

# RESISTOR WIREWOUND HIGH POWER RATING

## RWH SERIES



### KEY FEATURES

- Excellent Pulse Handling
- Resistance Tolerances to  $\pm 0.01\%$
- Resistance from 0.02 to 260kOhms
- MIL-R-26 / MIL-R-39007 Power Ratings
- Low TCR:  $\pm 20\text{ppm}/^\circ\text{C}$  Standard
- Non-Inductive Windings available

### APPLICATIONS

- HDVC Systems
- Braking Systems
- Power Supplies
- Fluid Heater

### PRODUCT SUMMARY

| PRODUCT SERIES (RWH) | POWER RATING (W) | DIELECTRIC STRENGTH                                     | TOLERANCE   | TEMPERATURE COEFFICIENT   | TEMPERATURE RANGE   |
|----------------------|------------------|---|---|---|---|
| Miniature Axial      | 1 to 15          | <b>500 VAC:</b><br>E01, E02, E03,<br>E04, E05, E06      | $\pm 0.01\%$<br>to<br>$\pm 10\%$<br>(1% Standard) | <ul style="list-style-type: none"> <li>• <math>&gt;10\Omega : \pm 20\text{ppm}/^\circ\text{C}</math></li> <li>• <math>1\Omega</math> to <math>10\Omega : \pm 50\text{ppm}/^\circ\text{C}</math></li> <li>• <math>&lt;1\Omega</math> : Call Factory</li> </ul> | -55°C to + 250°C  |
| Axial                | 0.1 to 15        | <b>500 VAC:</b><br>F01, F02, F03,<br>F04, F05, F06, F07 |   |   | <p><b>Characteristic U:</b><br/>-55°C to + 275°C</p> <p><b>Characteristic V:</b><br/>-55°C to + 350°C</p> |

### HOW TO ORDER

| RWH                           | S                                 | E02   | T   | U   | 003K8   | F   | S                           |
|-------------------------------|-----------------------------------|---|---|---|---|---|-----------------------------|
| RESISTOR WIREWOUND HIGH POWER | WINDINGS                          | PACKAGE CODE, WATTS, RESISTANCE   | OPERATING TEMPERATURE   | TEMPERATURE COEFFICIENT OF RESISTANCE (TCR)   | RESISTANCE  | TOLERANCE   | PACKING                     |
|                               | S = Standard<br>N = Non-Inductive | <p><b>Miniature Axial</b><br/>E01, 1.0W, 33Vmax<br/>E02, 1.0W, 33Vmax</p> <p><b>Axial</b><br/>F01, 0.1W, 8.5Vmax<br/>F02, 0.4W, 20Vmax</p> <p>See Table</p> | T = -55°C to +250°C<br>U = -55°C to +275°C<br>V = -55°C to +350°C | U = $\pm 20\text{ppm}/^\circ\text{C}$<br>Q = $\pm 50\text{ppm}/^\circ\text{C}$<br>Z = Special | <p>0R038 = 0.038<math>\Omega</math><br/>003K8 = 3.8K<math>\Omega</math><br/>038K0 = 38.0K<math>\Omega</math><br/>380K0 = 380.0K<math>\Omega</math><br/>003M8 = 3.8M<math>\Omega</math></p> <p>Letter denotes decimal place.<br/>R = decimal, "K" <math>10^3</math>, "M" <math>10^6</math><br/>Remaining 4 digits are significant or placeholders.</p> | T = $\pm 0.01\%$<br>Q = $\pm 0.02\%$<br>A = $\pm 0.05\%$<br>B = $\pm 0.1\%$<br>F = $\pm 1.0\%$<br>J = $\pm 5.0\%$<br>K = $\pm 10.0\%$ | S = Bulk<br>T = Tape & Reel |

For Tin/Lead coated leads, add "- Pb" to part number.

Standard Termination Finish: Matte Tin (Sn)

Example P/N: RWHSE02TU003K8FS is Resistor Wirewound High Power, Standard, 1.0W, 33V, -55°C to +250°C,  $\pm 20\text{ppm}/^\circ\text{C}$ , 3.8K $\Omega$ ,  $\pm 1.0\%$ , bulk

