

DATA SHEET

Product Name Resistors of Capacitor Voltage Balance

Part Name PRTM Series

Uniroyal Electronics Global Co., Ltd.

88 Longteng Road, Economic & Technical Development Zone, Kunshan, Jiangsu, China

Tel +86 512 5763 1411 / 22 /33

Email marketing@uni-royal.cn

Manufacture Plant Uniroyal Electronics Industry (kunshan) co., ltd.
Uniroyal Electronics Industry Co., Ltd.
Uniroyal Electronics Global Co.,Ltd Shenzhen Branch
Aeon Technology Corporation
Uniroyal Electronics Global Co.,Ltd Xiamen Branch
Kunshan Foss Electronic material Co., Ltd.

Brands *RoyalOhm* *UniOhm*



1. Scope

- 1.1 This specification for approve relates to the Resistors of Capacitor Voltage Balance manufactured by UNI-ROYAL.
- 1.2 Self-extinguishing .
- 1.3 Extremely small & sturdy mechanically safe .
- 1.4 Excellent flame & moisture resistance .
- 1.5 Too low or too high values on Wire-Wound & Power-film type can be supplied on a case to case basis.

2. Part No. System

The standard Part No. includes 14 digits with the following explanation:

2.1 1th ~4th digits

This is to indicate the Chip Resistor. Example: PRTM= Resistors of Capacitor Voltage Balance

1W~16W ($\geq 1W$)

| | | | | | | | | | |
|-------------|----|----|----|----|----|----|----|----|----|
| Wattage | 1 | 2 | 3 | 5 | 7 | 8 | 9 | 10 | 15 |
| Normal Size | 1W | 2W | 3W | 5W | 7W | 8W | 9W | AW | FW |

2.2.1 For power rating of 1watt to 16watt, the 5th digit will be a number or a letter code and the 6th digit will be the letters of W.

Example: 5W=5W

2.2.2 For power rating between20 watt to 99 watt, the 5th and the 6th digit will show the whole numbers of the power rating itself

Example: 20=20W

2.3 The 7th digit is to denote the Resistance Tolerance. The following letter code is to be used for indicating the standard Resistance Tolerance.

F=±1% G=±2% J=±5% K= ±10%

2.4 The 8th to 11th digits is to denote the Resistance Value.

2.4.1 For Cement Fixed Resistors the 8th digits will be coded with “W”or “P”to denote Wire-wound type or Power Film type respectively of the Cement Fixed Resistor product. The 9th to 11th please refer to point a) of item 4.

Example:

W12J=1.2Ω W12I=120Ω P503=50KΩ

2.5 The 12th, 13th & 14th digits.

2.5.1 The 12th digit is to denote the Packaging Type with the following codes:

B=Bulk/Box

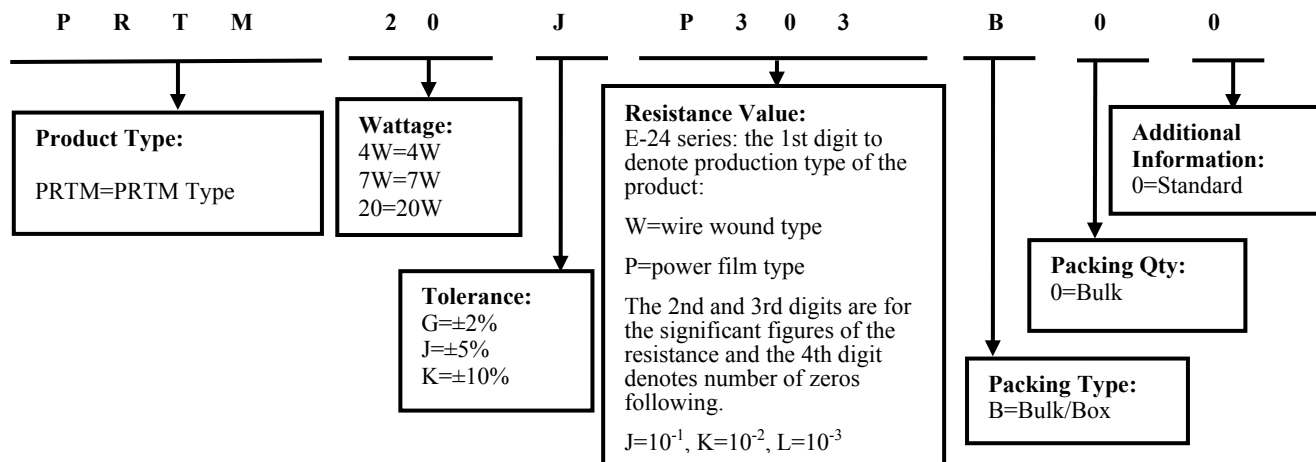
2.5.2 The 13th digit is normally to indicate the Packing Quantity, This digit should be filled with “0”for the Cement products with “Bulk/Box”packing requirements.

