

## Wirewound Power Radial Terminal Resistor

### WPRT Series

- 10 to 50 watts
- Quick connect or soldered tag terminals
- Optional mounting bracket
- High overload capability
- AEC-Q200 qualified
- Flameproof case
- RoHS compliant



All parts are Pb-free and comply with EU Directive 2011/65/EU amended by (EU) 2015/863 (RoHS3)

### Electrical Data

|                            |         | WPRT10                 | WPRT15    | WPRT20    | WPRT30    | WPRT40    | WPRT50    |
|----------------------------|---------|------------------------|-----------|-----------|-----------|-----------|-----------|
| Power rating at 25°C       | watts   | 10                     | 15        | 20        | 30        | 40        | 50        |
| Power rating at 70°C       | watts   | 10                     | 12.3      | 16.4      | 24.6      | 32.8      | 41        |
| 5s overload rating at 25°C | watts   | 50                     | 75        | 100       | 150       | 200       | 250       |
| Resistance range           | ohms    | 1R0 - 820R             | 1R0 - 1K0 | 2R0 - 1K2 | 3R0 - 1K5 | 6R0 - 1K5 | 6R0 - 1K5 |
| Thermal impedance          | °C/watt | 18                     | 14        | 12        | 8.5       | 7         | 7         |
| Isolation voltage          | volts   | 1000                   |           |           |           |           |           |
| TCR                        | ppm/°C  | <20R: ±400, ≥20R: ±350 |           |           |           |           |           |
| Resistance Tolerance       | %       | ±5                     |           |           |           |           |           |
| Standard Values            |         | E24                    |           |           |           |           |           |
| Ambient temperature range  | °C      | -55 to +155            |           |           |           |           |           |

Note: No LEV applies. Maximum voltage (dc or rms) is  $\sqrt{P \times R}$

### Physical Data

Figure 1 - soldered tag (S) and the same with bracket (SB)



Figure 2 - soldered tag with rugged bracket (SR)



All dimensions in mm and weights in g Maximum bow on length and width <1.00mm

| Type   | L<br>±1.5 | W<br>±1.0 | D        | P<br>±1.0 | ØJ<br>±0.2 | C<br>±0.4 | ØB<br>±0.2 | K<br>±1.0 | F<br>±0.5 | G<br>±0.5 | E<br>±0.5 | M1<br>±0.1 | M2<br>±0.1 | H<br>±1.0 | N<br>±0.2 | S<br>±0.3 | R<br>±0.3 | Weight (nom.) |      |       |
|--------|-----------|-----------|----------|-----------|------------|-----------|------------|-----------|-----------|-----------|-----------|------------|------------|-----------|-----------|-----------|-----------|---------------|------|-------|
|        |           |           |          |           |            |           |            |           |           |           |           |            |            |           |           |           |           | S             | SB   | SR    |
| WPRT10 | 48        | 10        | 9.0±1.0  | 32        | 4.1        | 5.5       | 2.5        | 3.0       | 8.7       | 5.0       | 12        | 4.2        | 4.2        | 18        | 23        | 60        | 72        | 11            | 16.5 | 18.5  |
| WPRT15 | 48        | 12.5      | 11.5±1.0 | 32        | 4.1        | 6.2       | 2.5        | 3.0       | 8.0       | 6.0       | 12        | 4.2        | 4.2        | 21        | 23        | 60        | 72        | 18            | 24   | 27.5  |
| WPRT20 | 63        | 12.5      | 13.5±1.0 | 44        | 4.1        | 6.2       | 2.5        | 3.0       | 10.0      | 6.0       | 12        | 4.2        | 4.2        | 21        | 23        | 74        | 86.5      | 27            | 34   | 37.5  |
| WPRT30 | 75        | 19        | 19±1.0   | 54        | 4.1        | 7.6       | 3.2        | 4.0       | 9.5       | 7.5       | 18        | 4.2        | 4.2        | 32        | 39        | 88        | 105       | 66            | 80   | 87.5  |
| WPRT40 | 90        | 19        | 19±0.6   | 70        | 4.1        | 7.6       | 3.2        | 4.0       | 9.5       | 7.5       | 18        | 5.2        | 4.5        | 32        | 39        | 104       | 122       | 81            | 94   | 105.5 |
| WPRT50 | 90        | 19        | 19±0.6   | 70        | 4.1        | 7.6       | 3.2        | 4.0       | 9.5       | 7.5       | 18        | 5.2        | 4.5        | 32        | 39        | 104       | 122       | 81            | 94   | 105.5 |

#### General Note

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WPRT Series

Physical Data

Figure 3 - quick connect "amp" tag (A) and the same with bracket (AB)



