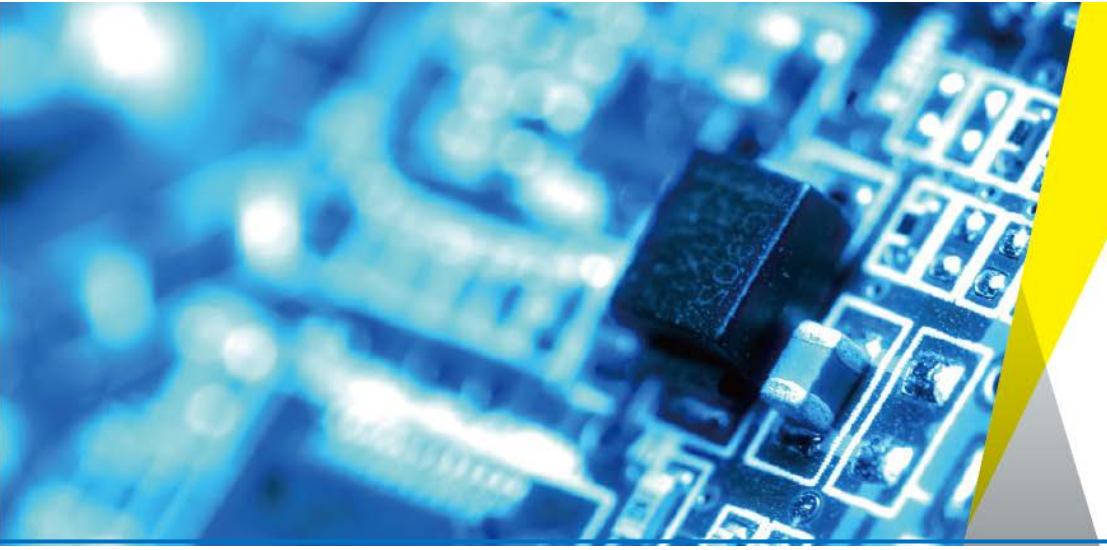

DATA SHEET

Product Name	**Power Flat Alloy Resistors**
Part Name	**PFAT Series**
File No.	**DIP-SP-035**

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	Royal Technology (Thailand) Co., Ltd.

1. Scope

1.1 This datasheet is the characteristics of Power Flat Alloy Resistors manufactured by UR.

1.2 Low inductance

1.3 Safety flameroof construction

1.4 Thin lightweight body save the PCB space considerably

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: PFAT=PFAT-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: 2W=2W、3W=3W，5W=5W

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 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:
$0=10^0$ $1=10^1$ $2=10^2$ $3=10^3$ $4=10^4$ $5=10^5$
$6=10^6$ $J=10^{-1}$ $K=10^{-2}$ $L=10^{-3}$ $M=10^{-4}$

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

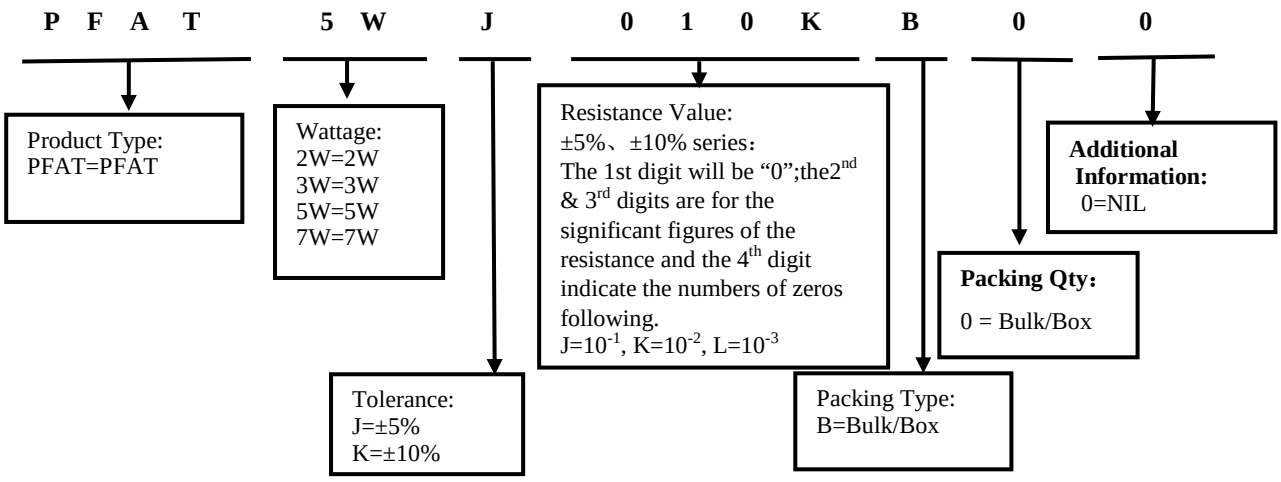
2.5.1 The 12th digit is to denote the Packaging Type with the following codes:
B=Bulk/Box

2.5.2 The 13th digit is normally to indicate the Packing Quantity of Tape/Box & Tape/Reel packaging types. Using "0" to indicate the Bulk packaging types, the following letter codes is to be used for some packing quantities:
A=500pcs B=2500pcs C=10000pcs D=20000pcs G=25000pcs H=50000pcs

