

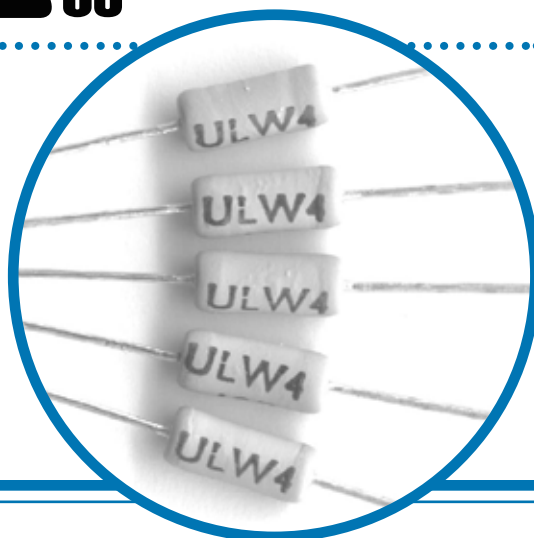
UL Recognised Wirewound Resistors



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

TT electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT electronics' own data and is considered accurate at time of going to print.



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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

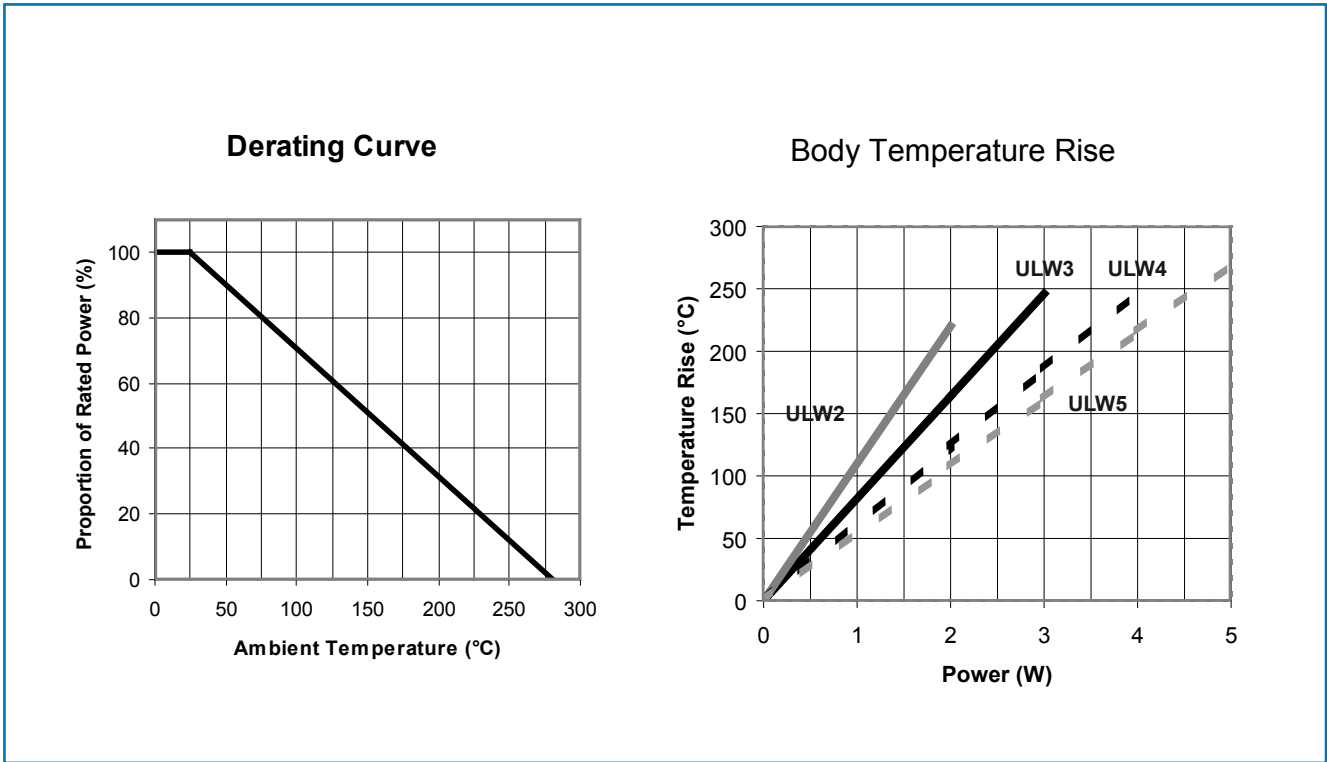
The resistor coating will not burn or emit incandescent particles under any condition of applied temperature or power overload.

