

DATA SHEET

Product Name Radial Type Cement Fixed Resistors

Part Name PRM Series

Uniroyal Electronics Global Co., Ltd.

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Manufacture Plant Uniroyal Electronics Industry (kunshan) co., ltd.
Uniroyal Electronics Industry Co., Ltd.
Uniroyal Electronics Global Co.,Ltd Shenzhen Branch
Aeon Technology Corporation
Uniroyal Electronics Global Co.,Ltd Xiamen Branch
Kunshan Foss Electronic material Co., Ltd.

Brands *RoyalOhm* *UniOhm*



1. Scope

This specification for approve relates Power Radial 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: PRM0=PRM- 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; AW=10W; FW=15W

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

Example: 20=20W 75=75W

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.

F=±1% 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 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

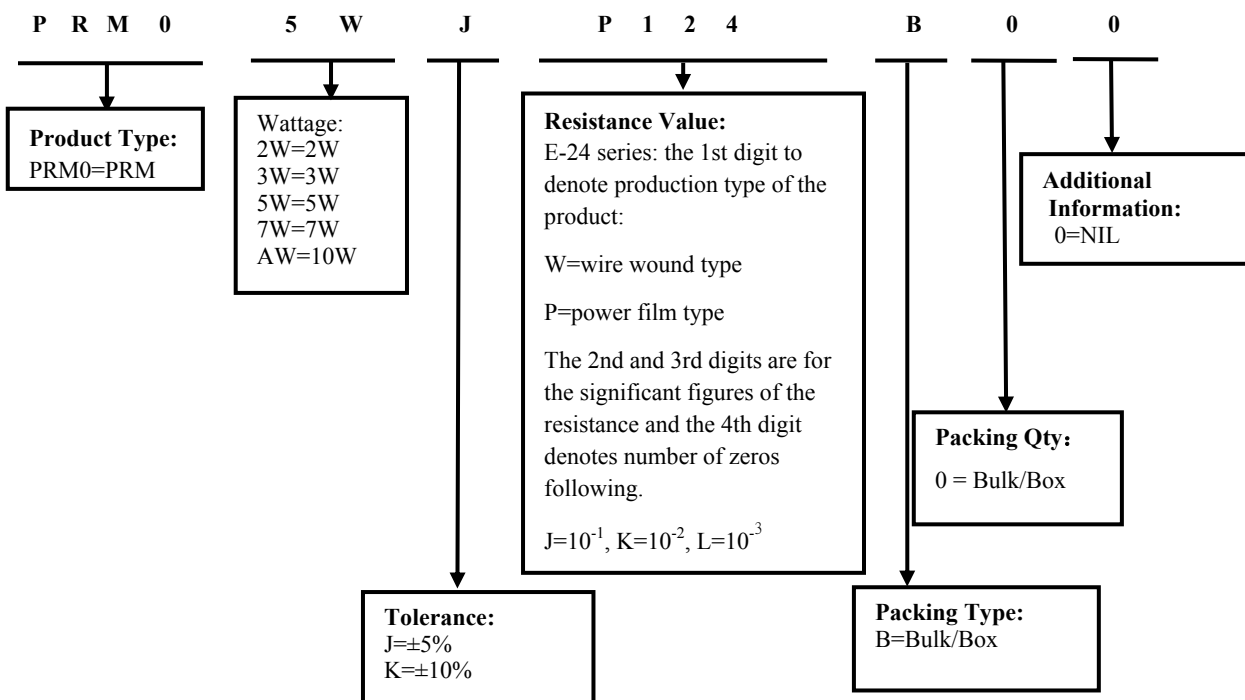
2.5.2 The 13th digit is normally to indicate the Packing Quantity, This digit should be filled with “0”for the Cement products with “Bulk/Box”packing requirements.

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

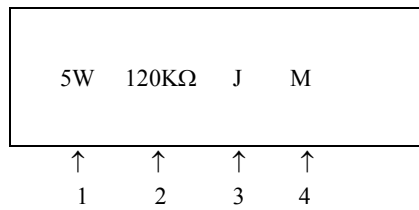
3. Ordering Procedure

(Example: PRM 5W ±5% 120KΩ B/B)



4. Marking

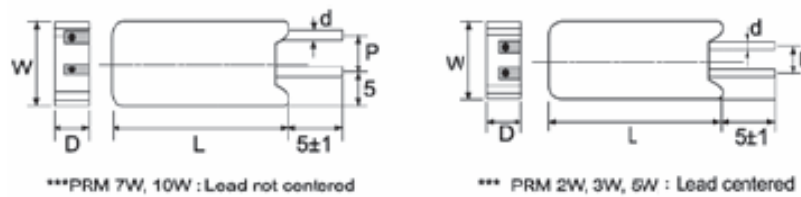
Example:



Code description and regulation:

