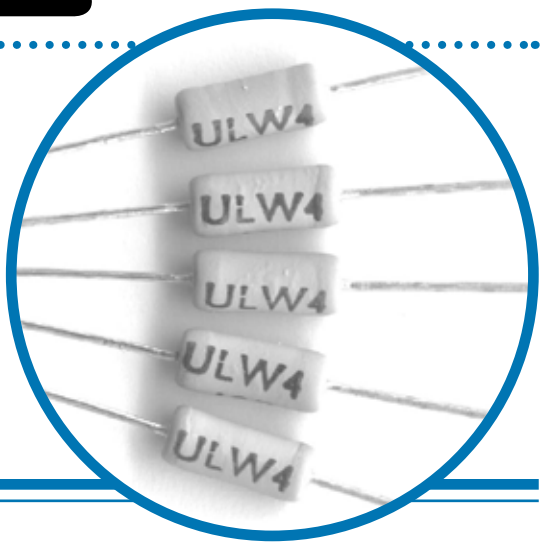
UL Recognised Wirewound Resistors

TT electronics
Welwyn Components

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

Note - no limiting element voltage applies; maximum continuous voltage is √(P.R)

Physical Data

Dimensions (mm) and weight (g)							
Type	L Max	D Max	f min	d nom	PCB mount centres	Min bend radius	Min bend radius
ULW2	9.0	3.6	19.8	0.8	12.7	1.2	0.5
ULW3	14.5	5.2	24.6		20.3		1.1
ULW4	13	5.6	22.8		18.9		1.0

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 resistors are legend marked with type, value and tolerance.

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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

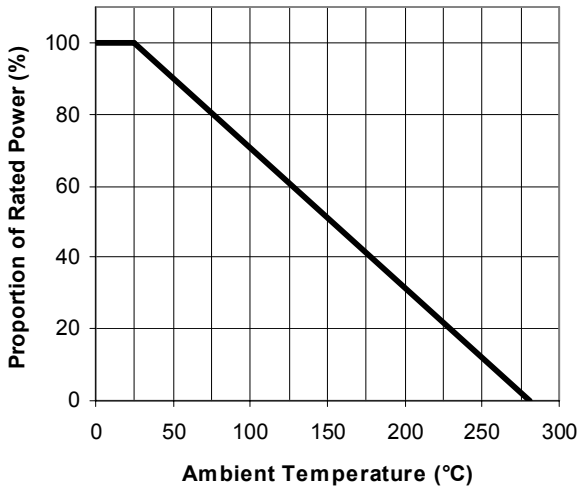
The resistor coating will not burn or emit incandescent particles under any condition of applied temperature or power overload.

Performance Data

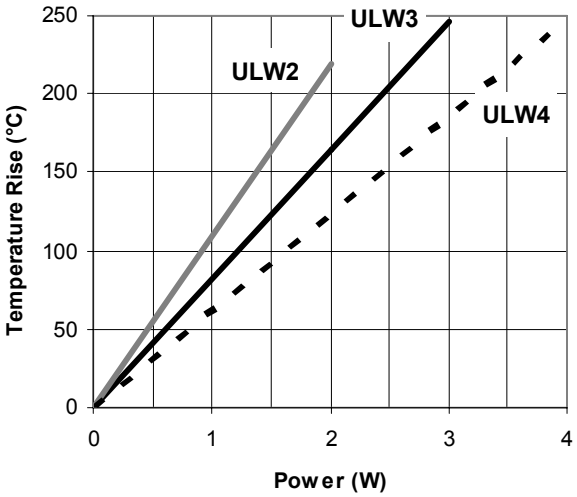
		Maximum	Typical
Load at rated power (1000 hours @ 25°C)	ΔR%	5	3
Short term overload (5 x Pr for 5 seconds)	ΔR%	5	1
Pulse (see Pulse Performance graphs)	ΔR%	5	2
Climatic	ΔR%	5	2
Long term damp heat (56 days)	ΔR%	5	1
Climatic category		55/200/56	
Temperature rapid change	ΔR%	5	1
Dry heat (1000 hours @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

