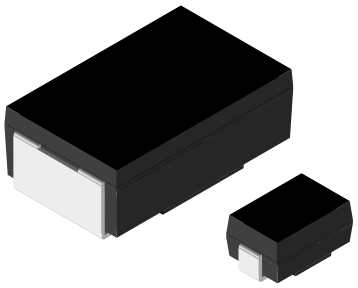
# Wirewound Resistors, Precision Power, Surface Mount



## DESIGN SUPPORT TOOLS

click logo to get started

3D Models Available

## FEATURES

- All welded construction
- Molded encapsulation
- Wraparound terminations
- Excellent stability at different environmental conditions
- High power ratings (up to 3 W)
- Superior surge capability
- Available in non-inductive styles with Ayrton-Perry winding (WSN in lieu of WSC, maximum resistance is one-half WSC range)
- AEC-Q200 qualified (1)
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE GRADE

Pb-free Available

e3

RoHS* Available

HALOGEN FREE Available

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

(1) Flame retardance test may not be applicable to some resistor technologies

## STANDARD ELECTRICAL SPECIFICATIONS

| GLOBAL MODEL | HISTORICAL MODEL | SIZE | POWER RATING $P_{70\,°C}$ W | RESISTANCE RANGE Ω | TOLERANCE ± % | WEIGHT (typical) g/1000 pieces | ENCAPSULATION |
|---|---|---|---|---|---|---|---|
| WSC01/2 | WSC-1/2 | 2012 | 0.5 | 0.1 to 4.99 | 0.5, 1, 5 | 90 | Epoxy |
| WSC0001 (2) | WSC-1 | 2515 | 1 | 0.1 to 2.77K | 0.5, 1, 5 | 165 | Thermoplastic (1) |
| WSC2515 | WSC2515 | 2515 | 1 | 0.1 to 2.5K | 0.5, 1, 5 | 165 | Thermoplastic |
| WSC0002 | WSC-2 | 4527 | 2 | 0.1 to 4.92K | 0.5, 1, 5 | 760 | Thermoplastic (1) |
| WSC4527 | WSC4527 | 4527 | 2 | 0.1 to 4.92K | 0.5, 1, 5 | 760 | Thermoplastic |
| WSC6927 | WSC6927 | 6927 | 3 | 0.1 to 8K | 0.5, 1, 5 | 1675 | Thermoplastic |

**Notes**

- Part marking: 1/2 W - DALE, value; 1 W - model, value, tolerance, date code; 2 W and 3 W - DALE, model, value, tolerance, date code

(1) As of 1/1/2010, the WSC0001 and WSC0002 are molded with thermoplastic in lieu of epoxy. Reference PCN-DR-002-2009 and PCN-DR-003-2009

(2) As of February 19, 2016, the WSC0001 was obsoleted by PCN-DR-013-2015; the WSC2515 is a drop-in replacement. You may contact your sales representative or submit an inquiry via ww2bresistors@vishay.com for supporting information

## TECHNICAL SPECIFICATIONS

| PARAMETER | UNIT | WSC01/2 | WSC2515 | WSC0002 | WSC4527, WSC6927 |
|---|---|---|---|---|---|
| Temperature coefficient | ppm/°C | ± 50 = 1.0 Ω to 4.99 Ω; ± 90 = 0.1 Ω to 0.99 Ω | ± 20 = 26.51 Ω and above; ± 50 = 1.0 Ω to 26.5 Ω; ± 90 = 0.31 Ω to 0.99 Ω; ± 150 = 0.1 Ω to 0.3 Ω | ± 20 = 10.0 Ω and above; ± 50 = 1.0 Ω to 9.9 Ω; ± 90 = 0.1 Ω to 0.99 Ω | ± 20 = 10 Ω and above; ± 50 = 1.0 Ω to 9.9 Ω; ± 90 = 0.31 Ω to 0.99 Ω; ± 150 = 0.1 Ω to 0.3 Ω |
| Dielectric withstanding voltage | $V_{AC}$ | > 500 | | | |
| Insulation resistance | Ω | $> 10^9$ | | | |
| Operating temperature range | °C | -65 to +175 | -65 to +275 | | |
| Maximum working voltage | V | $(P \times R)^{1/2}$ | | | |

## GLOBAL PART NUMBER INFORMATION

**Global Part Numbering example: WSC2515R7000FEA** (visit www.vishay.net Vishay Dale parts numbering manual for all options)

| W | S | C | 2 | 5 | 1 | 5 | R | 7 | 0 | 0 | 0 | F | E | A | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