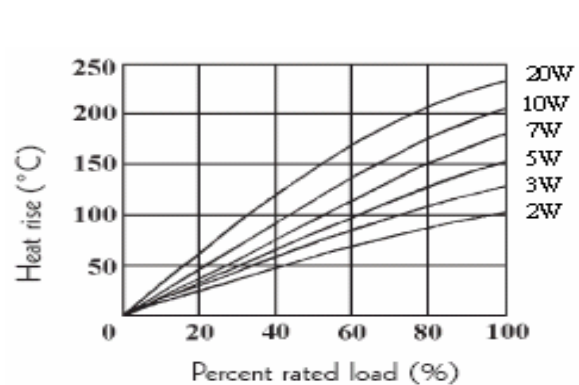
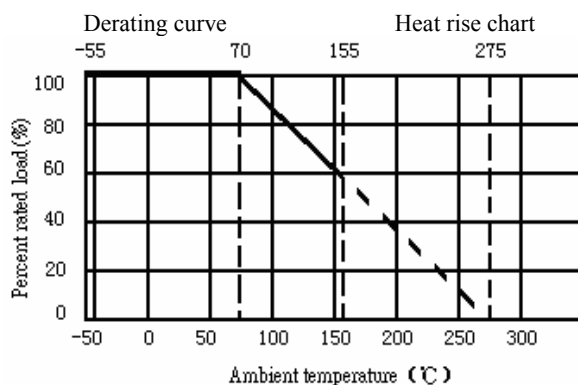
1. Wattage Rating
2. Nominal Resistance Value
3. Resistance Tolerance. J: $\pm 5\%$
K: $\pm 10\%$
4. Pattern:
M: Power film
W: Wire wound
Color of marking: Black Ink

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	0.1 Ω -27 Ω	28 Ω -120K Ω
PRM 3W	12.5	8.5	25	5	0.70	300V	600V	0.1 Ω -39 Ω	40 Ω -150K Ω
PRM 5W	13	9	25	5	0.75	350V	700V	0.1 Ω -47 Ω	48 Ω -150K Ω
PRM 7W	13	9	38	5	0.75	500V	1000V	0.1 Ω -680 Ω	681 Ω -200K Ω
PRM10W	13	9	50	5	0.75	700V	1400V	0.1 Ω -910 Ω	911 Ω -200K Ω

6. Derating Curve



6.1 Voltage rating:

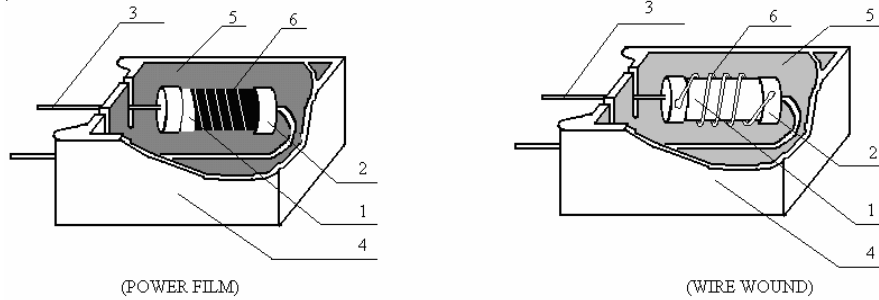
Resistors shall have a rated direct-current (DC) continuous working voltage or an approximate sine-wave root-mean-square (RMS) alternating-current (AC) continuous working voltage at commercial-line frequency and waveform corresponding to the power rating, as determined from the following formula:

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

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 ₂ O ₃
2	Cap	Tin plated iron
3	Lead	Copper wire
4	Ceramic case	Al ₂ O 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 Method (GB/T5729&JIS-C-5201&IEC60115)
Temperature Coefficient	$\geq 20\Omega$: $\pm 350\text{PPM}/^\circ\text{C}$ max.. $< 20\Omega$: $\pm 400\text{PPM}/^\circ\text{C}$ max..	4.8 Natural resistance changes per temp. Degree centigrade $\frac{R_2 - R_1}{R_1(t_2 - t_1)} \times 10^6 \text{ (PPM}/^\circ\text{C)}$ $\frac{R_3 - R_1}{R_1(t_3 - t_1)} \times 10^6 \text{ (PPM}/^\circ\text{C)}$ R ₁ : Resistance Value at room temperature (t ₁) ; R ₂ : Resistance Value at upper limit temperature $\pm 2^\circ\text{C}$ (t ₂) R ₃ : Resistance Value at lower limit temperature $\pm 3^\circ\text{C}$ (t ₃) Test pattern : Room temperature : (t ₁) Upper limit temperature : (t ₂) Lower limit temperature : (t ₃)
Short-time overload	Resistance change rate must be in $\pm(5\%+0.05\Omega)$,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.
Resistance to soldering heat	Resistance change rate must be in $\pm(1\%+0.05\Omega)$,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 $\pm 5^\circ\text{C}$ 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°C±3°C 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.
Rapid change of temperature	For Wire-wound: $\Delta R/R: \pm 5\%$ For Power film range: < 100K Ω $\Delta R/R: \pm 5\%$ $\geq 100K\Omega$ $\Delta R/R: \pm 10\%$	4.19 30 min at lower limit temperature and 30 min at upper limit temperature, 5 cycles.
Humidity (Steady state)	Resistance change rate must be in $\pm(5\%+0.05\Omega)$, 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	For Wire-wound: $\Delta R/R: \pm 5\%$ For Power film range: < 100K Ω $\Delta R/R: \pm 5\%$ $\geq 100K\Omega$ $\Delta R/R: \pm 10\%$	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°C±2°C and 90 to 95% relative humidity.
Load life	For Wire-wound: $\Delta R/R: \pm 5\%$ For Power film range: < 100K Ω $\Delta R/R: \pm 5\%$ $\geq 100K\Omega$ $\Delta R/R: \pm 10\%$	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°C±2°C ambient.
Low Temperature Storage	For Wire-wound: $\Delta R/R: \pm 5\%$ For Power film range: < 100K Ω $\Delta R/R: \pm 5\%$ $\geq 100K\Omega$ $\Delta R/R: \pm 10\%$	4.23.4 Lower limit temperature, for 2H.
High Temperature Exposure	For Wire-wound: $\Delta R/R: \pm 5\%$ For Power film range: < 100K Ω $\Delta R/R: \pm 5\%$ $\geq 100K\Omega$ $\Delta R/R: \pm 10\%$	4.23.2 Upper limit temperature, for 16H.

