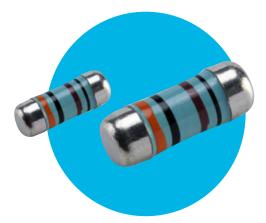
# Resistors

# **High Power MELF Resistors**

#### **WRM-HP** Series

- AEC-Q200 qualified
- High power up to 1W
- Tolerance down to ±0.1%
- TCR down to ±15ppm/°C
- High pulse handling capability





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

### **Electrical Data**

		WRM0204HP	WRM0207HP			
Power rating at 70°C	watts	0.4	1			
Resistance range	ohms	R10 -	1M0			
Limiting element voltage	volts	200	350			
Maximum overload voltage	volts	400	700			
TCR	ppm/°C	15, 25, 50, 100	15, 25, 50, 100			
Resistance tolerance	%	0.1, 0.25, 0.5, 1, 5				
Standard values		E24 & E96				
Thermal impedance	°C /W	200	140			
Ambient temperature range	°C	-55 to +155				
Insulation resistance	ohms	>1010				
Voltage proof	volts	284 497				

# **Physical Data**

Dimensions (mm) and weight (g)						L	
Туре	L max	D max	D1 max	K min	L <sup>1</sup> min	Weight	
WRM 0204HP	3.7	1.55	1.55	0.7	1.5	0.02	
WRM 0207HP	6.1	2.4	2.4	1.2	2.9	0.08	L1 K

### Construction

A metal film is deposited onto a high dissipation ceramic former to which tin plated terminating caps are fitted.

The resistor is adjusted to value by a helical cut in the film and the body is protected by a lacquer coating.

### Marking

Resistance values are colour coded with three or four bands, indicating value and multiplier.

### Terminations

Material Plated steel cap.

Solderability The pure tin finish produces ageing free contacts on which low melting solders can be used. Dipped area shall be covered with a smooth and bright solder coating after 3 seconds immersion at 215°C.

### Solvent Resistance

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

#### General Note

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### TCR and Tolerance Range

Туре	TCR (±ppm/°C)	Tolerance (±%)						
		5	1	0.5	0.25	0.1		
	±100	OR1-	-1M0	-	-	-		
WRM0204HP	±50	0R2 –	-1M0	10R-1M0				
WKIVIUZU4HP	±25	-	10R - 1M0					
	±15	-	10R – 300K					
	±100	OR1-	-1M0	-				
	±50	0R2 –	1M0	1R0 -	- 1M0	10R-1M0		
WRM0207HP	±25	-	10R - 1M0					
	±15	_	10R – 300K					

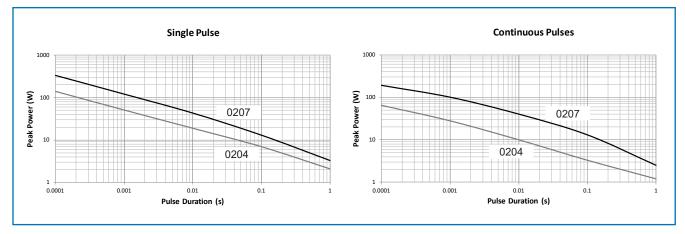
### Performance Data

		Maximum
Short time overload: 5s at lesser of 6.25 x rated power or 2 x LEV	±ΔR%	0.15
Biased humidity: 1000hrs 85°C/85%RH 10% of rated power	±ΔR%	0.15
Surge test: IEC 60115-1, 10/700 $\mu s$ at lesser of $V(P_{70}.R)$ & 2 x LEV	±ΔR%	0.15
High temperature exposure: 1000hrs at 155°C	±ΔR%	0.3
Bending test: 2mm deflection for 60s	±ΔR%	0.05
Resistance to soldering heat: 260±5°C for 10s	±ΔR%	0.15
Temperature rapid change: 1000cycles-55/125°C	±ΔR%	0.2
Endurance: 1000hrs rated power at 70°C (For endurance at 8000hrs multiply stability by 2, for endurance at 225,000hrs multiply stability by 6)	±ΔR%	0.25
Mechanical shock: half-sine waveform, peak 100g, duration 6ms	±ΔR%	0.1
Vibration: 5g for 20min, 12 cycles each of 3 orientations, 10-2000Hz	±ΔR%	0.15
ESD: 2kV human body model	±ΔR%	0.5
Solderability: 245±5°C for 3s		>95% coverage
Voltage proof: 1.42 x LEV		No breakdown or flashover

# Pulse & Thermal Performance

Single Pulse: 50 rectangular pulses applied at 60s intervals such that mean power is <10% of rated power. Maximum permitted change ±1%.

Continuous Pulses: Continuous rectangular pulses applied at intervals such that mean power is equal to the rated power. Maximum permitted change ±1%.



#### General Note

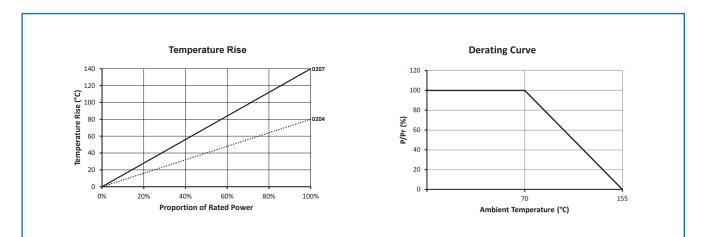
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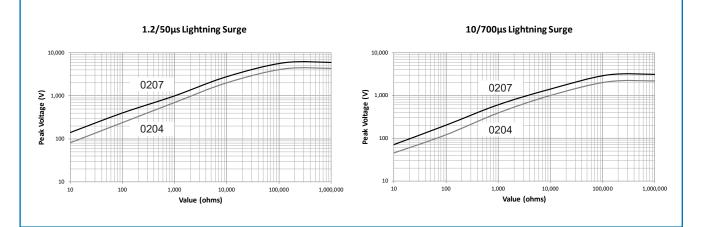


#### **WRM-HP** Series



#### Lightning Surge Performance

Resistors are tested in accordance with IEC 60115-1 using both 1.2/50µs and 10/700µs pulse shapes. 10 pulses are applied. The limit of acceptance is a shift in resistance of less than 0.5% from the initial value.



# **Ordering Procedure**

Example: WRM0204HPC-2K49FT3 (WRM0204HP, 50ppm/°C, 2.49 kilohms ±1%, Pb-free)

W R M 0 2 0 4 H P	C -	2 K 4 9	F	T 3
1	2	3	4	5

1	2	3	4			5
Туре	TCR	Value	Tolerance		Packing	
WRM0204HP	Y = ±15ppm/°C	3/4 characters	B = ±0.1%	T3	0204	3000 / 7" reel
WRM0207HP	D = ±25ppm/°C		C = ±0.25%	T2	0207	2000 / 7" reel
	C = ±50ppm/°C		D = ±0.5%			
	Z = ±100ppm/°C	M = megohms	F = ±1%			
			J = ±5%			

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