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### MINIATURE AXIAL



| Package Code                             | E01   | E02             | E03             | E04             | E05             | E06              | E07              | E08             | E09              |                  |
|--|---|-----------------|-----------------|-----------------|-----------------|------------------|------------------|-----------------|------------------|------------------|
| Max Resistance ( $\Omega$ ) <sup>1</sup> | 3.4k  | 3.4k            | 7.5k            | 7.5k            | 10k             | 10k              | 12.5k            | 25k             | 32k              |                  |
| Max Working Voltage (V)                  | 33  | 33              | 42              | 42              | 80              | 80               | 135              | 162             | 194              |                  |
| Power Rating (W)                         | 1   | 1               | 1.5             | 1.5             | 2               | 2                | 3                | 4               | 5                |                  |
| Dimensions<br>Inches [mm]                | <b>A</b><br>$\pm 0.062''$<br>[ $\pm 1.57\text{mm}$ ]              | 0.250<br>[6.35] | 0.250<br>[6.35] | 0.312<br>[7.92] | 0.312<br>[7.92] | 0.406<br>[10.31] | 0.406<br>[10.31] | 0.350<br>[8.89] | 0.560<br>[14.22] | 0.500<br>[12.70] |
|  | <b>B</b><br>$\pm 0.031''$<br>[ $\pm 0.79\text{mm}$ ]              | 0.085<br>[2.16] | 0.085<br>[2.16] | 0.078<br>[1.98] | 0.078<br>[1.98] | 0.094<br>[2.39]  | 0.094<br>[2.39]  | 0.156<br>[3.96] | 0.187<br>[4.75]  | 0.218<br>[5.54]  |
|  | <b>C</b> <sup>2</sup><br>$\pm 0.002''$<br>[ $\pm 0.05\text{mm}$ ] | 0.020<br>[0.51] | 0.025<br>[0.64] | 0.020<br>[0.51] | 0.025<br>[0.64] | 0.025<br>[0.64]  | 0.020<br>[0.51]  | 0.032<br>[0.81] | 0.032<br>[0.81]  | 0.040<br>[1.02]  |
| MIL-R-26 / MIL-R-39007                   | RW-81<br>RWR-81   | RW-81<br>RWR-81 | RWR-82          | RWR-82          | RW-80<br>RWR-80 | RW-80<br>RWR-80  |                  |                 |                  |                  |

| Package Code                             | E10   | E11              | E12              | E13              |                  |
|--|---|------------------|------------------|------------------|------------------|
| Max Resistance ( $\Omega$ ) <sup>1</sup> | 50k   | 95k              | 150k             | 260k             |                  |
| Max Working Voltage (V)                  | 258   | 425              | 607              | 1050             |                  |
| Power Rating (W)                         | 6   | 7                | 10               | 15               |                  |
| Dimensions<br>Inches [mm]                | <b>A</b><br>$\pm 0.062''$<br>[ $\pm 1.57\text{mm}$ ]              | 0.625<br>[15.88] | 0.875<br>[22.23] | 1.220<br>[30.99] | 1.780<br>[45.21] |
|  | <b>B</b><br>$\pm 0.031''$<br>[ $\pm 0.79\text{mm}$ ]              | 0.250<br>[6.35]  | 0.312<br>[7.92]  | 0.312<br>[7.92]  | 0.375<br>[9.53]  |
|  | <b>C</b> <sup>2</sup><br>$\pm 0.002''$<br>[ $\pm 0.05\text{mm}$ ] | 0.040<br>[1.02]  | 0.040<br>[1.02]  | 0.040<br>[1.02]  | 0.040<br>[1.02]  |
| MIL-R-26 / MIL-R-39007                   |   | RW-84            |                  |                  |                  |



<sup>1</sup> For non-inductive windings / divide maximum resistance by 2

<sup>2</sup> Lead Diameter:

