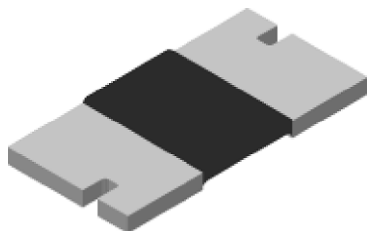


# Power Metal Strip® Resistors, Low Value (down to 0.0005 Ω), Surface Mount, 4-Terminal



## DESIGN SUPPORT TOOLS AVAILABLE



## FEATURES

- 4-terminal design allows for 1 % tolerance down to 0.0005 Ω and 0.5 % tolerance down to 0.001 Ω
- 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 extremely low resistance values (down to 0.0005 Ω)
- Sulfur resistance by construction that is unaffected by high sulfur environments
- 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
- 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)



## 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 | RESISTANCE VALUE RANGE<br>Ω |              |               | WEIGHT<br>(typical)<br>g/1000 pieces |
|--------------|------|-----------------------------------------------|-----------------------------|--------------|---------------|--------------------------------------|
|              |      |                                               | Tol. ± 0.1 %                | Tol. ± 0.5 % | Tol. ± 1.0 %  |                                      |
| WSK2512      | 2512 | 1.0                                           | 0.01 to 0.2                 | 0.001 to 0.2 | 0.0005 to 0.2 | 63.6                                 |

## Note

- Part marking: Value, tolerance; due to resistor size limitations some resistance values will be marked with only the resistance value

## TECHNICAL SPECIFICATIONS

| PARAMETER                   | UNIT   | RESISTOR CHARACTERISTICS                                                                                                     |
|-----------------------------|--------|------------------------------------------------------------------------------------------------------------------------------|
| Temperature coefficient     | ppm/°C | ± 350 for 0.5 mΩ to 0.99 mΩ,<br>± 250 for 0.001 Ω to 0.0029 Ω,<br>± 75 for 0.003 Ω to 0.0049 Ω,<br>± 35 for 0.005 Ω to 0.2 Ω |
| Operating temperature range | °C     | -65 to +170                                                                                                                  |
| Maximum working voltage     | V      | $(P \times R)^{1/2}$                                                                                                         |

## GLOBAL PART NUMBER INFORMATION

Global Part Numbering example: WSK25125L000FTA (visit [www.vishay.net](http://www.vishay.net) Vishay Dale parts numbering manual for all options)

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|--|
| W | S | K | 2 | 5 | 1 | 2 | 5 | L | 0 | 0 | 0 | F | T | A |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|--|

GLOBAL MODEL

WSK2512

RESISTANCE VALUE <sup>(1)</sup>

L = mΩ\*  
R = decimal  
5L000 = 0.005 Ω  
R0100 = 0.01 Ω

\* Use "L" for resistance values < 0.01 Ω

TOLERANCE CODE

B = ± 0.1 %  
D = ± 0.5 %  
F = ± 1.0 %

PACKAGING CODE <sup>(2)</sup>

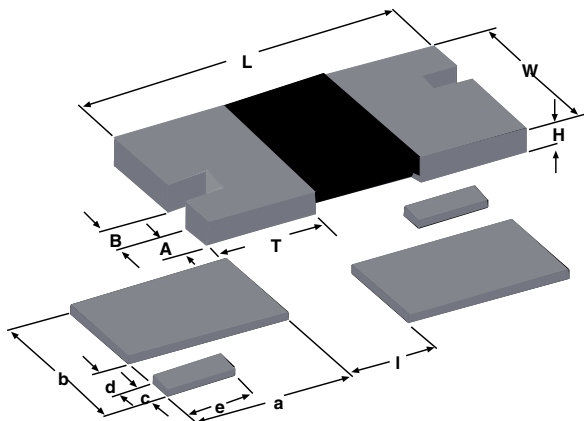
EA = lead (Pb)-free, tape / reel  
EK = lead (Pb)-free, bulk  
TA = tin / lead, tape / reel (R86)  
BA = tin / lead, bulk (B43)

SPECIAL

(dash number)  
(up to 2 digits)  
From 1 to 99 as applicable

## Notes

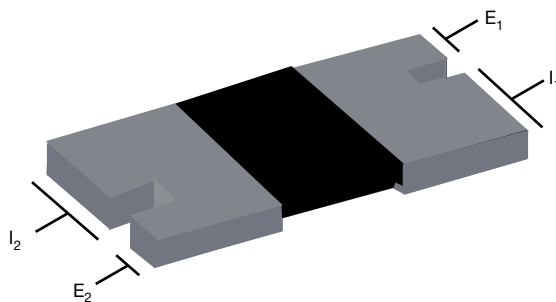
- <sup>(1)</sup> WSL marking ([www.vishay.com/doc?30327](http://www.vishay.com/doc?30327))
- <sup>(2)</sup> Packaging code: EB (lead (Pb)-free) and TB (tin / lead) are non-standard packaging codes designating 1000 piece reels. These non-standard packaging codes are identical to our standard EA (lead (Pb)-free) and TA (tin / lead), except that they have a package quantity of 1000 pieces

