

# DATASHEET

**Product Name**    **High power Starting Resistors**

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**Part Name**    **HPSR 3×200W Series**

**File No.**    **DIP-SP-090**

## **Uniroyal Electronics Global Co., Ltd.**

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Royal Technology (Thailand) Co., Ltd.

## 1. Scope

- 1.1 This datasheet is the characteristics of High power Starting Resistors manufactured by UNI-ROYAL.
- 1.2 Anti-vibration, high stability.
- 1.3 Excellent transient current impact capability, suitable for the start of the inverter under harsh conditions.
- 1.4 High stability, reliability
- 1.5 High overload capacity
- 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 1<sup>th</sup> ~4<sup>th</sup> digits

This is to indicate the Chip Resistor. Example: HPSR= HPSR

### 2.2 5<sup>th</sup> ~6<sup>th</sup> digits:

2.2.1 For power rating between 20W to 99W, the 5<sup>th</sup> & 6<sup>th</sup> digits will show the whole numbers of the power rating itself.

Example: 80 = 80W.

2.2.2 For power rating of 100W & over, the 5<sup>th</sup> & 6<sup>th</sup> digits will be indicated with "00" and the actual wattage being indicated at the last 3 digits (12<sup>th</sup> ~14<sup>th</sup>) of the Part No.

2.3 The 7<sup>th</sup> digit is to denote the Resistance Tolerance. The following letter code is to be used for indicating the standard Resistance Tolerance.

J=±5%

2.4 The 8<sup>th</sup> to 11<sup>th</sup> digits is to denote the Resistance Value.

2.4.1 For the standard resistance values of 5%&10% series, the 8<sup>th</sup> digit is "0", the 9<sup>th</sup> & 10<sup>th</sup> digits are to denote the significant figures of the resistance and the 11<sup>th</sup> digit is the number of zeros following;

2.4.2 The following number s and the letter codes are to be used to indicate the number of zeros in the 11th digit:

0=10<sup>0</sup> 1=10<sup>1</sup> 2=10<sup>2</sup> 3=10<sup>3</sup> 4=10<sup>4</sup> 5=10<sup>5</sup> 6=10<sup>6</sup> J=10<sup>-1</sup> K=10<sup>-2</sup> L=10<sup>-3</sup> M=10<sup>-4</sup>

2.5 The 12<sup>th</sup> ~14<sup>th</sup> digits. For power rating between 20W to 99W:

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

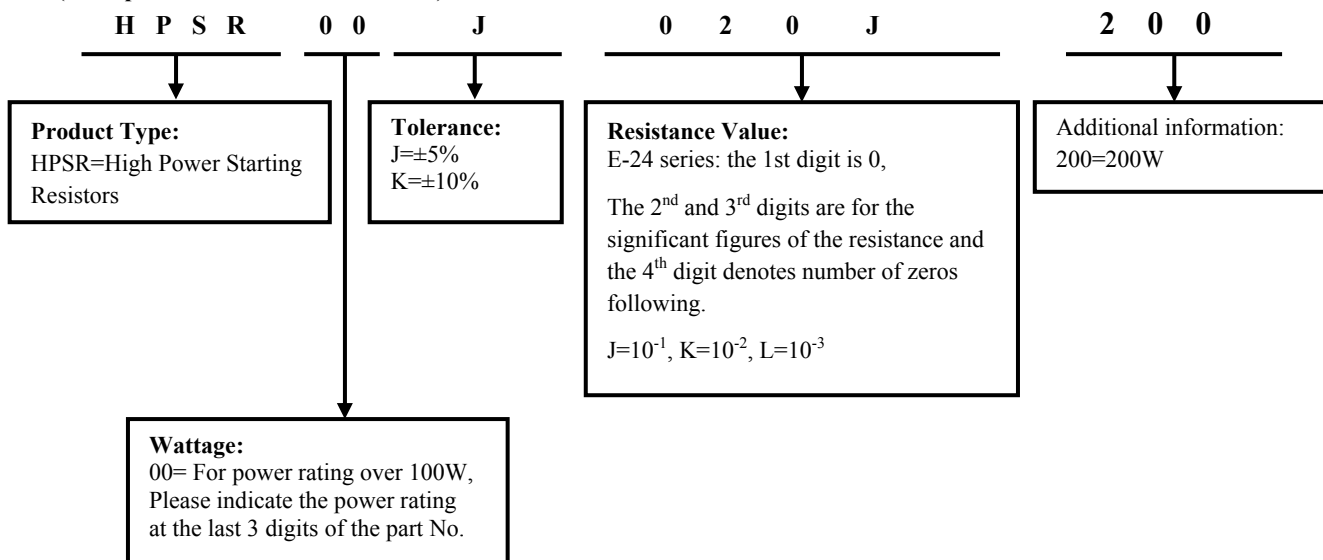
2.5.2 The 13<sup>th</sup> digit is normally to indicate the Packing Quantity: 0 = Bulk/Box

2.5.3 The 14<sup>th</sup> digit alone can use to denote special features of additional information with the following codes or standard product.