9. Note

- 9.1 UNI-ROYAL recommend the storage condition temperature: 15°C~35°C, 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) may be 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:
- Storage in high Electrostatic
 - Storage in direct sunshine、rain and snow or condensation
 - Where the products are exposed to sea winds or corrosive gases, including Cl₂, H₂S₃, NH₃, SO₂, NO₂.

10. Record

Version	Description of amendment	Page	Date	Amended by	Checked by
1	First issue of this specification	1~5	Mar.20, 2018	Chen Haiyan	Chen Nana

DATA SHEET

Product Name Radial Type Cement Fixed Resistors

Part Name PRMA Series

Uniroyal Electronics Global Co., Ltd.

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Brands *RoyalOhm* *UniOhm*



1. Scope

This specification for approve relates Radial Type Cement Fixed Resistors manufactured by UNI-RPYAL.

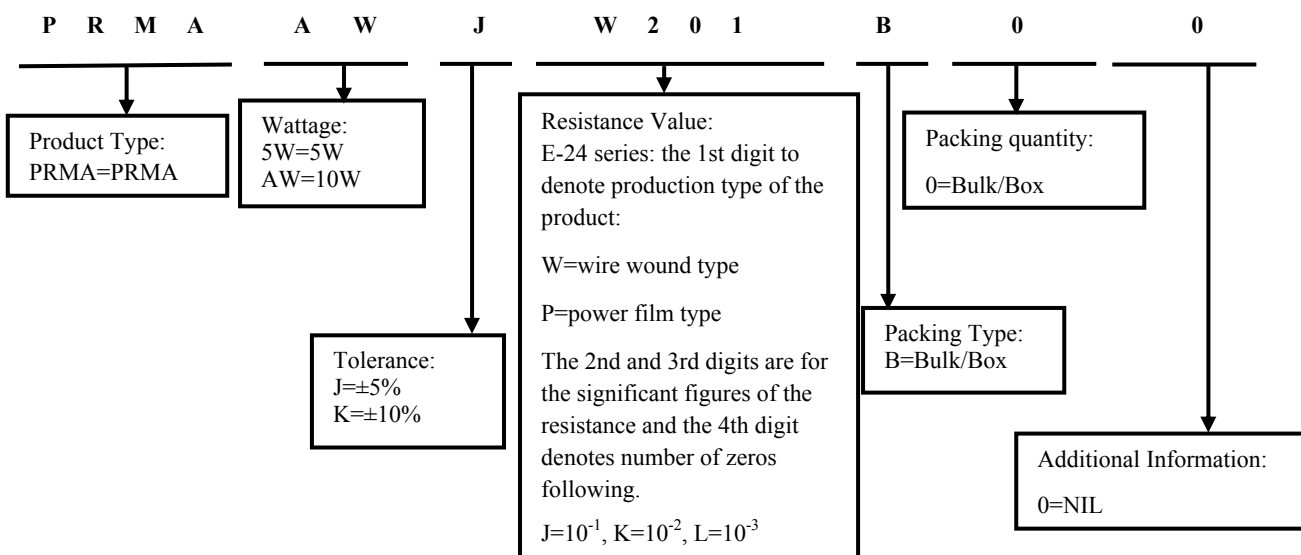
2. Part No. System

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: PRMA=PRMA 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; AW=10W
- 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.
 F=±1% 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 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.
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 Example: 0= standard product

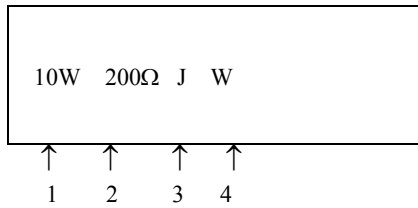
3. Ordering Procedure

(Example: PRMA 10W ±5% 200Ω B/B)



4. Marking

Example:



Code description and regulation:

