

High Voltage MELF Resistors

WRM-HV Series



Features:

- High limiting element voltage up to 1.2kV
- 1.2/50 μ s surge voltage to 6kV
- Tolerance down to 0.1%
- TCR down to 25ppm/ $^{\circ}$ C
- AEC-Q200 qualified



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

Electrical Data

| | | WRM0204HV | WRM0207HV |
|-------------------------------|-------------------|---|-----------|
| Power rating @70 $^{\circ}$ C | W | 0.4 | 1 |
| Resistance range | ohms | 100K – 10M | |
| Limiting element voltage | V | 700 | 1200 |
| Maximum overload voltage | V | 1400 | 2400 |
| TCR | ppm/ $^{\circ}$ C | \leq 3M4: 25, 50 $>$ 3M4: 50 | |
| Resistance tolerance | % | \leq 1M0: 0.1, 0.25, 0.5, 1 $>$ 1M0: 0.5, 1 | |
| Standard values | | E24 & E96 | |
| Thermal impedance | $^{\circ}$ C/W | 200 | 140 |
| Ambient temperature range | $^{\circ}$ C | -55 to +155 | |
| Insulation resistance | ohms | $>10^{10}$ | |
| Voltage proof | V | 990 | 1700 |

Physical Data

| Dimensions in mm and weight in g | | | | | | | |
|----------------------------------|----------|----------|-----------|----------|-----------|-------------|--|
| Type | L max | D max | D1 max | K min | L1 min | Wt. nom. | |
| WRM0204HV | 3.7 | 1.55 | 1.55 | 0.7 | 1.5 | 0.02 | |
| WRM0207HV | 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 $^{\circ}$ C.

Solvent Resistance

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

Performance Data

| | | Maximum (+0.01Ω) |
|--|------|---------------------------|
| Short term overload: Lesser of 6.25xP _r or 2xLEV for 5s | ±ΔR% | 0.15 |
| Biased humidity: 1000hrs 85°C/85%RH 10% of P _r (≤100V) | ±ΔR% | ≤332K: 0.25 >332K: 1 |
| High temperature exposure: 1000 hours at 155°C | ±ΔR% | ≤332K: 0.25 >332K: 0.5 |
| Bending test: 2mm deflection for 60s | ±ΔR% | 0.5 |
| Resistance to solder heat: 260±5°C for 10s | ±ΔR% | 0.25 |
| Temperature rapid change: 1000 cycles -55/125°C | ±ΔR% | 1 |
| Endurance: P _r for 1000 hours at 70°C | ±ΔR% | ≤332K: 0.25 >332K: 0.5 |
| Solderability: 245±5°C for 3s | | >95% coverage |
| Voltage proof: 1.42 x LEV | | No breakdown or flashover |
| Mechanical shock: half-sine, 100g peak, 6ms | ±ΔR% | 0.25 |
| ESD: human body model, 0204: 2kV, 0207: 4kV | ±ΔR% | 0.5 |
| Vibration: 5g for 20min, 12 cycles each of 3 orientations, 10 – 2000Hz | ±ΔR% | 0.5 |
| Terminal strength: 1.8kg for 60s | ±ΔR% | No breakage |
| Flammability: UL94-V0 or V1 | | Pass |

Pulse & Thermal Performance

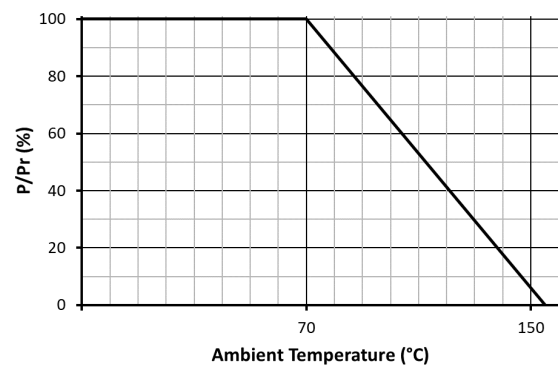
Pulse Performance

| Peak surge voltage | WRM0204HV | WRM0207HV |
|--------------------|-----------|-----------|
| 1.2/50μs | 4.5kV | 6kV |
| 10/700μs | 2.2kV | 3kV |

Note 1: Apply 10 pulses of alternating polarity.

Note 2: Pass criterion is |ΔR| < 0.5%.

Derating Curve



Packaging

WRM0204HV resistors are supplied in 8mm plastic tape on 7" reels. WRM0207HV resistors are supplied in 12mm plastic tape on 7" reels. Packing complies with the requirements of IEC286-3.

Ordering Procedure

Example: WRM0204HVC-1M0FT3 (WRM0204HV, 50ppm/°C, 1 megohm ±1%, Pb-free)

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W | R | M | 0 | 2 | 0 | 4 | H | V | C | - | 1 | M | 0 | | F | T | 3 |
| 1 | | | | | | | | | | 2 | 3 | | | 4 | 5 | | |

| 1 | 2 | 3 | 4 | 5 |
|-----------|---------------|---|------------|------------------------|
| Type | TCR | Value | Tolerance | Packing |
| WRM0204HV | D = ±25ppm/°C | E24/E96 3/4 characters K = kilohms M = megohms | B = ±0.1% | T3 0204 3000 / 7" reel |
| WRM0207HV | C = ±50ppm/°C | | C = ±0.25% | T2 0207 2000 / 7" reel |
| | | | D = ±0.5% | |
| | | | F = ±1% | |