

## General Purpose Cement Coated Wirewound Resistors

### WA80 Series

#### Features

- Surface mount ZI-form option
- Flameproof protection
- Can replace carbon comp. in many applications
- Resistance values down to 0.01 ohms
- Ideal for pulse handling applications



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

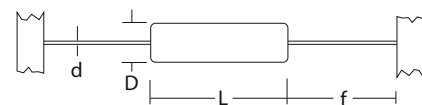
## Electrical Data

|                           |         | WA82                             | WA83         | WA835        | WA84        | WA85         |
|---------------------------|---------|----------------------------------|--------------|--------------|-------------|--------------|
| Power rating at 25°C      | watt s  | 1                                | 2.0          | 2.5          | 3.0         | 5            |
| Power rating at 70°C      | watt s  | .86                              | 1.6          | 2.0          | 2.5         | 4.3          |
| Resistance range          | ohms    | 0R068 to 430                     | 0R05 to 900R | 0R05 to 900R | 0R01 to 2K2 | 0R015 to 6K8 |
| Limiting element voltage  | volts   | 50                               | 50           | 75           | 100         | 150          |
| Isolation voltage         | volts   | 250                              | 250          | 250          | 350         | 500          |
| TCR                       | ppm/°C  | <1Ω:350                          |              | >1Ω:200      |             |              |
| Resistance tolerance      | %       | <20R: 5, 10    ≥20R: 1, 2, 5, 10 |              |              |             |              |
| Values                    |         | E24 preferred                    |              |              |             |              |
| Thermal impedance         | °C/watt | 140                              | 110          | 90           | 82          | 54           |
| Ambient temperature range | °C      | - 55 to 200                      |              |              |             |              |

## Physical Data

| Dimensions (mm) and Weight (g) |        |                 |        |        |                      |                 |         |
|--------------------------------|--------|-----------------|--------|--------|----------------------|-----------------|---------|
| Type                           | L max. | D max.          | f min. | d nom. | PCB mounting centres | Min bend radius | Wt nom. |
| WA82                           | 6.2    | 2.8             | 21.20  | 0.6    | 10.20                | 0.6             | 0.22    |
| WA83                           | 9.0    | 3.6             | 19.80  | 0.8    | 12.50                | 1.2             | 0.50    |
| WA835                          | 12.5   | 4.5             | 17.80  | 0.8    | 17.50                | 1.2             | 0.50    |
| WA84                           | 14.5   | 5.2<br>(Note 1) | 24.55  | 0.8    | 20.00                | 1.2             | 1.10    |
| WA85                           | 16.5   | 7.0<br>(Note 2) | 23.55  | 0.8    | 22.00                | 1.2             | 1.75    |

Note 1: 5.4 for values ≤0R1    Note 2: 7.2 for values ≤0R1



### Construction

A high quality ceramic substrate is assembled with interference fit end caps to which are welded the termination wires. The resistive element is wound on the substrate and welded to the caps. Cement protection is applied to the resistor body before marking with indelible ink.

### Terminations

**Material** High tin dipped copper wire

### Strength

The terminations meet requirements of IEC 68.2.21.

### Solderability

The terminations meet the requirements of IEC 115-1, Clause 4.17.3.2.

### General Note

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# General Purpose Cement Coated Wirewound Resistors

## WA80 Series



### Marking

WA85 resistors are legend marked with type reference, resistance value and tolerance. In conformance with IEC 62.

WA82, 83, 835 and 84 resistors OR1 and above are colour coded with 4 bands in conformance with IEC 62. Values below OR1 are 3 band marked, two digits and tolerance, there is no multiplier band.

### Solvent Resistance

The body protection and marking are resistant to all normal industrial cleaning fluids suitable for printed circuits.

### Flammability

The resistor coating will not burn under any condition of applied temperature or component overload.

