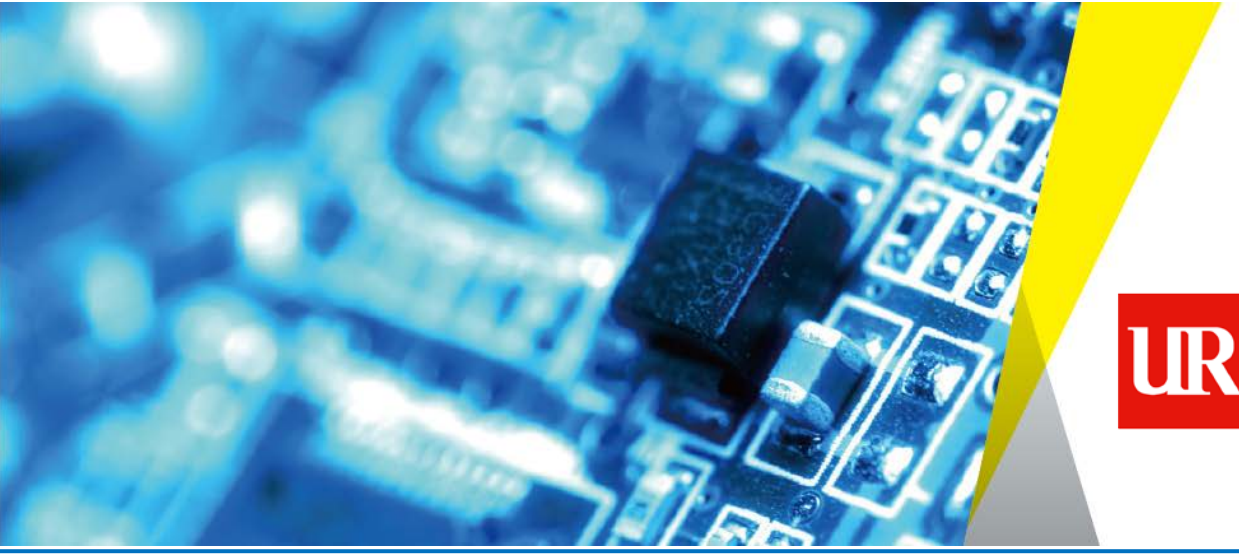

DATA SHEET

Product Name	**Axial Leaded Type Cement Fixed Resistors**
Part Name	**PRWC Series**
File No.	**DIP-SP-026**

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1. Scope

1.1 This datasheet is the characteristics of Axial Leaded Type Cement Fixed Resistors manufactured by UNI-ROYAL.

1.2 Self-extinguishing

1.3 Extremely small & sturdy mechanically safe

1.4 Non-inductive type available

1.5 Excellent flame & moisture resistance

1.6 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: PRWC = PRWC 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: 5W=5W

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

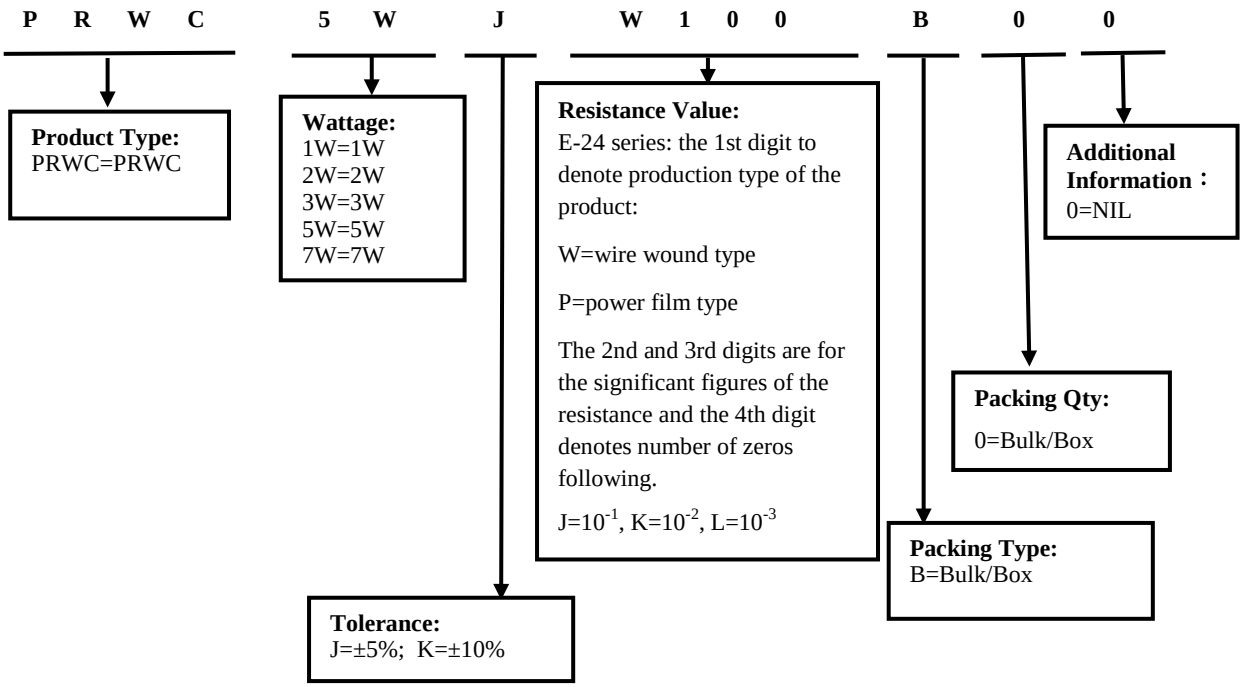
2.5.2 The 13th digit is normally to indicate the Packing Quantity, This digit should be filled with "0"for the Cement products with "Bulk/Box" packing requirements.

