



## Wirewound Resistors, Military, MIL-PRF-26 Qualified, Type RW, Precision Power, Silicone Coated, Axial Lead



### FEATURES

- High temperature coating (> 350 °C)
- Complete welded construction
- Qualified to MIL-PRF-26
- Excellent stability in operation (typical resistance shift < 0.5 %)

### STANDARD ELECTRICAL SPECIFICATIONS

| MILITARY MODEL | VISHAY REFERENCE MODEL | POWER RATING<br>$P_{25\text{ }^{\circ}\text{C}}$ W<br>CHARACTERISTIC U | POWER RATING<br>$P_{25\text{ }^{\circ}\text{C}}$ W<br>CHARACTERISTIC V | RESISTANCE RANGE<br>$\Omega$ | TOLERANCE<br>$\pm \%$ | WEIGHT<br>(typical)<br>g |
|----------------|------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|------------------------------|-----------------------|--------------------------|
| RW81           | G001...380             | 1.0                                                                    | -                                                                      | 0.1 to 1K                    | 0.1, 0.5, 1           | 0.20                     |
| RW70           | RS01A...300            | 1.0                                                                    | -                                                                      | 0.1 to 2.74K                 | 0.1, 0.5, 1           | 0.34                     |
| RW80           | G003...380             | 2.0                                                                    | -                                                                      | 0.1 to 2.74K                 | 0.1, 0.5, 1           | 0.34                     |
| RW79           | RS02B...300            | 3.0                                                                    | -                                                                      | 0.1 to 6.49K                 | 0.1, 0.5, 1           | 0.70                     |
| RW69           | RS02C...23             | -                                                                      | 3.0                                                                    | 0.1 to 2.0K                  | 5, 10                 | 1.6                      |
| RW74           | RS005...69             | 5.0                                                                    | -                                                                      | 0.1 to 24.3K                 | 0.1, 0.5, 1           | 4.2                      |
| RW67           | RS005...70             | -                                                                      | 6.5                                                                    | 0.1 to 8.2K                  | 5, 10                 | 4.2                      |
| RW78           | RS010...38             | 10.0                                                                   | -                                                                      | 0.1 to 71.5K                 | 0.1, 0.5, 1           | 9.0                      |
| RW68           | RS010...39             | -                                                                      | 11.0                                                                   | 0.1 to 20K                   | 5, 10                 | 9.0                      |

#### Note

- RW67, RW68, RW69 available tolerance for these MIL parts is  $\pm 5 \%$  for 1  $\Omega$  and above,  $\pm 10 \%$  below 1  $\Omega$

### TECHNICAL SPECIFICATIONS

| PARAMETER                   | UNIT     | RW RESISTOR CHARACTERISTICS                                                                                 |
|-----------------------------|----------|-------------------------------------------------------------------------------------------------------------|
| Temperature Coefficient     | ppm/°C   | $\pm 20$ for 10 $\Omega$ and above, $\pm 50$ for 1 $\Omega$ to 9.9 $\Omega$ , $\pm 90$ for below 1 $\Omega$ |
| Maximum Working Voltage     | V        | $(P \times R)^{1/2}$                                                                                        |
| Insulation Resistance       | $\Omega$ | 1000 M $\Omega$ minimum dry, 100 M $\Omega$ minimum after moisture test                                     |
| Solderability               | -        | MIL-PRF-26 type - meets requirements of ANSI J-STD-002                                                      |
| Operating Temperature Range | °C       | Characteristic U = - 65 to + 250, characteristic V = - 65 to + 350                                          |

