

MELF Resistors

WRM Series

- AEC-Q200
- High reliability
- Predictable pulse handling capability
- Tolerances down to 0.1%
- TCR down to 5 ppm/°C



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

Electrical Data

| | | WRM 0102 | WRM 0204 | WRM 0207 |
|---------------------------------------------|--------|----------------------|------------------------|-----------------|
| Power rating @70°C | watts | 0.2 | 0.25 | 0.4 |
| Resistance Range | ohms | 1R0- 1M0 | R22-5M1 | R22- 4M7 |
| Limiting element voltage | volts | 200 | 200 | 250 |
| TCR | ppm/°C | 15, 25, 50, 100 | 5, 10, 15, 25, 50, 100 | 15, 25, 50, 100 |
| Resistance tolerance | % | 0.1, 0.25, 0.5, 1, 5 | | |
| Standard values | | E24 & E96 | | |
| Thermal impedance | k/W | 250 | 200 | 140 |
| Ambient temperature range | °C | -55 to +155 | -55 to +125 | |
| Insulation resistance | ohms | >10 ¹⁰ | | |
| Zero ohm jumper current rating | amps | 2 | | 4 |
| Zero ohm jumper maximum residual resistance | mΩ | 15 | | |

Physical Data

| Dimensions (mm) & weight (g) | | | | | | | |
|------------------------------|-------|-------|--------------------|-------|--------------------|--------|--|
| Type | L max | D max | D ¹ max | K min | L ¹ min | Weight | |
| WRM 0102 | 2.3 | 1.35 | 1.3 | 0.3 | 1.1 | 0.01 | |
| WRM 0204 | 3.7 | 1.55 | 1.55 | 0.5 | 1.5 | 0.02 | |
| WRM 0207 | 6.1 | 2.4 | 2.4 | 0.5 | 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 four bands, three indicating value and one indicating the multiplier. (Note this describes standard marking, but certain values may still be supplied with the addition of a tolerance band following the 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

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.

TCR and Tolerance Range

| Type Reference | TCR | Tolerance | | | | |
|----------------|---------|-----------|------------|------------|------------|------------|
| | | 5% | 1.0% | 0.5% | 0.25% | 0.1% |
| WRM0102 | ±100ppm | 1R0- 1M0 | 1R0- 1M0 | - | - | - |
| | ±50ppm | 1R0- 1M0 | 1R0- 1M0 | 8R2- 1M0 | - | - |
| | ±25ppm | - | 49R9- 390K | 49R9- 200K | 100R- 82K | 100R- 82K |
| | ±15ppm | - | 100R- 56K | 100R- 56K | 100R- 56K | 100R- 56K |
| WRM0204 | ±100ppm | R22- R91 | - | - | - | - |
| | ±50ppm | - | 1R- 5M1 | 10R- 1M6 | 22R- 332K | 43R- 332K |
| | ±25ppm | - | 4R7- 500K | 10R- 500K | 22R- 402K | 43R- 332K |
| | ±15ppm | - | - | 10R- 221K | 22R- 221K | 43R- 221K |
| | ±10ppm | - | - | - | 22R- 221K | 43R- 221K |
| | ±05ppm | - | - | - | 100R- 100K | 100R- 100K |
| WRM0207 | ±100ppm | R22- R91 | - | - | - | - |
| | ±50ppm | - | 1R- 4M7 | 10R- 1M6 | - | - |
| | ±25ppm | - | 10R- 1M | 10R- 680K | 51R1- 330K | 100R- 100K |
| | ±15ppm | - | - | 51R1- 10K | 51R1- 10K | 100R- 10K |

* TC 10ppm & 5ppm is specified over the temperature range -10°C to +85°C.