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

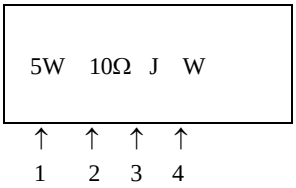
3. Ordering Procedure

(Example: PRWC 5W ±5% 10Ω B/B)



4. Marking

Example:

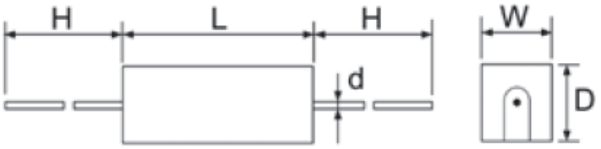


Code description and regulation:

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

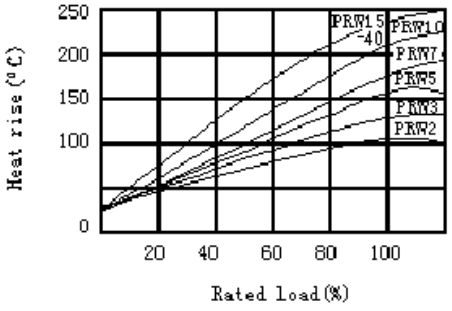
5. Ratings & Dimension



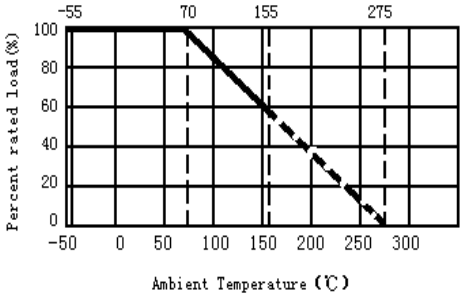
Type	Dimension(mm)					Resistance Range	
	W±1	D±1	L±1	H	d±0.05	Wire Wound	Power Film
PRWC 1W	6	6	12	25±3	0.70	1Ω~27Ω	28Ω~33KΩ
PRWC 2W	6	6	18	28±5	0.70	1Ω~27Ω	28Ω~33KΩ
PRWC 3W	6	6	20	28±5	0.70	1Ω~27Ω	28Ω~120KΩ
PRWC 5W	6	6	25	35±5	0.75	1Ω~200Ω	201Ω~150KΩ
PRWC 7W	9	9	25	35±5	0.75	1Ω~200Ω	201Ω~150KΩ

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:

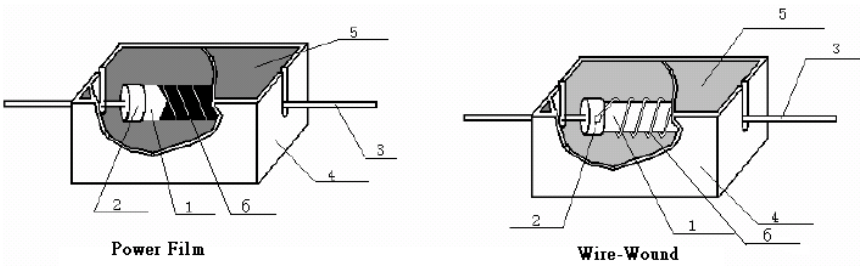
$$RCWV = \sqrt{P \times R}$$

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	Body	Al_2O_3
2	Cap	Tin plated iron
3	Lead	Copper Wire
4	Ceramic Case	Al_2O_3 CaO
5	Filling Materials	SiO_2
6	Resistance element	Power Film: Metal Mixed film
		Wire-Wound: Alloy Wire

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 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.
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 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℃±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 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℃ 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 the storage condition temperature: 15℃~35℃, 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) manybe 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 Cl_2, H_2S_3 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	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

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