

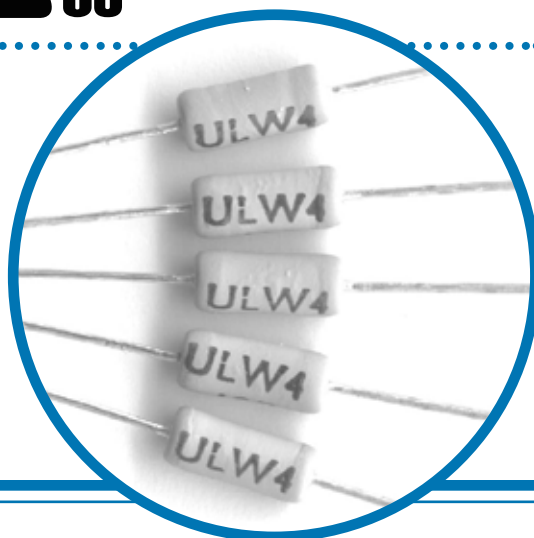
# UL Recognised Wirewound Resistors



## ULW Series

- **UL1412 recognised fusible resistor \***
- **Failsafe mains fusing at 120 / 240Vrms**
- **Inrush and surge withstanding**
- **UL94-V0 flameproof coating**
- **SMD leadform option available**
- **RoHS compliant**

\* UL file number E234469.



## Electrical Data

|                                  |         | ULW2                         | ULW3                                 | ULW4 | ULW5                             |
|----------------------------------|---------|------------------------------|--------------------------------------|------|----------------------------------|
| Power rating at 25°C             | watts   | 2                            | 3                                    | 4    | 5                                |
| 5 second overload rating at 25°C | watts   | 10                           | 15                                   | 20   | 25                               |
| Inrush / surge performance       |         | See Pulse Performance graphs |                                      |      |                                  |
| Resistance range                 | ohms    | 4R7 to 100                   | 4R7 to 100                           | 10   | 4R7-100                          |
| TCR                              | ppm/°C  | ±200                         |                                      |      |                                  |
| Isolation voltage                | volts   | 250                          | 350                                  | 500  |                                  |
| Resistance tolerance             | %       | 5                            |                                      |      |                                  |
| UL recognised standard values    | ohms    | 4R7, 10, 22, 33, 47, 68, 100 | 4R7, 10, 22, 27, 33, 39, 47, 68, 100 | 10   | 4R7, 10, 22, 27, 33, 47, 68, 100 |
| Thermal impedance                | °C/watt | 110                          | 82                                   | 62   | 54                               |
| Ambient temperature range        | °C      | -55 to +155                  |                                      |      |                                  |

Note - no limiting element voltage applies; maximum continuous voltage is  $\sqrt{P \cdot R}$

## Physical Data

| Dimensions (mm) and weight (g) |       |       |       |       |                   |                 |         |  |
|--------------------------------|-------|-------|-------|-------|-------------------|-----------------|---------|--|
| Type                           | L Max | D Max | f min | d nom | PCB mount centres | Min bend radius | Wt. Nom |  |
| ULW2                           | 9.0   | 3.8   | 19.8  | 0.8   | 12.7              | 1.2             | 0.5     |  |
| ULW3                           | 14.5  | 5.8   | 24.6  |       | 20.3              |                 | 1.1     |  |
| ULW4                           | 13    | 5.6   | 22.8  |       | 18.9              |                 | 1.0     |  |
| ULW5                           | 16.5  | 7.2   | 23.6  |       | 22.9              |                 | 1.8     |  |

## Construction

A high purity ceramic rod is assembled with interference fit end caps to which are welded the terminations. The surge withstanding resistive element is wound on the rod and welded to the caps. Flameproof fusible cement coating is applied prior to marking with indelible ink. The components are then leadformed if required and packed.

## Marking

ULW2 & ULW3 resistors are marked with five colour bands. The first four indicate value and tolerance in conformance with IEC62. The fifth yellow band denotes defined fusibility. ULW4 and ULW5 resistors are legend marked with type, value and tolerance.

## General Note

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www.bitechnologies.com www.ircctt.com www.welwyn-tt.com

Terminations

Material: Hot tin dipped copper wire  
Strength: The terminations meet the requirements of IEC 68.2.21  
Solderability: The terminations meet the requirements of IEC 115-1 Clause 4.17.3.2