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

* Addition of 0.01Ω applies

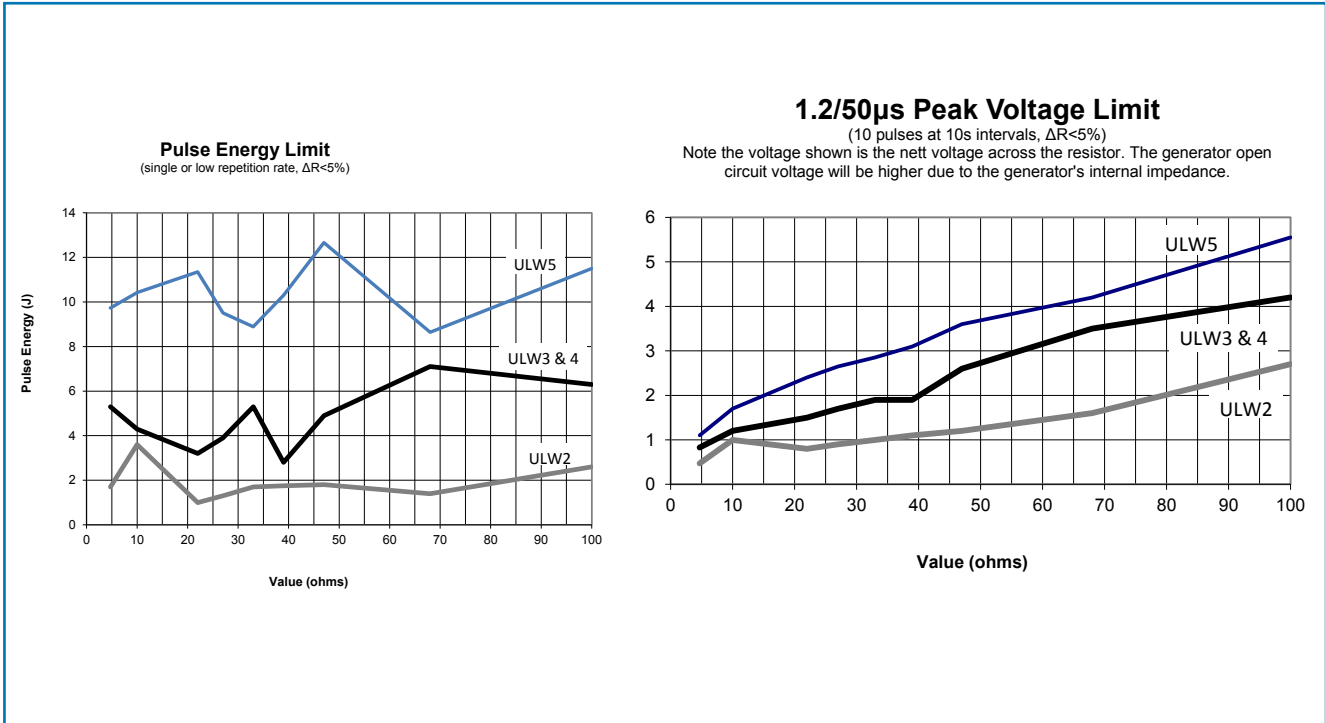
Thermal Performance



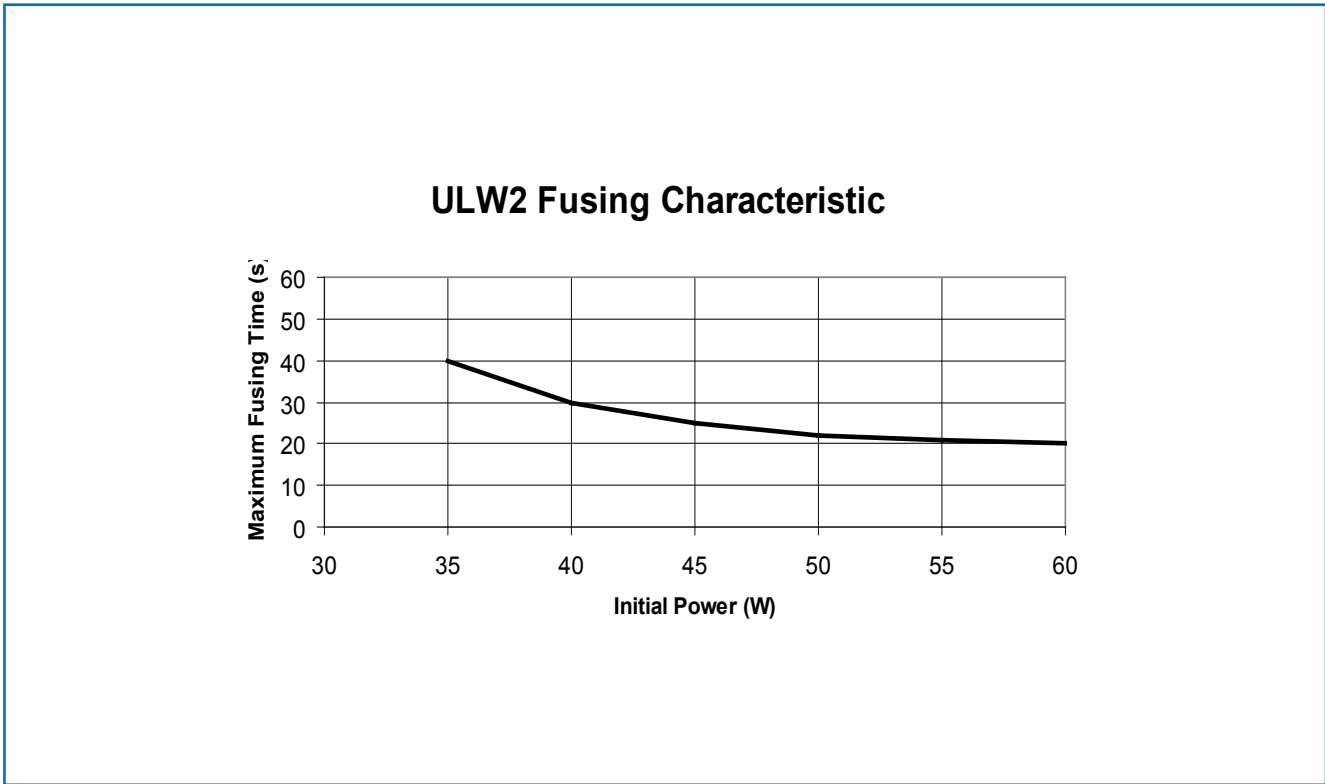
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Pulse Performance

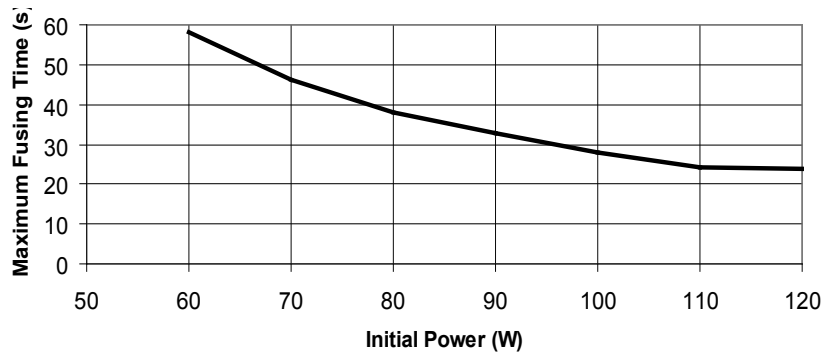


Fusing Performance

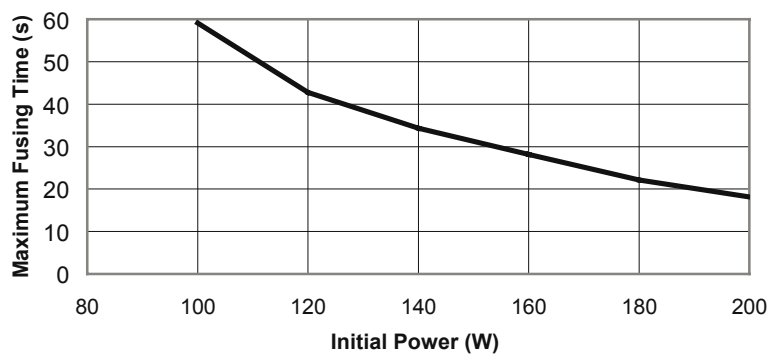


Fusing Performance

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.

General Note

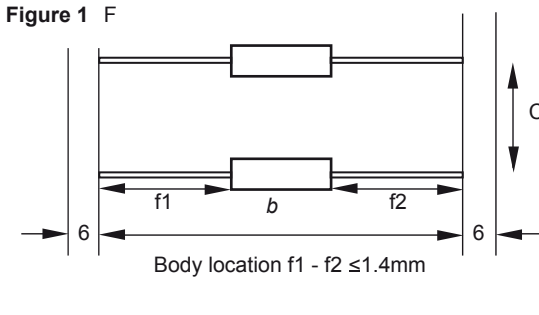
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Packaging

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.

Dimensions (mm)		
Type	<i>b</i>	C
ULW2	52	5
ULW3	67	10
ULW4	63	10
ULW5		

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%
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Packing _____

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

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