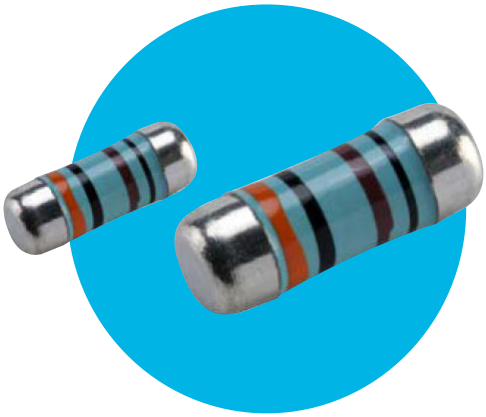
Resistors

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

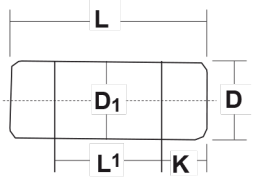
All parts are Pb-free and comply with EU Directive 2011/65/EU amended by (EU) 2015/863 (RoHS3)

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	$>10^{10}$	
Voltage proof	volts	284	497

Physical Data

Dimensions (mm) and weight (g)						
Type	L max	D max	D1 max	K min	L^1 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



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.

TCR and Tolerance Range

Type	TCR (±ppm/°C)	Tolerance (±%)				
		5	1	0.5	0.25	0.1
WRM0204HP	±100	0R1 – 1M0		–	–	–
	±50	0R2 – 1M0		1R0 – 1M0		10R – 1M0
	±25	–	10R – 1M0			
	±15	–	10R – 300K			
WRM0207HP	±100	0R1 – 1M0		–	–	–
	±50	0R2 – 1M0		1R0 – 1M0		10R – 1M0
	±25	–	10R – 1M0			
	±15	–	10R – 300K			

Performance Data

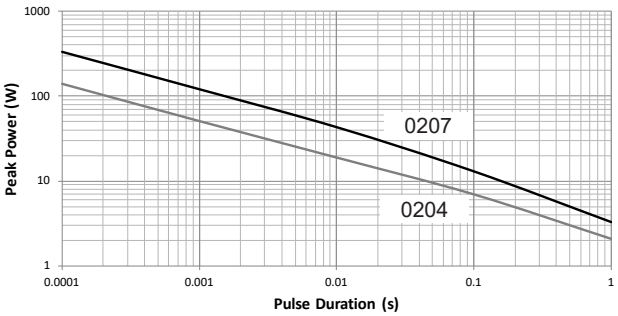
		Maximum
Short time overload: 5s at lesser of 6.25 x rated power or 2 x LEV	±ΔR%	0.15
Biased humidity: 1000hrs 85°C/85%RH 10% of rated power	±ΔR%	0.15
Surge test: IEC 60115-1, 10/700µs at lesser of $V(P_{70}.R)$ & 2 x LEV	±ΔR%	0.15
High temperature exposure: 1000hrs at 155°C	±ΔR%	0.3
Bending test: 2mm 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

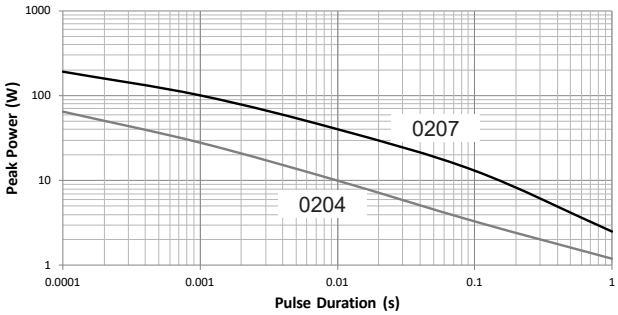
Single Pulse: 50 rectangular pulses applied at 60s intervals such that mean power is <10% of rated power. Maximum permitted change ±1%.

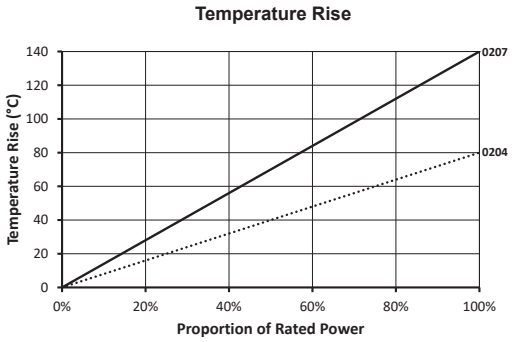
Continuous Pulses: Continuous rectangular pulses applied at intervals such that mean power is equal to the rated power. Maximum permitted change ±1%.

