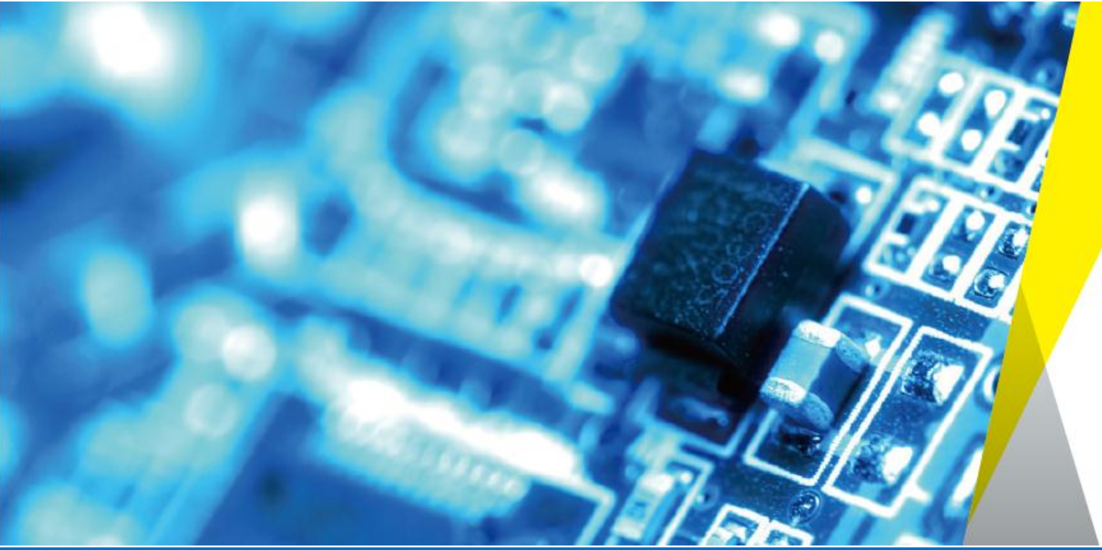

DATA SHEET

Product Name **Radial Type Cement Fixed Resistors**

Part Name **PRM Series**

File No. **DIP-SP-029**

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1. Scope

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

1.1 Compliant with RoHS directive.

1.2 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^{th} digit will be “0”

Example: PRM0=PRM- type

2.2 5^{th}~6^{th} 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; AW=10W;

2.2.2 For power rating Between 20 watt to 99 watt, the 5^{th} and the 6^{th} digits will show the whole numbers of the power rating itself.

Example: 20=20W 75=75W

2.3 The 7^{th} 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^{th} to 11^{th} digits is to denote the Resistance Value.

2.4.1 For Cement Fixed Resistors the 8^{th} 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^{th} & 10^{th} digits are to denote the significant figures of the resistance and the 11^{th} digit is the number of zeros following

Example: W12J=1.2Ω W120=12Ω P273=27KΩ

2.5 The 12^{th}, 13^{th} & 14^{th} digits.

2.5.1 The 12th digit is to denote the Packaging Type with the following codes: B=Bulk/Box

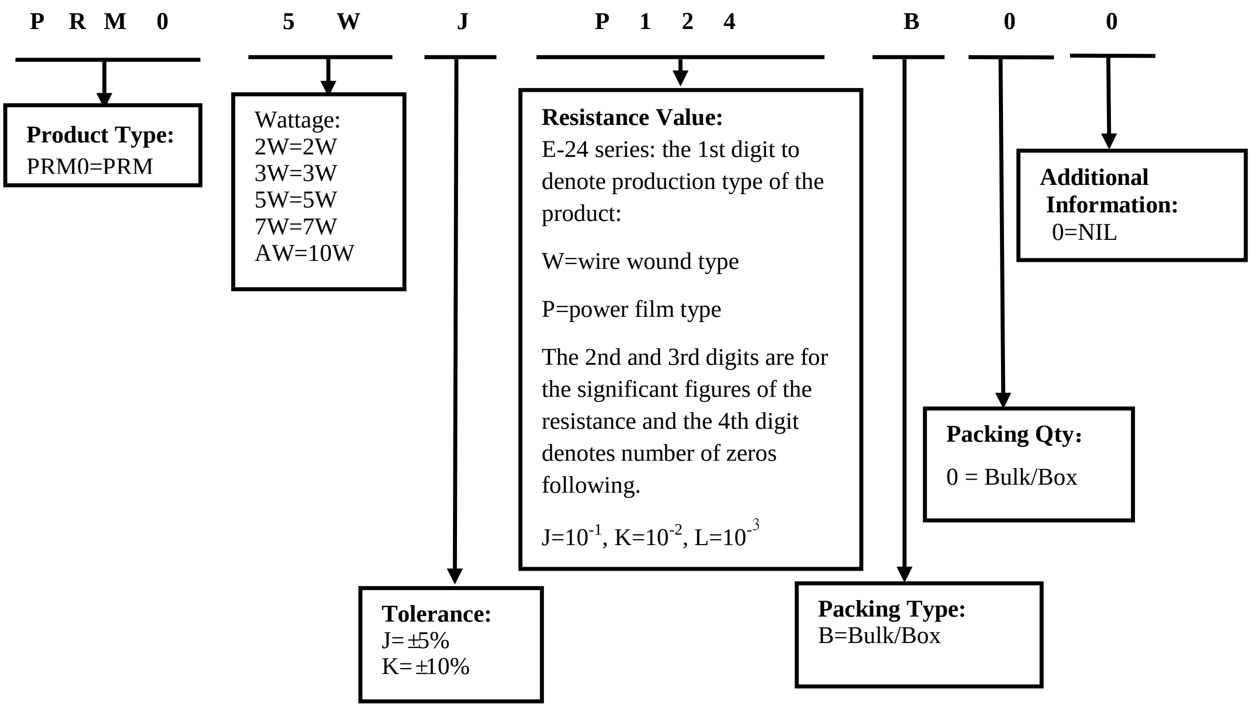
2.5.2 The 13^{th} digit is normally to indicate the Packing Quantity, This digit should be filled with “0”for the Cement products with “Bulk/Box”packing requirements.