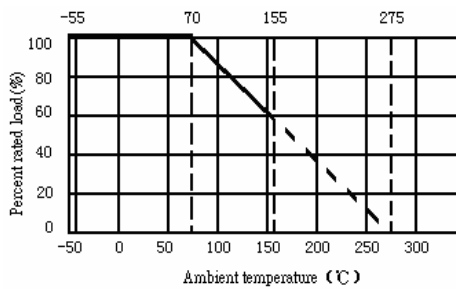
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- 2. Nominal Resistance Value
- 3. Resistance Tolerance. J: ± 5%
 K: ± 10%
- 4. Pattern:
 M: Power film
 W: Wire wound
 Color of marking: Black Ink

5. Ratings & Dimension



Type	Dimension(mm)					Max. working voltage	Max. Overload voltage	Resistance Range	
	W±1	D±1	L±1	P±1	d±0.05			Wire Wound	Power Film
PRMA 5W	13	9	25	7.5	0.75	350V	700V	0.1Ω-47Ω	48Ω-100KΩ
PRMA 10W	16	12	35	7.5	0.75	700V	1400V	0.1Ω-560Ω	561Ω-100KΩ

6. 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:

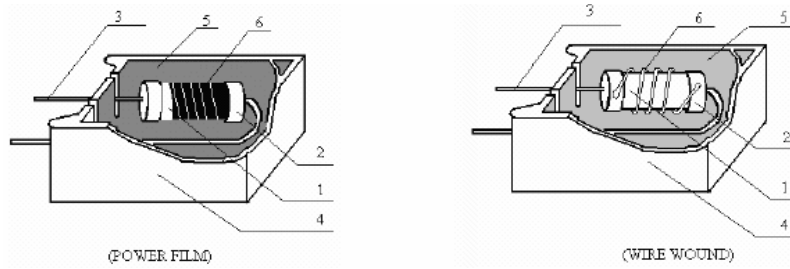
$$RCWV = \sqrt{P \times R}$$

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 ₂ O ₃
2	Cap	Tin plated iron
3	Lead	Copper wire
4	Ceramic case	Al ₂ O 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 Method (GB/T5729&JIS-C-5201&IEC60115)
Temperature Coefficient	$\geq 20\Omega$: $\pm 350\text{PPM}/^\circ\text{C}$ max.. $< 20\Omega$: $\pm 400\text{PPM}/^\circ\text{C}$ max..	4.8 Natural resistance changes per temp. Degree centigrade $\frac{R_2 - R_1}{R_1(t_2 - t_1)} \times 10^6 \text{ (PPM}/^\circ\text{C}) \quad \frac{R_3 - R_1}{R_1(t_3 - t_1)} \times 10^6 \text{ (PPM}/^\circ\text{C})$ R ₁ : Resistance Value at room temperature (t ₁) ; R ₂ : Resistance Value at upper limit temperature $\pm 2^\circ\text{C}$ (t ₂) R ₃ : Resistance Value at lower limit temperature $\pm 3^\circ\text{C}$ (t ₃) Test pattern : Room temperature : (t ₁) Upper limit temperature : (t ₂) Lower limit temperature : (t ₃)
Short-time overload	Resistance change rate must be in $\pm(5\%+0.05\Omega)$, 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.
Resistance to soldering heat	Resistance change rate must be in $\pm (1\%+0.05\Omega)$, 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 $\pm 5^\circ\text{C}$ 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°C $\pm 3^\circ\text{C}$ Dwell time in solder: 2~3seconds.
Humidity (Steady state)	Resistance change rate must be in $\pm(5\%+0.05\Omega)$, and no mechanical damage damage.	4.24 Temporary resistance change after 240 hours exposure in a humidity test chamber controlled at 40 $\pm 2^\circ\text{C}$ and 90~95%RH relative humidity
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.

Rapid change of temperature	For Wire-wound: $\Delta R/R: \pm 5\%$ For Power film range: < 100K Ω $\Delta R/R: \pm 5\%$ $\geq 100K\Omega$ $\Delta R/R: \pm 10\%$	4.19 30 min at lower limit temperature and 30 min at upper limit temperature, 5 cycles.
Load life in humidity	For Wire-wound: $\Delta R/R: \pm 5\%$ For Power film range: < 100K Ω $\Delta R/R: \pm 5\%$ $\geq 100K\Omega$ $\Delta R/R: \pm 10\%$	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°C \pm 2°C and 90 to 95% relative humidity.
Load life	For Wire-wound: $\Delta R/R: \pm 5\%$ For Power film range: < 100K Ω $\Delta R/R: \pm 5\%$ $\geq 100K\Omega$ $\Delta R/R: \pm 10\%$	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°C \pm 2°C ambient.
Low Temperature Storage	For Wire-wound: $\Delta R/R: \pm 5\%$ For Power film range: < 100K Ω $\Delta R/R: \pm 5\%$ $\geq 100K\Omega$ $\Delta R/R: \pm 10\%$	4.23.4 Lower limit temperature , for 2H.
High Temperature Exposure	For Wire-wound: $\Delta R/R: \pm 5\%$ For Power film range: < 100K Ω $\Delta R/R: \pm 5\%$ $\geq 100K\Omega$ $\Delta R/R: \pm 10\%$	4.23.2 Upper limit tempearture , for 16H.

