

# DATA SHEET

**Product Name** Radial Terminal Type Resistors

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**Part Name** PRTC、PRTD Series

**File No.** DIP-SP-044

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## 1. Scope

- 1.1 This datasheet is the characteristics of 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
- 1.6 Compliant with RoHS directive.
- 1.7 Halogen free requirement.

## 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 4<sup>th</sup> digit will be “0”  
Example:

PRTC=PRTC type ; PRTD=PRTD type

2.2 5<sup>th</sup>~6<sup>th</sup> digits:

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

Example:

40=40W

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

J=±5% K= ±10%

2.4 The 8<sup>th</sup> to 11<sup>th</sup> digits is to denote the Resistance Value.

2.4.1 For Cement Fixed Resistors the 8<sup>th</sup> 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 9<sup>th</sup> to 11<sup>th</sup> please refer to point a) of item 4.

Example:

W12J=1.2Ω W121=120Ω P503=50KΩ

2.5 The 12<sup>th</sup>, 13<sup>th</sup> & 14<sup>th</sup> digits.

2.5.1 The 12<sup>th</sup> digit is to denote the Packaging Type with the following codes:

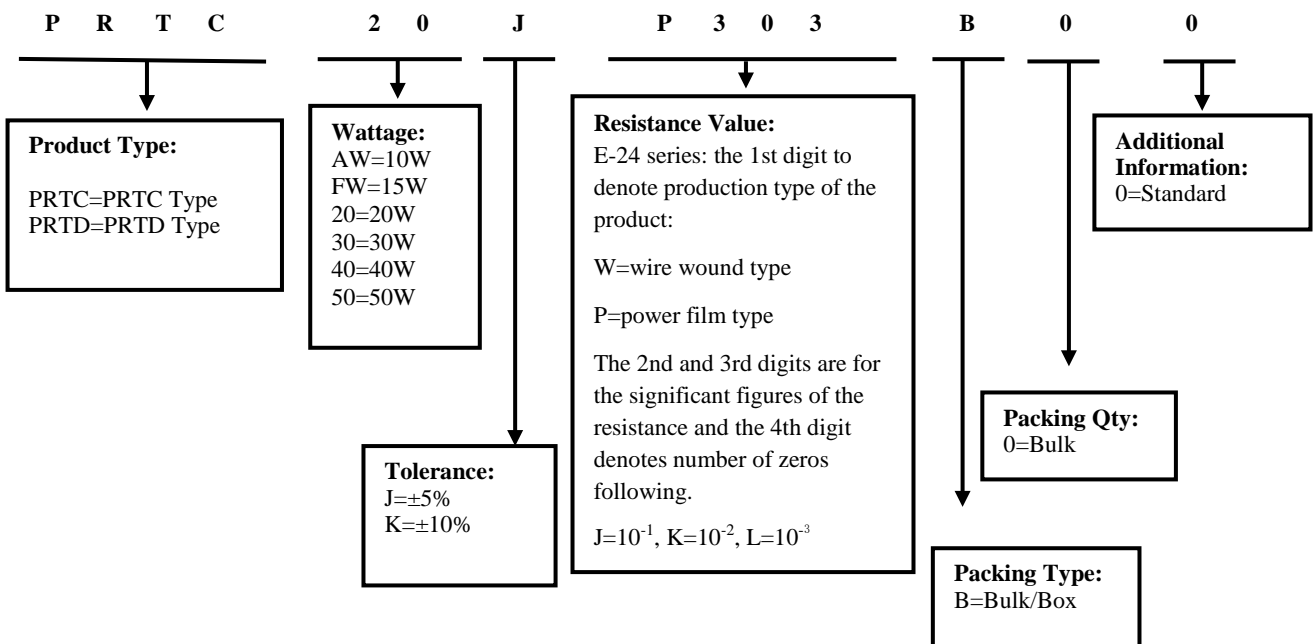
B=Bulk/Box

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

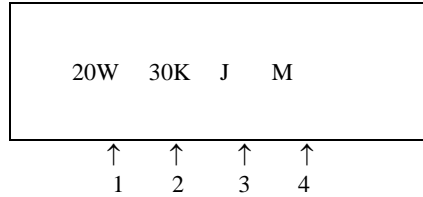
2.5.3 For some items, the 14<sup>th</sup> digit alone can use to denote special features of additional information with the following codes or standard product  
Example: 0= standard product

