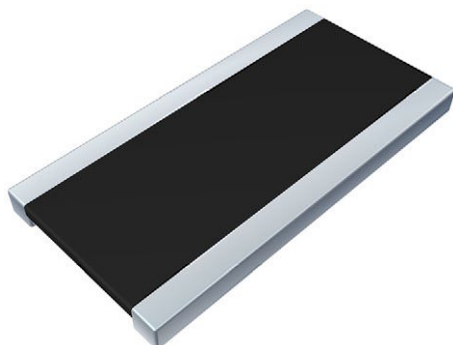


## Power Metal Strip® Resistors, Wide Terminal, Low Value (0.00075 Ω to 0.006 Ω), Surface Mount



### DESIGN SUPPORT TOOLS

[click logo to get started](#)

**3D**  
Models  
Available

  
Design Tools  
Available

### FEATURES

- Wide side terminal construction that yields high power to foot print size ratio (2 W in 1020 and 1 W in 0612 package)
- All welded construction of the Power Metal Strip® resistors are ideal for all types of current sensing, voltage division and pulse applications
- Proprietary processing technique produces low resistance values (down to 0.00075 Ω)
- Sulfur resistance by construction that is unaffected by high sulfur environments
- Very low inductance, 0.5 nH to 5 nH
- Low thermal EMF (< 3 μV/°C)
- AEC-Q200 qualified <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

**Pb-free**  
Available

**e3**

**RoHS\***  
Available  
**HALOGEN  
FREE**  
**GREEN**  
(5-2008)  
Available

### Notes

\* This datasheet provides information about parts that are RoHS-compliant and / or parts that are non-RoHS-compliant. For example, parts with lead (Pb) terminations are not RoHS-compliant. Please see the information / tables in this datasheet for details

• Follow link to Overview of Automotive Grade Products for more details: [www.vishay.com/doc?49924](http://www.vishay.com/doc?49924)

<sup>(1)</sup> Flame retardance test may not be applicable to some resistor technologies

### STANDARD ELECTRICAL SPECIFICATIONS

| GLOBAL MODEL | SIZE | POWER RATING<br>$P_{70^\circ\text{C}}$<br>W | TOLERANCE<br>± % | RESISTANCE<br>VALUE RANGE<br>Ω | WEIGHT<br>(typical)<br>g/1000 pieces |
|--------------|------|---------------------------------------------|------------------|--------------------------------|--------------------------------------|
| WSL0612      | 0612 | 1.0                                         | 1.0, 5.0         | 0.75m to 5m                    | 8.5                                  |
| WSL1020      | 1020 | 2.0                                         | 0.5, 1.0, 5.0    | 1m to 6m                       | 38.74                                |

### GLOBAL PART NUMBER INFORMATION

Global Part Numbering: **WSL10206L000FEA** (visit [www.vishay.net](http://www.vishay.net) Vishay Dale parts numbering manual for all options)

**W** **S** **L** **1** **0** **2** **0** **6** **L** **0** **0** **0** **F** **E** **A**

| GLOBAL MODEL<br>(7 digits)       | RESISTANCE VALUE <sup>(1)</sup><br>(5 digits)                                                                                                                                                                          | TOLERANCE CODE<br>(1 digit)                                    | PACKAGING CODE <sup>(2)</sup><br>(2 digits)                                 | SPECIAL<br>(up to 2 digits)                               |
|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|-----------------------------------------------------------------------------|-----------------------------------------------------------|
| <b>WSL0612</b><br><b>WSL1020</b> | <b>L</b> = mΩ*<br><b>1L000</b> = 0.001 Ω<br><b>2L000</b> = 0.002 Ω<br><b>3L000</b> = 0.003 Ω<br><b>4L000</b> = 0.004 Ω<br><b>5L000</b> = 0.005 Ω<br><b>6L000</b> = 0.006 Ω<br>* Use "L" for resistance values < 0.01 Ω | <b>D</b> = ± 0.5 %<br><b>F</b> = ± 1.0 %<br><b>J</b> = ± 5.0 % | <b>EA</b> = lead (Pb)-free, tape / reel<br><b>EK</b> = lead (Pb)-free, bulk | (dash number)<br>from <b>1</b> to <b>99</b> as applicable |