Thermal Performance

Derating Curve



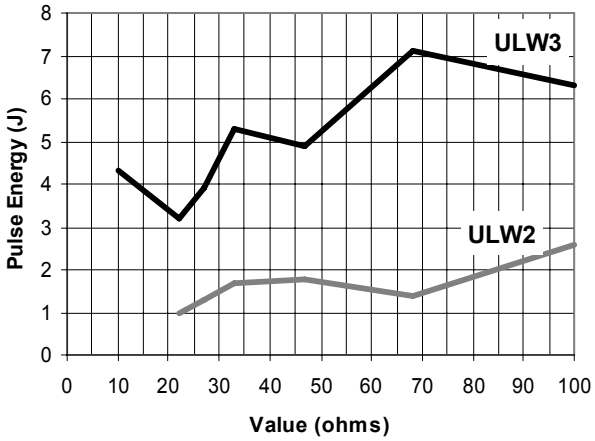
Body Temperature Rise



Pulse Performance

Pulse Energy Limit

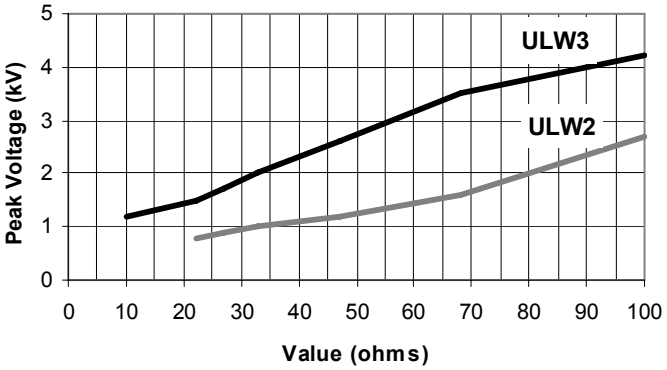
(single or low repetition rate, ΔR<5%)



1.2/50µs Peak Voltage Limit

(10 pulses at 10s intervals, ΔR<5%)

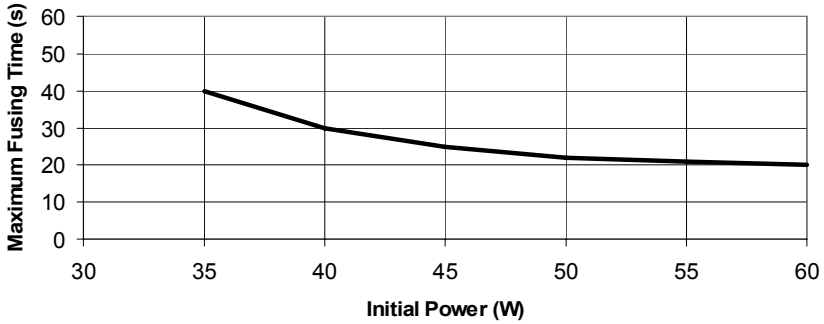
Note the voltage shown is the nett voltage across the resistor. The generator open circuit voltage will be higher due to the generator's internal impedance.



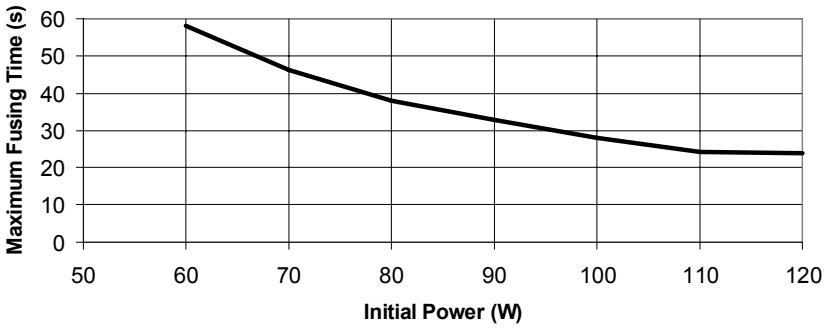
ULW4-10RJ has an energy limit of 4.3J and a 1.2/50µs peak voltage limit of 1.1kV.

Fusing Performance

ULW2 Fusing Characteristic



ULW3 & ULW4 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.

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Application Notes

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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.

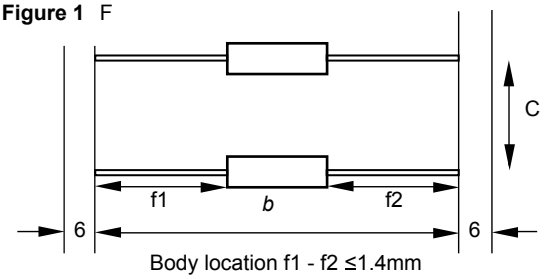
3.3 Limited Short Circuit testing should be performed in the complete appliance.

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. 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.

Dimensions (mm)		
Type	*b*	C
ULW2	52	5
ULW3	67	10
ULW4	63	10

Figure 1 F



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	