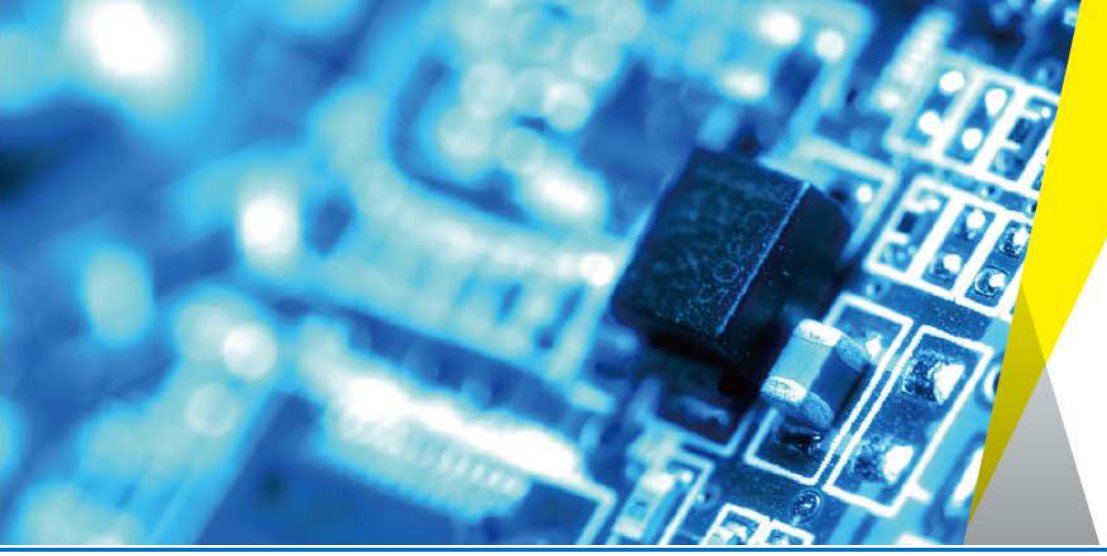


DATA SHEET

Product Name	**Radial Terminal Type Cement Fixed Resistors**
Part Name	**PRUA Series**
File No.	**DIP-SP-039**

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 Co., Ltd.
	Aeon Technology Corporation
	Royal Electronic Factory (Thailand) Co., Ltd.
	Royal Technology (Thailand) Co., Ltd.

1. Scope

This datasheet is the characteristics of Radial Terminal Type Cement Fixed Resistors manufactured by UNI-ROYAL.

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: PRUA=PRUA type

2.2 5th~6th digits:

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

Example: AW=10W FW=15W

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

Example: 30=30W 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.

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 & 10th digits are to denote the significant figures of the resistance and the 11th digit is the number of zeros following.

Example: W12J=1.2Ω W120=12Ω P273=27KΩ

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

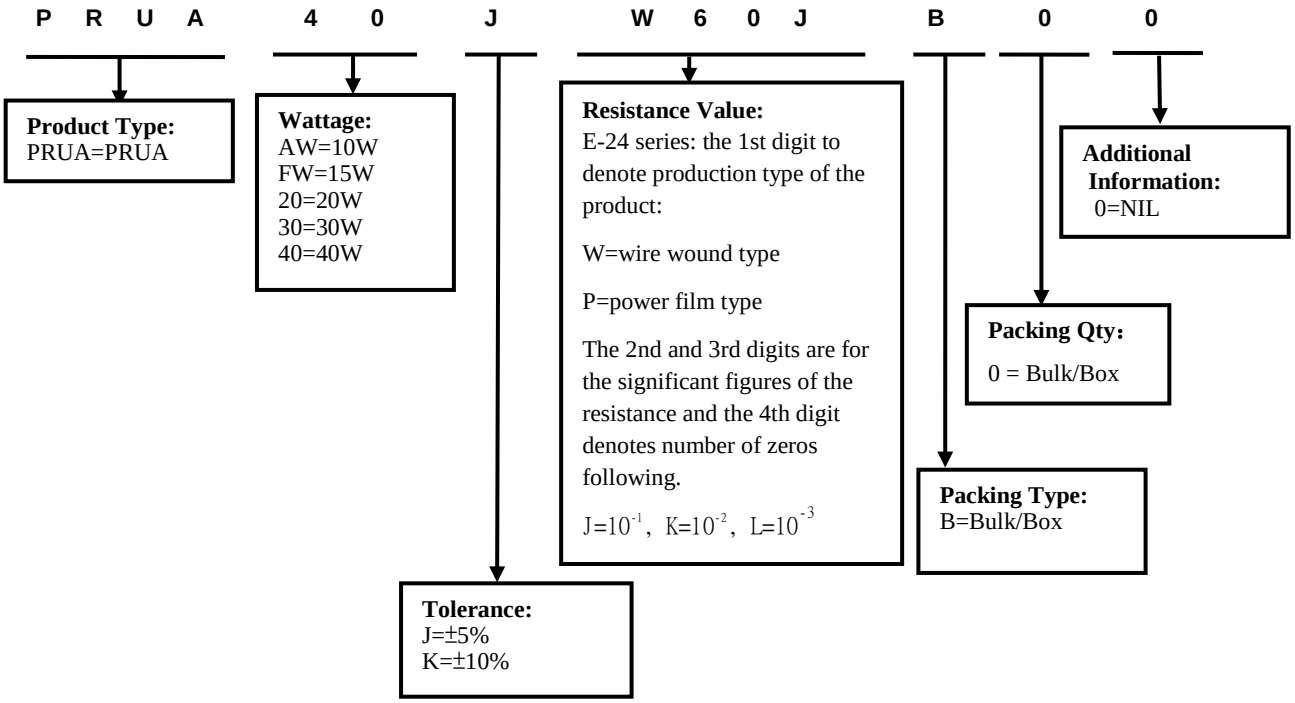
2.5.2 The 13th digit is normally to indicate the Packing Quantity, This digit should be filled with "0"for the Cement products with "Bulk/Box"packing requirements.