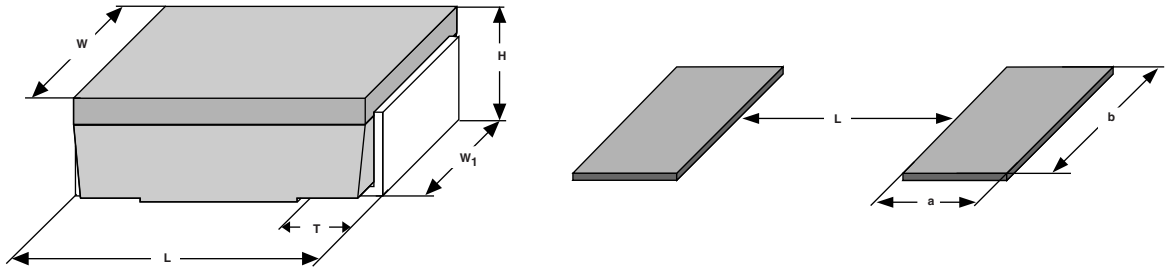
| GLOBAL MODEL | SIZE | VALUE (1) | TOLERANCE | PACKAGING | SPECIAL |
|---|---|---|---|---|---|
| **WSC**<br>**WSN** | **01/2**<br>**2515**<br>**0002**<br>**4527**<br>**6927** | **R** = decimal<br>**K** = thousand<br>**R7000** = 0.70 Ω<br>**1K500** = 1.5 kΩ | **D** = ± 0.5 %<br>**F** = ± 1.0 %<br>**G** = ± 2.0 %<br>**H** = ± 3.0 %<br>**J** = ± 5.0 %<br>**K** = ± 10 % | **EA** = lead (Pb)-free, tape / reel<br>**EK** = lead (Pb)-free, bulk<br>**TA** = tin / lead, tape / reel (R86)<br>**BA** = tin / lead, bulk (B43) | (dash number)<br>(up to 2 digits)<br>from **1 to 99**<br>as applicable |

**Notes**

(1) WSC / WSN Marking (www.vishay.com/doc?30327)

- 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)

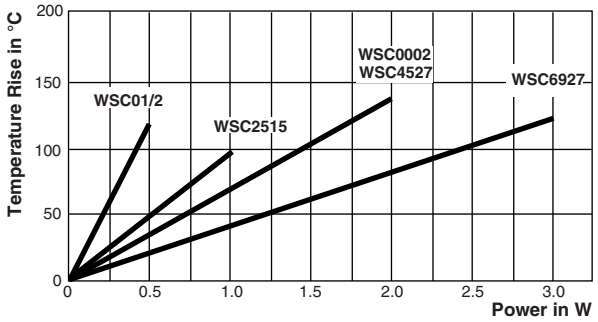



| GLOBAL MODEL | DIMENSIONS | | | | | SOLDER PAD DIMENSIONS | | |
|---|---|---|---|---|---|---|---|---|
| | L | H | T | W | $W_1$ | a | b | L |
| WSC01/2 | 0.200 ± 0.020 (5.08 ± 0.508) | 0.096 ± 0.015 (2.44 ± 0.381) | 0.040 ± 0.010 (1.02 ± 0.254) | 0.125 ± 0.005 (3.18 ± 0.127) | 0.050 ± 0.010 (1.27 ± 0.254) | 0.085 (2.16) | 0.070 (1.78) | 0.080 (2.03) |
| WSC2515 | 0.250 ± 0.020 (6.35 ± 0.508) | 0.110 ± 0.015 (2.79 ± 0.381) | 0.045 ± 0.010 (1.14 ± 0.254) | 0.150 ± 0.005 (3.81 ± 0.127) | 0.098 ± 0.005 (2.49 ± 0.127) | 0.090 (2.29) | 0.115 (2.92) | 0.120 (3.05) |
| WSC0002 | 0.455 ± 0.020 (11.56 ± 0.508) | 0.167 ± 0.010 (4.24 ± 0.254) | 0.100 ± 0.010 (2.54 ± 0.254) | 0.275 ± 0.005 (6.98 ± 0.127) | 0.215 ± 0.005 (5.46 ± 0.127) | 0.155 (3.94) | 0.230 (5.84) | 0.205 (5.21) |
| WSC4527 | 0.455 ± 0.020 (11.56 ± 0.508) | 0.167 ± 0.010 (4.24 ± 0.254) | 0.100 ± 0.010 (2.54 ± 0.254) | 0.275 ± 0.005 (6.98 ± 0.127) | 0.215 ± 0.005 (5.46 ± 0.127) | 0.155 (3.94) | 0.230 (5.84) | 0.205 (5.21) |
| WSC6927 | 0.690 ± 0.032 (17.53 ± 0.813) | 0.280 ± 0.015 (7.11 ± 0.381) | 0.100 ± 0.010 (2.54 ± 0.254) | 0.275 ± 0.005 (6.98 ± 0.127) | 0.215 ± 0.015 (5.46 ± 0.381) | 0.155 (3.94) | 0.235 (5.97) | 0.470 (11.94) |