## Performance Data

|                                             |     | Maximum                                                                                                                                                                                                                                                                                 | Typical |
|---------------------------------------------|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| Load at rated power: 1000 hrs at 25 or 70°C | ΔR% | 5.0 + .001Ω                                                                                                                                                                                                                                                                             | 3.0     |
| Dry heat: 1000 hrs at 200°C                 | ΔR% | 5.0 + .001Ω                                                                                                                                                                                                                                                                             | 3.0     |
| Derating from rated power at 25° c          |     | See derating curve                                                                                                                                                                                                                                                                      |         |
| Short term overload                         | ΔR% | 5.0 + .001Ω                                                                                                                                                                                                                                                                             | 1.0     |
| Climatic                                    | ΔR% | 5.0 + .001Ω                                                                                                                                                                                                                                                                             | 2.0     |
| Climatic category                           | ΔR% | 55/200/56                                                                                                                                                                                                                                                                               |         |
| Long term damp Heat: 56 days                | ΔR% | 5.0 + .001Ω                                                                                                                                                                                                                                                                             | 1.0     |
| T.R.C. & Vibration                          | ΔR% | 5.0 + .001Ω                                                                                                                                                                                                                                                                             | 1.0     |
| Robustness & Solder Heat                    | ΔR% | 5.0 + .001Ω                                                                                                                                                                                                                                                                             | 1.0     |
| Pulse Handling                              |     | See:<br><a href="https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Resistors/ApplicationNotes/Wirewound-Pulse-Overload-Resistors.pdf">https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Resistors/ApplicationNotes/Wirewound-Pulse-Overload-Resistors.pdf</a> |         |

## Application Notes

Care must be taken when determining clearance between the resistor body and the P.C.B. or other components. Resistance is measured 6mm from body.

### Packaging

All resistors are supplied tape packed ready for loading onto automatic sequencing and insertion machines. The critical dimensions are shown in figure 2.

Component wires will not protrude beyond the outside edge of the tapes.

All taped resistors will be supplied either on reels or in ammpacks, depending upon quantities ordered.

WA80 resistors can be supplied with radial, goalpost or lancet pre-formed leads- see

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Resistors/ApplicationNotes/TN008-resistors-Leadform-Capability.pdf>.

WA83, 84 and 85 is also available in ZI-form SMD format packed in blister tape- see

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Resistors/Datasheets/ZI-form.pdf>

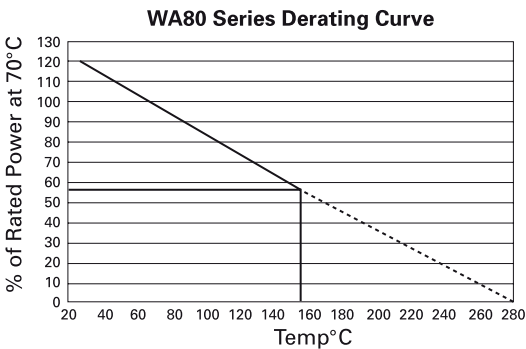
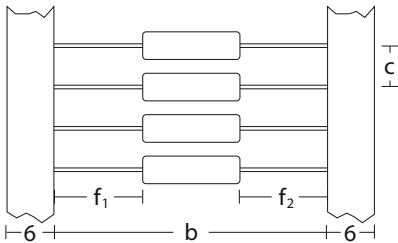


Figure 2



| Type | WA82 | WA83 | WA835 | WA84 | WA85 |
|------|------|------|-------|------|------|
| b    | 52   | 52   | 52    | 67   | 63   |
| c    | 5    | 5    | 5     | 10   | 10   |

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[www.ttelectronics.com/resistors](http://www.ttelectronics.com/resistors)

Ordering Procedure

Example: WA83-470RJ (WA83, 470 ohms  $\pm 5\%$ , Pb-free)

|   |   |   |   |  |   |   |   |   |   |   |   |
|---|---|---|---|--|---|---|---|---|---|---|---|
| W | A | 8 | 3 |  | - | 4 | 7 | 0 | R | J | I |
| 1 |   |   |   |  | 2 |   |   |   | 3 | 4 |   |

| 1<br>Type | 2<br>Value           | 3<br>Tolerance | 4<br>Packing |      |       |          |
|-----------|----------------------|----------------|--------------|------|-------|----------|
| WA82      | E24 = 3/4 characters | F = $\pm 1\%$  | I            | Ammo | WA82  | 5000/box |
| WA83      | R = ohms             | G = $\pm 2\%$  |              |      | WA83  | 2500/box |
| WA835     | K = kilohms          | J = $\pm 5\%$  |              |      | WA835 | 1500/box |
| WA84      |                      | K = $\pm 10\%$ |              |      | WA84  | 1000/box |
| WA85      |                      |                |              | Tape | WA85  | 750/reel |