9. Note

9.1. UNI-ROYAL recommend the storage condition temperature: 15°C~35°C, 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) many be 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
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Version	Description of amendment	Page	Date	Amended by	Checked by
1	First issue of this specification	1~5	Mar.20, 2018	Chen Haiyan	Chen Nana

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1. Scope

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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:

PRMB=PRMB 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: 7W=7W

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.

F=±1% G=±2% J=±5% K= ±10%

2.4 The 8th to 11th digits is to denote the Resistance Value.

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Example: W12J=1.2Ω W120=12Ω P273=27KΩ

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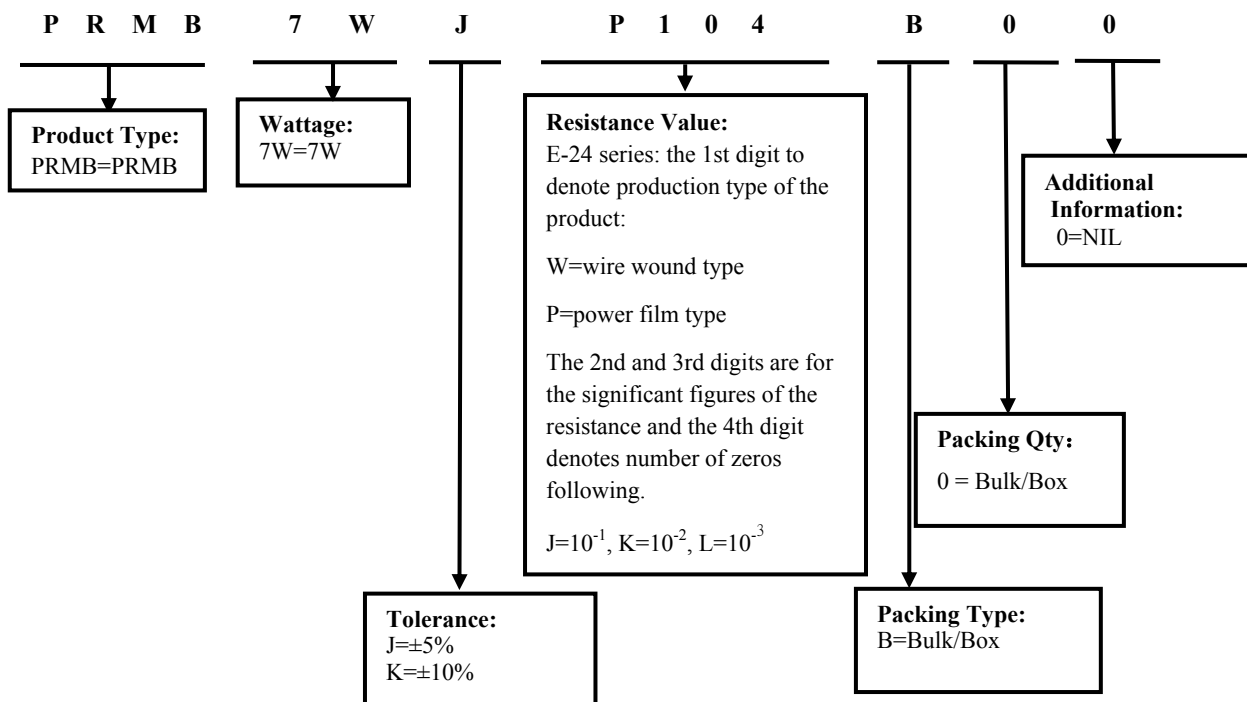
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Example: 0= standard product

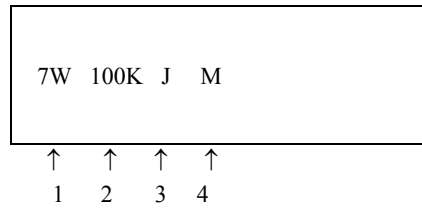
3. Ordering Procedure

(Example: PRMB 7W ±5% 100KΩ B/B)



4. Marking

Example:



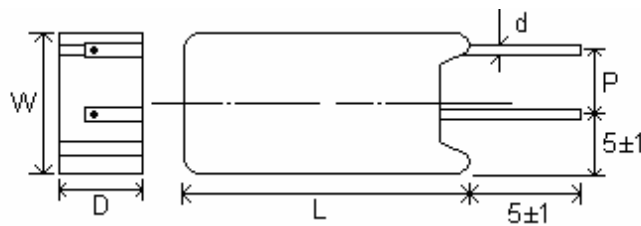
Code description and regulation:

- 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

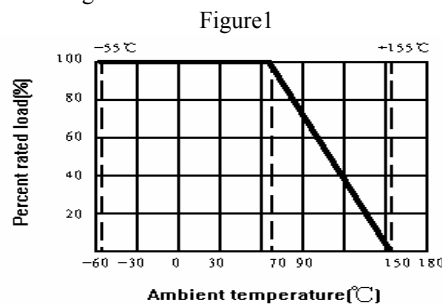
5. Ratings & Dimension



Type	Dimension(mm)					Max Working Voltage	Max Overload Voltage	Resistance Range	
	W±1	D±1	L±1	P±1	d±0.05			Wire Wound	Power Film
PRMB 7W	12.5	9	38	5	0.75	500V	1000V	0.1Ω-680Ω	681Ω-200KΩ

6. Derating Curve

Resistors shall have a power rating based on continuous load operation at an ambient temperature from -55°C to 70°C. For temperature in excess of 70°C, the load shall be derate as shown in figure 1



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:

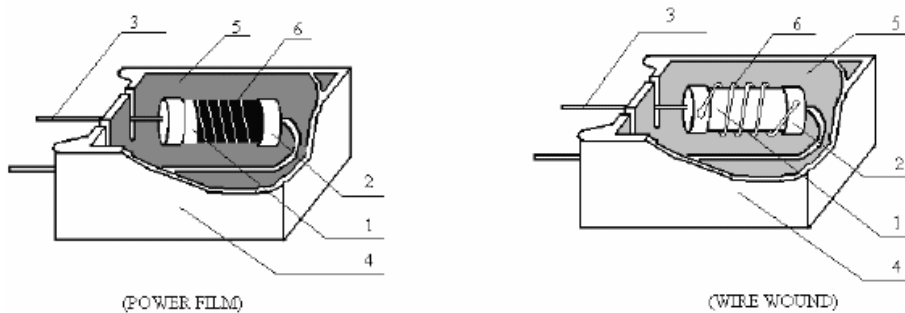
$$RCWV = \sqrt{P \times R}$$

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)

The overload voltage is 2.5 times RCWV or Max. Overload voltage whichever is less.

7. Structure



No.	Name	Material Generic Name
1	Body	Al ₂ O ₃
2	Cap	Tin plated iron
3	Lead	Copper wire
4	Ceramic case	Al ₂ O 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 Method (GB/T5729&JIS-C-5201&IEC60115)
Temperature Coefficient	$\geq 20\Omega$: $\pm 350\text{PPM}/^\circ\text{C max.}$ $< 20\Omega$: $\pm 400\text{PPM}/^\circ\text{C max.}$	4.8 Natural resistance changes per temp. Degree centigrade $\frac{R_2 - R_1}{R_1(t_2 - t_1)} \times 10^6 \text{ (PPM}/^\circ\text{C)}$ $\frac{R_3 - R_1}{R_1(t_3 - t_1)} \times 10^6 \text{ (PPM}/^\circ\text{C)}$ R ₁ : Resistance Value at room temperature (t ₁) ; R ₂ : Resistance Value at upper limit temperature $\pm 2^\circ\text{C}$ (t ₂) R ₃ : Resistance Value at lower limit temperature $\pm 3^\circ\text{C}$ (t ₃) Test pattern : Room temperature : (t ₁) Upper limit temperature : (t ₂) Lower limit temperature : (t ₃)
Short-time overload	Resistance change rate must be in $\pm(5\%+0.05\Omega)$, 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.
Resistance to soldering heat	Resistance change rate must be in $\pm(1\%+0.05\Omega)$, and no mechanical damage.	4.18 Permanent resistance change when leads immersed to a point 2.0-2.5mm from the body in $260^\circ\text{C}\pm 5^\circ\text{C}$ 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: $245^\circ\text{C}\pm 3^\circ\text{C}$ 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.

Rapid change of temperature	For Wire-wound: $\Delta R/R: \pm 5\%$ For Power film range: $< 100K\Omega \Delta R/R: \pm 5\%$ $\geq 100K\Omega \Delta R/R: \pm 10\%$	4.19 30 min at lower limit temperature and 30 min at upper limit temperature, 5 cycles.
Humidity (Steady state)	Resistance change rate must be in $\pm(5\%+0.05\Omega)$, and no mechanical damage	4.24 Temporary resistance change after 240 hours exposure in a humidity test chamber controlled at $40\pm 2^\circ\text{C}$ and 90~95%RH relative humidity
Load life in humidity	For Wire-wound: $\Delta R/R: \pm 5\%$ For Power film range: $< 100K\Omega \Delta R/R: \pm 5\%$ $\geq 100K\Omega \Delta R/R: \pm 10\%$	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 $40^\circ\text{C}\pm 2^\circ\text{C}$ and 90 to 95% relative humidity.
Load life	For Wire-wound: $\Delta R/R: \pm 5\%$ For Power film range: $< 100K\Omega \Delta R/R: \pm 5\%$ $\geq 100K\Omega \Delta R/R: \pm 10\%$	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 $70^\circ\text{C}\pm 2^\circ\text{C}$ ambient.
Low Temperature Storage	For Wire-wound: $\Delta R/R: \pm 5\%$ For Power film range: $< 100K\Omega \Delta R/R: \pm 5\%$ $\geq 100K\Omega \Delta R/R: \pm 10\%$	4.23.4 Lower limit temperature , for 2H.
High Temperature Exposure	For Wire-wound: $\Delta R/R: \pm 5\%$ For Power film range: $< 100K\Omega \Delta R/R: \pm 5\%$ $\geq 100K\Omega \Delta R/R: \pm 10\%$	4.23.2 Upper limit temperature , for 16H.