Performance Data

| Test | Δ R/R | | | | |
|------------------------------|---------------------------|---------------------------|----------------|----------------|---------------|
| | 0204 and 0207 | | | 0102 | |
| | 75R - 100K | 10R - <75R & >100K - 332K | <10R & >332K | All values | |
| Short time overload* | ≤0.05% + 0.01Ω | ≤0.1% + 0.01Ω | ≤0.25% + 0.05Ω | ≤0.25% + 0.05Ω | |
| Bending test* | ≤0.05% + 0.01Ω | ≤0.1% + 0.01Ω | ≤0.25% + 0.05Ω | ≤0.25% + 0.05Ω | |
| Resistance to soldering heat | ≤0.05% + 0.01Ω | ≤0.1% + 0.01Ω | ≤0.25% + 0.05Ω | ≤0.25% + 0.05Ω | |
| Temperature rapid change | ≤0.05% + 0.01Ω | ≤0.1% + 0.01Ω | ≤0.25% + 0.05Ω | ≤0.25% + 0.05Ω | |
| Endurance* | | | | | |
| Load life | | | | | |
| | 1000h | ≤0.15% + 0.05Ω | ≤0.15% + 0.05Ω | ≤0.3% + 0.05Ω | ≤0.5% + 0.05Ω |
| | 8000h | ≤0.3% + 0.05Ω | ≤0.3% + 0.05Ω | ≤0.6% + 0.05Ω | ≤1.0% + 0.05Ω |
| | 225,000h | ≤0.9% + 0.05Ω | ≤0.9% + 0.05Ω | ≤1.8% + 0.05Ω | ≤3.0% + 0.05Ω |
| Climatic sequence* | ≤0.25% + 0.05Ω | ≤0.5% + 0.05Ω | ≤1.0% + 0.05Ω | ≤1.0% + 0.05Ω | |
| Damp heat steady state* | ≤0.25% + 0.05Ω | ≤0.5% + 0.05Ω | ≤1.0% + 0.05Ω | ≤1.0% + 0.05Ω | |
| Current noise | <0.05μV/V | <0.25μV/V | <3μV/V | <3μV/V | |
| Solderability | >95% coverage | | | | |
| Voltage coefficient | 0 to -0.5ppm/V | | | | |
| Voltage proof | No flashover or breakdown | | | | |

* Resistors to be mounted on a PC-board according to IEC 115-1, clause 4.27.1.

* AEC-Q200 approval applies to all values up to and including 3M4 at TCRs above 5ppm/°C and to zero ohm jumpers.

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.

WRM Series

Single Pulse

Maximum Pulse Load



Continuous Pulses

Maximum Pulse Load



Packaging

The WRM 0102 and 0204 resistors are supplied reeled on 8mm blister tape. WRM 0207 resistors are supplied on 12mm blister tape. Packaging complies with the requirements of IEC 286-3.

Ordering Procedure

Example: WRM0204C-1K0FI (WRM0204, 50ppm/°C, 1 kilohm ±1%, Pb-free)

Example: WRM0204-R000I (WRM0204, zero ohm jumper, Pb-free)



| 1 Type | 2 TCR | 3 Value | 4 Tolerance | 5 Packing | |
|-----------|-----------------|----------------------------------------------------------|-----------------|--------------|-----------------------------|
| WRM0102 | V = ±5ppm/°C | 3/4 characters R = ohms K = kilohms M = megohms | B = ±0.1% | I = Standard | |
| WRM0204 | T = ±10ppm/°C | | C = ±0.25% | 0102 | 3000 / 7" reel |
| WRM0207 | Y = ±15ppm/°C | R000 = Jumper | D = ±0.5% | 0204 | 3000 / 7" reel ¹ |
| | D = ±25ppm/°C | | F = ±1% | 0207 | 1500 / 7" reel |
| | C = ±50ppm/°C | | J = ±5% | | |
| | Z = ±100ppm/°C | | Omit for Jumper | | |
| | Omit for Jumper | | | | |

Note 1: High precision parts may be supplied on 1000 piece reels – please enquire

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.



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)

Факс: 8 (812) 320-02-42

Электронная почта: org@eplast1.ru

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.