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

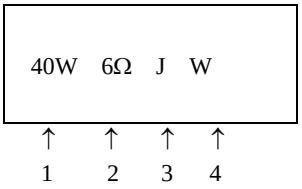
3. Ordering Procedure

(Example: PRUA 40W ±5% 6Ω B/B)



4. Marking

Example:



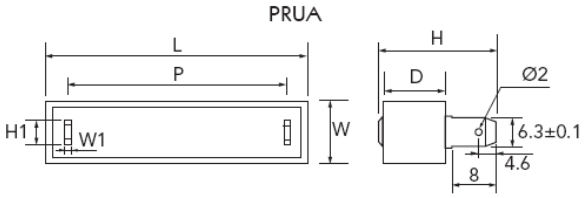
Code description and regulation:

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: (Unit:mm)

5.1Dimension:(mm)

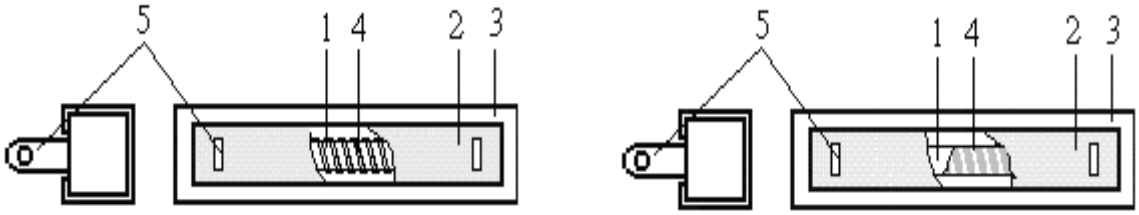


WATTS	W± 1.0mm	D± 1.0mm	L± 1.5mm	P± 1.0mm	H± 1.0mm	H1± 0.4mm	Ø2± 0.2mm	W1± 0.08mm
10W	10	9	48	32	19	8.0	1.6	0.8
15W	12.5	11.5	48	32	23.5	7.6	1.6	0.8
20W	12.5	13.5	63	44	25	7.6	1.6	0.8
30W	19	19	75	54	30	7.6	1.6	0.8
40W	19	19	90	70	30	8.0	1.6	0.8
50W	19	19	90	70	30	8.0	1.6	0.8

5.2 Ratings:

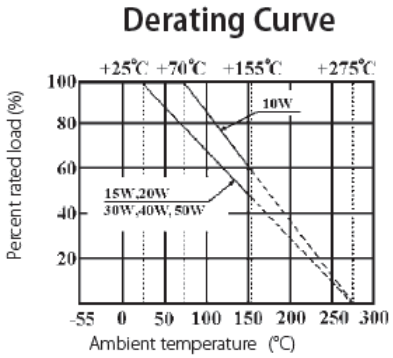
STYLE	Wire-wound	Power Film
10W	1Ω~820Ω	821Ω~200KΩ
15W	1Ω~1KΩ	1.1KΩ~200KΩ
20W	2Ω~1.2KΩ	1.3KΩ~200KΩ
30W	3Ω~1.5KΩ	/
40W	6Ω~1.5KΩ	/
50W	6Ω~1.5KΩ	/

