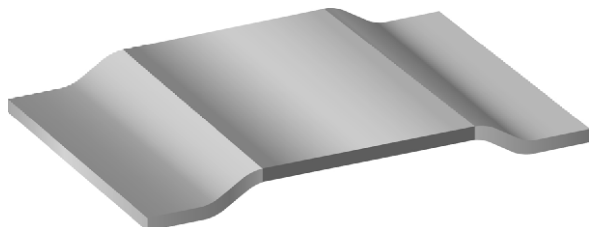


## Power Metal Strip® Resistors, Low Value (down to 0.0002 Ω), Surface Mount



### 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
- 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
- Low thermal EMF (< 3 μV/°C)
- AEC-Q200 qualified available <sup>(1)</sup>
- Compliant to RoHS Directive 2002/95/EC

AUTOMOTIVE  
GRADE  
Available



**RoHS**  
COMPLIANT

**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>$P_{70\text{ }^{\circ}\text{C}}$<br>W | TOLERANCE<br>% | RESISTANCE VALUE<br>RANGE<br>Ω | RESISTANCE VALUES<br>CURRENTLY AVAILABLE <sup>(2)</sup><br>Ω | WEIGHT<br>(typical)<br>g/1000 pieces |
|--------------|------|-------------------------------------------------------|----------------|--------------------------------|--------------------------------------------------------------|--------------------------------------|
| WSL3921      | 3921 | 3.0                                                   | 1.0, 5.0       | 0.3m to 4m                     | 0.3m, 0.5m, 1m, 2m, 3m, 4m                                   | 281                                  |
| WSL5931      | 5931 | 5.0                                                   | 1.0, 5.0       | 0.2m to 3m                     | 0.2m, 0.3m, 0.5m, 1m, 2m, 3m                                 | 398                                  |

### Note

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

### TECHNICAL SPECIFICATIONS

| PARAMETER                   | UNIT   | RESISTOR CHARACTERISTICS                                             |
|-----------------------------|--------|----------------------------------------------------------------------|
| Temperature coefficient     | ppm/°C | ± 225 for 0.2 mΩ, ± 175 for 0.3 mΩ and 0.5 mΩ, ± 75 for 1 mΩ to 4 mΩ |
| Operating temperature range | °C     | - 65 to + 170                                                        |
| Maximum working voltage     | V      | $(P \times R)^{1/2}$                                                 |

### GLOBAL PART NUMBER INFORMATION

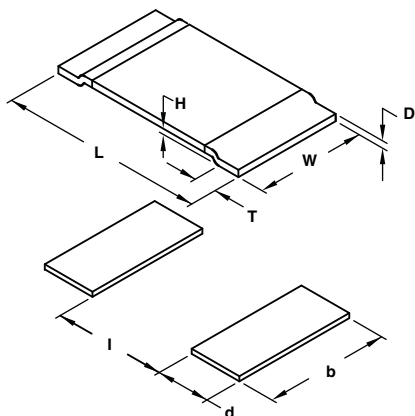
Global Part Numbering: WSL3921L5000FEA (WSL3921, 0.0005 Ω, ± 1 %)

W S L 3 9 2 1 L 5 0 0 0 F E A

| GLOBAL MODEL       | RESISTANCE VALUE           | TOLERANCE CODE             | PACKAGING CODE                                              | SPECIAL                                                            |
|--------------------|----------------------------|----------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|
| WSL3921<br>WSL5931 | L = mΩ<br>L5000 = 0.0005 Ω | F = ± 1.0 %<br>J = ± 5.0 % | EA = Lead (Pb)-free, tape/reel<br>EK = Lead (Pb)-free, bulk | (Dash number)<br>(Up to 2 digits)<br>From 1 to 99 as<br>applicable |

\*\* Please see document "Vishay Material Category Policy": [www.vishay.com/doc?99902](http://www.vishay.com/doc?99902)

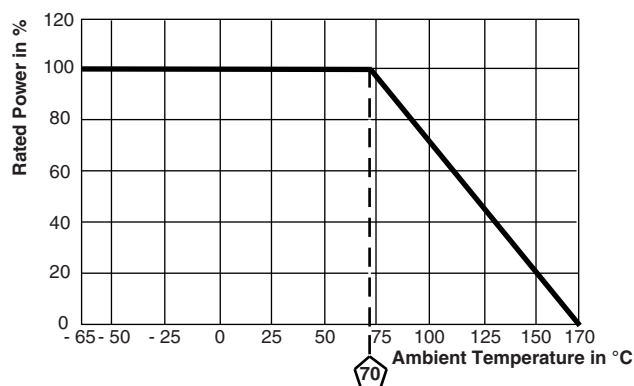
## DIMENSIONS



| MODEL   | DIMENSIONS in inches (millimeters) |                                 |                |                                 |
|---------|------------------------------------|---------------------------------|----------------|---------------------------------|
|         | L                                  | W                               | H              | T                               |
| WSL3921 | 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) |
| WSL5931 | 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                              |
| WSL3921 | 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) |
| WSL5931 | 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



| GLOBAL MODEL | RESISTANCE VALUE (mΩ) | "D" THICKNESS (inches) | ELEMENT MATERIAL |
|--------------|-----------------------|------------------------|------------------|
| WSL3921      | 0.3                   | 0.0510                 | Mn-Cu            |
| WSL3921      | 0.5                   | 0.0300                 | Mn-Cu            |
| WSL3921      | 1.0                   | 0.0150                 | Mn-Cu            |
| WSL3921      | 2.0                   | 0.0270                 | Fe-Cr            |
| WSL3921      | 3.0                   | 0.0170                 | Fe-Cr            |
| WSL3921      | 4.0                   | 0.0130                 | Fe-Cr            |
| WSL5931      | 0.2                   | 0.0485                 | Mn-Cu            |
| WSL5931      | 0.3                   | 0.0300                 | Mn-Cu            |
| WSL5931      | 0.5                   | 0.0180                 | Mn-Cu            |
| WSL5931      | 1.0                   | 0.0330                 | Fe-Cr            |
| WSL5931      | 2.0                   | 0.0155                 | Fe-Cr            |
| WSL5931      | 3.0                   | 0.0105                 | Fe-Cr            |

## PERFORMANCE

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

## PACKAGING

| MODEL   | REEL                   |            |             |      |
|---------|------------------------|------------|-------------|------|
|         | TAPE WIDTH             | DIAMETER   | PIECES/REEL | CODE |
| WSL3921 | 16 mm/embossed plastic | 330 mm/13" | 3000        | EA   |
| WSL5931 | 24 mm/embossed plastic | 330 mm/13" | 1500        | EA   |

### Note

- Embossed carrier tape per EIA-481.



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Электрон  
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