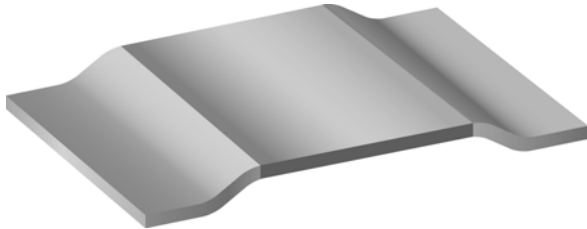




# Power Metal Strip® Resistors, Very High Power (to 10 W), Low Value (down to 0.0002 Ω), Surface Mount



## FEATURES

- Ideal for all types of current sensing, voltage division and pulse applications including switching and linear power supplies, instruments, power amplifiers
- Proprietary processing technique produces extremely low resistance values, down to 0.0002 Ω
- Specially selected and stabilized materials allow for high power rating (to 10 W)
- All welded construction
- Solid metal iron-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 Available



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><i>P</i> <sub>70°C</sub><br>W | TOLERANCE<br>% | RESISTANCE VALUE RANGE<br>Ω | RESISTANCE VALUES CURRENTLY AVAILABLE <sup>(2)</sup><br>Ω | WEIGHT (typical)<br>g/1000 pieces |
| WSLP3921                           | 3921 | 5.0   | 1.0, 5.0       | 2m to 4m                    | 2m, 3m, 4m  | 281                               |
| WSLP3921                           | 3921 | 9.0   | 1.0, 5.0       | 0.2m to 1m                  | 0.2m, 0.3m, 0.5m, 1m                                      | 281                               |
| WSLP5931                           | 5931 | 7.0   | 1.0, 5.0       | 1m to 3m                    | 1m, 2m, 3m  | 398                               |
| WSLP5931                           | 5931 | 10.0  | 1.0, 5.0       | 0.2m to 0.5m                | 0.2m, 0.3m, 0.5m  | 398                               |

### Note

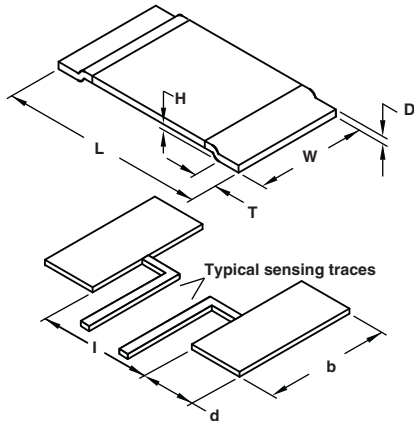
<sup>(2)</sup> Other values may be available, contact factory.

| TECHNICAL SPECIFICATIONS   |  |   |          |          |  |  |
|--|--|---|----------|----------|--|--|
| PARAMETER  | UNIT   | RESISTOR CHARACTERISTICS  |          |          |  |  |
|  |  | WSLP3921  |          |          |  |  |
| Temperature coefficient  | ppm/°C   | <table border="1"> <thead> <tr> <th>WSLP3921</th> <th>WSLP5931</th> </tr> </thead> <tbody> <tr> <td>± 325 for 0.2 mΩ,<br/>± 175 for 0.3 mΩ and 0.5 mΩ,<br/>± 75 for 1 mΩ to 4 mΩ</td> <td>± 225 for 0.2 mΩ,<br/>± 175 for 0.3 mΩ and 0.5 mΩ,<br/>± 75 for 1 mΩ to 4 mΩ</td> </tr> </tbody> </table> | WSLP3921 | WSLP5931 | ± 325 for 0.2 mΩ,<br>± 175 for 0.3 mΩ and 0.5 mΩ,<br>± 75 for 1 mΩ to 4 mΩ | ± 225 for 0.2 mΩ,<br>± 175 for 0.3 mΩ and 0.5 mΩ,<br>± 75 for 1 mΩ to 4 mΩ |
| WSLP3921   | WSLP5931   |   |          |          |  |  |
| ± 325 for 0.2 mΩ,<br>± 175 for 0.3 mΩ and 0.5 mΩ,<br>± 75 for 1 mΩ to 4 mΩ | ± 225 for 0.2 mΩ,<br>± 175 for 0.3 mΩ and 0.5 mΩ,<br>± 75 for 1 mΩ to 4 mΩ |   |          |          |  |  |
| Element TCR  | ppm/°C   | < 20  |          |          |  |  |
| Operating temperature range  | °C   | -65 to +170   |          |          |  |  |
| Maximum continuous current   | A  | (P/R) <sup>1/2</sup>  |          |          |  |  |

| GLOBAL PART NUMBER INFORMATION          |   |   |                           |   |   |                            |   |   |   |   |   |   |                              |   |   |  |  |
|---|---|---|---------------------------|---|---|----------------------------|---|---|---|---|---|---|------------------------------|---|---|--|--|
| Global Part Numbering: WSLP39212L000FEA |   |   |                           |   |   |                            |   |   |   |   |   |   |                              |   |   |  |  |
| W                                       | S | L | P                         | 3 | 9 | 2                          | 1 | 2 | L   | 0 | 0 | 0 | F                            | E | A |  |  |
| GLOBAL MODEL                            |   |   | RESISTANCE VALUE          |   |   | TOLERANCE CODE             |   |   | PACKAGING CODE  |   |   |   | SPECIAL                      |   |   |  |  |
| WSLP3921<br>WSLP5931                    |   |   | L = mΩ<br>2L000 = 0.002 Ω |   |   | F = ± 1.0 %<br>J = ± 5.0 % |   |   | EA = Lead (Pb)-free, tape/reel<br>EK = Lead (Pb)-free, bulk |   |   |   | Reserved for future specials |   |   |  |  |