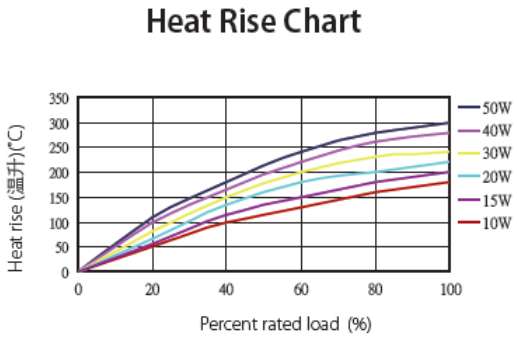
6. Construction



No.	Name	Material Generic Name
1	Body	Al_2O_3
2	Filling materials	SiO_2
3	Ceramic case	Al_2O_3 CaO
4	Bracket	Iron
4	Resistance element	Power Film: Metal Oxide Film
		Wire-Wound: Alloy Wire
5	Terminal lug	Steel(tin plated iron surface)

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 Methods (GB/T5729&JIS-C-5201&IEC60115-1)
Temperature Coefficient	≧20Ω: ±350PPM/℃ ＜20Ω: ±400PPM/℃	4.8 Natural resistance changes per temp. Degree centigrade $\frac{R_2-R_1}{R_1(t_2-t_1)} \times 10^6$ (PPM/℃) R_1: Resistance Value at room temperature （t_1）; R_2: Resistance at test temperature （t_2） t_1: +25°C or specified room temperature t_2: Test temperature（-55℃or 125℃）

Short-time overload	Resistance change rate is: ±(5%+0.05Ω)Max. With no evidence of 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.
Terminal strength	No evidence of mechanical damage	4.16 Direct load: Resistance to a 2.5 kg direct load for 10 seconds in the direction of the longitudinal axis of the terminal leads. Twist test: Terminal leads shall be bent through 90°at a point of about 6mm from the body of the resistor and shall be rotated through 360° about the original axis of the bent terminal in alternating direction for a total of 3 rotations.
Resistance to soldering heat	Resistance change rate is: ± (1%+0.05Ω) Max. With no evidence of mechanical damage	4.18 Permanent resistance change when leads immersed to a point 2.0-2.5mm from the body in 260℃±5°c solder for 10±1 seconds.
Solderability	95% coverage Min.	4.17 The area covered with a new, smooth, clean, shiny and continuous surface free from concentrated pinholes. Test temp. Of solder:245℃±3℃ Dwell time in solder: 2~3seconds.
Humidity (Steady state)	Resistance change rate is: ±(5%+0.05Ω)Max. With no evidence of mechanical damage.	4.24 Temporary resistance change after 240 hours exposure in a humidity test chamber controlled at 40±2℃ and 90~95%RH relative humidity.
Load life in humidity	For Wire-wound: ΔR/R: ±5% For Power film range: ＜100KΩ ΔR/R: ±5% ≧100KΩ ΔR/R: ±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 ℃±2℃ and 90 to 95% relative humidity.
Load life	For Wire-wound: ΔR/R: ±5% For Power film range: ＜100KΩ ΔR/R: ±5% ≧100KΩ ΔR/R: ±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 ℃±2℃ ambient.
Low Temperature Storage	For Wire-wound: ΔR/R: ±5% For Power film range: ＜100KΩ ΔR/R: ±5% ≧100KΩ ΔR/R: ±10%	IEC 60068-2-1 (Aa) Lower limit temperature ，for 2H.
High Temperature Exposure	For Wire-wound: ΔR/R: ±5% For Power film range: ＜100KΩ ΔR/R: ±5% ≧100KΩ ΔR/R: ±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℃ 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_2, H_2S, NH_3, SO_2, NO_2, Br etc.

10. Record

Version	Description	Page	Date	Amended by	Checked by
1	First version	1~5	Mar.20, 2018	Haiyan Chen	Nana Chen
2	Modify characteristic	4~5	Feb.26, 2019	Haiyan Chen	Yuhua Xu
3	Delete the dimensions that are not on the drawing	3	Sep.23,2020	Song Nie	Yuhua Xu
4	Modify characteristic	5	Nov.20,2020	Song Nie	Yuhua Xu
5	Modify the temperature coefficient test conditions	4	Nov.07, 2022	Haiyan Chen	Yuhua Xu