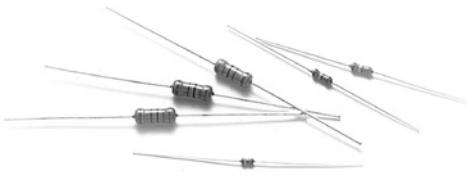


## Wirewound Resistors

# High Power Type

## Ultra Miniature Style [ PNP Series ]



### INTRODUCTION

The resistor element is a resistive wire which is wound in a single layer on a ceramic rod, with tinned connecting wires of electrolytic copper welded to the end-caps. The ends of the resistive wire and the leads are connected to the caps by welding. The resistors are coated with layers of green color flame-proof lacquer. High power in small packages.

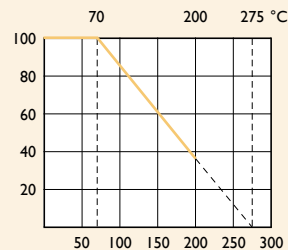
### FEATURES

Power Rating	1W, 2W, 3W, 4W
Resistance Tolerance	±1%, ±5%
T.C.R.	±300ppm/°C
Flameproof Multi-layer Coating Meets	UL-94V-0
Flameproof Feature Meets Overload Test	UL-1412

### DERATING CURVE

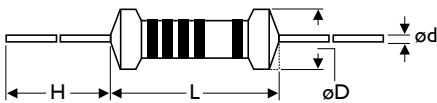
For resistors operated in ambient temperatures above 70°C, power rating must be derated in accordance with the curve below.

Rated Load (%)



Ambient Temperature (°C)

### DIMENSIONS



5th color code: violet

Unit: mm

STYLE	DIMENSION			
	L	øD	H	ød
Ultra Miniature				
PNP100	6.3±0.5	2.4±0.2	28±2.0	0.55±0.05
PNP200	9.0±0.5	3.3±0.3	26±2.0	0.55±0.05
PNP300	11.5±1.0	4.5±0.5	35±2.0	0.8±0.05
PNP400	15.5±1.0	5.0±0.5	33±2.0	0.8±0.05

Note:

## ELECTRICAL CHARACTERISTICS

STYLE	PNP100	PNP200	PNP300	PNP400
Power Rating at 70°C	1W	2W	3W	4W
Dielectric Withstanding Voltage	300V			
Resistance Range (±1%)	0.22 Ω - 130 Ω	0.1 Ω - 820 Ω	0.1 Ω - 2.2K Ω	0.1 Ω - 2.8K Ω
Resistance Range (±5%)	0.1 Ω - 130 Ω	0.068 Ω - 820 Ω	0.025 Ω - 2.2K Ω	0.03 Ω - 2.8K Ω
Operating Temp. Range	-40°C to +200°C			
Temperature Coefficient	±300ppm/°C			

Note: Special value is available on request

## ENVIRONMENTAL CHARACTERISTICS

PERFORMANCE TEST	TEST METHOD		APPRAISE
Short Time Overload	IEC 60115-1 4.13	10 times rated power for 5 Sec.	±2.0%+0.05 Ω
Voltage Proof	IEC 60115-1 4.7	in V-block for 60 Sec., test voltage by type	By type
Temperature Coefficient	IEC 60115-1 4.8	-55°C to +155°C	By type
Insulation Resistance	IEC 60115-1 4.6	in V-block for 60 Sec.	>100M Ω
Solderability	IEC 60115-1 4.17	235±5°C for 3±0.5 Sec.	95% Min. coverage
Solvent Resistance of Marking	IEC 60115-1 4.30	IPA for 5±0.5 Min. with ultrasonic	No deterioration of coatings and markings
Robustness of Terminations	IEC 60115-1 4.16	Direct load for 10 Sec. in the direction of the terminal leads	≥2.5kg (24.5N)
Damp Heat Steady State	IEC 60115-1 4.24	40±2°C, 90-95% RH for 56 days, loaded with 0.1 times RCWV	±5.0%+0.05 Ω
Endurance at 70°C	IEC 60115-1 4.25	70±2°C at RCWV for 1,000 Hr. (1.5 Hr. on, 0.5 Hr. off)	±5.0%+0.05 Ω
Temperature Cycling	IEC 60115-1 4.19	-55°C ⇌ Room Temp. ⇌ +155°C ⇌ Room Temp. (5 cycles)	±1.0%+0.05 Ω
Resistance to Soldering Heat	IEC 60115-1 4.18	260±3°C for 10±1 Sec., immersed to a point 3±0.5mm from the body	±1.0%+0.05 Ω
Accidental Overload Test	IEC 60115-1 4.26	4 times RCWV for 1 Min.	No evidence of flaming or arcing

Note: Rated Continuous Working Voltage (RCWV) =  $\sqrt{\text{Power Rating} \times \text{Resistance Value}}$