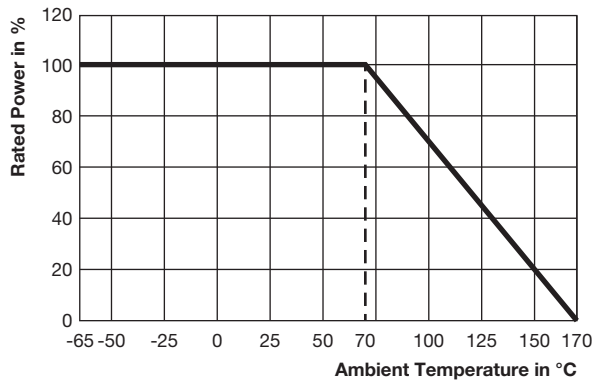
**DIMENSIONS**



| MODEL    | DIMENSIONS in inches (millimeters) |                                 |                |                                 |
|----------|------------------------------------|---------------------------------|----------------|---------------------------------|
|          | L                                  | W                               | H              | T                               |
| WSLP3921 | 0.394 ± 0.010<br>(10.0 ± 0.254)    | 0.205 ± 0.010<br>(5.20 ± 0.254) | 0.020<br>(0.5) | 0.080 ± 0.010<br>(2.00 ± 0.254) |
| WSLP5931 | 0.591 ± 0.010<br>(15.0 ± 0.254)    | 0.305 ± 0.010<br>(7.75 ± 0.254) | 0.020<br>(0.5) | 0.157 ± 0.010<br>(4.00 ± 0.254) |

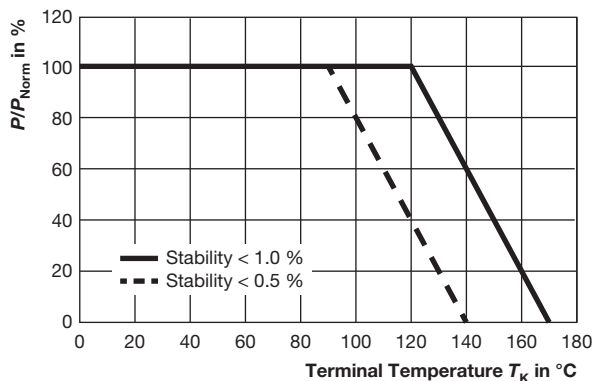
| MODEL    | SOLDER PAD DIMENSIONS in inches (millimeters) |                                 |                                |
|----------|---|---------------------------------|--------------------------------|
|          | d   | b                               | l                              |
| WSLP3921 | 0.106 ± 0.010<br>(2.70 ± 0.254)               | 0.244 ± 0.010<br>(6.20 ± 0.254) | 0.220 ± 0.005<br>(5.60 ± 0.13) |
| WSLP5931 | 0.205 ± 0.010<br>(5.20 ± 0.254)               | 0.344 ± 0.010<br>(8.75 ± 0.254) | 0.220 ± 0.005<br>(5.60 ± 0.13) |

**DERATING - AMBIENT TEMPERATURE**

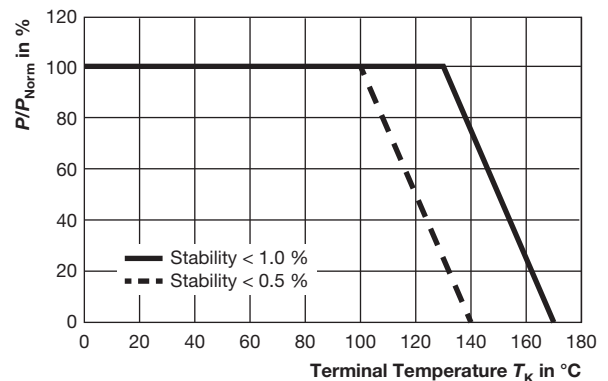


| GLOBAL MODEL | RESISTANCE VALUE (mΩ) | "D" THICKNESS (Inches) | ELEMENT MATERIAL |
|--------------|-----------------------|------------------------|------------------|
| WSLP3921     | 0.2                   | 0.0510                 | Mn-Cu            |
| WSLP3921     | 0.3                   | 0.0510                 | Mn-Cu            |
| WSLP3921     | 0.5                   | 0.0300                 | Mn-Cu            |
| WSLP3921     | 1.0                   | 0.0150                 | Mn-Cu            |
| WSLP3921     | 2.0                   | 0.0270                 | Fe-Cr            |
| WSLP3921     | 3.0                   | 0.0170                 | Fe-Cr            |
| WSLP3921     | 4.0                   | 0.0130                 | Fe-Cr            |
| WSLP5931     | 0.2                   | 0.0490                 | Mn-Cu            |
| WSLP5931     | 0.3                   | 0.0300                 | Mn-Cu            |
| WSLP5931     | 0.5                   | 0.0180                 | Mn-Cu            |
| WSLP5931     | 1.0                   | 0.0330                 | Fe-Cr            |
| WSLP5931     | 2.0                   | 0.0155                 | Fe-Cr            |
| WSLP5931     | 3.0                   | 0.0105                 | Fe-Cr            |

**DERATING - TERMINAL TEMPERATURE**



Example: WSLP3921 0.0005 Ω



Example: WSLP5931 0.0005 Ω



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

| PACKAGING |                        |            |             |      |
|-----------|------------------------|------------|-------------|------|
| MODEL     | REEL                   |            |             |      |
|           | TAPE WIDTH             | DIAMETER   | PIECES/REEL | CODE |
| WSLP3921  | 16 mm/embossed plastic | 330 mm/13" | 3000        | EA   |
| WSLP5931  | 24 mm/embossed plastic | 330 mm/13" | 1500        | EA   |

Note

- Embossed Carrier Tape per EIA-481.



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