18 AWG = 0.040" / 20 AWG = 0.032" / 22 AWG = 0.025" / 24 AWG = 0.020"

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**AXIAL**



| Package Code                             |  | F01             | F02             | F03             | F04             | F05             | F06              | F07              | F08             | F09              | F10              |
|--|--|-----------------|-----------------|-----------------|-----------------|-----------------|------------------|------------------|-----------------|------------------|------------------|
| Max Resistance ( $\Omega$ ) <sup>1</sup> |  | 500             | 2.5k            | 2.5k            | 7.5k            | 7.5k            | 10k              | 10k              | 12.5k           | 22k              | 22k              |
| Max Working Voltage (V)                  |  | 8.5             | 20              | 20              | 29              | 29              | 52               | 52               | 60              | 130              | 140              |
| Power Rating (W)                         | U  | 0.1             | 0.4             | 0.4             | 0.75            | 0.75            | 1.0              | 1.0              | 1.5             | 2.5              | 3.0              |
|  | V  | 0.25            | 0.5             | 0.5             | 0.9             | 0.9             | 1.5              | 1.5              | 2.0             | 3.0              | 3.75             |
| Dimensions Inches [mm]                   | A<br>$\pm 0.062"$<br>[ $\pm 1.57$ mm]              | 0.150<br>[3.81] | 0.250<br>[6.35] | 0.250<br>[6.35] | 0.330<br>[8.38] | 0.330<br>[8.38] | 0.406<br>[10.31] | 0.406<br>[10.31] | 0.350<br>[8.89] | 0.500<br>[12.70] | 0.560<br>[14.22] |
|  | B<br>$\pm 0.031"$<br>[ $\pm 0.79$ mm]              | 0.078<br>[1.98] | 0.094<br>[2.39] | 0.094<br>[2.39] | 0.094<br>[2.39] | 0.094<br>[2.39] | 0.094<br>[2.39]  | 0.094<br>[2.39]  | 0.156<br>[3.96] | 0.187<br>[4.75]  | 0.187<br>[4.75]  |
|  | C <sup>2</sup><br>$\pm 0.002"$<br>[ $\pm 0.05$ mm] | 0.018<br>[0.45] | 0.020<br>[0.51] | 0.025<br>[0.64] | 0.020<br>[0.51] | 0.025<br>[0.64] | 0.020<br>[0.51]  | 0.025<br>[0.64]  | 0.032<br>[0.81] | 0.032<br>[0.81]  | 0.032<br>[0.81]  |
| MIL-R-26 / MIL-R-39007                   |  |                 |                 |                 |                 |                 | RW-70            | RW-70            |                 | RW-69            | RW-79            |

| Package Code                             |  | F11              | F12              | F13              | F14              | F15              | F16              | F17              | F18              | F19              | F20              |
|--|--|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Max Resistance ( $\Omega$ ) <sup>1</sup> |  | 40k              | 40k              | 30k              | 45k              | 45k              | 91k              | 65k              | 95k              | 150k             | 100k             |
| Max Working Voltage (V)                  |  | 140              | 140              | 140              | 210              | 210              | 360              | 390              | 504              | 650              | 590              |
| Power Rating (W)                         | U  | 3.0              | 3.0              | 3.0              | 4.0              | 4.0              | 5.0              | 5.0              | 5.0              | 7.0              | 7.0              |
|  | V  | 4.0              | 4.0              | 3.5              | 5.5              | 5.5              | 6.5              | 6.5              | 6.5              | 9.0              | 9.0              |
| Dimensions Inches [mm]                   | A<br>$\pm 0.062"$<br>[ $\pm 1.57$ mm]              | 0.500<br>[12.70] | 0.500<br>[12.70] | 0.500<br>[12.70] | 0.675<br>[17.15] | 0.675<br>[17.15] | 0.875<br>[22.23] | 0.970<br>[24.64] | 1.025<br>[26.04] | 1.375<br>[34.93] | 1.400<br>[35.56] |
|  | B<br>$\pm 0.031"$<br>[ $\pm 0.79$ mm]              | 0.250<br>[6.35]  | 0.250<br>[6.35]  | 0.200<br>[5.08]  | 0.270<br>[6.68]  | 0.270<br>[6.68]  | 0.312<br>[7.92]  | 0.250<br>[6.35]  | 0.312<br>[7.92]  | 0.375<br>[9.52]  | 0.312<br>[7.92]  |
|  | C <sup>2</sup><br>$\pm 0.002"$<br>[ $\pm 0.05$ mm] | 0.040<br>[1.02]  | 0.032<br>[0.81]  | 0.032<br>[0.81]  | 0.040<br>[1.02]  | 0.032<br>[0.81]  | 0.040<br>[1.02]  | 0.032<br>[0.81]  | 0.040<br>[1.02]  | 0.040<br>[1.02]  | 0.032<br>[0.81]  |
| MIL-R-26 / MIL-R-39007                   |  |                  |                  |                  |                  |                  | RW-74            |                  | RW-67            |                  |                  |

| Package Code                             |  | F21              | F22              | F23              |
|--|--|------------------|------------------|------------------|
| Max Resistance ( $\Omega$ ) <sup>1</sup> |  | 154k             | 260k             | 320k             |
| Max Working Voltage (V)                  |  | 620              | 850              | 1500             |
| Power Rating (W)                         | U  | 7.0              | 10               | 15               |
|  | V  | 9.0              | 13               | -                |
| Dimensions Inches [mm]                   | A<br>$\pm 0.062"$<br>[ $\pm 1.57$ mm]              | 1.200<br>[30.99] | 1.780<br>[45.21] | 1.810<br>[45.95] |
|  | B<br>$\pm 0.031"$<br>[ $\pm 0.79$ mm]              | 0.312<br>[7.92]  | 0.375<br>[9.52]  | 0.510<br>[12.95] |
|  | C <sup>2</sup><br>$\pm 0.002"$<br>[ $\pm 0.05$ mm] | 0.040<br>[1.02]  | 0.040<br>[1.02]  | 0.050<br>[1.27]  |
| MIL-R-26 / MIL-R-39007                   |  |                  | RW-78            |                  |

