

DATA SHEET

Product Name Resistors of Capacitor Voltage Balance

Part Name PRTM Series

File No. DIP-SP-045

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1. Scope

- 1.1 This datasheet is the characteristics of Resistors of Capacitor Voltage Balance 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 1th ~4th digits

This is to indicate the Chip Resistor. Example: PRTM= Resistors of Capacitor Voltage Balance

1W~16W ($\geq 1W$)

Wattage	4	7
Normal Size	4W	7W

2.2.1 For power rating 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: 4W=4W

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

Example: 20=20W

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.

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

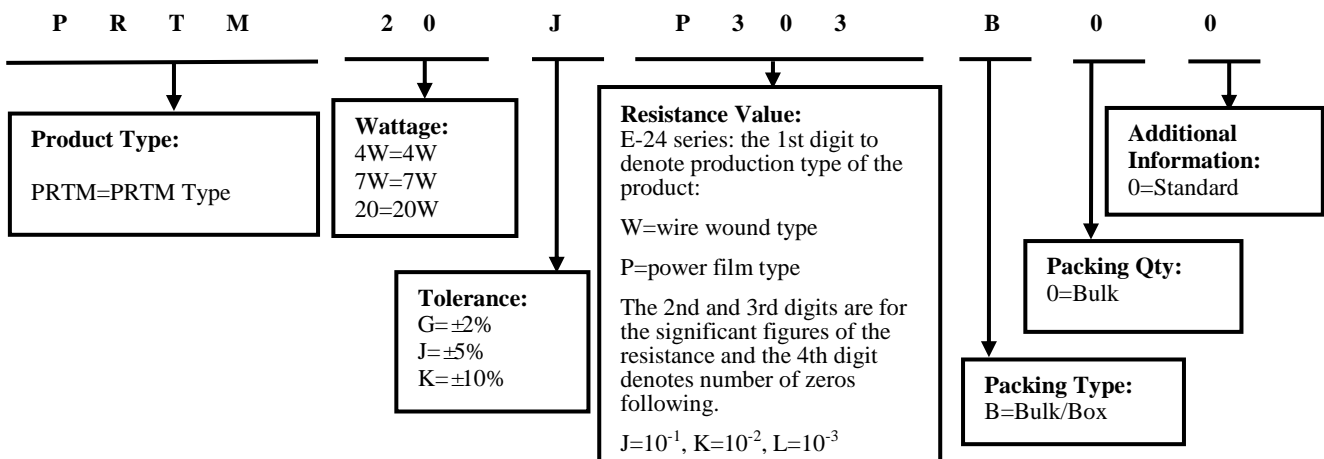
2.5.2 The 13th digit is normally to indicate the Packing Quantity, This digit should be filled with “0” for the Cement products with “Bulk/Box” packing requirements.

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

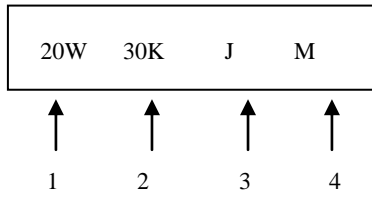
Example: 0= standard product

3. Ordering Procedure

(Example: PRTM 20W ±5% 30KΩ B/B)

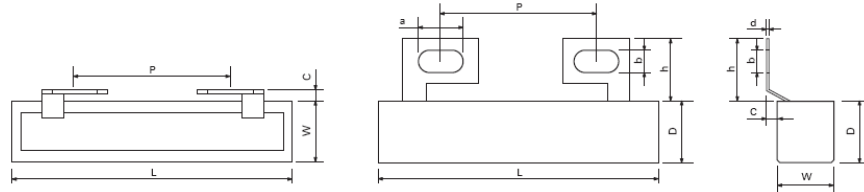


4. Marking



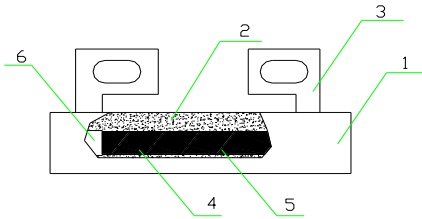
Code description and regulation:
 1. Wattage Rating
 2. Nominal Resistance Value
 3. Resistance Tolerance. J: ± 5% ; K: ± 10%
 4. Pattern:
 M: Power film
 W: Wire wound
 Color of marking: Black Ink
 Note: The marking code shall be prevailed in kind!

5. Dimension



Type	Resistance Range	Dimension(mm)								
		W ±1.0	D ±1.5	L ±1.5	P ±1.5	a ±0.8	b ±0.5	c ±0.5	d ±0.1	h ±1.0
PRTM 4W	1.3KΩ~200KΩ	12.5	12.5	48.0	27.0	11.0	5.2	1.0	0.5	12.5
PRTM 7W		12.5	12.5	63.0	27.0	11.0	5.2	1.0	0.5	12.5
PRTM 20W		12.5	13.5	63.0	35.0	10.0	5.0	2.5	0.8	14.0

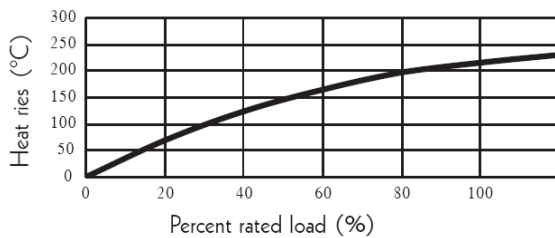
6. Construction



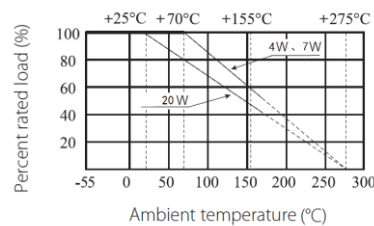
NO.	NAME	MATERIAL GENERIC NAME
1	Ceramic case	Al ₂ O ₃ CaO
2	Filling materials	SiO ₂
3	Bracket	Iron
4	Resistor	Metal Oxide Film
5	Body	Al ₂ O ₃
6	Cap	Iron

7. Derating Curve

Heat rise chart:



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	±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 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°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 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 Cl₂, H₂S, NH₃, SO₂, NO₂, 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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