



# Approval Sheet

for

**Power Wirewound Resistor  
Flame-Proof & Safety Type**

**PNS Series**

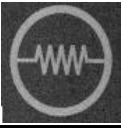
**±5%**

**YAGEO CORPORATION**

**Headquarters:** 3F, No.233-1, Pao Chiao Rd., Xindian, Taipei, Taiwan, R.O.C.

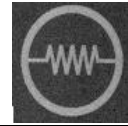
**Tel:** 886-2-6629-9999 **Fax:** 886-2-6628-8885

URL: [www.yageo.com](http://www.yageo.com)



Rev.	Description	Issue Date	Drawn	Approved
00	issue new spec.	May 29, 2012	Feng Ye	Ken Hsu
01	Revised the power rating code and the thermal resistance	Jul. 29, 2015	Feng Ye	Flora Shen
02	Revised the marking method.	Jul. 31, 2015	Feng Ye	Flora Shen

<b>Description</b>	Power Wirewound Resistors, Flame-Proof & Safety Type		
<b>Series</b>	PNS	<b>Rev.</b>	02



## 1. PRODUCT:

Resistors of series PNS are wound on ceramic carriers, all-welded contacts. Coated, the resistors comply with all requirements for precision and high ratings.

FLAME-PROOF & SAFETY TYPE

Body colour: Grey

## 2. PART NUMBER:

Part number of the precision power wirewound resistor is identified by the name, power, tolerance, packing, temperature coefficient, special type and resistance value.

Example :

<b>PNS</b>	<b>100</b>	<b>J</b>	<b>T</b>	<b>-</b>	<b>52-</b>	<b>10R</b>
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Series Name	Power Rating	Resistance Tolerance	Packing Style	Temperature Coefficient of Resistance	Special Type	Resistance Value

(1) Style: PNS SERIES

(2) Power Rating : 100=1W 、 180=1.8W 、 230=2.3W 、 270=2.7W 、 360=3.6W 、 450=4.5W

(3) Tolerance: J=±5%

(4) Packaging Type: T=Tape on Box Packing

(5) Temperature Coefficient : ”-“=Base on spec.

(6) Special Type :

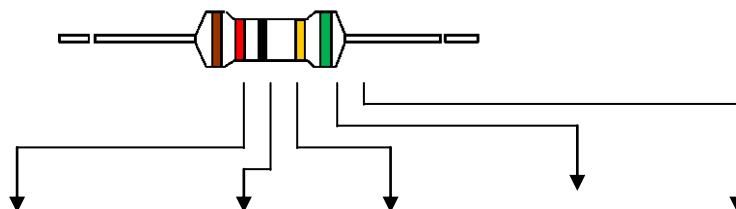
- 52-=52.4mm
- 73-=73mm
- 52G= 52.4mm packing with  $\psi$  d=0.65±0.05mm
- 52Z= 52.4mm packing with spacing 10mm for PNS230 (Normal spacing is 5mm)

(7) Resistance Value : E24 Series

Example : 1R 、 10R 、 100R 、 .....



### 3. MARKING:



COLOR	1ST BAND	2ND BAND	MULTIPLIER	TOLERANCE
BLACK	0	0	1 Ω	
BROWN	1	1	10 Ω	
RED	2	2	100 Ω	
ORANGE	3	3	1K Ω	
YELLOW	4	4		
GREEN	5	5		PNS series
BLUE	6	6		
VIOLET	7	7		
GREY	8	8		
WHITE	9	9		
GOLD			0.1 Ω	± 5 % (J)
SILVER			0.01 Ω	± 10 % (K)