### MILITARY PART NUMBER INFORMATION

Military Part Numbering example: RW80U49R9FB12

| R W 8 0 U 4 9 R 9 F B 1 2                                            |                                                    |  |                                                                                                                                                                                |  |  |                                                                                                                           |  |  |                                                                                                                      |  |  |
|----------------------------------------------------------------------|----------------------------------------------------|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|---------------------------------------------------------------------------------------------------------------------------|--|--|----------------------------------------------------------------------------------------------------------------------|--|--|
| MIL TYPE                                                             | CHARACTERISTIC                                     |  | RESISTANCE VALUE                                                                                                                                                               |  |  | TOLERANCE CODE                                                                                                            |  |  | PACKAGING CODE                                                                                                       |  |  |
| RW67<br>RW68<br>RW69<br>RW70<br>RW74<br>RW78<br>RW79<br>RW80<br>RW81 | U = Max. hotspot 275 °C<br>V = Max. hotspot 350 °C |  | <b>U Characteristic</b><br>3 digit significant figure,<br>followed by a multiplier<br><b>49R9</b> = 49.9 $\Omega$<br><b>1000</b> = 100 $\Omega$<br><b>1001</b> = 1000 $\Omega$ |  |  | Tolerance for "U"<br>Characteristic only<br><b>B</b> = $\pm 0.1 \%$<br><b>D</b> = $\pm 0.5 \%$<br><b>F</b> = $\pm 1.0 \%$ |  |  | <b>B12</b> = Bulk pack<br><b>S70</b> = Tape/reel<br>(smaller than 5 W)<br><b>S73</b> = Tape/reel<br>(5 W and higher) |  |  |
|                                                                      |                                                    |  | <b>V Characteristic</b><br>2 digit significant figure,<br>followed by a multiplier<br><b>4R7</b> = 4.7 $\Omega$<br><b>102</b> = 1000 $\Omega$                                  |  |  | Tolerance for "V"<br>Characteristic is not listed<br>and is as specified by<br>MIL-PRF-26                                 |  |  |                                                                                                                      |  |  |

## DIMENSIONS in inches [millimeters]



### Note

<sup>(1)</sup> On some standard reel pack methods, the leads may be trimmed to a shorter length than shown

## MATERIAL SPECIFICATIONS

**Element:** Copper-nickel alloy or nickel-chrome alloy, depending on resistance value

**Core:** Ceramic, steatite or alumina, depending on physical size

**Coating:** Special high temperature silicone

**Standard Terminals:** 60/40 Sn/Pb coated Copperweld®

**End Caps:** Stainless steel

| MILITARY MODEL | DIMENSIONS in inches [millimeters]             |                         |                                 |                                  |
|----------------|------------------------------------------------|-------------------------|---------------------------------|----------------------------------|
|                | A                                              | B <sup>(2)</sup> (max.) | C                               | D                                |
| RW81           | 0.250 ± 0.031<br>[6.35 ± 0.787]                | 0.281<br>[7.14]         | 0.085 ± 0.020<br>[2.16 ± 0.508] | 0.020 ± 0.002<br>[0.508 ± 0.051] |
| RW70<br>RW80   | 0.406 ± 0.031<br>[10.31 ± 0.787]               | 0.437<br>[11.10]        | 0.094 ± 0.031<br>[2.39 ± 0.787] | 0.020 ± 0.002<br>[0.508 ± 0.051] |
| RW79           | 0.560 ± 0.062<br>[14.22 ± 1.57]                | 0.622<br>[15.80]        | 0.187 ± 0.031<br>[4.75 ± 0.787] | 0.032 ± 0.002<br>[0.813 ± 0.051] |
| RW69           | 0.500 ± 0.062<br>[12.70 ± 1.57]                | 0.593<br>[15.06]        | 0.218 ± 0.031<br>[5.54 ± 0.787] | 0.032 ± 0.002<br>[0.813 ± 0.051] |
| RW74<br>RW67   | 0.875 ± 0.062<br>[22.23 ± 1.57]                | 1.0<br>[25.4]           | 0.312 ± 0.031<br>[7.92 ± 0.787] | 0.040 ± 0.002<br>[1.02 ± 0.051]  |
| RW78           | 1.78 ± 0.062<br>[45.21 ± 1.57]                 | 1.87<br>[47.50]         | 0.375 ± 0.031<br>[9.53 ± 0.787] | 0.040 ± 0.002<br>[1.02 ± 0.051]  |
| RW68           | 1.875 ± 0.063 - 0.125<br>[47.63 ± 1.60 - 3.18] | 1.94<br>[49.28]         | 0.344 ± 0.094<br>[8.74 ± 2.39]  | 0.040 ± 0.002<br>[1.02 ± 0.051]  |