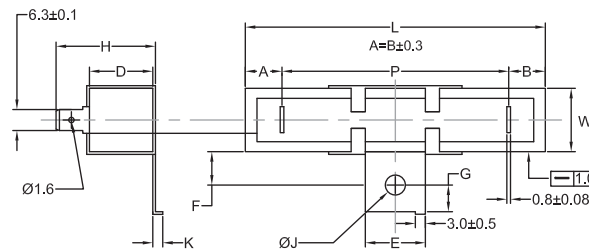
Figure 4 - quick connect "amp" tag with rugged bracket (AR)



All dimensions in mm and weights in g Maximum bow on length and width <1.00mm

| Type   | L<br>±1.5 | W<br>±1.0 | D        | P<br>±1.0 | ØJ<br>±0.2 | K<br>±1.0 | F<br>±0.5 | G<br>±0.5 | E<br>±0.5 | M1<br>±0.1 | M2<br>±0.1 | H<br>±1.0 | N<br>±0.2 | S<br>±0.3 | R<br>±0.3 | Weight (nom.) |      |       |
|--------|-----------|-----------|----------|-----------|------------|-----------|-----------|-----------|-----------|------------|------------|-----------|-----------|-----------|-----------|---------------|------|-------|
|        |           |           |          |           |            |           |           |           |           |            |            |           |           |           |           | A             | AB   | AR    |
| WPRT10 | 48        | 10        | 9.0±1.0  | 32        | 4.1        | 3.0       | 8.7       | 5.0       | 12        | 4.2        | 4.2        | 19        | 23        | 60        | 72        | 11            | 16.5 | 18.5  |
| WPRT15 | 48        | 12.5      | 11.5±1.0 | 32        | 4.1        | 3.0       | 8.0       | 6.0       | 12        | 4.2        | 4.2        | 23.5      | 23        | 60        | 72        | 18            | 24   | 27.5  |
| WPRT20 | 63        | 12.5      | 13.5±1.0 | 44        | 4.1        | 3.0       | 10.0      | 6.0       | 12        | 4.2        | 4.2        | 25        | 23        | 74        | 86.5      | 27            | 34   | 37.5  |
| WPRT30 | 75        | 19        | 19±1.0   | 54        | 6.0        | 4.0       | 9.5       | 7.5       | 18        | 4.2        | 4.2        | 30        | 39        | 88        | 105       | 66            | 80   | 87.5  |
| WPRT40 | 90        | 19        | 19±0.6   | 70        | 6.0        | 4.0       | 9.5       | 7.5       | 18        | 5.2        | 4.5        | 30        | 39        | 104       | 122       | 81            | 94   | 105.5 |
| WPRT50 | 90        | 19        | 19±0.6   | 70        | 6.0        | 4.0       | 9.5       | 7.5       | 18        | 5.2        | 4.5        | 30        | 39        | 104       | 122       | 81            | 94   | 105.5 |

Figure 5 – as configuration A but with tighter tolerance terminal alignment (AT) and the same with bracket (AD)



All dimensions in mm and weights in g  
Maximum bow on length and width <1.00mm

| Type   | L<br>+0.5/-1.0 | W<br>+0.5/-1.0 | D         | P<br>±0.3 | ØJ<br>±0.2 | K<br>±1.0 | F<br>±0.5 | G<br>±0.5 | E<br>±0.5 | H<br>±1.0 | Weight (nom.) |      |
|--------|----------------|----------------|-----------|-----------|------------|-----------|-----------|-----------|-----------|-----------|---------------|------|
|        |                |                |           |           |            |           |           |           |           |           | AT            | AD   |
| WPRT10 | 48             | 10             | 9.0 ±1.0  | 32        | 4.1        | 3.0       | 8.7       | 5.0       | 12        | 19        | 11            | 16.5 |
| WPRT15 | 48             | 12.5           | 11.5 ±1.0 | 32        | 4.1        | 3.0       | 8.0       | 6.0       | 12        | 23.5      | 18            | 24   |
| WPRT20 | 63             | 12.5           | 13.5 ±1.0 | 44        | 4.1        | 3.0       | 10.0      | 6.0       | 12        | 25        | 27            | 34   |
| WPRT30 | 75             | 19             | 19 ±1.0   | 54        | 6.0        | 4.0       | 9.5       | 7.5       | 18        | 30        | 66            | 80   |
| WPRT40 | 90             | 19             | 19 ±0.6   | 68        | 6.0        | 4.0       | 9.5       | 7.5       | 18        | 30        | 81            | 94   |
| WPRT50 | 90             | 19             | 19 ±0.6   | 68        | 6.0        | 4.0       | 9.5       | 7.5       | 18        | 30        | 81            | 94   |

