

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 ⁽¹⁾
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

 AUTOMOTIVE
GRADE

RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

Note

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

STANDARD ELECTRICAL SPECIFICATIONS

| GLOBAL MODEL | SIZE | POWER RATING $P_{70^{\circ}\text{C}}$ W | RESISTANCE VALUE RANGE Ω | | WEIGHT (typical) 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 (8 digits) |
| WSLP0603 WSLP0805 WSLP1206 WSLP2010 WSLP2512 |

| |
|-----------------------------------------------------------------------------------------|
| RESISTANCE VALUE (5 digits) |
| L = mΩ* R = Decimal 4L000 = 0.004 Ω R0100 = 0.01 Ω |
| * Use "L" for resistance values < 0.01 Ω |

| |
|------------------------------------------|
| TOLERANCE CODE (1 digit) |
| D = ± 0.5 % F = ± 1.0 % |

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

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

DIMENSIONS


| MODEL | RESISTANCE RANGE (Ω) | 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 (1.52 \pm 0.254) | 0.030 \pm 0.010 (0.76 \pm 0.254) | 0.013 \pm 0.010 (0.330 \pm 0.254) | 0.015 \pm 0.010 (0.381 \pm 0.254) | 0.040 (1.02) | 0.040 (1.02) | 0.020 (0.50) | |
| WSLP0805 | 0.01 to 0.05 | 0.080 \pm 0.010 (2.03 \pm 0.254) | 0.050 \pm 0.010 (1.27 \pm 0.254) | 0.013 \pm 0.010 (0.330 \pm 0.254) | 0.015 \pm 0.010 (0.381 \pm 0.254) | 0.040 (1.02) | 0.050 (1.27) | 0.020 (0.50) | |
| WSLP1206 | 0.001 to 0.0019 | 0.126 \pm 0.010 (3.20 \pm 0.254) | 0.063 \pm 0.010 (1.60 \pm 0.254) | 0.025 \pm 0.010 (0.635 \pm 0.254) | 0.041 \pm 0.010 (1.04 \pm 0.254) | 0.062 (1.57) | 0.070 (1.78) | 0.030 (0.76) | |
| | 0.002 to 0.0059 | | | | 0.025 \pm 0.010 (0.635 \pm 0.254) | | | | |
| | 0.006 to 0.050 | | | | 0.020 \pm 0.010 (0.508 \pm 0.254) | | | | |
| WSLP2010 | 0.001 to 0.0069 | 0.200 \pm 0.010 (5.08 \pm 0.254) | 0.100 \pm 0.010 (2.54 \pm 0.254) | 0.025 \pm 0.010 (0.635 \pm 0.254) | 0.058 \pm 0.010 (1.47 \pm 0.254) | 0.093 (2.36) | 0.120 (3.05) | 0.055 (1.40) | |
| | 0.007 to 0.010 | | | | 0.020 \pm 0.010 (0.508 \pm 0.254) | | | 0.055 (1.40) | 0.130 (3.30) |
| WSLP2512 | 0.0005 to 0.00099 | 0.250 \pm 0.010 (6.35 \pm 0.254) | 0.125 \pm 0.010 (3.18 \pm 0.254) | 0.025 \pm 0.010 (0.635 \pm 0.254) | 0.107 \pm 0.010 (2.72 \pm 0.254) | 0.120 (3.05) | 0.145 (3.68) | 0.050 (1.27) | |
| | 0.001 to 0.0049 | | | | 0.087 \pm 0.010 (2.21 \pm 0.254) | | | 0.125 (3.18) | |
| | 0.005 to 0.0069 | | | | 0.047 \pm 0.010 (1.19 \pm 0.254) | | | 0.083 (2.11) | 0.160 (4.06) |
| | 0.006 to 0.01 | | | | 0.030 \pm 0.010 (0.762 \pm 0.254) | | | 0.065 (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 Ω) ΔR |
| Low temperature operation | -65 °C for 45 min | \pm (0.5 % + 0.0005 Ω) ΔR |
| High temperature exposure | 1000 h at + 170 °C | \pm (1.0 % + 0.0005 Ω) ΔR |
| Bias humidity | +85 °C, 85 % RH, 10 % bias, 1000 h | \pm (0.5 % + 0.0005 Ω) ΔR |
| Mechanical shock | 100 g's for 6 ms, 5 pulses | \pm (0.5 % + 0.0005 Ω) ΔR |
| Vibration | Frequency varied 10 Hz to 2000 Hz in 1 min, 3 directions, 12 h | \pm (0.5 % + 0.0005 Ω) ΔR |
| Load life | 1000 h at 70 °C, 1.5 h "ON", 0.5 h "OFF" | \pm (1.0 % + 0.0005 Ω) ΔR |
| Resistance to solder heat | +260 °C solder, 10 s to 12 s dwell, 25 mm/s emergence | \pm (0.5 % + 0.0005 Ω) ΔR |
| Moisture resistance | MIL-STD-202, method 106, 0 % power, 7b not required | \pm (0.5 % + 0.0005 Ω) ΔR |

| 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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