

# Approval Sheet

for

**Power Wire Wound Resistors  
Flame-Proof & High Power Style**

**PNP V series**

**$\pm 5\%$ ,  $\pm 10\%$**

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## 1. PRODUCT:

### POWER WIRE WOUND RESISTORS

The resistors are coated with a green lacquer of flameproof silicone, the 5<sup>th</sup> colour band is violet to represent power wire wound resistors. High power dissipation in small volume.

## 2. PART NUMBER:

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

Example :

<b>PNP</b>	<b>3WV</b>	<b>J</b>	<b>T</b>	<b>-</b>	<b>73-</b>	<b>100R</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: PNP SERIES

(2) Power Rating : 1WV = 1W 、 3WV = 3W 、 4WV = 4W 、 5WV = 5W 、 7WV = 7W 、 10V = 10W

(3) Tolerance: J=±5% K=±10%

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

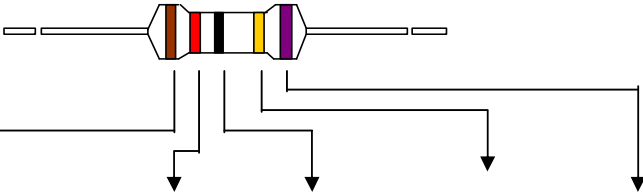
(5) Temperature Coefficient : 0~600 ppm/°C

(6) Special Type :           52- = 52.4mm  
  73- = 73mm  
  91- = 91mm

(7) Resistance Value : E24 Series

Example : 0R1 、 1R 、 10R 、 100R

### 3. BAND-CODE:



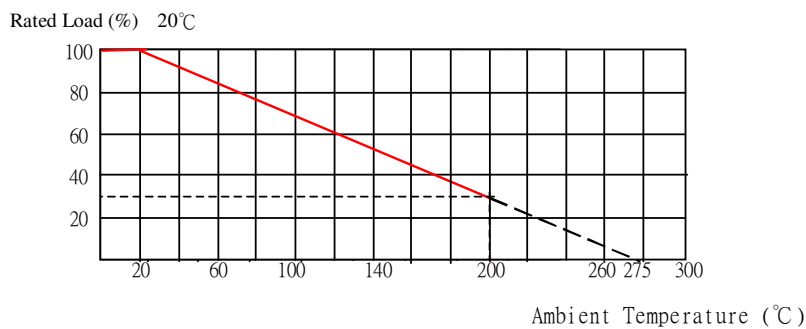
COLOR	1ST BAND	2ND BAND	MULTIPLIER	TOLERANCE
BLACK	0	0	1 Ω	
BROWN	1	1	10 Ω	
RED	2	2	100 Ω	
ORANGE	3	3	1K Ω	
YELLOW	4	4		
GREEN	5	5		
BLUE	6	6		
VIOLET	7	7		PNP V series
GREY	8	8		
WHITE	9	9		
GOLD			0.1 Ω	± 5 % (J)
SILVER			0.01 Ω	± 10 % (K)

### 4. ELECTRICAL CHARACTERISTICS

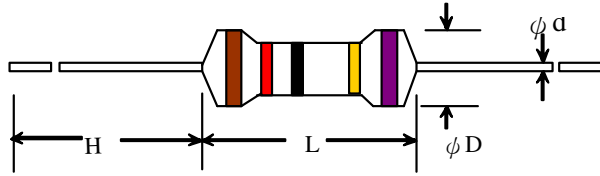
STYLE	PNP1WV	PNP3WV	PNP4WV	PNP5WV	PNP7WV	PNP10V
Power Rating at 70 °C	1 W	3 W	4 W	5 W	7W	10W
Dielectric Withstanding Voltage	$\sqrt{\text{Power Rating} \times \text{Resistance Value}}$					
Resistance Range	0.1Ω~2KΩ	0.1Ω~2KΩ	0.1Ω~39KΩ	0.1Ω~39KΩ	0.43Ω~56KΩ	1Ω~10KΩ
Operating Temp. Range	-40 °C to + 200 °C					
Temperature Coefficient	0~ 600 ppm /°C					

\* Below or over this resistance range on request.

### 5. DERATING CURVE



## 6. DIMENSIONS



STYLE	DIMENSION			
	L	$\phi D$	H	$\phi d$
PNP1WV	10±1.0	4.3±0.5	32±2.0	0.8±0.05
PNP3WV	13±1.0	5.5±0.5	33±2.0	0.8±0.05
PNP4WV	17±1.0	5.7±0.5	28±2.0	0.8±0.05
PNP5WV	17±1.0	7.5±0.5	32±2.0	0.8±0.05
PNP7WV	25±1.0	7.5±0.5	38±2.0	0.8±0.05
PNP10V	44±1.0	8.0±0.5	28±2.0	0.8±0.05

## 7. ENVIRONMENTAL CHARACTERISTICS

### (1) Short Time Over Load Test

At 2.5 times of the rated voltage applied for 5 seconds, the resistor should be free from defects after the resistor is released from load for about 30 minutes

$$\text{Short Time Overload Voltage} = 2.5 * \sqrt{\text{Power Rating} \times \text{Resistance Value}}$$

The change of the resistance value should be within  $\pm 2.0 \% + 0.05 \Omega$

### (2) Dielectric Withstanding Voltage

The resistor is placed on the metal V Block. Apply a Table I dielectric withstanding between the terminals connected together with the block for about 60 seconds.

