

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°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 (Ω) | POWER RATING (W) AT 70°C | RESISTANCE RANGE (Ω) | POWER RATING (W) AT 70°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 Ω 003K8 = 3.8K Ω 038K0 = 38.0K Ω 380K0 = 380.0K Ω 003M8 = 3.8M Ω 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, $\pm 10\text{ppm}/^\circ\text{C}$, 3.8K Ω , $\pm 0.1\%$, embossed tape & reel



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STANDARD POWER RATING SPECIFICATIONS

| Standard Package Size | | Size 0402 (RNP07S) | | | | | Size 0603 (RNP14S) | | | | | Size 0805 (RNP15S) | | | | |
|---------------------------------------|------------------|--------------------|---------------|-----------------|---------------|---------------|--------------------|-----|-------------|-----------|---------------|--------------------|-------------|-----|-----|-----|
| Max Working Voltage (V) ¹ | | 25V | | | | | 50V | | | | | 100V | | | | |
| Max Overload Voltage (V) ² | | 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 | 4.7Ω to 1MΩ | | | |
| | ±0.1% Tolerance | | 10Ω to 255KΩ | | 4.7Ω to 1MΩ | | 4.7Ω to 1MΩ | | 1Ω 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 | | 4.7Ω to 511KΩ | | 4.7Ω to 511KΩ | | 4.7Ω to 511KΩ | | 1Ω to 1MΩ | | | 1Ω to 2MΩ | | | | |
| | ±1% Tolerance | | 4.7Ω to 511KΩ | | 4.7Ω to 511KΩ | | 4.7Ω to 511KΩ | | 1Ω to 1MΩ | | | 1Ω to 2MΩ | | | | |

| Standard Package Size | | Size 1206 (RNP18S) | | | | | Size 2010 (RNP19S) | | | | | Size 2512 (RNP20S) | | | | |
|---------------------------------------|------------------|--------------------|----------------|-----|----------------|----------------|--------------------|-----|-------------|-----|----------------|--------------------|-------------|-----|-----|-----|
| Max Working Voltage (V) ¹ | | 150V | | | | | 150V | | | | | 150V | | | | |
| Max Overload Voltage (V) ² | | 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 | | | |
| | ±0.1% Tolerance | | 4.7Ω to 2.49MΩ | | 4.7Ω to 2.49MΩ | | 4.7Ω to 3MΩ | | 4.7Ω to 3MΩ | | | | 4.7Ω to 3MΩ | | | |
| | ±0.25% Tolerance | | 4.7Ω to 1MΩ | | 4.7Ω to 1MΩ | | 4.7Ω to 1MΩ | | 1Ω to 3MΩ | | | 1Ω to 3MΩ | | | | |
| | ±0.5% Tolerance | | 1Ω to 2.49MΩ | | 1Ω to 2.49MΩ | | 1Ω to 3MΩ | | 1Ω to 3MΩ | | | 1Ω to 3MΩ | | | | |
| | ±1% Tolerance | | 1Ω to 2.49MΩ | | 1Ω to 2.49MΩ | | 1Ω to 3MΩ | | 1Ω to 3MΩ | | | 1Ω to 3MΩ | | | | |

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

² 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) ¹ | 75V | | | | | 150V | | | | | 200V | | | | |
| Max Overload Voltage (V) ² | 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 | 24.9 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 | | | | | | |
| | ±0.25% Tolerance | | 4.7Ω to 332KΩ | | 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 | | 4.7Ω to 1MΩ | | | | | | |
| | ±1% Tolerance | | 4.7Ω to 332KΩ | | 4.7Ω to 1MΩ | | 4.7Ω to 1MΩ | | 4.7Ω to 1MΩ | | | | | | |

| High Power Package Size | Size 2010 (RNP19H) | | | | | Size 2512 (RNP20H) | | | |
|---------------------------------------|--------------------|-----------------|----------------|-----|-----|--------------------|-----|-----|-----|
| Max Working Voltage (V) ¹ | 200V | | | | | 200V | | | |
| Max Overload Voltage (V) ² | 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 | | | 4.7Ω to 2KΩ | | | |
| | ±0.25% Tolerance | | 4.7Ω to 1MΩ | | | 4.7Ω to 2KΩ | | | |
| | ±0.5% Tolerance | | 4.7Ω to 1MΩ | | | 4.7Ω to 2KΩ | | | |
| | ±1% Tolerance | | 4.7Ω to 1MΩ | | | 4.7Ω to 2KΩ | | | |

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

² 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] |
| 0402 | 0.04 [1.02] | 0.02 [0.51] | 0.012 [0.30] | 0.007 [0.18] |
| 0603 | 0.06 [1.52] | 0.03 [0.76] | 0.018 [0.46] | 0.012 [0.30] |
| 0805 | 0.08 [2.03] | 0.05 [1.27] | 0.022 [0.56] | 0.012 [0.30] |
| 1206 | 0.12 [3.05] | 0.06 [1.52] | 0.022 [0.56] | 0.016 [0.41] |
| 2010 | 0.19 [4.83] | 0.09 [2.29] | 0.022 [0.56] | 0.023 [0.58] |
| 2512 | 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% | |
| Bending Strength | $\Delta R \pm 0.05\%$ | $\Delta R \pm 0.2\%$ | Bending amplitude 3mm for 10 seconds |
| Resistance to Soldering Heat | $\Delta R \pm 0.05\%$ | $\Delta R \pm 0.2\%$ | 260±5°C for 10 seconds |
| Thermal Shock | $\Delta R \pm 0.05\%$ | $\Delta R \pm 0.25\%$ | -55°C~150°C, 100 cycles |
| Insulation Resistance | >1000 MΩ | | Apply 100VDC for 1 minute |
| TCR | As Spec. | | +25/-55/+25/+125/+25°C |
| Solderability | 95% min coverage | | 245±5°C for 3 seconds |
| Damp Heat With Load | $\Delta R \pm 0.05\%$ | $\Delta R \pm 0.3\%$ | 40±2°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) | | |
| Load Life | $\Delta R \pm 0.05\%$ | $\Delta R \pm 0.2\%$ | 70±2°C, Max. working voltage for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF" |
| | >7kΩ ΔR ±0.5% | | |
| | $\Delta R \pm 0.5\%$ (For High Power Rating) | | |
| Low Temperature Operation | $\Delta R \pm 0.05\%$ | $\Delta R \pm 0.2\%$ | 1 hour, -65°C, followed by 45 minutes of RCWW |
| | $\Delta R \pm 0.5\%$ (For High Power Rating) | | |
| Short Time Overload | $\Delta R \pm 0.05\%$ | $\Delta R \pm 0.2\%$ | 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 «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

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- Поставка сложных, дефицитных, либо снятых с производства позиций;
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- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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JONHON

«JONHON» (основан в 1970 г.)

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«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели,
кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



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