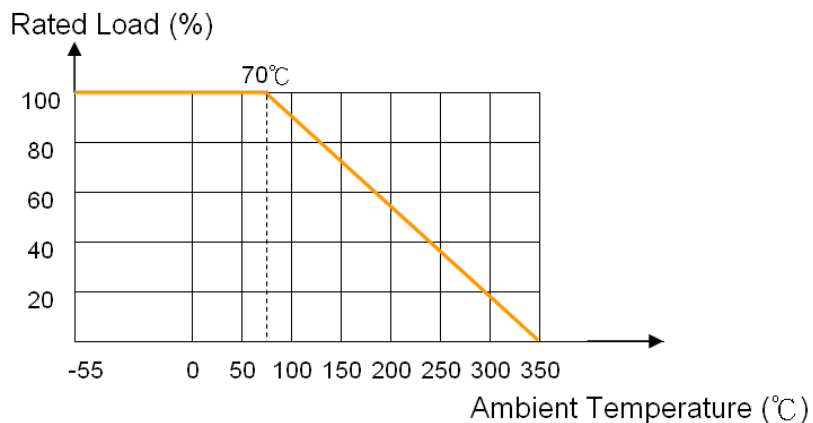
### 4. ELECTRICAL CHARACTERISTICS

TABLE I

STYLE	PNS100	PNS180	PNS230	PNS270	PNS360	PNS450
Power Rating at 70 °C	1W	1.8W	2.3W	2.7W	3.6W	4.5W
Max. Cont. Work. Voltage	$\sqrt{P_{70}} \times R$					
Thermal resistance (°C/W)	280	155	127	103	77	62
Resistance Range	1R~100R	1R~240R	1R~330R			
Tolerances	±5%					
Temperature Coefficient	120 ± 50 ppm/°C					
Insulation Voltage (1min.)	Max. 500V					
Operating Temp. Range	- 55 °C to + 350 °C					

\* Below or over this resistance on request.

### 5. DERATING CURVE



## 6. SAFETY CHARACTERISTIC

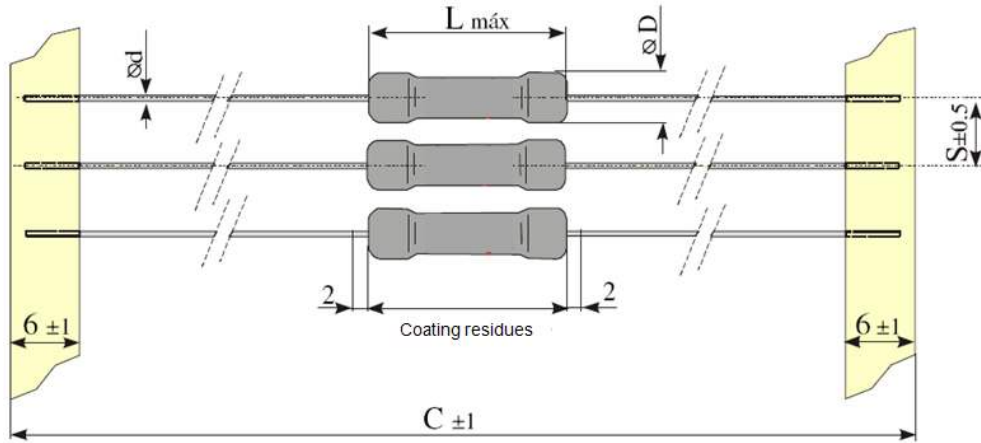
The special construction of resistance values >10R results in an immediate interruption (<1s, 230ms typical), when mains voltage (220V/240V<sub>RMS</sub>) is applied. No flames, no explosion. After fusing, the resistance value is >100KOhm.

For other voltages test suitability in the application!

\* Resistance values < 10R are flame retardant.

The interruption mechanism is not clearly defined and has to be tested in the final application!