## 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%

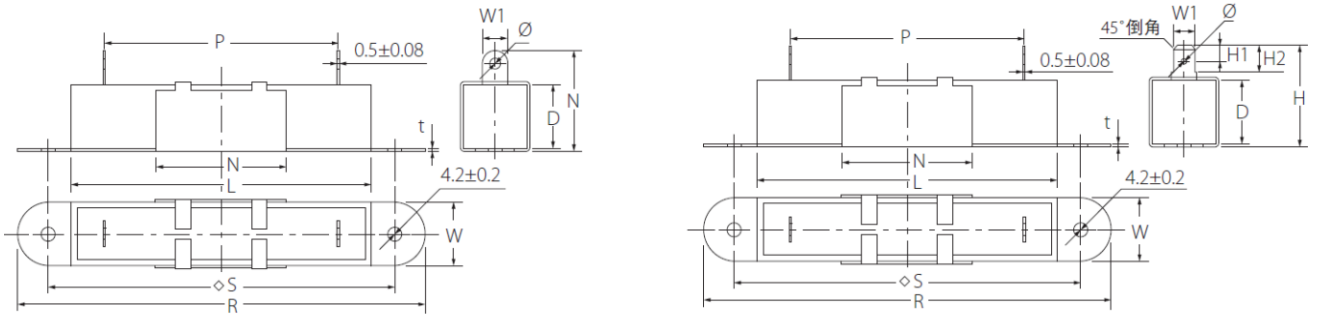
4. Pattern:

M: Power film          W: Wire wound

Color of marking: Black Ink

Note: The marking code shall be prevailed in kind!

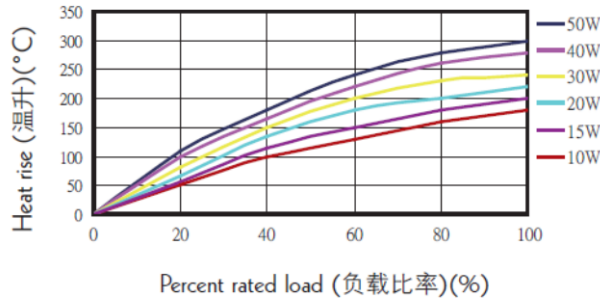
5. Ratings & Dimension



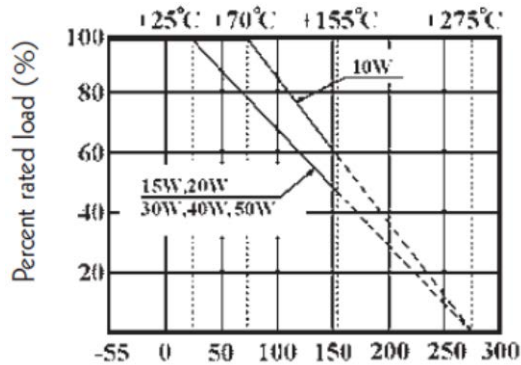
Type	Dimension(mm)													Resistance Range	
	W ±1	D ±1	L ±1.5	P ±1	H ±1	S ±0.5	R ±0.5	W1 ±0.3	W2 ±0.2	H1 ±0.2	H2 ±0.2	t ±0.1	Φ ±0.2	Wire Wound	Power Film
PRTC10W PRTD10W	10	9	48	32	18	60	72	6.3	8.0	4.6	8.0	0.8	2.5	1Ω ~820Ω	821Ω ~200KΩ
					19								1.6		
PRTC15W PRTD15W	12.5	11.5	48	32	21	60	72	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:

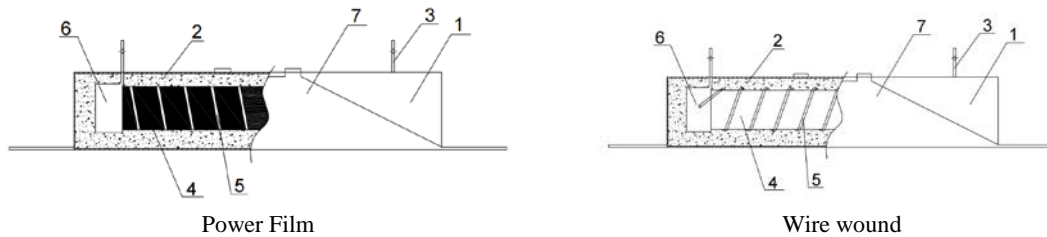
$$RCWV = \sqrt{P \times R}$$

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	Main Material Generic Name
1	Ceramic case	Al <sub>2</sub> O <sub>3</sub> , CaO
2	Filling materials	SiO <sub>2</sub>
3	Terminal lead	Iron ring
4	Resistance element	Power film: Metal Oxide Film Wire-wound: Alloys
5	Body	Al <sub>2</sub> O <sub>3</sub>
6	Cap	Tin plated iron
7	Bracket	Iron

## 8. Performance Specification

Characteristic	Limits	Test Methods (GB/T5729&JIS-C-5201&IEC60115-1)
Temperature Coefficient	<20Ω: ±400PPM/°C ≥20Ω: ±350PPM/°C	4.8 Natural resistance changes per temp. Degree centigrade $\frac{R_2 - R_1}{R_1(t_2 - t_1)} \times 10^6 \text{ (PPM/°C)}$ R <sub>1</sub> : Resistance Value at room temperature (t <sub>1</sub> ) ; R <sub>2</sub> : Resistance at test temperature (t <sub>2</sub> ) t <sub>1</sub> : +25°C or specified room temperature t <sub>2</sub> : Test temperature (-55°C or 125°C)
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 or Max.Overload Votage whichever less 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.
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 1000 hours (1.5 hours "ON" , 0.5 hours "OFF" ) at RCWV or Max.Working Voltage whichever less in a humidity test chamber controlled at 40±2°C and 93%±3% RH.
Load life	Resistance change rate must be in Wire-wound: ±5% Power Film:<100KΩ: ±5% ≥100KΩ: ±10%	4.25.1 Permanent Resistance change after 1000 hours operating at RCWV or Max.Working Voltage whichever less with duty cycle of 1.5 hours "ON" , 0.5 hour "OFF" at 25±2°C or 70±2°C ambient.
Low Temperature Storage	Resistance change rate must be in Wire-wound: ±5% Power Film:<100KΩ: ±5% ≥100KΩ: ±10%	IEC 60068-2-1 (Aa) Lower limit temperature , for 2H.
High Temperature Exposure	Resistance change rate must be in Wire-wound: ±5% Power Film:<100KΩ: ±5% ≥100KΩ: ±10%	MIL-STD-202 108A Upper limit temperature , for 16H.

## 9. Note

- 9.1. UNI-ROYAL recommend products store in warehouse with temperature between 15 to 35°C under humidity between 25 to 75%RH.  
Even under storage conditions recommended above, solder ability of products will be degraded stored over 1 year old.
- 9.2. Cartons must be placed in correct direction which indicated on carton, otherwise the reel or wire will be deformed.
- 9.3. Storage conditions as below are inappropriate:
  - a. Stored in high electrostatic environment
  - b. Stored in direct sunshine, rain, snow or condensation.
  - c. Exposed to sea wind or corrosive gases, such as Cl<sub>2</sub>, H<sub>2</sub>S, NH<sub>3</sub>, SO<sub>2</sub>, NO<sub>2</sub>, Br etc.

## 10. Record

Version	Description	Page	Date	Amended by	Checked by
1	First version	1~6	Mar.20, 2018	Haiyan Chen	Nana Chen
2	Modify characteristic	4~5	Feb.26, 2019	Haiyan Chen	Yuhua Xu
3	Modify characteristic	5	Nov.20,2020	Song Nie	Yuhua Xu
4	Modify the temperature coefficient test conditions	4	Nov.07, 2022	Haiyan Chen	Yuhua Xu
5	Modify the load life test conditions	5	Sep.28, 2024	Haiyan Chen	Yuhua Xu

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