

DATASHEET

Product Name High Power Wire-wound Flat Aluminum Shell Fixed Resistors

Part Name HFWR Series

File No. DIP-SP-052

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 Co., Ltd.

Aeon Technology Corporation

Royal Electronic Factory (Thailand) Co., Ltd.

Royal Technology (Thailand) Co., Ltd.

1. Scope

- 1.1 This datasheet is the characteristics of High Power Wire-wound Flat Aluminum Shell Fixed Resistors manufactured by UNI-ROYAL.
- 1.2 Completely flame-retardant materia
- 1.3 Anti-vibration, high stability
- 1.4 Flat structure with great saving space
- 1.5 Wire-wound process, good resistance to current impact
- 1.6 Application: Overload current protection of lithium battery pack in the start of new energy vehicle
- 1.7 Compliant with RoHS directive.
- 1.8 Halogen free requirement.

2. Part No. System

The standard Part No. includes 14 digits with the following explanation:

- 2.1 High Power Wire-wound Flat Aluminum Shell Fixed Resistors the 1st to 4th digits are to indicate the product type.

Example: HFWR= High Power Wire-wound Flat Aluminum Shell Fixed Resistors

- 2.2 5th~6th digits:

- 2.2.1 This is to indicate the wattage or power rating. To dieting the size and the numbers,

The following codes are used; and please refer to the following chart for detail:

Example: 90=90W

- 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 the standard resistance values of E-24 series, the 8th digit is "0", the 9th & 10th digits are to denote the significant figures of the resistance and the 11th digit is the zeros following;

For the standard resistance values of E-96 series, the 8th digit to the 10th digits is to denote the significant figures of the resistance and the 11th digit is the 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=10⁰ 1=10¹ 2=10² 3=10³ 4=10⁴ 5=10⁵ 6=10⁶ J=10⁻¹ K=10⁻² L=10⁻³ M=10⁻⁴ N=10⁻⁵ P=10⁻⁶

- 2.4.3 The 12th, 13th & 14th digits.

The 12th digit is to denote the Packaging Type with the following codes:

B=Bulk /Box

- 2.4.4 Current Sense Resistors, The 13th digit should be filled with "0"

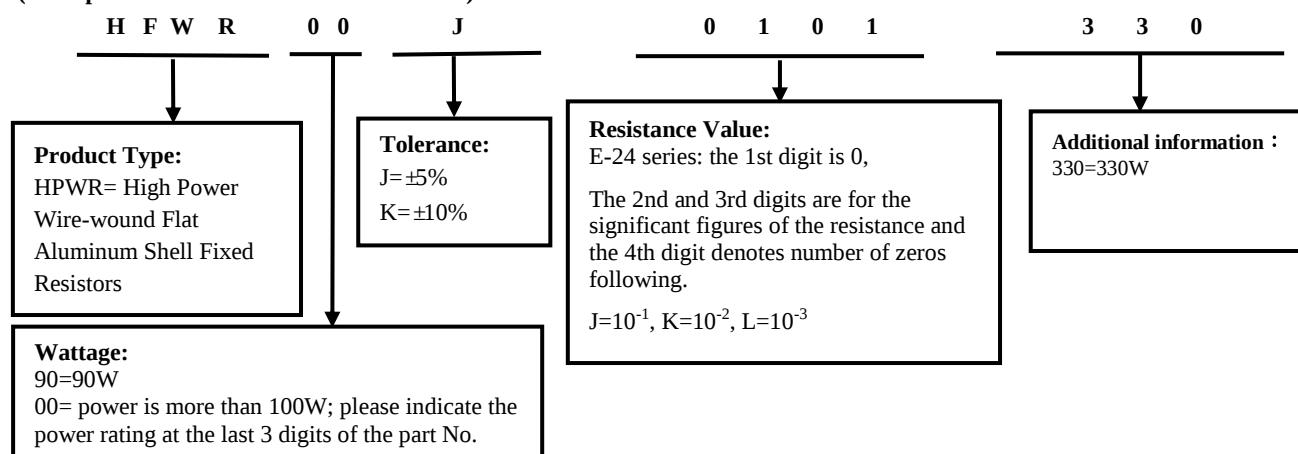
- 2.4.5 Current Sense Resistors, The 14th digit should be filled with "0"

- 2.4.6 For power rating over 100watt, the 12th to the 14th digits are to denote the actual wattage of the products