9. Note

9.1 UNI-ROYAL recommend the storage condition temperature: $15^\circ\text{C}\sim 35^\circ\text{C}$, 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) may be 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:

- Storage in high Electrostatic
- Storage in direct sunshine 、rain and snow or condensation
- Where the products are exposed to sea winds or corrosive gases, including Cl_2 , H_2S_3 , NH_3 , SO_2 , NO_2 .

10. Record

Version	Description of amendment	Page	Date	Amended by	Checked by
1	First issue of this specification	1~5	Mar.20, 2018	Chen Haiyan	Chen Nana

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DATA SHEET

Product Name Radial Type Cement Fixed Resistors

Part Name PRMT Series

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 (kunshan) co., ltd.
Uniroyal Electronics Industry Co., Ltd.
Uniroyal Electronics Global Co.,Ltd Shenzhen Branch
Aeon Technology Corporation
Uniroyal Electronics Global Co.,Ltd Xiamen Branch
Kunshan Foss Electronic material Co., Ltd.

Brands *RoyalOhm* *UniOhm*



1. Scope

This specification for approve relates Power Radial Type Cement Fixed Resistors manufactured by UNI-ROYAL..

2. Explanation of 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: PRMT=PRMT- 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; AW=10W; FW=15W

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

Example: 20=20W 75=75W

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.

F=±1% 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 W120=12Ω P273=27KΩ

2.5 The 12th, 13th & 14th digits.

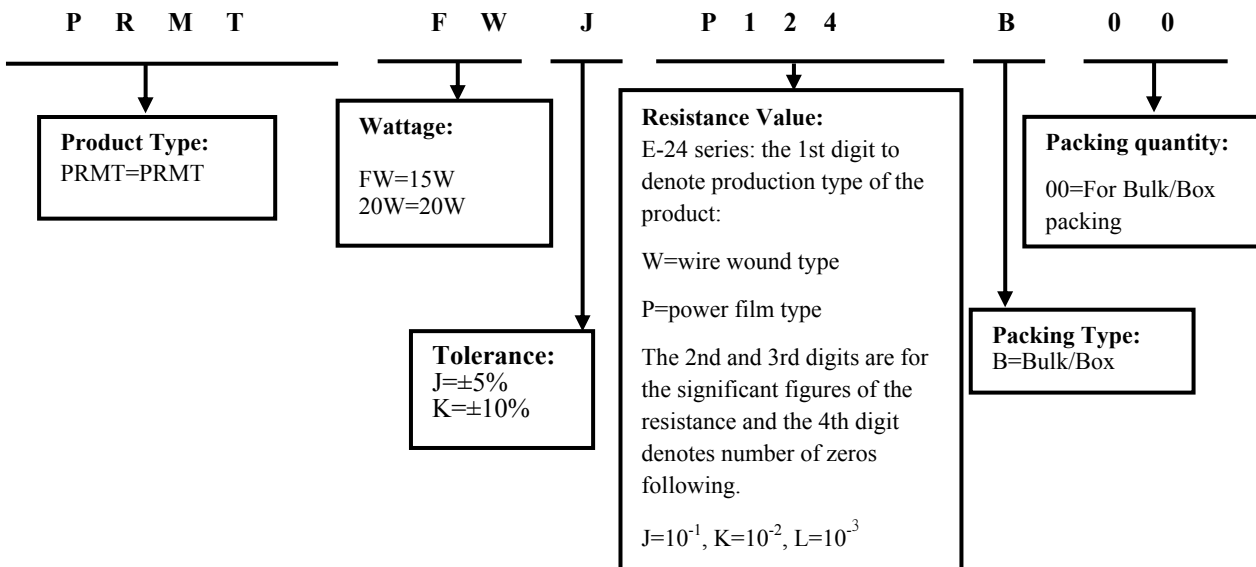
2.5.1 The 12th digit is to denote the Packaging Type with the following codes: B=Bulk/Box

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

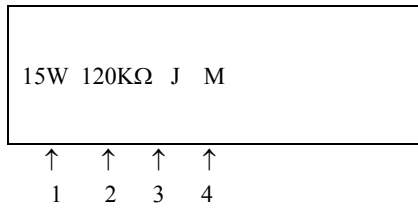
Example: 0= standard product

3. Ordering Procedure: (Example: PRMT 15W ±5% 120KΩ B/B)



4. Marking

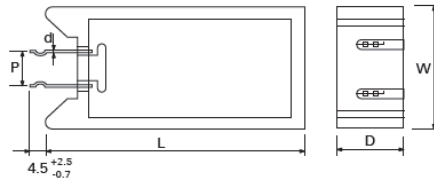
Example:



