

DATA SHEET

Product Name Radial Terminal Type Resistors

Part Name PRTC、PRTD Series

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Brands *RoyalOhm* *UniOhm*



1. Scope

- 1.1 This specification for approve relates to the Radial Terminal Type Resistors 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 For Cement Fixed Resistors, these 4 digits are to indicate the product type but if the product type has only 3digits, the 4th digit will be “0”
 Example:

PRTC=PRTC type ; PRTD=PRTD type

2.2 5th~6th digits:

2.2.1 For power rating between 20 watt to 99watt, the 5th and the 6th digit will show the whole numbers of the power rating itself

Example:

40=40W

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

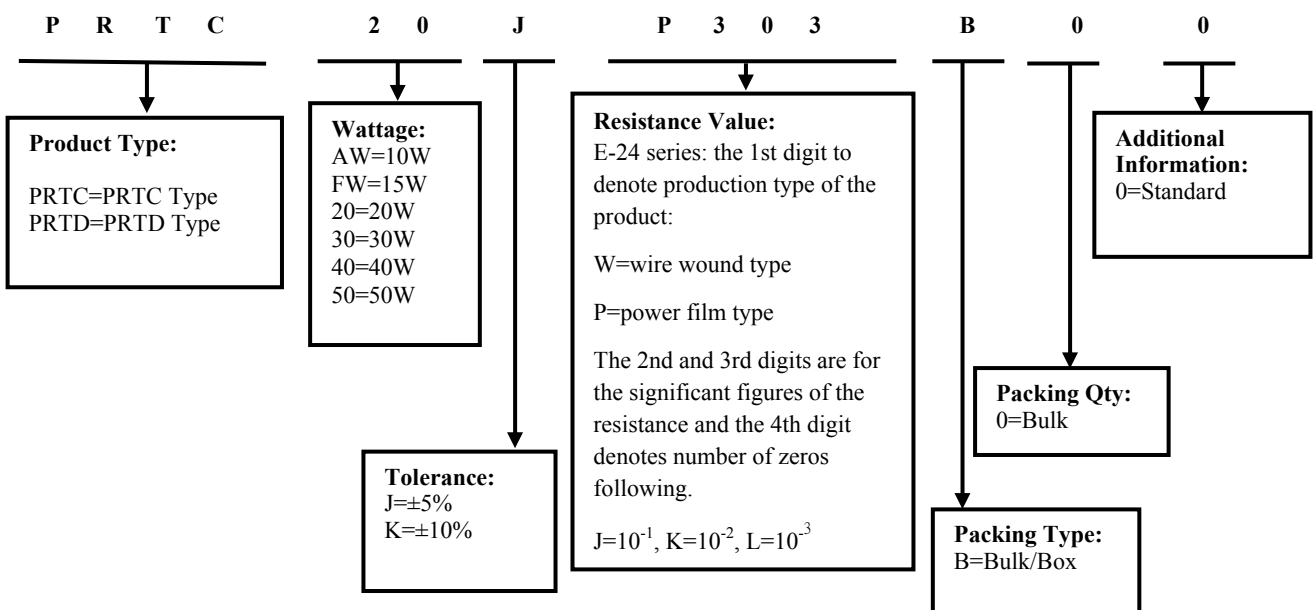
2.5.2 The 13th digit is normally to indicate the Packing Quantity, This digit should be filled with “0”for the Cement products with “Bulk/Box”packing requirements.

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

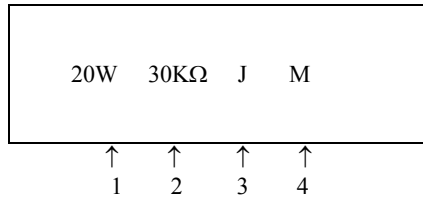
Example: 0= standard product

3. Ordering Procedure

(Example: PRTC 20W ±5% 30KΩ B/B)