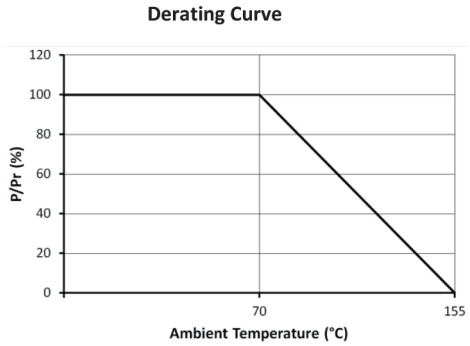
Single Pulse



Continuous Pulses

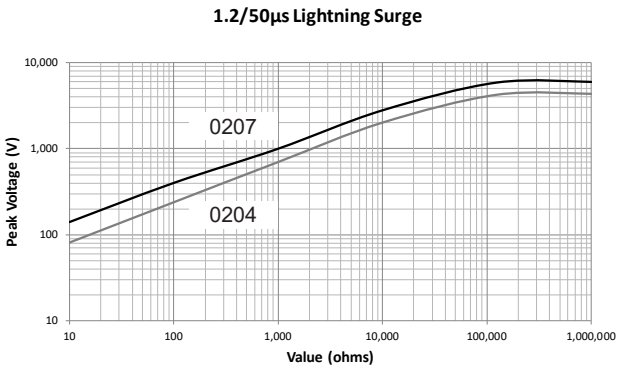


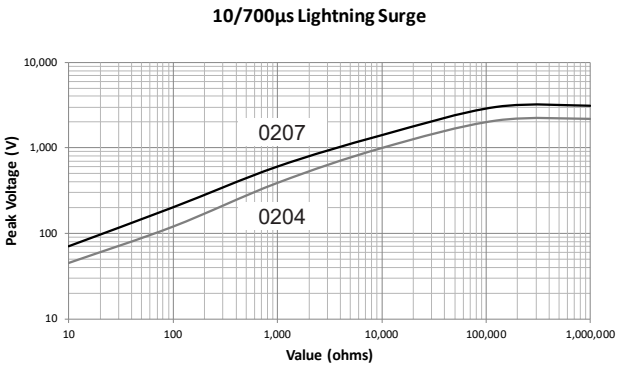




Lightning Surge Performance

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 Type	2 TCR	3 Value	4 Tolerance	5 Packing		
WRM0204HP	Y = ±15ppm/°C	3/4 characters R = ohms K = kilohms M = megohms	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		F = ±1%			
			J = ±5%			

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

TT Electronics:

WRM0204HPC-R91FT3 WRM0204HPC-510KBT3 WRM0204HPC-4R7FT3 WRM0204HPC-150RBT3 WRM0204HPC-15KFT3 WRM0204HPC-2K2BT3 WRM0204HPC-39RFT3 WRM0204HPC-110RFT3 WRM0204HPC-240RFT3 WRM0204HPC-3K3BT3 WRM0204HPC-620RBT3 WRM0204HPC-12KFT3 WRM0204HPC-91RBT3 WRM0204HPC-6K2BT3 WRM0204HPC-220RBT3 WRM0204HPC-160KBT3 WRM0204HPC-20KFT3 WRM0204HPC-10RBT3 WRM0204HPC-2K0FT3 WRM0204HPC-24RFT3 WRM0204HPC-13KBT3 WRM0204HPC-6R2FT3 WRM0204HPC-1K1BT3 WRM0204HPC-62KBT3 WRM0204HPC-3K6FT3 WRM0204HPC-5R6FT3 WRM0204HPC-12RFT3 WRM0204HPC-180KBT3 WRM0204HPC-3K9BT3 WRM0204HPC-15RBT3 WRM0204HPC-300KBT3 WRM0207HPC-1K0FT2 WRM0204HPC-1K8BT3 WRM0204HPC-12RBT3 WRM0204HPC-47KFT3 WRM0204HPC-130KBT3 WRM0204HPC-300KFT3 WRM0204HPC-30RFT3 WRM0204HPC-91KBT3 WRM0204HPC-330RBT3 WRM0204HPC-130RBT3 WRM0204HPC-620KFT3 WRM0204HPC-4R3FT3 WRM0204HPC-160RFT3 WRM0204HPC-200RFT3 WRM0204HPC-2K0BT3 WRM0204HPC-R75FT3 WRM0207HPC-100KFT2 WRM0204HPC-R30FT3 WRM0204HPC-3R0FT3 WRM0204HPC-2R2FT3 WRM0204HPC-11KBT3 WRM0204HPC-56KBT3 WRM0204HPC-3R3FT3 WRM0204HPC-390KBT3 WRM0204HPC-11RBT3 WRM0204HPC-27RFT3 WRM0204HPC-2R4FT3 WRM0204HPC-270KBT3 WRM0204HPC-160RBT3 WRM0204HPC-20RBT3 WRM0204HPC-56RFT3 WRM0204HPC-51KBT3 WRM0204HPC-120KBT3 WRM0204HPC-15KBT3 WRM0204HPC-750KBT3 WRM0204HPC-16KFT3 WRM0204HPC-43KFT3 WRM0204HPC-820RBT3 WRM0204HPC-2R0FT3 WRM0204HPC-36KFT3 WRM0204HPC-180KFT3 WRM0204HPC-910KBT3 WRM0204HPC-22KFT3 WRM0204HPC-15RFT3 WRM0204HPC-910RBT3 WRM0204HPC-62RFT3 WRM0204HPC-68RBT3 WRM0204HPC-560RBT3 WRM0204HPC-1R2FT3 WRM0204HPC-1R6FT3 WRM0204HPC-R62FT3 WRM0204HPC-110KFT3 WRM0204HPC-2R7FT3 WRM0204HPC-180RFT3 WRM0204HPC-430RBT3 WRM0204HPC-5K6BT3 WRM0204HPC-R24FT3 WRM0204HPC-33KBT3 WRM0204HPC-62RBT3 WRM0204HPC-4K7BT3 WRM0204HPC-62KFT3 WRM0204HPC-43RFT3 WRM0204HPC-820KFT3 WRM0204HPC-43KBT3 WRM0204HPC-200KFT3 WRM0204HPC-390RFT3 WRM0204HPC-1K3BT3 WRM0204HPC-560RFT3 WRM0204HPC-51RBT3