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WPRT Series

Construction

A high purity ceramic rod, with force fit end caps onto which is wound a wire element. The element is fitted into a ceramic case with fireproof insulation cement. The terminal material is tin plated steel.

|  | Name | Main Material    |                    |
|--|------|------------------|--------------------|
|  | 1    | Rod              | $Al_2O_3$          |
|  | 2    | Filling Material | $SiO_2$            |
|  | 3    | Ceramic Case     | $Al_2O_3$ CaO      |
|  | 4    | Terminal         | Steel (tin plated) |
|  | 5    | Bracket          | Steel              |
|  | 6    | Wire Element     | Resistance Alloy   |

Termination Strength: The terminations meet the requirements of IEC 86.2.21

Marking: Power rating, resistance value and tolerance are legend marked.

Flammability: The resistor will not burn under any condition of applied temperature or overload.

Solvent resistance: The body protection and marking are resistant to all normal industrial solvents suitable for printed circuits.

Performance Data

|  |              |  |
|--|--------------|--|
|  |              | Maximum  |
| Load at rated power (1000hrs at 25°C and 70°C)         | $\Delta R\%$ | 5  |
| Derating from rated power                              |              | Zero at 275°C (see graph)                            |
| Short term overload (5 x rated power)                  | $\Delta R\%$ | 5 +0.05 $\Omega$                                     |
| Damp heat steady state (56 days, 40°C, $\geq 90\%$ RH) | $\Delta R\%$ | 5 +0.05 $\Omega$                                     |
| Temperature rapid change (5 cycles -55°C to +155°C)    | $\Delta R\%$ | 2 +0.05 $\Omega$                                     |
| Resistance to solder heat                              | $\Delta R\%$ | 1 +0.05 $\Omega$                                     |
| Voltage Proof (1kV for 60s)                            |              | No flashover, mechanical damage, arcing or breakdown |
| Solderability  |              | Min. 95% coverage                                    |



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WPRT Series

## Pulse Performance

The pulse energy capacity limits in the graph below relate to pulses below 100ms duration based on an instantaneous wire temperature rise of 750°C.



## Application Notes

S, SR and SB configurations have terminals which can be soldered. However, for full power operation, due to the possibility of high terminal temperatures, it is recommended that the connections be secured mechanically, rather than relying on the solder joint alone. AT and AD configurations are designed for use in molded housing assemblies, where the alignment of terminals and the body dimensions must be defined to a greater tolerance.

SR and AR configurations have a bracket with two fixing points rather than one, and are ideal for high shock & vibration applications.

## Ordering Procedure

Example: WPRT50 at 1.2 kilohms 5% tolerance with quick connect “amp” tag terminals and bracket, bulk packed in a box of 168 pieces –

WPRT 50 AB - 1 K 2 J B 168

Type \_\_\_\_\_

Power Rating \_\_\_\_\_

Configuration \_\_\_\_\_

|    |  |          |
|----|--|----------|
| S  | Soldered tag without bracket                               | Figure 1 |
| SB | Soldered tag with bracket                                  |          |
| SR | Soldered tag with rugged bracket                           | Figure 2 |
| A  | Quick connect “amp” tag without bracket                    | Figure 3 |
| AB | Quick connect “amp” tag with bracket                       |          |
| AR | Quick connect “amp” tag with rugged bracket                | Figure 4 |
| AT | Configuration A with tighter tolerance terminal alignment  | Figure 5 |
| AD | Configuration AB with tighter tolerance terminal alignment |          |

Value (use IEC62 code) \_\_\_\_\_

Tolerance (use IEC62 code) \_\_\_\_\_

Packing \_\_\_\_\_

|      |      |                  |                           |           |          |
|------|------|------------------|---------------------------|-----------|----------|
| B440 | Bulk | WPRT10           | S / SB / A / AB / AT / AD | 440 / box | Standard |
| B330 |      |                  | SR / AR                   | 330 / box |          |
| B400 |      | WPRT15           | S / SB / A / AB / AT / AD | 400 / box |          |
| B300 |      |                  | SR / AR                   | 300 / box |          |
| B270 |      | WPRT20           | S / SB / A / AB / AT / AD | 270 / box |          |
| B270 |      |                  | SR / AR                   | 270 / box |          |
| B240 |      | WPRT30 / 40 / 50 | S / A / AT                | 240 / box |          |
| B168 |      |                  | SB / AB / AD              | 168 / box |          |
| B160 |      |                  | SR / AR                   | 160 / box |          |

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