

Power Metal Strip® Resistors, Very High Power (1 W), Low Value (down to 0.005 Ω), Surface Mount



FEATURES

- Very high power to foot print size ratio (1 W in 0805 / 2 W in 1206 package)
- All welded construction of the Power Metal Strip® resistors is ideal for all types of current sensing, voltage division and pulse applications
- Proprietary processing technique produces extremely low resistance values (down to 0.005 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
- Excellent frequency response to 50 MHz
- Low thermal EMF (< 3 μV/°C)
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

DESIGN SUPPORT TOOLS

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3D
Models
Available

Design Tools
Available

| STANDARD ELECTRICAL SPECIFICATIONS | | | | | |
|------------------------------------|------|---|------------------|--------------------------------|--------------------------------------|
| GLOBAL MODEL | SIZE | POWER RATING $P_{70^{\circ}\text{C}}$ W | TOLERANCE ± % | RESISTANCE VALUE RANGE Ω | WEIGHT (typical) g/1000 pieces |
| WSLP0805...18 | 0805 | 1.0 | 1.0, 5.0 | 0.005 to 0.01 | 4.8 |
| WSLP1206...18 | 1206 | 2.0 | 1.0, 5.0 | 0.005 to 0.012 | 16.2 |

| GLOBAL PART NUMBER INFORMATION | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|-----------------------------|---|--|---|---|--|---|---|---|---|---|
| Global Part Numbering example: WSLP0805R0100FEA18 | | | | | | | | | | | | | | | | | |
| W | S | L | P | 0 | 8 | 0 | 5 | R | 0 | 1 | 0 | 0 | F | E | A | 1 | 8 |
| GLOBAL MODEL (8 digits) | | | | RESISTANCE VALUE ⁽¹⁾ (5 digits) | | | TOLERANCE CODE (1 digit) | | PACKAGING CODE ⁽²⁾ (2 digits) | | | SPECIAL ⁽³⁾ (up to 2 digits) | | | | | |
| WSLP0805 WSLP1206 | | | | L = mΩ* R = Decimal 5L000 = 0.005 Ω R0100 = 0.01 Ω | | | F = ± 1.0 % J = ± 5.0 % | | EA = lead (Pb)-free, tape / reel EK = lead (Pb)-free, bulk pack | | | 18 = "high power" option | | | | | |
| * Use "L" for resistance values < 0.01 Ω | | | | | | | | | | | | | | | | | |

Notes

- (1) WSL Marking (www.vishay.com/doc?30327); WSL Decade Values (www.vishay.com/doc?30117)
- (2) EB (lead (Pb)-free) is a non-standard packaging code designated for 1000 piece reels. The non-standard packaging code is identical to our standard EA (lead (Pb)-free), except that it has a package quantity of 1000 pieces
- (3) Follow link for customization capabilities: www.vishay.com/doc?48163

| TECHNICAL SPECIFICATIONS | | |
|--|--------|--------------------------|
| PARAMETER | UNIT | RESISTOR CHARACTERISTICS |
| Temperature coefficient ⁽¹⁾ | ppm/°C | ± 110 for 5 mΩ to 6.9 mΩ |
| | | ± 75 for 7 mΩ to 12 mΩ |
| Element TCR ⁽²⁾ | ppm/°C | < 20 |
| Operating temperature range | °C | -65 to +170 |
| Maximum working voltage ⁽³⁾ | 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

Notes

- 3D models available: www.vishay.com/doc?30306
- Surface mount solder profile recommendations: www.vishay.com/doc?31052

| MODEL | RESISTANCE RANGE (Ω) | DIMENSIONS in inches (millimeters) | | | | SOLDER PAD DIMENSIONS in inches (millimeters) | | |
|---------------|----------------------|------------------------------------|---------------------------------|----------------------------------|----------------------------------|---|-----------------|-----------------|
| | | L | W | H | T | a | b | l |
| WSLP0805...18 | 0.005 to 0.01 | 0.080 ± 0.010 (2.03 ± 0.254) | 0.050 ± 0.010 (1.27 ± 0.254) | 0.013 ± 0.010 (0.330 ± 0.254) | 0.015 ± 0.010 (0.381 ± 0.254) | 0.040 (1.02) | 0.050 (1.27) | 0.020 (0.50) |
| WSLP1206...18 | 0.001 to 0.0019 | 0.126 ± 0.010 (3.20 ± 0.254) | 0.063 ± 0.010 (1.60 ± 0.254) | 0.025 ± 0.010 (0.635 ± 0.254) | 0.041 ± 0.010 (1.04 ± 0.254) | 0.062 (1.57) | 0.070 (1.78) | 0.030 (0.76) |
| | 0.002 to 0.0059 | | | | 0.025 ± 0.010 (0.635 ± 0.254) | | | |
| | 0.006 to 0.012 | | | | 0.020 ± 0.010 (0.508 ± 0.254) | | | |

WELDED CONSTRUCTION 1206


- 1) Resistive element: solid metal nickel-chrome or manganese-copper alloy resistive element with low TCR (< 20 ppm/°C)
- 2) Plated terminal: Solid copper, 100 % Sn (100 μ" min.) with 100 % Ni (20 μ" min.) under layer finish
- 3) Terminal / element weld
- 4) Silicone coating with ink print

CLAD CONSTRUCTION 0805


- 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

DERATING

PULSE CAPABILITY

www.vishay.com/resistors/power-metal-strip-calculator

| PERFORMANCE | | |
|---------------------------|--|-------------|
| 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 | 0805: 5x rated power for 5s | ± 1.0 % |
| | 1206: 3x rated power for 5 s | |
| Low temperature operation | -65 °C for 24 h | ± 0.5 % |
| High temperature exposure | 1000 h at +170 °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, 1.5 h "ON", 0.5 h "OFF" | ± 1.0 % |
| Resistance to solder heat | +260 °C solder, 10 s to 12 s dwell, 25 mm/s emergence | ± 0.5 % |
| Moisture resistance | MIL-STD-202, method 106, 0 % power, 7b not required | ± 0.5 % |

| PACKAGING | | | | |
|---------------|--------------------|-----------|-------------|------|
| MODEL | REEL | | | |
| | TAPE WIDTH | DIAMETER | PIECES/REEL | CODE |
| WSLP0805...18 | 8 mm/punched paper | 178 mm/7" | 5000 | EA |
| WSLP1206...18 | 8 mm/punched paper | 178 mm/7" | 4000 | EA |

Notes

- Embossed carrier tape per EIA-481-2
- Additional packaging details at www.vishay.com/doc?20051



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