Solvent Resistance

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

Flammability

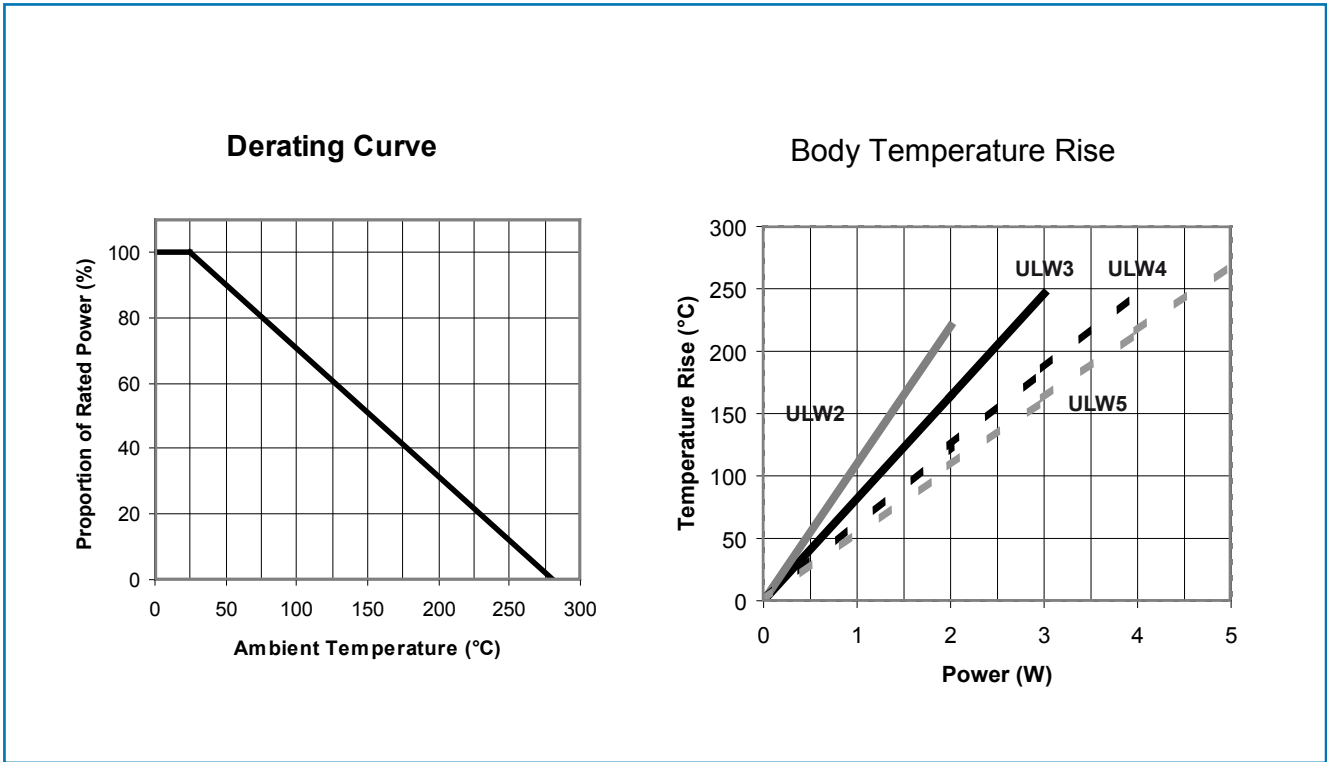
The resistor coating will not burn or emit incandescent particles under any condition of applied temperature or power overload.

Performance Data

|                                            |     | Maximum*  | Typical |
|--------------------------------------------|-----|-----------|---------|
| Load at rated power (1000 hours @ 25°C)    | ΔR% | 5         | 3       |
| Short term overload (5 x Pr for 5 seconds) | ΔR% | 5         | 1       |
| Pulse (see Pulse Performance graphs)       | ΔR% | 5         | 2       |
| Climatic                                   | ΔR% | 5         | 2       |
| Long term damp heat (56 days)              | ΔR% | 5         | 1       |
| Climatic category                          |     | 55/200/56 |         |
| Temperature rapid change                   | ΔR% | 5         | 1       |
| Dry heat (1000 hours @ 200°C)              | ΔR% | 5         | 3       |
| Vibration                                  | ΔR% | 5         | 1       |
| Robustness & solder heat                   | ΔR% | 5         | 1       |

