

# RESISTOR THIN FILM PRECISION RNP SERIES



## KEY FEATURES

- Resistances from 1 Ohm to 3M Ohms
- Resistance Tolerances to  $\pm 0.01\%$
- Power Rating 0.06 to 0.75 watts
- TCR's up to  $\pm 5\text{ppm}/^\circ\text{C}$
- Operating Temperature:  $-55^\circ\text{C}$  to  $155^\circ\text{C}$
- Available in sizes 0402, 0603, 0805, 1206, 2010, 2512

## APPLICATIONS

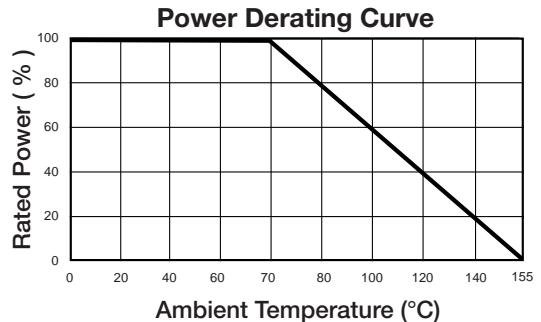
- Motor Control
- Precision Scales
- Smart Grid Metering
- Temperature Sensors

## PRODUCT SUMMARY

PACKAGE SIZE	STANDARD POWER RATING (PAGE 44)		HIGH POWER RATING (PAGE 45)	
	RESISTANCE RANGE ( $\Omega$ )	POWER RATING (W) AT $70^\circ\text{C}$	RESISTANCE RANGE ( $\Omega$ )	POWER RATING (W) AT $70^\circ\text{C}$
0402	1 - 511K	0.0625	-	-
0603	1 - 1M	0.0625	4.7 - 1M	0.100
0805	1 - 2M	0.100	1 - 1M	0.125
1206	1 - 2.49M	0.125	4.7 - 1M	0.250
2010	1 - 3M	0.250	4.7 - 1M	0.333
2512	1 - 3M	0.500	1 - 2K	0.750

## AVAILABLE OPTIONS (Consult Factory)

- Special Testing Requirements



## HOW TO ORDER

RNP	14	H	W	003K8	B	T
RESISTOR THIN FILM PRECISION	PACKAGE CODE	POWER RATING	TEMPERATURE COEFFICIENT OF RESISTANCE (TCR)	RESISTANCE	TOLERANCE	PACKING
	07 = 0402 14 = 0603 15 = 0805 18 = 1206 19 = 2010 20 = 2512	S = Standard H = High Power	X = $\pm 5\text{ppm}/^\circ\text{C}$ W = $\pm 10\text{ppm}/^\circ\text{C}$ V = $\pm 15\text{ppm}/^\circ\text{C}$ T = $\pm 25\text{ppm}/^\circ\text{C}$ Q = $\pm 50\text{ppm}/^\circ\text{C}$	038R0 = $38\Omega$ 003K8 = $3.8\text{K}\Omega$ 038K0 = $38.0\text{K}\Omega$ 380K0 = $380.0\text{K}\Omega$ 003M8 = $3.8\text{M}\Omega$ Letter denotes decimal place. R = decimal, "K" $10^3$ , "M" $10^6$ Remaining 4 digits are significant or placeholders.	T = $\pm 0.01\%$ A = $\pm 0.05\%$ B = $\pm 0.1\%$ C = $\pm 0.25\%$ D = $\pm 0.5\%$ F = $\pm 1.0\%$	T = Paper Tape

Standard Termination Finish: Nickel Tin Alloy

Example P/N:

RNP14HW003K8BE is Resistor Thin Film Precision, 0603 size, high power rating,  $\pm 10\text{ppm}/^\circ\text{C}$ ,  $3.8\text{K}\Omega$ ,  $\pm 0.1\%$ , embossed tape & reel