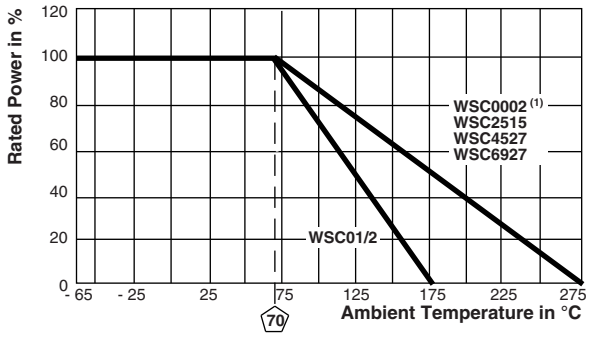
**Notes**

- 3D models available: www.vishay.com/doc?30328
- Surface mount solder profile recommendations: www.vishay.com/doc?31052
- Refer to WSC, WSN conversion guide for detailed construction drawings: www.vishay.com/doc?49616

## TEMPERATURE RISE



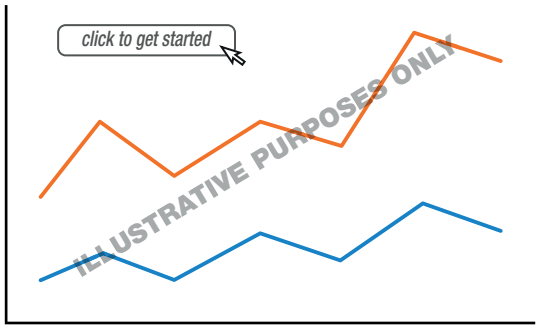

## DERATING




**Note**

(1) As of 1/1/2010, WSC0002 will be molded with thermoplastic and have the higher 275 °C temperature derating

## PULSE CAPABILITY




www.vishay.com/resistors/SMD-wirewound-pulse-capability-calculator/

**Note**

- Pulse capability increases based on the amount of wire for the resistance value and construction. The WSC0002 has greater pulse capability than WSC4527 due to differences in internal construction. The non-inductive WSN has greater pulse capability for the same size WSC because the second layer of wire increases the wire mass available to withstand pulse energy without exceeding temperature limits. Follow pulse graphic link for more information regarding capability

| PERFORMANCE | | |
|---|---|---|
| **TEST** | **CONDITIONS OF TEST** | **TEST LIMITS** |
| Thermal shock | -55 °C to +150 °C, 1000 cycles, 15 min at each extreme | ± 0.5 % + 0.05 Ω |
| Short time overload | 5 x rated power for 5 s | ± 0.2 % + 0.05 Ω |
| Low temperature storage | -65 °C for 24 h | ± 0.2 % + 0.05 Ω |
| High temperature exposure | 1000 h at + 275 °C (+175 °C for WSC01/2) | ± 0.5 % + 0.05 Ω |
| Bias humidity | +85 °C, 85 % RH, 10 % bias, 1000 h | ± 0.2 % + 0.05 Ω |
| Mechanical shock | 100 *g*'s for 6 ms, 5 pulses | ± 0.1 % + 0.05 Ω |
| Vibration | Frequency varied 10 Hz to 500 Hz in 1 min, 3 directions, 9 h | ± 0.1 % + 0.05 Ω |
| Load life | 1000 h at rated power, +70 °C, 1.5 h "ON", 0.5 h "OFF" | ± 1.0 % + 0.05 Ω |
| Resistance to solder heat | +260 °C solder, 10 s to 12 s dwell, 25 mm/s emergence | ± 0.5 % + 0.05 Ω |

| PACKAGING | | | | |
|---|---|---|---|---|
| **MODEL** | **REEL** | | | |
| | **TAPE WIDTH** | **DIAMETER** | **PIECES/REEL** | **CODE** |
| WSC01/2 | 12 mm/embossed plastic | 330 mm/13" | 2000 | EA/TA |
| WSC2515 | 16 mm/embossed plastic | 330 mm/13" | 2000 | EA/TA |
| WSC0002, WSC4527 | 24 mm/embossed plastic | 330 mm/13" | 1200 | EA/TA |
| WSC6927 | 32 mm/embossed plastic | 330 mm/13" | 725 | EA/TA |

**Notes**

- Embossed carrier tape per EIA-481
- Additional packaging details at www.vishay.com/doc?20051

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