2.5.3 For some items, the 14th digit alone can use to denote special features of additional information with the following codes or standard product

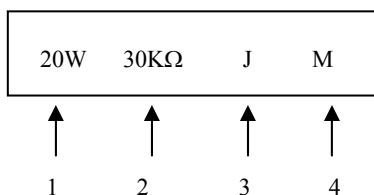
Example: 0= standard product

3. Ordering Procedure

(Example: PRTM 20W ±5% 30KΩ B/B)

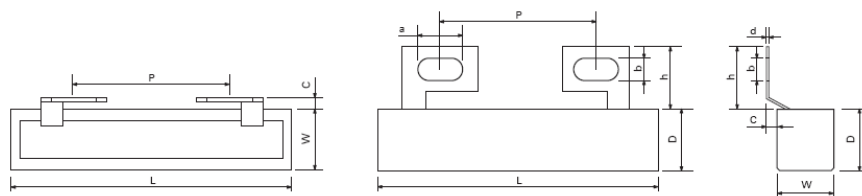


4. Marking



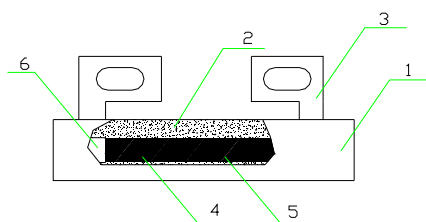
Code description and regulation:
 1. Wattage Rating
 2. Nominal Resistance Value
 3. Resistance Tolerance. J: ± 5% ; K: ± 10% 4.
 Pattern:
 M: Power film
 W: Wire wound
 Color of marking: Black Ink

5. Dimension



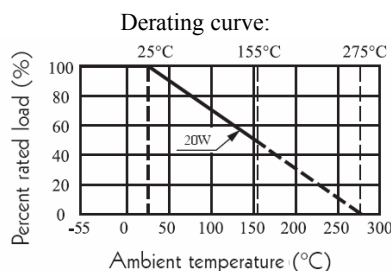
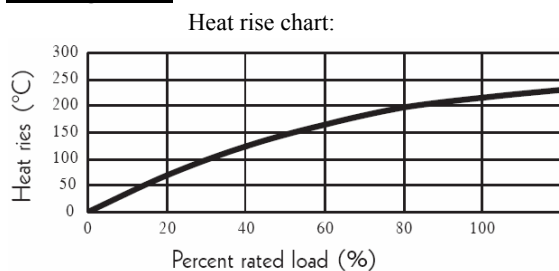
| Type | Resistance Range | Dimension(mm) | | | | | | | | |
|----------|------------------|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | | W ±1.0 | D ±1.5 | L ±1.5 | P ±1.5 | a ±0.8 | b ±0.5 | c ±0.5 | d ±0.1 | h ±1.0 |
| PRTM 4W | 1.3KΩ~200KΩ | 12.5 | 12.5 | 48.0 | 27.0 | 11.0 | 5.2 | 1.0 | 0.5 | 12.5 |
| PRTM 7W | | 12.5 | 12.5 | 63.0 | 27.0 | 11.0 | 5.2 | 1.0 | 0.5 | 12.5 |
| PRTM 20W | | 12.5 | 13.5 | 63.0 | 35.0 | 10.0 | 5.0 | 2.5 | 0.8 | 14.0 |

6. Construction



| NO. | NAME | MATERIAL GENERIC NAME |
|-----|-------------------|------------------------------------|
| 1 | Ceramic case | Al ₂ O ₃ CaO |
| 2 | Filling materials | SiO ₂ |
| 3 | Bracket | Iron |
| 4 | Resistor | Metal Oxide Film |
| 5 | Body | Al ₂ O ₃ |
| 6 | Cap | Iron |

7. Derating Curve



7.1 Voltage rating:

Resistors shall have a rated direct-current (DC) continuous working voltage or an approximate sine-wave root-mean-square (RMS) alternating-current (AC) continuous working voltage at commercial-line frequency and waveform corresponding to the power rating, as determined from the following formula:

$$RCWV = \sqrt{P \times R}$$

Where: RCWV = rated dc or RMS ac continuous working voltage at

commercial-line frequency and waveform (VOLT.)

P = power rating (WATT.)