# RESISTOR THIN FILM PRECISION



## RNP SERIES

### STANDARD POWER RATING SPECIFICATIONS

Standard Package Size		Size 0402 (RNP07S)					Size 0603 (RNP14S)					Size 0805 (RNP15S)						
Max Working Voltage (V) <sup>1</sup>		25V					50V					100V						
Max Overload Voltage (V) <sup>2</sup>		50V					100V					200V						
Power Rating (W) at 70°C		0.0625					0.0625					0.100						
TCR PPM/°C		±5	±10	±15	±25	±50	±5	±10	±15	±25	±50	±5	±10	±15	±25	±50		
Resistance Range (Ω)	±0.01% Tolerance	49.9Ω to 4.99KΩ	49.9Ω to 12KΩ		-	24.9Ω to 15KΩ	24.9Ω to 100KΩ		-		24.9Ω to 30KΩ	24.9Ω to 200KΩ		-				
	±0.05% Tolerance				49.9Ω to 12KΩ		4.7Ω to 332KΩ					4.7Ω to 1MΩ		4.7Ω to 1MΩ				
	±0.1% Tolerance				10Ω to 255KΩ		4.7Ω to 1MΩ					4.7Ω to 2MΩ						
	±0.25% Tolerance		49.9Ω to 60KΩ		49.9Ω to 69.8KΩ		4.7Ω to 511KΩ		4.7Ω to 511KΩ			1Ω to 1MΩ		1Ω to 1MΩ		1Ω to 2MΩ		
	±0.5% Tolerance																	
	±1% Tolerance																	

Standard Package Size		Size 1206 (RNP18S)					Size 2010 (RNP19S)					Size 2512 (RNP20S)						
Max Working Voltage (V) <sup>1</sup>		150V					150V					150V						
Max Overload Voltage (V) <sup>2</sup>		300V					300V					300V						
Power Rating (W) at 70°C		0.125					0.250					0.500						
TCR PPM/°C		±5	±10	±15	±25	±50	±5	±10	±15	±25	±50	±5	±10	±15	±25	±50		
Resistance Range (Ω)	±0.01% Tolerance	24.9Ω to 49.9KΩ	24.9Ω to 499KΩ		-	24.9Ω to 100KΩ	24.9Ω to 499KΩ		-		24.9Ω to 100KΩ	24.9Ω to 499KΩ		-				
	±0.05% Tolerance				4.7Ω to 1MΩ		4.7Ω to 1MΩ		4.7Ω to 1MΩ			4.7Ω to 1MΩ		4.7Ω to 1MΩ		4.7Ω to 1MΩ		
	±0.1% Tolerance				4.7Ω to 2.49MΩ		4.7Ω to 3MΩ		4.7Ω to 3MΩ			4.7Ω to 3MΩ		4.7Ω to 3MΩ		4.7Ω to 3MΩ		
	±0.25% Tolerance		4.7Ω to 1MΩ		1Ω to 2.49MΩ		1Ω to 3MΩ		1Ω to 3MΩ			1Ω to 3MΩ		1Ω to 3MΩ		1Ω to 3MΩ		
	±0.5% Tolerance																	
	±1% Tolerance																	

<sup>1</sup> Working Voltage =  $\sqrt{P \cdot R}$  or MAX Listed, whichever is lower.

<sup>2</sup> Overload Voltage =  $2.5 \cdot \sqrt{P \cdot R}$  or MAX Listed, whichever is lower.

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## High Power Ratings Specifications

High Power Package Size	Size 0603 (RNP14H)					Size 0805 (RNP15H)					Size 1206 (RNP18H)				
Max Working Voltage (V) <sup>1</sup>	75V					150V					200V				
Max Overload Voltage (V) <sup>2</sup>	150V					300V					400V				
Power Rating (W) at 70°C	0.100					0.125					0.250				
TCR PPM/°C	±5	±10	±15	±25	±50	±5	±10	±15	±25	±50	±5	±10	±15	±25	±50
Resistance Range (Ω)	±0.01% Tolerance	24.9Ω to 15KΩ	24.9Ω to 100KΩ			24.9Ω to 30KΩ	24.9 to 200K				24.9Ω to 49.9KΩ	24.9Ω to 499KΩ			
	±0.05% Tolerance		4.7Ω to 332KΩ		4.7Ω to 511KΩ			4.7Ω to 1MΩ							
	±0.1% Tolerance		4.7Ω to 332KΩ		4.7Ω to 1MΩ		4.7Ω to 1MΩ		4.7Ω to 1MΩ			4.7Ω to 1MΩ			
	±0.25% Tolerance		4.7Ω to 332KΩ		4.7Ω to 1MΩ		4.7Ω to 1MΩ		4.7Ω to 1MΩ			4.7Ω to 1MΩ			
	±0.5% Tolerance		4.7Ω to 332KΩ		4.7Ω to 1MΩ		4.7Ω to 1MΩ		1Ω to 1MΩ			4.7Ω to 1MΩ			
	±1% Tolerance		4.7Ω to 332KΩ		4.7Ω to 1MΩ		4.7Ω to 1MΩ		1Ω to 1MΩ			4.7Ω to 1MΩ			