The resistor shall be able to withstand without breakdown or flashover.

### (3) Temperature Coefficient Test

Test of resistors above room temperature  $100^{\circ}\text{C} \pm 2^{\circ}\text{C}$  ( Testing Temperature  $115^{\circ}\text{C}$  to  $130^{\circ}\text{C}$  ) 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

(4) Insulation Resistance

Apply test terminal on lead and resistor body.  
The test resistance should be high than 100M ohm.

(5) Solderability

Immerse the specimen into the solder pot at  $260 \pm 5$  °C for  $5 \pm 0.5$  seconds.  
At least 95% solder coverage on the termination.

(6) Resistance to Solvent

The specimen into the appropriate solvent of IPA condition of ultrasonic machine for 1 minutes.  
The specimen is no deterioration of coatings and color code.

(7) Terminal Strength

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 reacheds 5 pounds °  
The load shall be held for 10 seconds. The load of weight shall be  $\geq 2.5$  kg ( 24.5N ).

(8) Load Life in Humidity

Place the specimen in a test chamber at  $40 \pm 2$  °C and 90 ~ 95 % relative humidity. Apply the rated voltage to the specimen at the 1.5 hours on and 0.5 hour off cycle. The total length of test is 1,000 hours  
The change of the resistance value shall be within  $\pm 5\% + 0.05 \Omega$

(9) Load Life Test

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  $\pm 5\% + 0.05 \Omega$ .  
There shall be no remarkable change in the appearance and the color code shall be legible after the test.

(10) Temperature Cycling Test

The temperature cycle shown in the following table shall be repeated 5 times consecutively. The measurement of the resistance value is done before the first cycle and after ending the fifth cycle, leaving in the room temperature for about 1 hour °

Temperature Cycling Conditions:

Step	Temperature(°C)	Time (minute)
1	$-55 \pm 3$	30
2	$25 \pm 3$	2 ~ 3
3	$155 \pm 3$	30
4	$25 \pm 3$	2 ~ 3

The change of the resistance value shall be within  $\pm 1.0\% + 0.05 \Omega$   
After the test the resistor shall be free from the electrical or mechanical damage.

(11) Resistance to Soldering Heat

The terminal lead shall be dipped into the solder pot at  $350 \pm 10$  °C for  $3 \pm 0.5$  seconds up to 2 ~ 2.5 mm.  
The change of the resistance value shall be within  $\pm 1.0\% + 0.05 \Omega$

(12) Overload Flame Retardant

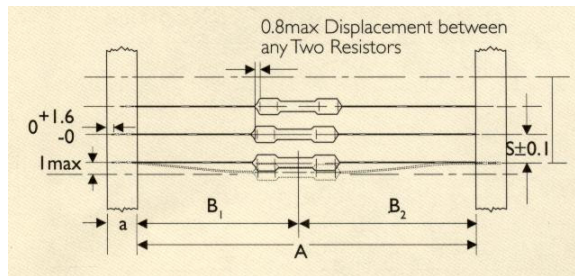
At 4 times of the rated voltage applied for 1 minute

$$\text{Overload Test Voltage} = 4 * \sqrt{\text{Power Rating} \times \text{Resistance Value}}$$

The resistor shall be able to no evidence of flaming arcing.

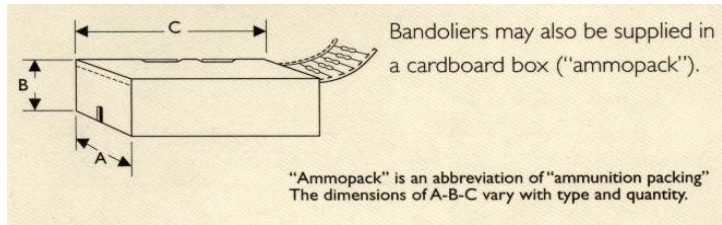
**8. PACKING METHODS**

Bandolier for Axial leads



STYLE	DIMENSIONS				Unit: : mm	
	a	A	B1-B2	S(spacing)	T (max. deviation of spacing)	
Normal		73.0 ± 1.5	1.5			
PNP1WV	6 ± 0.5	52.4 ± 1.0	1.2	10		
PNP3WV	6 ± 0.5	73.0 ± 1.5	1.5	10		
PNP4WV	6 ± 0.5	52.4 ± 1.0	1.2	10		
PNP5WV	6 ± 0.5	73.0 ± 1.5	1.5	10	1 mm per 10 spacing	
PNP7WV	6 ± 0.5	52.4 ± 1.0	1.2	10	0.5 mm per 5 spacing	
PNP10V	6 ± 0.5	91.0 ± 1.5	1.5	10		
		73.0 ± 1.5	1.2	10		

## 9. TAPE ON BOX PACKING



STYLE	Standard Lead Length			Qty per box
	W ( A )	H ( B )	L ( C )	
Normal				
PNP1WV	73	45	258	1000
PNP3WV	103	94	260	1000
PNP4WV	103	94	260	1000
PNP5WV	103	94	260	300
PNP7WV	116	79	255	300
PNP10V	116	79	255	250

## 10. Plant Address

- A. Taiwan Xindian Plant  
3F, No.5, Lane 560, Chung Cheng Road,  
Xindian, Taipei, Taiwan, ROC  
(台北縣新店市中正路 560 巷 5 號 3 樓)  
Tel. 886-2-2218-2139  
Fax. 886-2-6629-8898
- B. 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
- C. China MuDu Plant  
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