R = nominal resistance (OHM)

8. Performance Specification

| Characteristic | Limits | Test Method (GB/T5729&JIS-C-5201&IEC60115) |
|---------------------------------|--|--|
| Temperature Coefficient | <20Ω: ±400PPM/°C max.. ≥ 20Ω: ±350PPM/°C max.. | 4.8 Natural resistance changes per temp. Degree centigrade $\frac{R_2-R_1}{R_1(t_2-t_1)} \times 10^6 \text{ (PPM/°C)}$ $\frac{R_3-R_1}{R_1(t_3-t_1)} \times 10^6 \text{ (PPM/°C)}$ R ₁ : Resistance Value at room temperature (t ₁) ; R ₂ : Resistance Value at upper limit temperature ± 2°C (t ₂) R ₃ : Resistance Value at lower limit temperature ± 3°C (t ₃) Test pattern : Room temperature : (t ₁) Upper limit temperature : (t ₂) Lower limit temperature : (t ₃) |
| Short-time overload | Resistance change rate must be in±(5%+0.05Ω) , and no mechanical damage. | 4.13 Permanent resistance change after the application of a potential of 2.5 times rcwv for 5 seconds. |
| Dielectric withstanding voltage | No evidence of flashover mechanical damage, arcing or insulation break down. | 4.7 Resistors shall be clamped in the trough of a 90°metallic V-block and shall be tested at AC potential respectively specified in the above list for 60-70 seconds.for cement fixed resistors the testing voltage is 1000V. |
| Resistance to soldering heat | Resistance change rate must be in ± (1%+0.05Ω) , and no mechanical damage. | 4.18 Permanent resistance change when leads immersed to a point 2.0-2.5mm from the body in 260°C±5°C solder for 10±1 seconds. |
| Rapid change of temperature | Resistance change rate must be in Wire-wound: ±5% Power Film:<100KΩ: ±5% ≥ 100KΩ: ±10% | 4.19 30 min at lower limit temperature and 30 min at upper limit temperature , 5 cycles. |
| Humidity (Steady state) | Resistance change rate must be in±(5%+0.05Ω) , and no mechanical damage. | 4.24 Temporary resistance change after 240 hours exposure in a humidity test chamber controlled at 40±2°C and 90~95%RH relative humidity |
| Load life in humidity | Resistance change rate must be in Wire-wound: ±5% Power Film:<100KΩ: ±5% ≥ 100KΩ: ±10% | 7.9 Resistance change after 1,000 hours (1.5 hours “ON”, 0.5 hour “OFF”) at RCWV in a humidity test chamber controlled at 40°C±2°C and 90 to 95% relative humidity. |
| Load life | Resistance change rate must be in Wire-wound: ±5% Power Film:<100KΩ: ±5% ≥ 100KΩ: ±10% | 4.25.1 permanent resistance change after 1,000 hours operating at RCWV with duty cycle of 1.5 hours “ON”, 0.5 hour “OFF” at 25°C±2°C ambient. |
| Low Temperature Storage | Resistance change rate must be in Wire-wound: ±5% Power Film:<100KΩ: ±5% ≥ 100KΩ: ±10% | 4.23.4 Lower limit temperature , for 2H. |
| High Temperature Exposure | Resistance change rate must be in Wire-wound: ±5% Power Film:<100KΩ: ±5% ≥ 100KΩ: ±10% | 4.23.2 Upper limit temperature , for 16H. |

9. Precaution for storage/Transportation

- 9.1. UNI-ROYAL recommend the storage condition temperature: 15°C~35°C, humidity :25%~75%.
 (Put condition for individual product).Even under UNI-ROYAL recommended storage condition, solderability of products over 1 year old.
 (Put condition for each product) may be degraded.
- 9.2. Store / transport cartons in the correct direction, which is indicated on a carton as a symbol.
 Otherwise bent leads may occur due to excessive stress applied when dropping of a carton.
- 9.3. Product performance and soldered connections may deteriorate if the products are stored in the following places:
 - a. Storage in high Electrostatic.
 - b. Storage in direct sunshine , rain and snow or condensation.
 - c. Where the products are exposed to sea winds or corrosive gases, including Cl₂, H₂S₃ NH₃, SO₂, NO₂.



10. Record

| Version | Description of amendment | Page | Date | Amended by | Checked by |
|---------|-----------------------------------|------|--------------|-------------|------------|
| 1 | First issue of this specification | 1~5 | Mar.20, 2018 | Chen Haiyan | Chen Nana |

Uniroyal Electronics Global Co., Ltd. , all rights reserved. Spec. herein would be changed at any time without prior notice