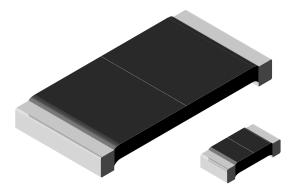
Vishay Dale



# Power Metal Strip<sup>®</sup> Resistors, High Power (2 x Standard WSL), Low Value (down to 0.001 $\Omega$ ), 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  $0.001 \ \Omega$ )



- Specially selected and stabilized materials COMPLIANT allow for high power ratings (2 x standard WSL rating)
- All welded construction
- Solid metal Nickel-Chrome or Manganese-Copper alloy resistive element with low TCR (< 20 ppm/°C)</li>
- Solderable terminations
- Very low inductance 0.5 nH to 5 nH
- Excellent frequency response to 50 MHz
- Low thermal EMF (< 3  $\mu\text{V/°C})$
- Lead (Pb)-free version is RoHS compliant

### STANDARD ELECTRICAL SPECIFICATIONS

| GLOBAL<br>MODEL | POWER RATING<br>P70 °C | $\begin{array}{c} \textbf{RESISTANCE RANGE} \\ \Omega \end{array}$ |              | WEIGHT<br>(typical) |  |  |
|-----------------|------------------------|--|--------------|---------------------|--|--|
| MODEL           | w                      | ± 0.5 %  | ± 1.0 %      | g/1000 pieces       |  |  |
| WSL060318       | 0.20                   | 0.015 - 0.1  | 0.015 - 0.1  | 1.9                 |  |  |
| WSL080518       | 0.25                   | 0.01 - 0.2   | 0.01 - 0.2   | 4.8                 |  |  |
| WSL120618       | 0.5                    | 0.006 - 0.2  | 0.001 - 0.2  | 16.2                |  |  |
| WSL201018       | 1.0                    | 0.004 - 0.5  | 0.001 - 0.5  | 38.9                |  |  |
| WSL251218       | 2.0                    | 0.003 - 0.02   | 0.001 - 0.02 | 63.6                |  |  |

### Note

· Part Marking: Value, Tolerance: due to resistor size limitations some resistors will be marked with only the resistance value

| TECHNICAL SPECIFICATIONS              |  |  |  |  |
|---------------------------------------|--|--|--|--|
| PARAMETER UNIT WSL RESISTOR CHARACTER |  | WSL RESISTOR CHARACTERISTICS   |  |  |
| Temperature Coefficient               | ppm/°C                                     | $\pm$ 275 for 1 mΩ to 2.9 mΩ, $\pm$ 150 for 3 mΩ to 4.9 mΩ<br>$\pm$ 110 for 5 mΩ to 6.9 mΩ, $\pm$ 75 for 7 mΩ to 0.5 Ω |  |  |
| Operating Temperature Range           | °C   | - 65 to + 170  |  |  |
| Maximum Working Voltage               | m Working Voltage V (P x R) <sup>1/2</sup> |  |  |  |

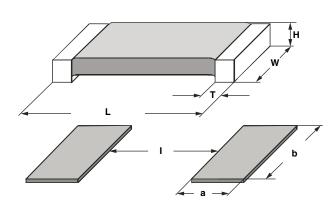
#### **GLOBAL PART NUMBER INFORMATION** NEW GLOBAL PART NUMBERING: WSL25124L000FTA18 (PREFERRED PART NUMBERING FORMAT) w 2 S 2 5 1 4 L 0 0 0 F Т Α 1 8 L GLOBAL MODEL VALUE TOLERANCE CODE PACKAGING SPECIAL 18 = "High Power" WSL0603 $L = m\Omega^*$ $D = \pm 0.5 \%$ EA = Lead (Pb)-free, tape/reel EK = Lead (Pb)-free, bulk R = Decimal **F** = ± 1.0 % option WSL0805 $5L000 = 0.005 \ \Omega$ **J** = ± 5.0 % WSL1206 TA = Tin/lead, tape/reel (R86) **R0100** = 0.01 Ω WSL2010 TG = Tin/lead, tape/reel (RT1) use "L" for resistance BA = Tin/lead, bulk (B43) WSL2512 values < 0.01 $\Omega$ HISTORICAL PART NUMBER EXAMPLE: WSL2512-18 0.004 Ω 1 % R86 (WILL CONTINUE TO BE ACCEPTED) WSL2512-18 **0.004** Ω 1% **R86** HISTORICAL MODEL RESISTANCE VALUE TOLERANCE PACKAGING CODE Pb containing terminations are not RoHS compliant, exemptions may apply