## 7. DIMENSIONS



STYLE	DIMENSIONS (unit: mm)		
	Lmax.	ψ D* max.	ψ d ±0.1
PNS100	9.0	3.0	0.65
PNS180	9.7	4.0	0.80
PNS230	14.5	4.5	0.65
PNS270	12.6	6.0	0.80
PNS360	17.0	6.0	0.80
PNS450	18.0	8.5	0.80

\*R<10R Dmax. +1

## 8. ENVIRONMENTAL CHARACTERISTICS

### (1) Voltage Proof

The resistor shall be clamped in the trough of a 90° metal V Block. Apply the insulation voltage specified in the "Table I" between the terminals connected together with the block for about 60 seconds. The resistor shall be able to withstand without breakdown or flashover.

### (2) Temperature Coefficient Test

Test of resistors above room temperature 100°C ± 2°C ( Testing Temperature 115°C to 130°C ) at the constant temperature silicon plate for over 5 minutes. Then measure the resistance value. The Temperature Coefficient is calculated by the following equation and its value should be within the range of requested.

$$\text{Resistor Temperature Coefficient} = \frac{R - R_0}{R_0} \times \frac{1}{t - t_0} \times 10^6$$



- R** = Resistance value under the testing temperature
- R<sub>0</sub>** = Resistance value at the room temperature
- t** = The testing temperature
- t<sub>0</sub>** = Room temperature

(3) Solderability

Immerse the specimen into the solder pot at  $235 \pm 5$  °C for  $3 \pm 0.5$  seconds.  
At least 95% solder coverage on the termination.

(4) Solvent Resistance of Marking

The specimen into the appropriate solvent of IPA condition of ultrasonic machine for  $5 \pm 0.5$  minutes.  
The specimen is no deterioration of coatings and color code

(5) Robustness of Terminations

Direct Load – Resistors shall be held by one terminal and the load shall be gradually applied in the direction of the longitudinal axis of the resistor unit the applied load reached the requirement.  
The load shall be held for 10 seconds. The load of weight shall be  $\geq 40N$

(6) Damp Heat Steady State

Place the specimen in a test chamber at  $40 \pm 2$  °C and 90 ~ 95 % relative humidity. Apply the 0.1 times rated voltage to the specimen at the 1.5 hours on and 0.5 hour off cycle. The total length of test is 56 days.  
The change of the resistance value shall be within  $\pm 5.0$  %

(7) Endurance at 70 °C

Placed in the constant temperature chamber of  $70 \pm 3$  °C the resistor shall be connected to the lead wire at the point of 25mm. Length with each terminal, the resistors shall be arranged not much effected mutually by the temperature of the resistors and the excessive ventilation shall not be performed, for 90 minutes on and 30 minutes off under this condition the rated D.C. voltage is applied continuously for 1000+48/-0 hours then left at no-load for 1hour, measured at this time the resistance value °  
The change of the resistance value shall be within  $\pm 5.0\%$   
There shall be no remarkable change in the appearance and the color code shall be legible after the test..

(8) Resistance to Soldering Heat

The terminal lead shall be dipped into the solder pot at  $260 \pm 3$  °C for  $10 \pm 1.0$  seconds up to 2.5 ~ 3.5 mm.  
The change of the resistance value shall be within  $\pm 0.5\%$

**9. PACKAGING**

STYLE	Packaging	Pieces	Pack.-code	C	s
PNS100	taped	1000	T	65	5
PNS180	taped	1000	T	65	5
PNS230	taped	1000	T	85	10
PNS270	taped	1000	T	85	10
PNS360	taped	1000	T	85	10
PNS450	taped	500	T	85	10



## 10. Plant Address

- A. China Dongguan Plant  
7-1, Gaoli Road, Gaoli Industrial Zone  
Tangxia Zhen, Dongguan, Guangdong, China  
(廣東省東莞市塘廈鎮高麗工業區高麗路 7-1 號)  
Tel. 86-769-8772 0275  
Fax. 86-769-8772 0275 #4333
  
- B. China Mudu Plant  
No.158, Fengjiang Road,  
Mudu New District, Suzhou, Kiangsu, China  
(江蘇省蘇州木瀆新區楓江路 158 號)  
Tel. 86-512-6651 8889  
Fax. 86-512-6651 9889