 % + 0.0005 $\Omega$ ) $\Delta R$ |
| Low temperature operation | -65 °C for 45 min  | $\pm$ (0.5 % + 0.0005 $\Omega$ ) $\Delta R$ |
| High temperature exposure | 1000 h at + 170 °C   | $\pm$ (1.0 % + 0.0005 $\Omega$ ) $\Delta R$ |
| Bias humidity             | +85 °C, 85 % RH, 10 % bias, 1000 h                             | $\pm$ (0.5 % + 0.0005 $\Omega$ ) $\Delta R$ |
| Mechanical shock          | 100 g's for 6 ms, 5 pulses                                     | $\pm$ (0.5 % + 0.0005 $\Omega$ ) $\Delta R$ |
| Vibration                 | Frequency varied 10 Hz to 2000 Hz in 1 min, 3 directions, 12 h | $\pm$ (0.5 % + 0.0005 $\Omega$ ) $\Delta R$ |
| Load life                 | 1000 h at 70 °C, 1.5 h "ON", 0.5 h "OFF"                       | $\pm$ (1.0 % + 0.0005 $\Omega$ ) $\Delta R$ |
| Resistance to solder heat | +260 °C solder, 10 s to 12 s dwell, 25 mm/s emergence          | $\pm$ (0.5 % + 0.0005 $\Omega$ ) $\Delta R$ |
| Moisture resistance       | MIL-STD-202, method 106, 0 % power, 7b not required            | $\pm$ (0.5 % + 0.0005 $\Omega$ ) $\Delta R$ |

| PACKAGING |                        |           |             |      |
|-----------|------------------------|-----------|-------------|------|
| MODEL     | REEL                   |           |             |      |
|           | TAPE WIDTH             | DIAMETER  | PIECES/REEL | CODE |
| WSLP0603  | 8 mm/punched paper     | 178 mm/7" | 5000        | EA   |
| WSLP0805  | 8 mm/punched paper     | 178 mm/7" | 5000        | EA   |
| WSLP1206  | 8 mm/embossed plastic  | 178 mm/7" | 4000        | EA   |
| WSLP2010  | 8 mm/embossed plastic  | 178 mm/7" | 4000        | EA   |
| WSLP2512  | 12 mm/embossed plastic | 178 mm/7" | 2000        | EA   |

**Note**

- Embossed Carrier Tape per EIA-481.



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