\* Addition of 0.01Ω applies

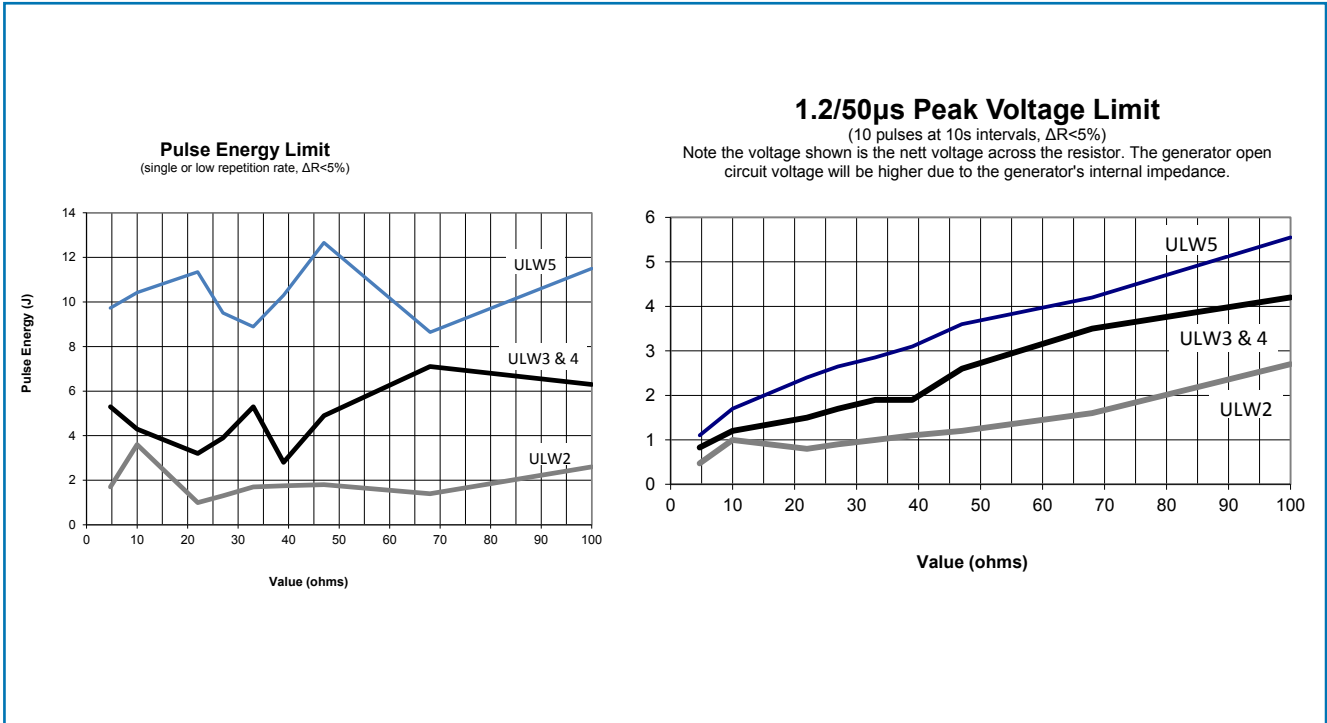
Thermal Performance



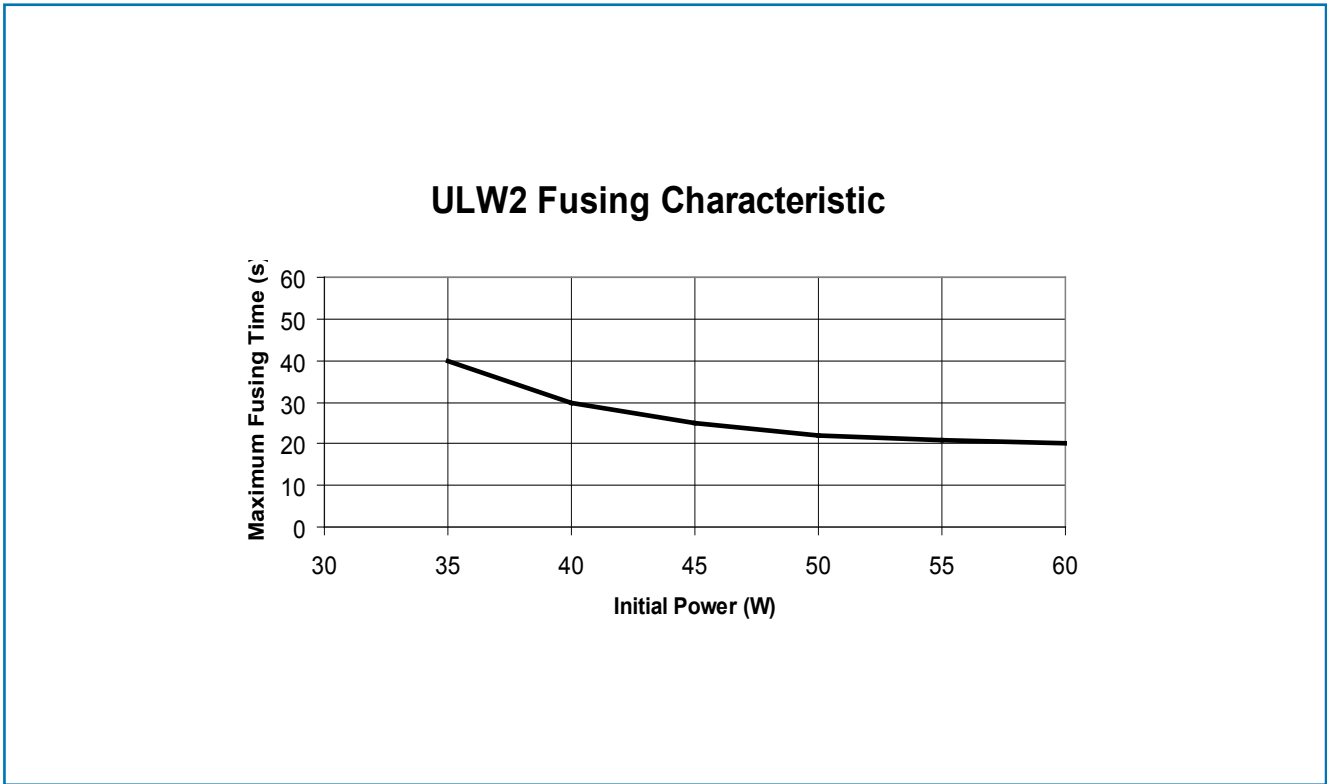
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Pulse Performance