**DIMENSIONS** in inches (millimeters)

**Notes**

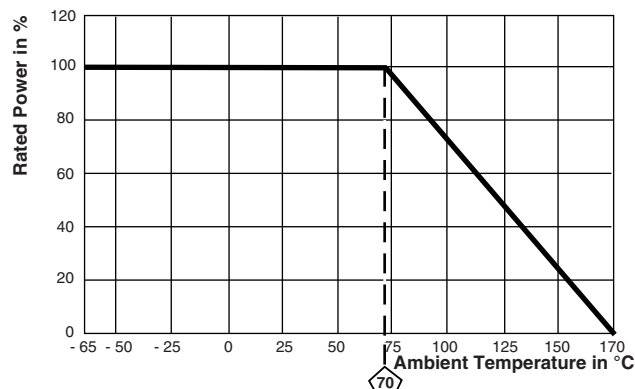
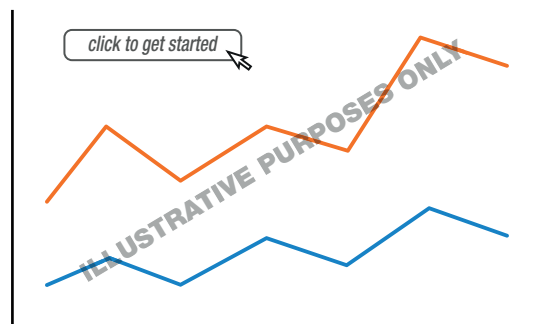
- 3D models available: [www.vishay.com/doc?30323](http://www.vishay.com/doc?30323)
- Surface mount solder profile recommendations: [www.vishay.com/doc?31052](http://www.vishay.com/doc?31052)

| MODEL   | DIMENSIONS                   |                                         |                                         |                                          |                                         |                                          |                                          |
|---------|------------------------------|-----------------------------------------|-----------------------------------------|------------------------------------------|-----------------------------------------|------------------------------------------|------------------------------------------|
|         | RESISTANCE RANGE<br>$\Omega$ | L                                       | W                                       | H                                        | T                                       | A                                        | B                                        |
| WSK2512 | 0.0005 to 0.00099            | $0.250 \pm 0.010$<br>(6.35 $\pm$ 0.254) | $0.125 \pm 0.010$<br>(3.18 $\pm$ 0.254) | $0.025 \pm 0.010$<br>(0.635 $\pm$ 0.254) | $0.105 \pm 0.010$<br>[2.66 $\pm$ 0.254] | $0.030 \pm 0.010$<br>(0.762 $\pm$ 0.254) | $0.020 \pm 0.010$<br>(0.508 $\pm$ 0.254) |
|         | 0.001 to 0.0049              |                                         |                                         |                                          | $0.087 \pm 0.010$<br>(2.21 $\pm$ 0.254) |                                          |                                          |
|         | 0.005 to 0.2                 |                                         |                                         |                                          | $0.047 \pm 0.010$<br>(1.19 $\pm$ 0.254) |                                          |                                          |

| MODEL   | SOLDER PAD DIMENSIONS        |              |              |              |              |              |              |
|---------|------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|
|         | RESISTANCE RANGE<br>$\Omega$ | a            | b            | c            | d            | e            | I            |
| WSK2512 | 0.0005 to 0.0049             | 0.130 (3.30) | 0.130 (3.30) | 0.030 (0.76) | 0.020 (0.51) | 0.067 (1.70) | 0.065 (1.65) |
|         | 0.005 to 0.2                 | 0.090 (2.29) |              |              |              |              | 0.145 (3.68) |

**ELECTRICAL CONNECTION**

**Notes**

- E1 and E2: voltage sense connections
- I1 and I2: current connection

**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 % + 0.0005 Ω |
| Short time overload       | 5 x rated power for 5 s                                        | ± 0.5 % + 0.0005 Ω |
| Low temperature operation | -65 °C for 24 h                                                | ± 0.5 % + 0.0005 Ω |
| High temperature exposure | 1000 h at +170 °C                                              | ± 1.0 % + 0.0005 Ω |
| Bias humidity             | +85 °C, 85 % RH, 10 % bias, 1000 h                             | ± 0.5 % + 0.0005 Ω |
| Mechanical shock          | 100 g's for 6 ms, 5 pulses                                     | ± 0.5 % + 0.0005 Ω |
| Vibration                 | Frequency varied 10 Hz to 2000 Hz in 1 min, 3 directions, 12 h | ± 0.5 % + 0.0005 Ω |
| Load life                 | 1000 h at rated power, +70 °C, 1.5 h "ON", 0.5 h "OFF"         | ± 1.0 % + 0.0005 Ω |
| Resistance to solder heat | +260 °C solder, 10 s to 12 s dwell, 25 mm/s emergence          | ± 0.5 % + 0.0005 Ω |
| Moisture resistance       | MIL-STD-202, method 106, 0 % power, 7a and 7b not required     | ± 0.5 % + 0.0005 Ω |

**PACKAGING (1)**

| MODEL   | REEL                     |             |               |      |
|---------|--------------------------|-------------|---------------|------|
|         | TAPE WIDTH               | DIAMETER    | PIECES / REEL | CODE |
| WSK2512 | 12 mm / embossed plastic | 178 mm / 7" | 2000          | EA   |

**Notes**

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



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