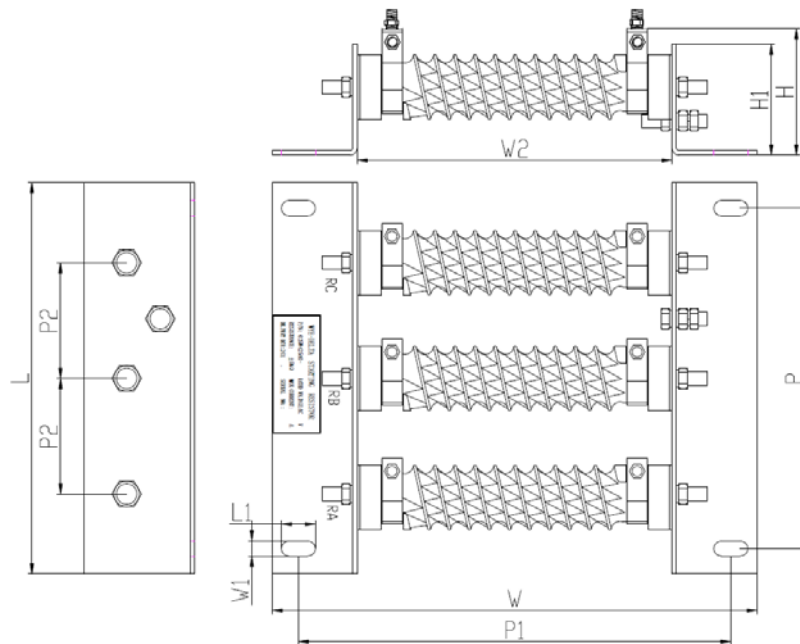
Example: 0=standard product

## 3. Ordering Procedure

(Example: HPSR 200W ±5% 2Ω B/B)



## 4. Dimension (Unit: mm)



Type	Pated voltage	Resistance	Impact current tolerance 0.5S	Finished stock size									
				L±1	L1±0.5	W±1.5	W1±0.2	W2±1.5	H±1	H1±1	P±1	P1±1.5	P2±1
HPSR 200W	660V	3*0.5Ω±5%	500A	230	20	290	9	185	95	65	200	254	70
		3*0.7Ω±5%	450A										
		3*1.0Ω±5%	350A										
		3*1.2Ω±5%	250A										
		3*1.40Ω±5%	150A										
		3*2.0Ω±5%	100A										

## 5. Marking

Laser lettering:

WYE-DELTA STARTING RESISTOR

P/N: 025W42540-10      RATED VOLTAGE: 660V

RESISTANCE:3\*0.7Ω      MAX.CURRENT: 450A

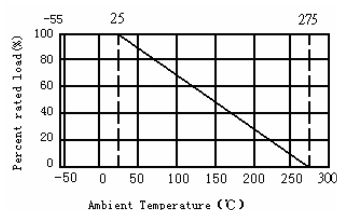
DELIVERY DATE:2015.12      SERIAL NO:\*\*\*

\*\*\* Note : The marking code shall be prevailed in kind!

## 6. Derating Curve

Resistors shall have a power rating based on continuous load operation at an ambient temperature from -55°C to 25°C. For temperature in excess of 25°C, the load shall be derated as shown in figure 1

Figure 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 commercial-line frequency and waveform (Volt.)

P = power rating (WATT.) R = nominal resistance (OHM)

In no case shall the rated DC or RMS AC continuous working voltage be greater than the applicable maximum value.

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

## 7. Performance Specification

Characteristic	Limits	Test Methods (GB/T5729&JIS-C-5201&IEC60115-1)
Appearance and mark	Resistance appearance clean, no sharp burr, make clear identification cannot be wiped	Visual in a good light environment
Resistance and tolerance	Within max. 5%	DC low resistance tester, testing environment 20~25°C
Temperature Coefficient	±200PPM/°C Max (By selecting the alloy wire)	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 <sub>1</sub> : Resistance value at room temp. (T <sub>1</sub> ) R <sub>2</sub> : Resistance value at room temp.+100°C (T <sub>2</sub> ) Test pattern: room temp. (T <sub>1</sub> ), room temp. +100°C(T <sub>2</sub> )
Insulation Resistance	Insulation Resistance > 1000MΩ	4.6 The measuring voltage shall be at 500V DC.
Dielectric withstanding voltage	No evidence of flashover mechanical damage, arcing or insulation break down.	4.7In resistors between the shell and alloy applied voltage AC 2000V 10mA for 60 seconds
Load life	The mark have no evidence of damage Resistance change rate is: ±(5%+0.05Ω)Max	4.25.1 permanent resistance change after 500 hours operating at RCWV or Max. Working Voltage whichever less with duty cycle of 1.5 hours “ON”, 0.5 hour “OFF” at 25°C±2°C ambient.

**8. Precaution for storage/Transportation**

8.1. 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.

8.2. 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.

8.3. 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<sub>2</sub>, H<sub>2</sub>S, NH<sub>3</sub>, SO<sub>2</sub>, NO<sub>2</sub>, Br etc.

**9. Record**

Version	Description	Page	Date	Amended by	Checked by
1	First version	1~4	Aug.09, 2023	Haiyan Chen	Yuhua Xu
2	Cancel load life in humidity test	4	Sep.26, 2024	Haiyan Chen	Yuhua Xu

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