Fusible MELF Wirewound Resistors

FMW Series

Features:

- UL1412 recognised fusing*
- Compact SMD format
- Flameproof wirewound technology
- Failsafe mains fusing at 120 / 240V_{rms}
- Specified surge performance

* UL file number E234469

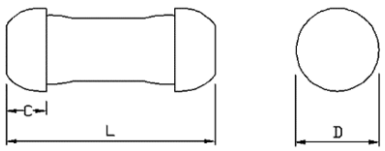
All parts are Pb-free and comply with EU Directive 2011/65/EU amended by (EU) 2015/863 (RoHS3)

Electrical Data

		FMW0309
Power rating at 70°C	W	1
5s overload rating	W	6.25
Resistance range	Ω	1R0 to 220R
Resistance tolerance	%	5
TCR	ppm/°C	±200
UL recognised standard values	Ω	Any value in the range 1R0 to 220R is recognised. E24 preferred.
Ambient temperature range	°C	-55 to +155

Physical Data

Dimensions in mm and weight in g				
Type	**L** ±0.5	**D** ±0.3	**C** min.	**Wt.** nom.
FMW0309	9	3.5	1.3	0.28



Construction

A high quality ceramic substrate is assembled with interference fit, tin plated end caps. 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.

Solderability

The pure tin finish produces ageing free contacts on which low melting point solders can be used. Dipped area shall be covered with a smooth and bright solder coating after three seconds immersion at 245°C.

Marking

FMW resistors are marked with five colour bands on a green body. The first four indicate value and the fifth indicates tolerance in conformance with IEC62.

Solvent Resistance

The component is resistant to all normal industrial cleaning solvents suitable for printed circuits.

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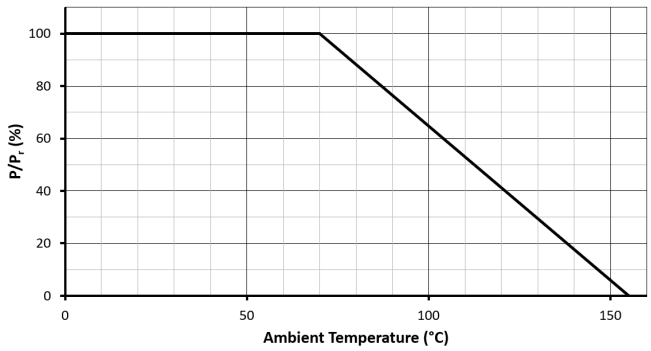
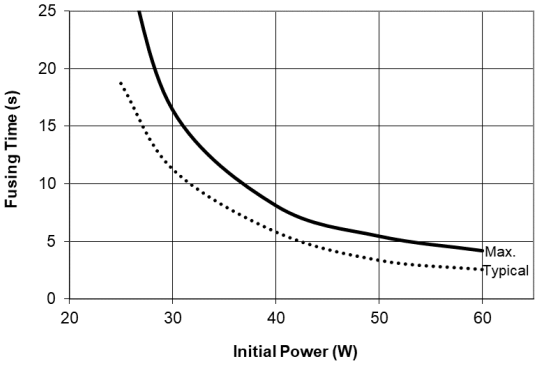
Performance Data

Test	Method		Maximum / Pass Criterion
Load life	1000 hours, cyclic load at 70°C	±ΔR%	5
Short term overload	6.25 × P_r for 5 s	±ΔR%	2
Resistance to solder heat	350 ± 10°C, 3 ± 0.5s	±ΔR%	1
Long term damp heat	56 days, 40°C/95%RH	±ΔR%	5
Temperature cycling	100 cycles, -55 to 155°C	±ΔR%	2
Single pulse	See Pulse Energy Limits graph below	±ΔR%	5
Surge 1.2/50µs	See Surge Performance graph below	±ΔR%	5
Fusing performance	See Fusing Characteristic graph below		
Solderability	245 ± 3°C, 3 ± 0.5s		>95% coverage

Temperature Derating



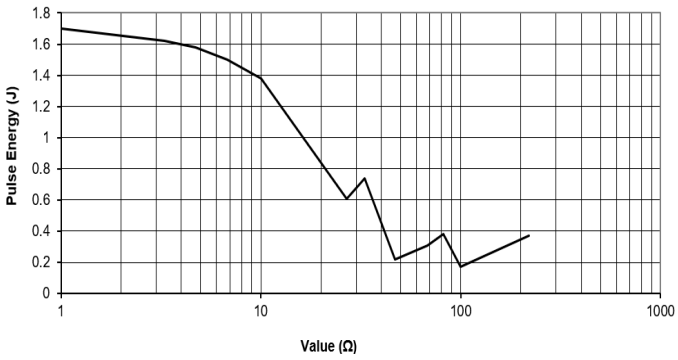
Fusing Characteristic



Note: After fusing the ohmic value is at least 100 times the initial value, provided initial power ≥ 28W is applied.