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

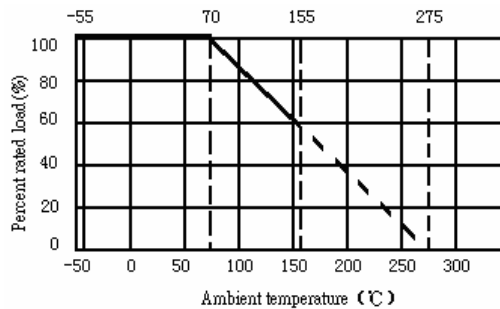
5. Ratings & Dimension



Type	Dimension(mm)					Max Working Voltage	Max Overload Voltage	Resistance Range	
	W±1	D±0.5	L±1	P±1	d±0.05			Wire Wound	Power Film
PRMT 15W	20	13	38	7.5	0.5	700V	1400V	0.1Ω-560Ω	561Ω-200KΩ
PRMT 20W	20	13	45	7.5	0.4	750V	1500V		

6. Derating Curve

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:

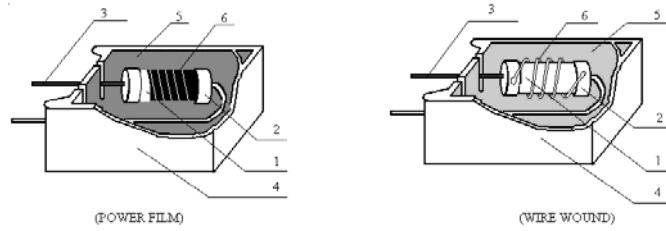
$$RCWV = \sqrt{P \times R}$$

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 ₂ O ₃
2	Cap	Tin plated iron
3	Lead	Copper wire
4	Ceramic case	Al ₂ O 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 Method (GB/T5729&JIS-C-5201&IEC60115)
Temperature Coefficient	$\geq 20\Omega$: $\pm 350\text{PPM}/^\circ\text{C}$ max.. $< 20\Omega$: $\pm 400\text{PPM}/^\circ\text{C}$ max..	4.8 Natural resistance changes per temp. Degree centigrade $\frac{R_2-R_1}{R_1(t_2-t_1)} \times 10^6 \text{ (PPM}/^\circ\text{C}) \quad \frac{R_3-R_1}{R_1(t_3-t_1)} \times 10^6 \text{ (PPM}/^\circ\text{C})$ R ₁ : Resistance Value at room temperature (t ₁) ; R ₂ : Resistance Value at upper limit temperature $\pm 2^\circ\text{C}$ (t ₂) R ₃ : Resistance Value at lower limit temperature $\pm 3^\circ\text{C}$ (t ₃) Test pattern : Room temperature : (t ₁) Upper limit temperature : (t ₂) Lower limit temperature : (t ₃)
Short-time overload	Resistance change rate must be in $\pm(5\%+0.05\Omega)$,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.
Resistance to soldering heat	Resistance change rate must be in $\pm(1\%+0.05\Omega)$,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 $\pm 5^\circ\text{C}$ 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°C $\pm 3^\circ\text{C}$ 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.

Rapid change of temperature	For Wire-wound: $\Delta R/R: \pm 5\%$ For Power film range: < 100K Ω $\Delta R/R: \pm 5\%$ $\geq 100K\Omega$ $\Delta R/R: \pm 10\%$	4.19 30 min at lower limit temperature and 30 min at upper limit temperature, 5 cycles.
Humidity (Steady state)	Resistance change rate must be in $\pm(5\%+0.05\Omega)$, and no mechanical damage.	4.24 Temporary resistance change after 240 hours exposure in a humidity test chamber controlled at $40\pm 2^\circ\text{C}$ and 90~95%RH relative humidity
Load life in humidity	For Wire-wound: $\Delta R/R: \pm 5\%$ For Power film range: < 100K Ω $\Delta R/R: \pm 5\%$ $\geq 100K\Omega$ $\Delta R/R: \pm 10\%$	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 $40^\circ\text{C}\pm 2^\circ\text{C}$ and 90 to 95% relative humidity.
Load life	For Wire-wound: $\Delta R/R: \pm 5\%$ For Power film range: < 100K Ω $\Delta R/R: \pm 5\%$ $\geq 100K\Omega$ $\Delta R/R: \pm 10\%$	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 $70^\circ\text{C}\pm 2^\circ\text{C}$ ambient.
Low Temperature Storage	For Wire-wound: $\Delta R/R: \pm 5\%$ For Power film range: < 100K Ω $\Delta R/R: \pm 5\%$ $\geq 100K\Omega$ $\Delta R/R: \pm 10\%$	4.23.4 Lower limit temperature, for 2H.
High Temperature Exposure	For Wire-wound: $\Delta R/R: \pm 5\%$ For Power film range: < 100K Ω $\Delta R/R: \pm 5\%$ $\geq 100K\Omega$ $\Delta R/R: \pm 10\%$	4.23.2 Upper limit temperature, for 16H.

9. Note

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 - 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 , NH_3 , SO_2 , NO_2 .

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1	First issue of this specification	1~5	Mar.20, 2018	Chen Haiyan	Chen Nana

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