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# TOKEN

## (KNP-R)

# Power Wire wound Resistor

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## ▶ Product Introduction

### Power Wire Wound Resistors Boast Consistent Precision Power Operation.

#### Features :

- Excellent load life stability
- High Precision and reliability
- Axial ceramic-silicone coated
- Meets the Standards of MIL-R-26E
- RoHS compliant with 100% lead free

#### Applications :

- Radar, Ground Vehicles
- Communications systems
- Bias supply, Current shunts, Voltage dropping
- Motor speed controls, Voltage divider networks
- Medical instrumentation and Medical implantables

Token's highest quality conformal axial terminal ceramic-silicone coated KNP-R power resistors for applications requiring high stability and precision. The KNP-R wire-wound has a low temperature coefficient and maintain a high degree of stability under demanding conditions.

The power precision KNP-R series meeting MIL-R-26E (U and V characteristics) and surface temperature (hot spot) 375°C max. Resistors with a wide range of 0.01Ω ~ 82kΩ, covering applications from precision to power. Products with lead-free terminations meet EU RoHS and China RoHS requirements.



Operating temperature range is -55°C ~ +375°C and derated power at high ambient temperatures as according to the chart below. Token is equipped to design and produce custom components to meet many design and reliability demands. In addition to standard military-grade resistor products, we also have many resistive products designed to meet various source-controlled drawings.

Contact us with your specific needs. Or link to Token official website "[General Purpose Resistors](http://www.token.com.tw)" for more information.

#### Characteristics U:

275°C Maximum hot spot temperature. 1% Maximum ΔR in 1000 hours load life.

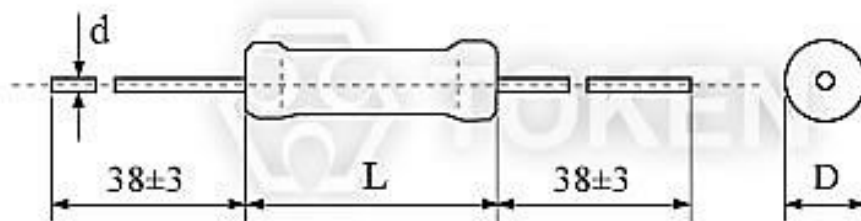
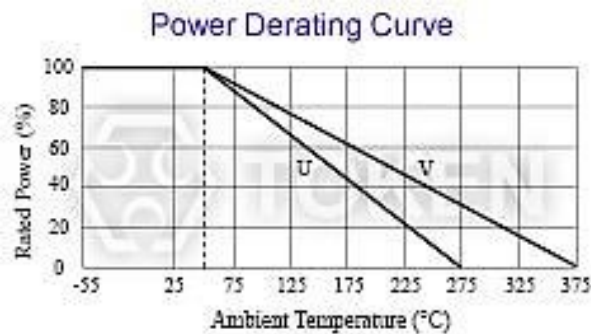
#### Characteristics V:

375°C Maximum hot spot temperature. 3% Maximum ΔR in 1000 hours load life.

## Technical Specifications

### Technical Specifications (KNP-R)

Type	MIL - R-26E	Power Rating (W)		Max. Working Voltage (V)		Resistance Range ( $\Omega$ )		Dimensions (Unit: mm)		
		U (275°C)	V (375°C)	U (275°C)	V (375°C)	0.1%, 0.25%, 0.5%	1%, 2%, 3%, 5%	L $\pm$ 0.81	D $\pm$ 0.81	d $\pm$ 0.1
KNP-R1/4	-	0.40	-	20	-	10~950	1~3.4K	6.35	1.98	0.51
KNP-R1/2	RW70	0.75	-	29	-	10~1.3K	1~4.9K	7.92	1.98	0.51
KNP-R1A	-	1.00	-	53	-	1~2.7K	0.1~10.4K	10.31	2.36	0.64
KNP-R1	RW69	1.10	-	62	-	1~4.0K	0.1~15K	13.49	2.36	0.64
KNP-R2A	-	2.50	3.25	138	157	1~8.6K	0.01~32.3K	12.70	5.33	0.81
KNP-R2	RW79	3.00	3.75	135	148	1~5K	0.01~2K	13.49	4.06	0.81
KNP-R3A	-	3.00	3.75	135	148	1~6.5K	0.01~34.5K	14.27	5.33	0.81
KNP-R3	-	3.25	4.75	185	220	1~11.4K	0.01~42.1K	20.62	5.33	1.02
KNP-R4	RW67	4.00	5.50	210	250	1~12.7K	0.01~47.1K	15.88	7.62	1.02
KNP-R5	RW74	5.00	6.50	330	376	0.5~24.5K	0.01~51K	22.22	7.62	1.02
KNP-R7	RW68	7.00	9.00	504	576	0.5~41.4K	0.01~75K	30.94	9.52	1.02
KNP-R10	RW78	10.00	13.00	799	911	0.5~71.3K	0.01~82K	45.21	9.52	1.02