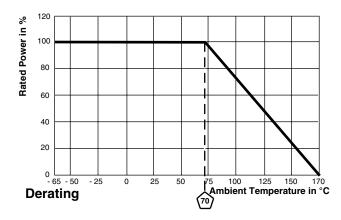


## WSL...18 High Power

Power Metal Strip<sup>®</sup> Resistors, High Power (2 x Standard WSL), Vishay Dale Low Value (down to 0.001  $\Omega$ ), Surface Mount

### DIMENSIONS





|            | DIMENSIONS in inches [millimeters]  |  |                    |                  |                                   |              |   |
|------------|---|--|--------------------|------------------|-----------------------------------|--------------|---|
| MODEL      | $\begin{array}{c} \textbf{RESISTANCE} \\ \textbf{RANGE} \ \Omega \end{array}$ | L  | W                  | I                | н                                 |              | т   |
| WSL0603-18 | 0.015 - 0.1   | 0.060 ± 0.010<br>[1.52 ± 0.254]                                    | 0.030 ±<br>[0.76 ± |                  | 0.013 ± 0.00<br>[0.330 ± 0.12     |              | $\begin{array}{c} 0.015 \pm 0.010 \\ [0.381 \pm 0.254] \end{array}$ |
| WSL0805-18 | 0.01 - 0.2  | 0.080 ± 0.010<br>[2.03 ± 0.254]                                    | 0.050 ±<br>[1.27 ± |                  | 0.013 ± 0.00<br>[0.330 ± 0.12     | -            | $\begin{array}{c} 0.015 \pm 0.010 \\ [0.381 \pm 0.254] \end{array}$ |
| WSL1206-18 | 0.002 - 0.2   | 0.126 ± 0.010<br>[3.20 ± 0.254]                                    | 0.063 ± (1.60 ±    |                  | $0.025 \pm 0.01$<br>[0.635 ± 0.25 | -            | $\begin{array}{c} 0.020 \pm 0.010 \\ [0.508 \pm 0.254] \end{array}$ |
| WSL2010-18 | 0.001 -<br>0.0069   | $\begin{array}{c} 0.200 \pm 0.010 \\ [5.08 \pm 0.254] \end{array}$ | 0.100 ±<br>[2.54 ± |                  | $0.025 \pm 0.01$<br>[0.635 ± 0.25 | -            | 0.058 ± 0.010<br>[1.47 ± 0.254]                                     |
|            | 0.007 - 0.5   | 0.200 ± 0.010<br>[5.08 ± 0.254]                                    | 0.100 ±<br>[2.54 ± |                  | 0.025 ± 0.01<br>[0.635 ± 0.25     | -            | $\begin{array}{c} 0.020 \pm 0.010 \\ [0.508 \pm 0.254] \end{array}$ |
| WSL2512-18 | 0.001 -<br>0.0049   | 0.250 ± 0.010<br>[6.35 ± 0.254]                                    | 0.125 ±<br>[3.18 ± |                  | $0.025 \pm 0.01$<br>[0.635 ± 0.25 | -            | 0.087 ± 0.010<br>[2.21 ± 0.254]                                     |
|            | 0.005 -<br>0.0069   | 0.250 ± 0.010<br>[6.35 ± 0.254]                                    | 0.125 ±<br>[3.18 ± |                  | $0.025 \pm 0.01$<br>[0.635 ± 0.25 | -            | 0.047 ± 0.010<br>[1.19 ± 0.254]                                     |
|            | 0.007 - 0.02  | 0.250 ± 0.010<br>[6.35 ± 0.254]                                    | 0.125 ±<br>[3.18 ± |                  | 0.025 ± 0.01<br>[0.635 ± 0.25     | -            | $\begin{array}{c} 0.030 \pm 0.010 \\ [0.762 \pm 0.254] \end{array}$ |
|            | SOLDER PAD DIMENSIONS in inches [millimet                                     |  |                    |                  |                                   | nillimeters] |   |
| MODEL      | $\begin{array}{c} \textbf{RESISTANCE} \\ \textbf{RANGE} \ \Omega \end{array}$ | a  |                    | b                |                                   | I            |   |
| WSL0603-18 | 0.015 - 0.1 0.040 [*  |  | .01]               | 0.040 [1.01]     |                                   |              | 0.020 [0.50]  |
| WSL0805-18 | 0.01 - 0.2  | 0.040 [1   | 0 [1.02] 0.0       |                  | )50 [1.27]                        |              | 0.020 [0.50]  |
| WSL1206-18 | 0.002 - 0.2   | 0.050 [1   | 0.050 [1.27]       |                  | 0.070 [1.78]                      |              | 0.055 [1.40]  |
| WSL2010-18 | 0.001 - 0.0069 0.093 [2.  |  | .36]               | 0.120 [3.05]     |                                   |              | 0.055 [1.40]  |
|            | 0.007 - 0.5 0.055 [1.   |  | .40]               | 0.120 [3.05]     |                                   |              | 0.130 [3.30]  |
| WSL2512-18 | 0.001 - 0.0049 0.120 [  |  | .05] 0.145 [3.68]  |                  | 45 [3.68]                         |              | 0.050 [1.27]  |
|            | 0.005 - 0.0069 0.083 [  |  | .11] 0.145 [3.68]  |                  |                                   | 0.125 [3.18] |   |
|            | 0.007 - 0.02  | 0.007 - 0.02 0.065 [1.   |                    | 65] 0.145 [3.68] |                                   |              | 0.160 [4.06]  |