High Power Package Size	Size 2010 (RNP19H)					Size 2512 (RNP20H)			
Max Working Voltage (V) <sup>1</sup>	200V					200V			
Max Overload Voltage (V) <sup>2</sup>	400V					400V			
Power Rating (W) at 70°C	0.333					0.750			
TCR PPM/°C	±5	±10	±15	±25	±50	±10	±15	±25	±50
Resistance Range (Ω)	±0.01% Tolerance	24.9Ω to 49.9KΩ	24.9Ω to 499KΩ			24.9Ω to 2KΩ			
	±0.05% Tolerance		4.7Ω to 1MΩ			4.7Ω to 2KΩ			
	±0.1% Tolerance		4.7Ω to 1MΩ			1Ω to 2KΩ			
	±0.25% Tolerance		4.7Ω to 1MΩ			1Ω to 2KΩ			
	±0.5% Tolerance		4.7Ω to 1MΩ			1Ω to 2KΩ			
	±1% Tolerance		4.7Ω to 1MΩ			1Ω to 2KΩ			

<sup>1</sup> Working Voltage =  $\sqrt{P \cdot R}$  or MAX Listed, whichever is lower.

<sup>2</sup> Overload Voltage =  $2.5 \cdot \sqrt{P \cdot R}$  or MAX Listed, whichever is lower.



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## MECHANICAL CHARACTERISTICS



Package Size	Dimensions			
	L (Length) Inches [mm]	W (Width) Inches [mm]	T (Thickness) Inches [mm]	EB (End Band) Inches [mm]
<b>0402</b>	0.04 [1.02]	0.02 [0.51]	0.012 [0.30]	0.007 [0.18]
<b>0603</b>	0.06 [1.52]	0.03 [0.76]	0.018 [0.46]	0.012 [0.30]
<b>0805</b>	0.08 [2.03]	0.05 [1.27]	0.022 [0.56]	0.012 [0.30]
<b>1206</b>	0.12 [3.05]	0.06 [1.52]	0.022 [0.56]	0.016 [0.41]
<b>2010</b>	0.19 [4.83]	0.09 [2.29]	0.022 [0.56]	0.023 [0.58]
<b>2512</b>	0.25 [6.35]	0.12 [3.05]	0.022 [0.56]	0.023 [0.58]

## ENVIRONMENTAL CHARACTERISTICS

Test	Requirement		Conditions
	Tolerance <0.05%	Tolerance >0.05%	
<b>Bending Strength</b>	$\Delta R \pm 0.05\%$	$\Delta R \pm 0.2\%$	Bending amplitude 3mm for 10 seconds
<b>Resistance to Soldering Heat</b>	$\Delta R \pm 0.05\%$	$\Delta R \pm 0.2\%$	260 $\pm$ 5 $^{\circ}$ C for 10 seconds
<b>Thermal Shock</b>	$\Delta R \pm 0.05\%$	$\Delta R \pm 0.25\%$	-55 $^{\circ}$ C~150 $^{\circ}$ C, 100 cycles
<b>Insulation Resistance</b>	>1000 M $\Omega$		Apply 100VDC for 1 minute
<b>TCR</b>	As Spec.		+25/-55/+25/+125/+25 $^{\circ}$ C
<b>Solderability</b>	95% min coverage		245 $\pm$ 5 $^{\circ}$ C for 3 seconds
<b>Damp Heat With Load</b>	$\Delta R \pm 0.05\%$	$\Delta R \pm 0.3\%$	40 $\pm$ 2 $^{\circ}$ C, 90~95% R.H. Max. working voltage for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
	$\Delta R \pm 0.5\%$ (For High Power Rating)		
<b>Load Life</b>	$\Delta R \pm 0.05\%$	$\Delta R \pm 0.2\%$	70 $\pm$ 2 $^{\circ}$ C, Max. working voltage for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
	>7k $\Omega$ $\Delta R \pm 0.5\%$		
	$\Delta R \pm 0.5\%$ (For High Power Rating)		
<b>Low Temperature Operation</b>	$\Delta R \pm 0.05\%$	$\Delta R \pm 0.2\%$	1 hour, -65 $^{\circ}$ C, followed by 45 minutes of RCWW
	$\Delta R \pm 0.5\%$ (For High Power Rating)		
<b>Short Time Overload</b>	$\Delta R \pm 0.05\%$	$\Delta R \pm 0.2\%$	RCWW*2.5 or Max. overload voltage for 5 seconds
	$\Delta R \pm 0.2\%$ (For High Power Rating)		

Moisture Sensitivity Level: MSL-1

This datasheet is subject to change without notice.



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

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- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
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- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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