### Notes

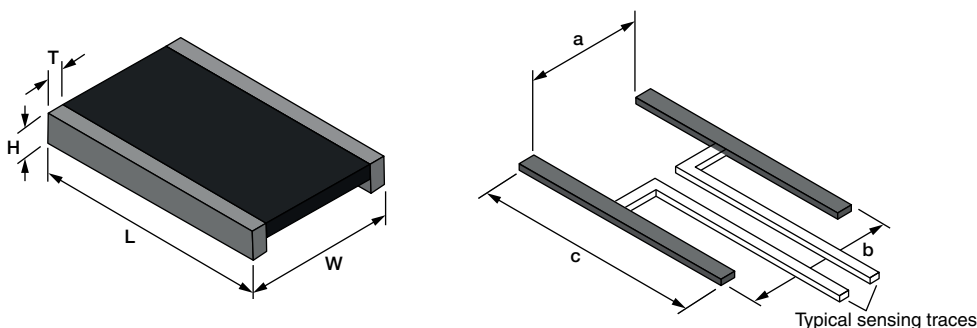
<sup>(1)</sup> WSL Marking ([www.vishay.com/doc?30327](http://www.vishay.com/doc?30327)); WSL Decade Values ([www.vishay.com/doc?30117](http://www.vishay.com/doc?30117))

<sup>(2)</sup> 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

| TECHNICAL SPECIFICATIONS                                              |        |                                                                                    |         |
|-----------------------------------------------------------------------|--------|------------------------------------------------------------------------------------|---------|
| PARAMETER                                                             | UNIT   | RESISTOR CHARACTERISTICS                                                           |         |
|                                                                       |        | WSL0612                                                                            | WSL1020 |
| Component temperature coefficient (including terminal) <sup>(1)</sup> | ppm/°C | +250 <sup>(4)</sup> for 0.75 mΩ and 1.9 mΩ<br>+150 <sup>(4)</sup> for 2 mΩ to 6 mΩ | < 50    |
| Element TCR <sup>(2)</sup>                                            | ppm/°C | < 20                                                                               |         |
| Operating temperature range                                           | °C     | -65 to +170                                                                        |         |
| Maximum working voltage <sup>(3)</sup>                                | V      | $(P \times R)^{1/2}$                                                               |         |

**Notes**

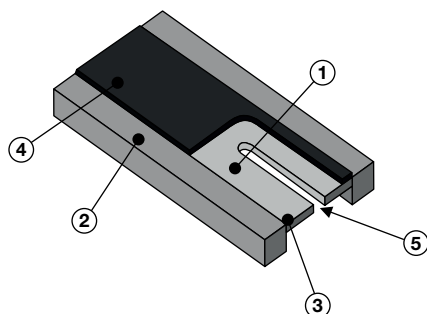
- (1) Component TCR - total TCR that includes the TCR effects of the resistor element and the copper terminal
- (2) Element TCR - only applies to the alloy used for the resistor element; refer to item 1 in the construction illustration on the following page
- (3) Maximum working voltage - the WSL is not voltage sensitive, but is limited by power / energy dissipation and is also not ESD sensitive
- (4) Typical TCR is positive, for more details contact factory

**DIMENSIONS**

**Notes**

- 3D models available: [www.vishay.com/doc?30348](http://www.vishay.com/doc?30348)
- Surface mount solder profile recommendations: [www.vishay.com/doc?31052](http://www.vishay.com/doc?31052)

| MODEL   | DIMENSIONS in inches (millimeters) |                                 |                                  |                                  |
|---------|------------------------------------|---------------------------------|----------------------------------|----------------------------------|
|         | L                                  | W                               | H                                | T                                |
| WSL0612 | 0.120 ± 0.005<br>(3.05 ± 0.127)    | 0.060 ± 0.005<br>(1.50 ± 0.127) | 0.018 ± 0.010<br>(0.457 ± 0.254) | 0.015 ± 0.010<br>(0.381 ± 0.254) |
| WSL1020 | 0.200 ± 0.005<br>(5.08 ± 0.127)    | 0.100 ± 0.005<br>(2.54 ± 0.127) | 0.025 ± 0.005<br>(0.635 ± 0.127) | 0.022 ± 0.008<br>(0.558 ± 0.203) |