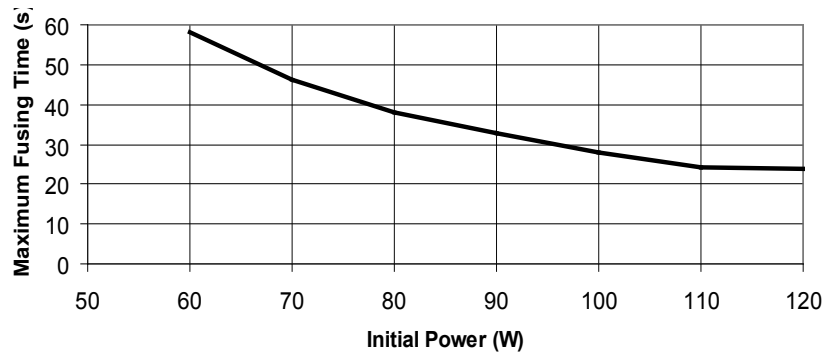


Fusing Performance

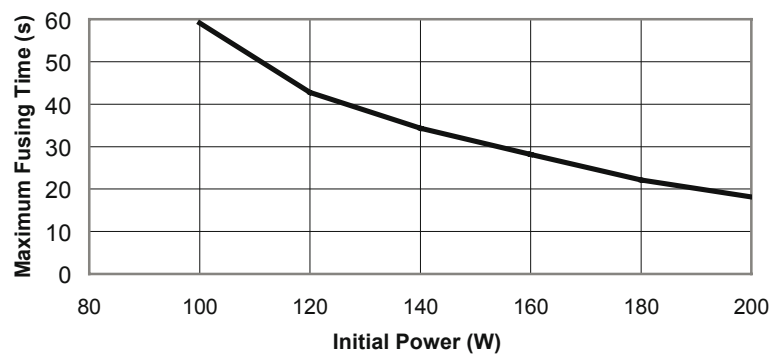


## Fusing Performance

**ULW3 & ULW4 Fusing Characteristic**



**ULW5 Fusing Characteristic**



**Notes:**

1. Typical fusing times are around 1/3 of the maximum figures.
2. After fusing the resistance value is >100 times the initial nominal value.
3. Suitable for fusing at voltages up to 264Vrms.

## Application Notes

### Application Notes

1. If the resistors are to dissipate full rated power, it is recommended that the terminations should not be soldered closer than 4mm from the body.
2. Due to operating temperature limits imposed by some PCB materials, derating may be necessary. An estimate of the temperature rise to be expected can be calculated using the thermal impedance figures given under Electrical Data.
3. For the purposes of UL approval, the following points should be observed:
  - 3.1 To protect against fire under all conditions of overload, a positive clearance of at least 13mm should be provided between the body of the resistor and any combustible materials.
  - 3.2 A positive clearance of 13mm should be provided between the resistor body or terminations and uninsulated parts of opposite polarity or uninsulated dead metal parts.
  - 3.3 Limited Short Circuit testing should be performed in the complete appliance.

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## Packaging

The standard packaging for ULW is taped. The critical dimensions are shown in Figure 1. The component wires will not protrude beyond the outside edge of the tapes. Taped product is then packed into ammo boxes for ULW2, 3 and 4 or onto reels for ULW5. Alternative packaging is available by request. Pre-formed resistors are supplied loose packed in plastic bags or boxes. For SMD leadformed option, see the Z-form datasheet.

## Ordering Procedure

Example: ULW2 at 33 ohms and 5% tolerance in ammo pack box of 2500 pieces -

U L W 2 - 3 3 R J A25

Type \_\_\_\_\_

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

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

J

5%

Packing \_\_\_\_\_

|      |      |            |          |          |
|------|------|------------|----------|----------|
| A25  | Ammo | ULW2       | 2500/box | Standard |
| A1   |      | ULW3, ULW4 | 1000/box |          |
| T075 |      | ULW5       | 750/reel |          |

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