**Power Precision Wire wound Resistor (KNP-R) Dimensions**

- Temperature Coefficient: 1  $\Omega$  and below  $\pm 150$  ppm/ $^{\circ}$ C, 1  $\Omega$  to 9.9  $\Omega$   $\pm 100$  ppm/ $^{\circ}$ C, 10  $\Omega$  and above  $\pm 100$  ppm/ $^{\circ}$ C, (50 ppm/ $^{\circ}$ C on request)

## Electrical Performance

### Electrical Performance (KNP-P)

Test Items	Test Method	Specifications
Short Time Overload	2.5 times of rated voltage 5 sec.	$\Delta R \pm (2\% + 0.05\Omega)$
Rated Load	Rated wattage 30 minutes.	$\Delta R \pm (1\% + 0.05\Omega)$
Voltage Withstanding	500VAC 1 minute.	$\Delta R \pm (1\% + 0.05\Omega)$
Insulation Resistance	500V	20M $\Omega$
Temp. Cycle	-20 $^{\circ}$ C ~ 85 $^{\circ}$ C 5 cycles	$\Delta R \pm (1\% + 0.05\Omega)$
Soldering After Resistance	235 $^{\circ}$ C for 3 sec	$\Delta R \pm (0.5\% + 0.05\Omega)$
Incombustibility	16 times of rated wattage for 5 min.	Not flamed
Load Life	+25 $^{\circ}$ C, 1.5Hrs on ~ 0.5Hrs off cycle, 1000 Hrs.	U: $\Delta R \pm (1\% + 0.05\Omega)$ V: $\Delta R \pm (3\% + 0.05\Omega)$

## Application Notes

### Application Notes of Wire wounds (KNP-R)

- When being used in AC circuits, some wirewound structures give inductance ingredients or parasitic capacity, so they may cause unusual phenomena such as oscillations etc. Quorum deviations of other components should be carefully taken into account for use.
- Application and Placement: Wirewound resistors use different gauges of wire as resistance elements. Sometimes the gauge is extremely thin (finer than a strand of human hair) and very susceptible to breakage in environments containing salts, ash, dust and corrosives. Avoid utilization in such environments.
- Do not install in dusty areas because the accumulation will cause shorts and poor conductance.

## Order Codes

### Order Codes (KNP-R)

KNP-R3A	U	100R	B	P
Part Number	Characteristic (°C)	Resistance Value (Ω)	Resistance Tolerance (%)	Package
KNP-R	U 275 $^{\circ}$ C V 375 $^{\circ}$ C	0R1 1.0 $\Omega$ 1R 1 $\Omega$ 100R 100 $\Omega$ 1K 1000 $\Omega$	B $\pm 0.1\%$ C $\pm 0.25\%$ D $\pm 0.5\%$ F $\pm 1\%$ G $\pm 2\%$ H $\pm 3\%$ J $\pm 5\%$	P Bulk TB Taping Box

### ► General Information

#### General Purpose Resistors with Customized Service

Token Electronics is expanding business to include a broad range of General Purpose Resistor products designed for high volume applications. This expanded range of commercial resistor presents a more comprehensive product offering for Customer Experience Management (CEM) and other high volume customers that require quality products at competitive pricing.

Backed by the same customer service, technical support and quality assurance that Token has always provided, these new commercial products enable you the opportunity to source a wider range of resistors from a trusted supplier.

#### General Use

When an ambient temperature exceeds a rated ambient temperature, resistor shall be applied on the derating curve by derating the load power. General purpose resistor under overloads is not combustion resistant and is likely to emit, flame, gas, smoke, red heat, etc. Flame retardant resistor generally emits smoke and red heat in a certain power and over but do not emit fire or flame.

When resistors are shielded or coated with resin etc., stress from the storage heat and the resins are applied. So, performance and reliability should be checked well before use.

When a voltage higher than rated is applied in a short time (single pulse, repeated pulses, surge, etc.), it does not necessarily ensure safety that an effective wattage is not higher than a rated wattage. Then consult with us with your specified pulse wave shape. Resistors shall be used in a condition causing no dew condensation.

Keep temperature from rising by choosing resistor with a higher rated capacity; do not use a component having the exact load value required. For considerations of safety in extended period applications, the rating should be more than four times higher than the actual wattage involved, but never use resistors at less than 25% of its rated power.

In applications where resistors are subject to intermittent current surges and spikes, be sure in advance that the components selected are capable of withstanding brief durations of increased load.

Do not exceed the recommended rated load. Resistor must use within the rated voltage range to prevent the shortening of service life and/or failure of the wound resistance elements.

Minimum load: Resistor must be utilized at 1/10 or more of the rated voltage to prevent poor conductance due to oxidation build-up. For basic particulars for cautions, refer to EIAJ Technical Report RCR-2121 "Guidance for care note on fixed-resistors".