### Note

<sup>(2)</sup> B (max.) dimension is clean lead to clean lead

| MARKING                                                                                |                                                                                       |
|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>MODELS:</b><br>RW70, RW74, RW78, RW79,<br>RW80, RW81                                | <b>MODELS:</b><br>RW67, RW68, RW69                                                    |
| Characteristic U<br>Tolerance code: B = 01 %,<br>D = 0.5 %, F = 1 %                    | Characteristic V<br>Tolerance code: Not listed                                        |
| <b>Example</b><br>Dale<br>RW80U Model<br>1001F Characteristic, value<br>0703 Date code | <b>Example</b><br>Dale<br>RW68 Model<br>V100 Characteristic, value<br>M0202 Date code |

## DERATING



| PERFORMANCE                     |                                                                                                                                |                       |                       |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|
| TEST                            | CONDITIONS OF TEST                                                                                                             | TEST LIMITS           |                       |
|                                 |                                                                                                                                | CHARACTERISTIC U      | CHARACTERISTIC V      |
| Thermal Shock                   | Rated power applied until thermally stable, then a minimum of 15 min at - 55 °C                                                | ± (0.2 % + 0.05 Ω) ΔR | ± (2.0 % + 0.05 Ω) ΔR |
| Short Time Overload             | 5 x rated power (3.75 W and smaller), 10 x rated power (4 W and larger) for 5 s                                                | ± (0.2 % + 0.05 Ω) ΔR | ± (2.0 % + 0.05 Ω) ΔR |
| Dielectric Withstanding Voltage | 500 V <sub>RMS</sub> min. (RW70, RW80, RW81),<br>1000 V <sub>RMS</sub> for all others, duration of 1 min                       | ± (0.1 % + 0.05 Ω) ΔR | ± (0.1 % + 0.05 Ω) ΔR |
| Low Temperature Storage         | - 65 °C for 24 h                                                                                                               | ± (0.2 % + 0.05 Ω) ΔR | ± (2.0 % + 0.05 Ω) ΔR |
| High Temperature Exposure       | 250 h at: U = + 250 °C, V = + 350 °C                                                                                           | ± (0.5 % + 0.05 Ω) ΔR | ± (2.0 % + 0.05 Ω) ΔR |
| Moisture Resistance             | MIL-STD-202 Method 106, 7b not applicable                                                                                      | ± (0.2 % + 0.05 Ω) ΔR | ± (2.0 % + 0.05 Ω) ΔR |
| Shock, Specified Pulse          | MIL-STD-202 Method 213, 100 g's for 6 ms, 10 shocks                                                                            | ± (0.1 % + 0.05 Ω) ΔR | ± (0.2 % + 0.05 Ω) ΔR |
| Vibration, High Frequency       | Frequency varied 10 Hz to 2000 Hz, 20 g peak, 2 directions 6 h each                                                            | ± (0.1 % + 0.05 Ω) ΔR | ± (0.2 % + 0.05 Ω) ΔR |
| Load Life                       | 2000 h at rated power, + 25 °C, 1.5 h "ON", 0.5 h "OFF"                                                                        | ± (0.5 % + 0.05 Ω) ΔR | ± (3.0 % + 0.05 Ω) ΔR |
| Terminal Strength               | Pull test 5 s to 10 s, 5 lb (RW70, RW80, RW81),<br>10 lb for all others; torsion test - 3 alternating directions,<br>360° each | ± (0.1 % + 0.05 Ω) ΔR | ± (1.0 % + 0.05 Ω) ΔR |



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