| PERFORMANCE               |   |                                     |  |  |  |
|---------------------------|---|-------------------------------------|--|--|--|
| TEST                      | CONDITIONS OF TEST  | TEST LIMITS                         |  |  |  |
| Thermal Shock             | - 55 °C to + 150 °C, 1000 cycles, 15 min at each extreme    | ± (0.5 % + 0.0005 Ω) Δ <i>R</i>     |  |  |  |
| Short Time Overload       | 5 x rated power for 5 s                                     | $\pm$ (0.5 % + 0.0005 Ω) Δ <i>R</i> |  |  |  |
| Low Temperature Storage   | - 65 °C for 24 h  | ± (0.5 % + 0.0005 Ω) Δ <i>R</i>     |  |  |  |
| High Temperature Exposure | 1000 h at + 170 °C  | ± (1.0 % + 0.0005 Ω) Δ <i>R</i>     |  |  |  |
| Bias Humidity             | + 85 °C, 85 % RH, 10 % Bias, 1000 h                         | ± (0.5 % + 0.0005 Ω) Δ <i>R</i>     |  |  |  |
| Mechanical Shock          | 100 g's for 6 ms, 5 pulses                                  | ± (0.5 % + 0.0005 Ω) Δ <i>R</i>     |  |  |  |
| Vibration                 | Frequency varied 10 to 2000 Hz in 1 min, 3 directions, 12 h | ± (0.5 % + 0.0005 Ω) Δ <i>R</i>     |  |  |  |
| Load Life                 | 1000 h at rated power, + 70 °C, 1.5 h "ON", 0.5 h "OFF"     | ± (1.0 % + 0.0005 Ω) Δ <i>R</i>     |  |  |  |
| Resistance to Solder Heat | + 260 °C Solder, 10 to 12 s dwell, 25 mm/s emergence        | $\pm$ (0.5 % + 0.0005 Ω) ΔR         |  |  |  |
| Moisture Resistance       | MIL-STD-202, Method 106, 0 % power, 7a and 7b not required  | $\pm$ (0.5 % + 0.0005 Ω) Δ <i>R</i> |  |  |  |

## PACKAGING

| MODEL      |                        | REEL      |             |      |  |  |
|------------|------------------------|-----------|-------------|------|--|--|
|            | TAPE WIDTH             | DIAMETER  | PIECES/REEL | CODE |  |  |
| WSL0603-18 | 8 mm/Punched Paper     | 178 mm/7" | 5000        | EA   |  |  |
| WSL0805-18 | 8 mm/Punched Paper     | 178 mm/7" | 5000        | EA   |  |  |
| WSL1206-18 | 8 mm/Embossed Plastic  | 178 mm/7" | 4000        | EA   |  |  |
| WSL2010-18 | 12 mm/Embossed Plastic | 178 mm/7" | 4000        | EA   |  |  |
| WSL2512-18 | 12 mm/Embossed Plastic | 178 mm/7" | 2000        | EA   |  |  |

Note

• Embossed carrier tape per EIA-481-1A



Vishay

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