- For non-inductive windings / divide maximum resistance by 2
- Lead Diameter:  
18 AWG = 0.040" / 20 AWG = 0.032" / 22 AWG = 0.025" /  
24 AWG = 0.020" / 25 AWG = 0.018"



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### ENVIRONMENTAL PERFORMANCE

| Environmental Performance<br>(MIL-STD 202) | $\Delta R$                                   |                           |                           |
|--|--|---------------------------|---------------------------|
|  | Miniature Axial                              | Axial - Characteristic U  | Axial - Characteristic V  |
| <b>Vibration</b>                           | $\pm 0.1\% + 0.05 \Omega$                    | $\pm 0.1\% + 0.05 \Omega$ | $\pm 0.2\% + 0.05 \Omega$ |
| <b>Load Life</b>                           | To 1% Depending on Resistance Value and Size | $\pm 1\% + 0.05 \Omega$   | $\pm 3\% + 0.05 \Omega$   |
| <b>Moisture Resistance</b>                 | $\pm 0.2\% + 0.05 \Omega$                    | $\pm 0.2\% + 0.05 \Omega$ | $\pm 2\% + 0.05 \Omega$   |
| <b>Dielectric</b>                          | $\pm 0.2\% + 0.05 \Omega$                    | $\pm 0.2\% + 0.05 \Omega$ | $\pm 0.2\% + 0.05 \Omega$ |
| <b>Storage</b>                             | $\pm 0.2\% + 0.05 \Omega$                    | $\pm 0.2\% + 0.05 \Omega$ | $\pm 2\% + 0.05 \Omega$   |
| <b>Shock</b>                               | $\pm 0.1\% + 0.05 \Omega$                    | $\pm 0.1\% + 0.05 \Omega$ | $\pm 0.2\% + 0.05 \Omega$ |
| <b>Thermal Shock</b>                       | $\pm 0.2\% + 0.05 \Omega$                    | $\pm 0.2\% + 0.05 \Omega$ | $\pm 2\% + 0.05 \Omega$   |
| <b>5X Overload (5s)</b>                    | $\pm 0.2\% + 0.05 \Omega$                    | $\pm 0.2\% + 0.05 \Omega$ | $\pm 2\% + 0.05 \Omega$   |

#### CONSTRUCTION NOTES:

- ♦ Centerless ground ceramic core
- ♦ Tinned copper or copperweld leads
- ♦ All welded terminations
- ♦ High Temperature / trivalent / inorganic silicone coating

### PACKAGING INFORMATION

MINIATURE AXIAL: Bulk Only

AXIAL:

| Package Code    | F01                  | F02  | F03  | F04  | F05  | F06  | F07  | F08  | F09  | F10  | F11  | F12  | F13  |      |
|-----------------|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| <b>Bulk</b>     | Bulk Only.<br>No T&R | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 |      |
| <b>10" Reel</b> |                      | 2000 | 2000 | 2000 | 2000 | 2000 | 2000 | 2000 | 500  | 500  | 500  | 500  | 500  |      |
| <b>12" Reel</b> |                      | 3000 | 3000 | 3000 | 3000 | 3000 | 3000 | 3000 | 3000 | 1500 | 1500 | 1000 | 1000 | 1000 |
| <b>14" Reel</b> |                      | 5000 | 5000 | 5000 | 5000 | 5000 | 5000 | 5000 | 5000 | 3000 | 3000 | 1500 | 1500 | 1500 |

| Package Code    | F14  | F15  | F16  | F17  | F18  | F19  | F20  | F21  | F22  |
|-----------------|------|------|------|------|------|------|------|------|------|
| <b>Bulk</b>     | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 |
| <b>10" Reel</b> | N/A  | N/A  | N/A  | 500  | N/A  | N/A  | N/A  | N/A  | N/A  |
| <b>12" Reel</b> | 500  | 500  | 500  | 1000 | 500  | 500  | 500  | 500  | 500  |
| <b>14" Reel</b> | 1000 | 1000 | 1000 | 1500 | 1000 | 750  | 750  | 750  | 750  |

Moisture Sensitivity Level: MSL-1

### AVAILABLE OPTIONS (Consult Factory)

- Special Testing Requirements
- Special Pulse Requirements

This datasheet is subject to change without notice.





Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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