4. Marking



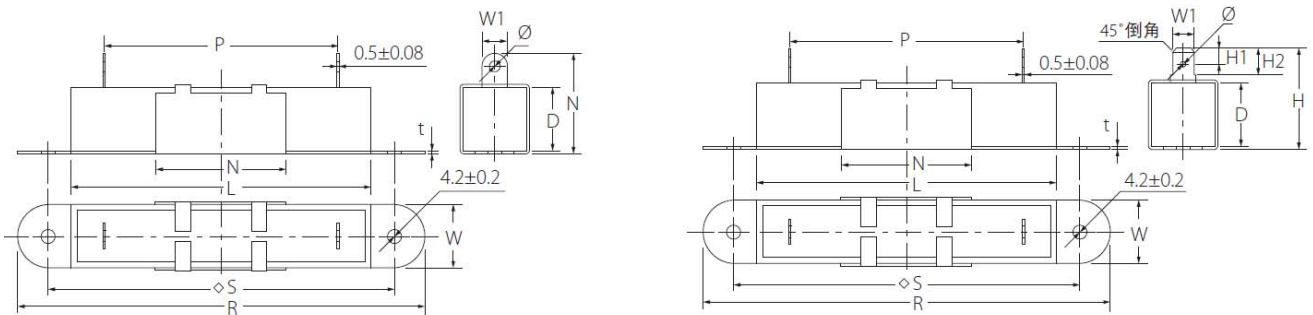
Code description and regulation:

- 1. Wattage Rating
- 2. Nominal Resistance Value
- 3. Resistance Tolerance. G=± 2%
 J: ± 5%
 K: ± 10%

4. Pattern:

M: Power film W: Wire wound
 Color of marking: Black Ink

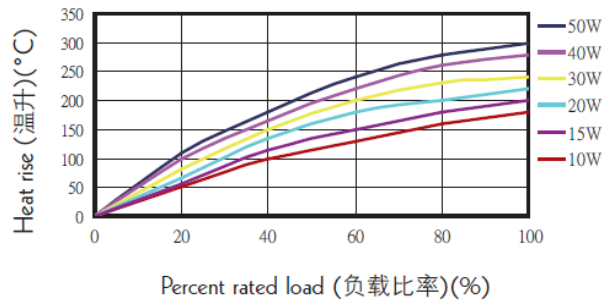
5. Ratings & Dimension



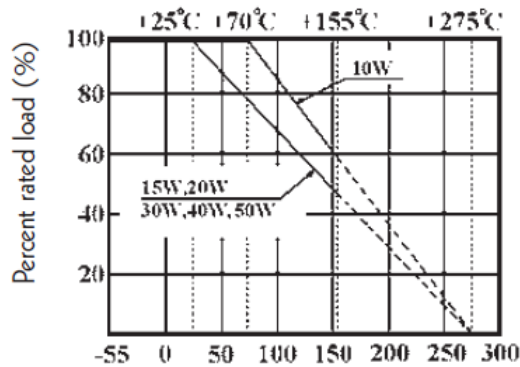
Type	Dimension(mm)													Resistance Range	
	W ±1	D ±1	L ±1.5	P ±1	H ±1	S ±0.5	R ±0.5	W1 ±0.3	W2 ±0.2	H1 ±0.2	H2 ±0.2	t ±0.1	Φ ±0.2	Wire Wound	Power Film
PRTC10W PRTD10W	10	9	48	32	18	60	72	6.3	8.0	4.6	8.0	0.8	2.5	1Ω ~820Ω	821Ω ~200KΩ
					19								1.6		
PRTC15W PRTD15W	12.5	11.5	48	32	21	60	72	6.3	7.6	4.6	8.0	0.8	2.5	1Ω ~1KΩ	1.1KΩ ~200KΩ
					23.5								1.6		
PRTC20W PRTD20W	12.5	13.5	63	44	21	74	86.5	6.3	7.6	4.6	8.0	0.8	2.5	2Ω ~1.2KΩ	1.3KΩ ~200KΩ
					25								1.6		
PRTC30W PRTD30W	19	19	75	54	32	88	105	6.3	7.6	4.6	8.0	0.8	2.5	3Ω ~1.5KΩ	/
					30								1.6		
PRTC40W PRTD40W	19	19	90	70	32	104	122	6.3	8.0	4.6	8.0	0.8	2.5	6Ω ~1.5KΩ	/
					32								1.6		
PRTC50W PRTD50W	19	19	90	70	32	104	122	6.3	8.0	4.6	8.0	0.8	2.5	6Ω ~1.5KΩ	/
					30								1.6		

6. Derating Curve

Heat rise chart:



Derating curve:



6.1 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:

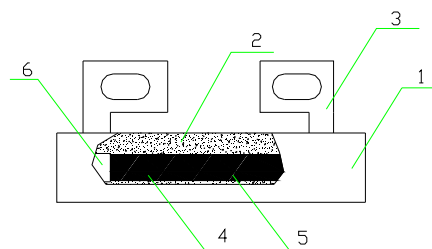
$$RCWV = \sqrt{P \times R}$$

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)

7. Structure



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

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 70°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. Note

- 9.1 UNI-ROYAL recommended 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	1~6	Mar.20, 2018	Chen Haiyan	Chen Nana

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