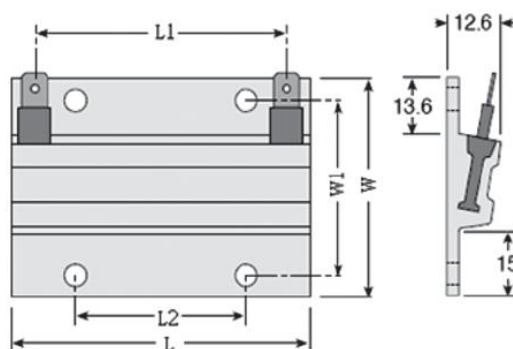
Example: 330 = 330W ;

3. Ordering Procedure

(Example: HFWR 330W ±5% 100 Ω B/B)



4. Dimension

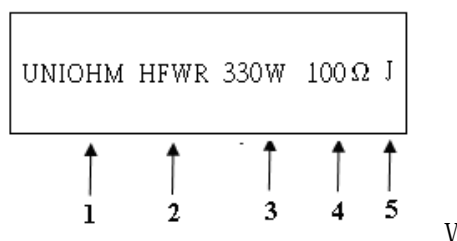


Unit:mm

Type	L±1.0	L1±0.5	L2±0.3	W±0.3	W1±0.3
HFWR 90W	70	53	39.7	51	41
HFWR 330W	280	263	2*100	51	41

*Remark: For further information, please contact our sales team.

5. Resistor marked



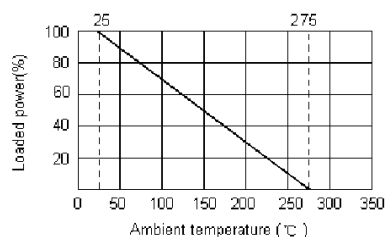
Code description and regulation:

1. Trademark
2. Resisters type
3. Wattage rating
4. Nominal resistance value
5. Resistance tolerance. J: ± 5%

marking: LASER PRINT

Note : The marking code shall be prevailed in kind!

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. Performance Specification

Characteristic	Limits	Test method (GB/T 5729&JIS-C-5201&IEC60115-1)
Temperature Coefficient	$\pm 300 \text{ PPM}/^{\circ}\text{C}$	4.8 Natural resistance changes per temp. Degree centigrade $\frac{R_2 - R_1}{R_1(t_2 - t_1)} \times 10^6 \text{ (PPM}/^{\circ}\text{C})$ R_1 : Resistance Value at room temperature (t_1) ; R_2 : Resistance at test temperature (t_2) t_1 : +25 $^{\circ}\text{C}$ or specified room temperature t_2 : Test temperature (-55 $^{\circ}\text{C}$ or 125 $^{\circ}\text{C}$)
Short-time overload	Resistance change rate is: $\pm(5\% + 0.05\Omega)\text{max.}$ With no evidence of mechanical damage.	4.13 Permanent resistance change after the application of a potential of 2.5 times RCWV or the max. Overload voltage respectively specified in the above list, whichever less for 5 seconds.
Humidity (Steady State)	Resistance change rate is: $\pm(5\% + 0.05\Omega)\text{max.}$ With no evidence of mechanical damage.	7.9 Resistance change after 240 hours without load in a humidity test chamber controlled at 40 $^{\circ}\text{C} \pm 2^{\circ}\text{C}$ and 90 to 95% relative humidity.
Load life	Resistance change rate is: $\pm(5\% + 0.05\Omega)\text{max.}$ With no evidence of mechanical damage.	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 $\pm 2^{\circ}\text{C}$ ambient.
Rapid change of temperature	Resistance change rate is: $\pm(5\% + 0.05\Omega)\text{max.}$ With no evidence of mechanical damage.	4.19 30 min at -55 $^{\circ}\text{C}$ and 30 min at 155 $^{\circ}\text{C}$; 100 cycles.
Dielectric withstanding voltage	No evidence of flashover mechanical damage, (2000V).	4.7 Resistors shall be clamped in the trough of a 90 $^{\circ}\text{C}$ metallic v-block and shall be tested at ac potential respectively specified in the given list of each product type for 60-70 seconds.
Resistance to Soldering heat	$\Delta R/R \leq \pm(1\% + 0.05\Omega)$	4.18 Dip the resistor into a solder bath having a temperature of 260 $^{\circ}\text{C} \pm 5^{\circ}\text{C}$ and hold it for 10 ± 1 seconds.

8. Note

- 6.1. UNI-ROYAL recommend products store in warehouse with temperature between 15 to 35 $^{\circ}\text{C}$ 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.
- 6.2. Cartons must be placed in correct direction which indicated on carton, otherwise the reel or wire will be deformed.
- 6.3. 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 , Br etc.

9. Record

Version	Description	Page	Date	Amended by	Checked by
1	First version	1~4	Apr.25, 2019	Haiyan Chen	Yuhua Xu
2	Modify the temperature coefficient test conditions	4	Nov.08, 2022	Haiyan Chen	Yuhua Xu