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

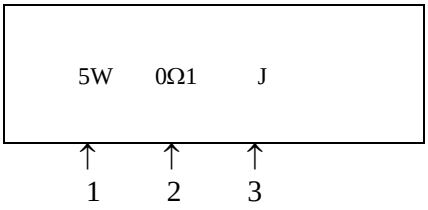
3. Ordering Procedure

(Example: PFAT 5W ±5% 0.1Ω B/B))



4. Marking

Example:

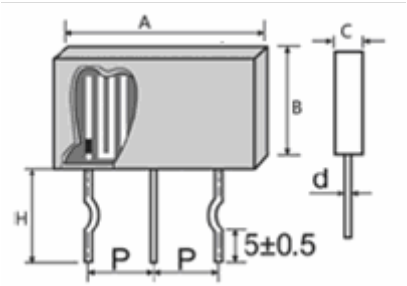


Code description and regulation:

1. Wattage Rate
2. Nominal Resistance Value
3. Resistance Tolerance. J: ± 5%
   K: ± 10%

Color of marking: Black Ink

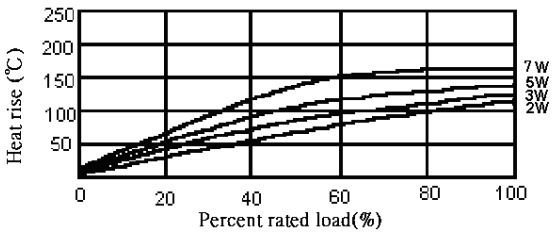
5. Ratings & Dimension



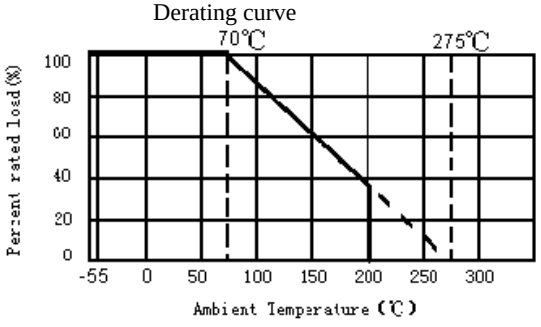
Type	Dimension(mm)						Tolerance	Resistance Range
	A±1.0	B±1.0	C±0.5	d±0.05	P±1.0	H±1		
PFAT 2W	26.0	9.0	5.0	0.75	10	13	±5%、±10%	0.05Ω~1Ω
PFAT 3W	26.0	13.0	5.0	0.75			±5%、±10%	0.05Ω~1Ω
PFAT 5W	26.0	18.0	5.0	0.75			±5%、±10%	0.05Ω~1Ω
PFAT 7W	26.0	20.0	5.0	0.75			±5%、±10%	0.1Ω-1Ω

6. Derating Curve

Heat rise chart



Derating curve



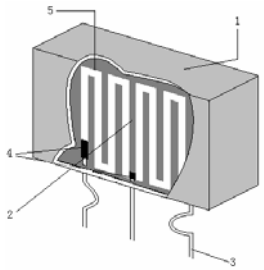
6.1 Voltage rating:

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	Ceramic case	Steatite
2	Cement	SiO_2
3	Terminal	Copper wire Platted with tin
4	Weld point	/
5	Alloy ribbon	Ni & Cr

8. Performance Specification

Characteristic	Limits	Test Methods (GB/T5729&JIS-C-5201&IEC60115-1)
Temperature Coefficient	0.01Ω~0.1Ω Please contact uniohm ≥0.1Ω: ±350PPM/℃;	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 ΔR/R≤±(2%+0.05Ω) , 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	2000V	4.7 Resistors shall be clamped in the trough of a 90°metallic v-block and shall be tested at ac potential respectively for 60+10/-0 seconds.
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.
Resistance to soldering heat	Resistance change rate must be in ΔR/R≤±(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℃ solder for 10±1 seconds.
Resistance to solvent	No deterioration of protective coating and markings	4.29 Speciments shall be immersed in a bath of sopropanol completely for 3 minutes with ultrasonic.
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.
Humidity (Steady state)	Resistance change rate must be in ΔR/R≤±(5%+0.05Ω), and no mechanical damage.	4.24 Temporary resistance change after a 240 hours exposure in a humidity test chamber controlled at 40℃± 2℃ and 90 to 95% relative humidity.

Load life in humidity	Resistance change rate must be in ΔR/R≤±(5%+0.05Ω), and no mechanical damage.	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℃±2℃ and 90 to 95% relative humidity.
Load life	Resistance change rate must be in ΔR/R≤±(5%+0.05Ω), and no mechanical damage.	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℃±2℃ ambient.
Low Temperature Storage	Resistance change rate must be in ΔR/R≤±(5%+0.05Ω), and no mechanical damage.	IEC 60068-2-1 (Aa) Lower limit temperature，for 2H.
High Temperature Exposure	Resistance change rate must be in ΔR/R≤±(5%+0.05Ω), and no mechanical damage.	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, 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	4	Nov.20,2020	Song Nie	Yuhua Xu
4	Modify the temperature coefficient test conditions	4	Nov.07, 2022	Haiyan Chen	Yuhua Xu