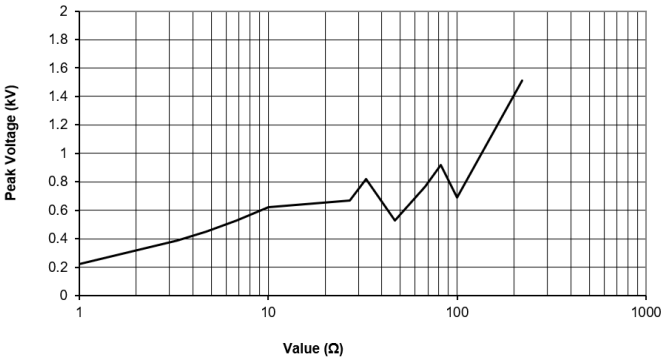
Pulse Energy Limits

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



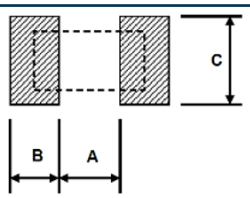
Surge Performance

(1.2/50µs, 10 pulses at 60s intervals, |ΔR|<5%)



Recommended Solder Pads

Dimensions in mm			
Type	**A**	**B**	**C**
FMW0309	5.2	3.4	4.2



Notes:

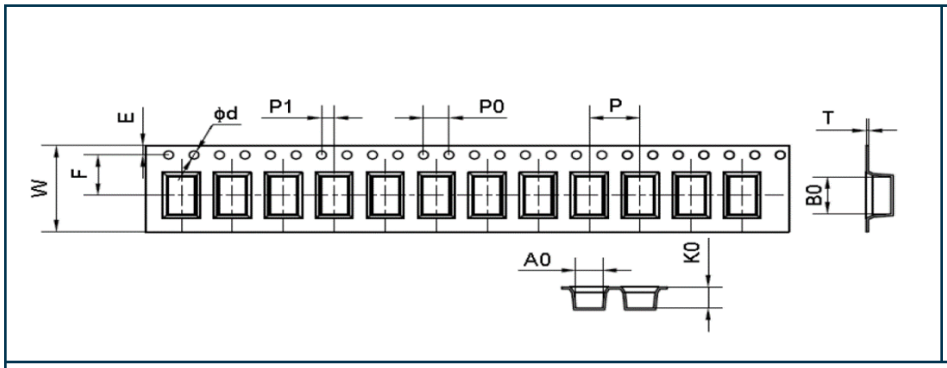
1. For correct fusing operation, avoid close thermal contact between mounting pads and large copper areas.
2. A PCB cutout between the mounting pads may be required. See Application Notes.

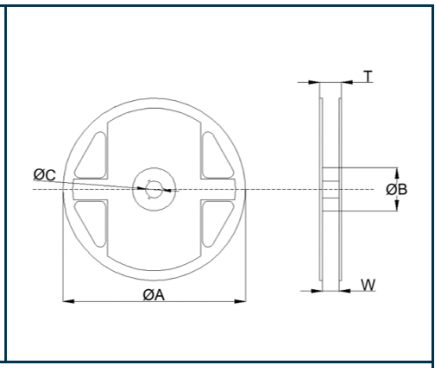
Application Notes

For the purposes of UL approval and safe fusing performance, the following points should be observed:

1. To protect against fire under all conditions of overload, a positive clearance of 13mm should be provided between the body of the resistor and any combustible materials.
2. If a possible failure mode leads to overload below the minimum fusing power or to a maximum fusing time exceeding 5s, then it is strongly recommended that a PCB cutout be provided between the mounting pads in order to avoid overheating of FR4 material.
3. A positive clearance of 13mm should be provided between the resistor and uninsulated parts of opposite polarity or uninsulated dead metal parts.
4. Limited Short Circuit testing should be performed in the complete appliance.

Packaging





All dimensions in mm (tolerances are ±0.1 unless otherwise stated)

Type	A0	B0	K0	P	Φd	E	F	W	T	P0	P1	øA	øB	øC	W	T	Qty
FMW0309	3.8	9.5	3.9	8	1.6 +0.1/-0	1.75	7.5	16 ±0.3	0.35 ±0.05	4	2	330 ±1.5	100 ±1.5	13 ±0.5	17 ±0.5	20 ±1	2000

Ordering Procedure

Example: FMW0309-47RJT2 (47 ohms ±5%, Pb-free)

F	M	W	0	3	0	9	-	4	7	R		J	T	2
1								2				3	4	

1 Type	2 Value	3 Tolerance	4 Packing
FMW0309	E24 3/4 characters R = ohms	J = ±5%	T2 = plastic tape, 2000/reel