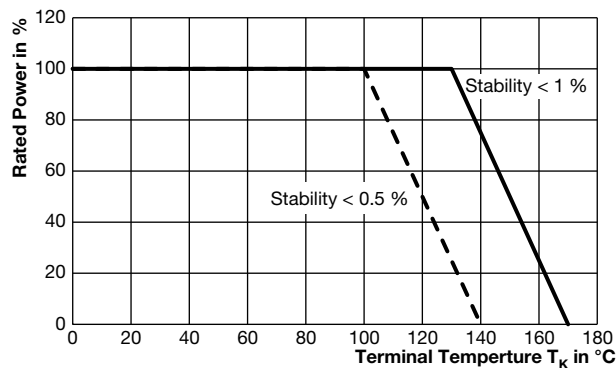
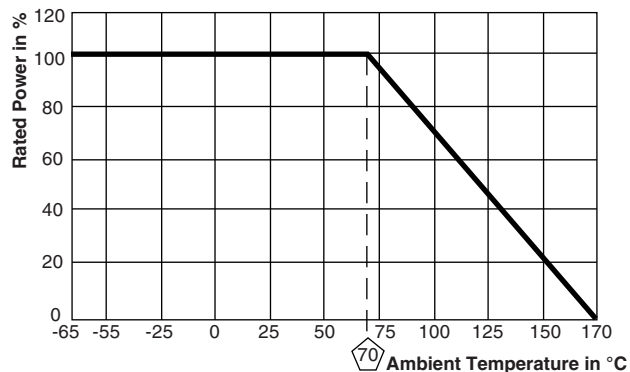
| MODEL   | SOLDER PAD DIMENSIONS in inches (millimeters) |                 |                 |
|---------|-----------------------------------------------|-----------------|-----------------|
|         | a                                             | b               | c               |
| WSL0612 | 0.030<br>(0.76)                               | 0.078<br>(1.98) | 0.134<br>(3.40) |
| WSL1020 | 0.039<br>(1.00)                               | 0.138<br>(3.50) | 0.222<br>(5.65) |

**WELDED CONSTRUCTIONS**


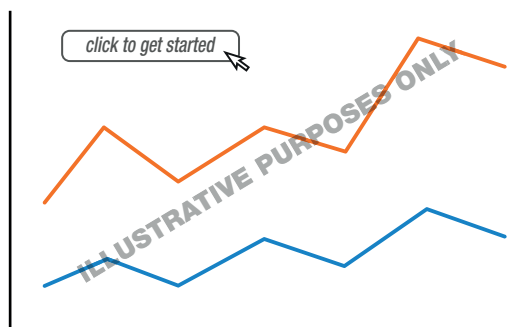
- Resistive element: nickel-chrome or manganese-copper alloy with low TCR (< 20 ppm/°C)
- Terminal: solid copper with 100 % Sn finish  
100 % Sn (100 μ" min.) with 100 % Ni (20 μ" min.) under layer finish
- Terminal / element weld (electron beam weld)
- High temperature encapsulant: "siliconized polyester" coating material
- Laser calibration



## DERATING



## PULSE CAPABILITY



[www.vishay.com/resistors/power-metal-strip-calculator](http://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 %     |
| 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 |
| WSL0612   | 8 mm/embossed plastic  | 178 mm/7" | 4000        | EA   |
| WSL1020   | 12 mm/embossed plastic | 178 mm/7" | 4000        | EA   |

### Notes

- Embossed carrier tape per EIA-481-2
- (1) Additional packaging details at [www.vishay.com/doc?20051](http://www.vishay.com/doc?20051)



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