2.5.3 For some items, the 14^{th} 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: PRM 5W ±5% 120KΩ B/B)



4. Marking

Example:

5W	120K	J	M
↑	↑	↑	↑
1	2	3	4

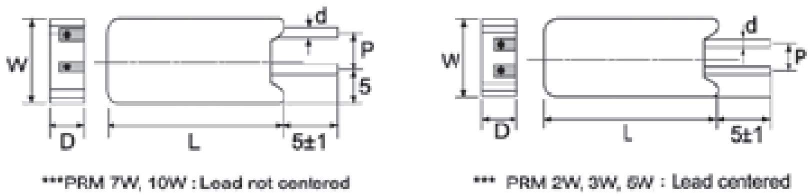
Code description and regulation:

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

Note：The marking code shall be prevailed in kind!

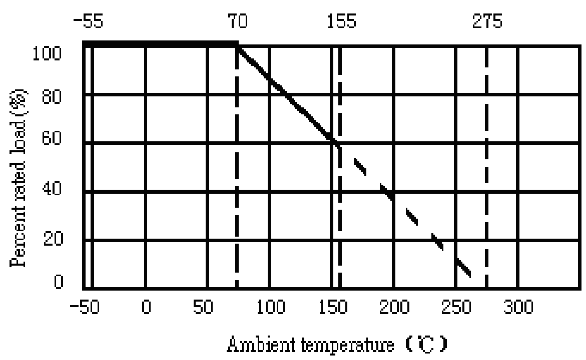
5. Ratings & Dimension



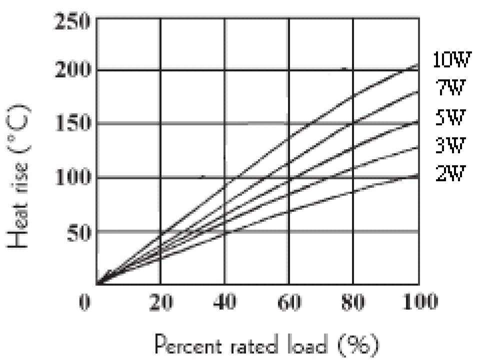
Type	Dimension(mm)					Max Working Voltage	Max Overload Voltage	Resistance Range	
	W±1	D±1	L±1	P±1	d±0.05			Wire Wound	Power Film
PRM 2W	11.5	7.5	20	5	0.70	250V	500V	0.1Ω-27Ω	28Ω-120KΩ
PRM 3W	12.5	8.5	25	5	0.70	300V	600V	0.1Ω-39Ω	40Ω-150KΩ
PRM 5W	13	9	25	5	0.75	350V	700V	0.1Ω-47Ω	48Ω-150KΩ
PRM 7W	13	9	38	5	0.75	500V	1000V	0.1Ω-680Ω	681Ω-200KΩ
PRM10W	13	9	50	5	0.75	700V	1400V	0.1Ω-910Ω	911Ω-200KΩ

6. Derating Curve

Derating curve



Heat rise chart



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:

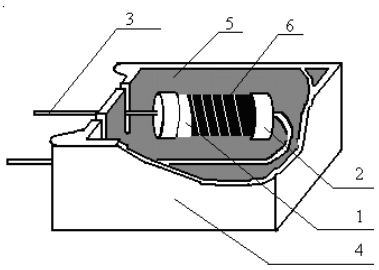
$$RCWV = \sqrt{P \times R}$$

Where: RCWV = rated dc or RMS ac continuous working voltage at commercial-line frequency and waveform (VOLT.)

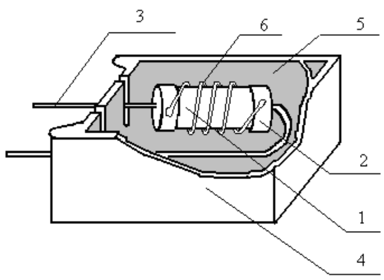
P = power rating (WATT.)

R= nominal resistance (OHM)

7. Structure



(POWER FILM)



(WIRE WOUND)

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 Oxide Film Wire-wound: Ni-Cr alloys

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 ℃ 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 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℃±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.
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.
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 1000 hours (1.5hours "ON" ，0.5hours "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	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 1000 hours operating at RCWV or Max.Working Voltage whichever less with duty cycle of 1.5 hours "ON"， 0.5 hour "OFF" at 70±2° C 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, 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