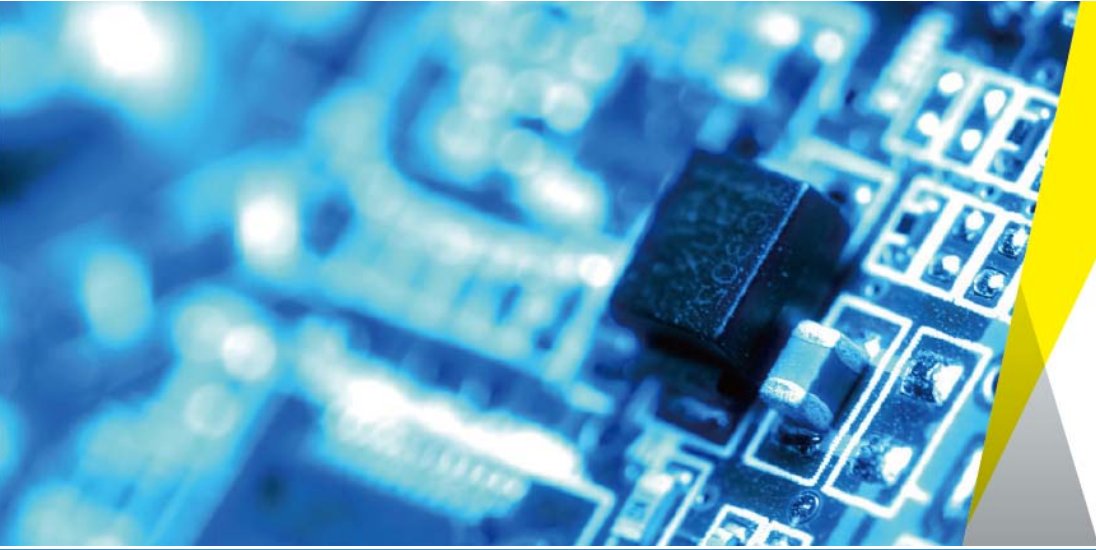




UniRoyal

DATASHEET

Product Name **Wire-wound Fixed Resistors**

Part Name **KNH0 、KNHA Series**

File No **DIP-SP-009**

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1. Scope

- 1.1 This datasheet is the characteristics of Wire-wound Fixed Resistors manufactured by UNI-ROYAL
- 1.2 Excellent flame retardant coating
- 1.3 Too low or too high ohmic value can be supplied on a case to basis
- 1.4 Non-inductive type available
- 1.5 Compliant with RoHS directive.
- 1.6 Halogen free requirement.

2. Part No. System

The standard Part No. includes 14 digits with the following explanation:

- 2.1 Coated type, the 1st to 3rd digits are to indicate the product type and 4th digit is the special feature.

Example: KNH0=KNH0

- 2.2 5th~6th digits:

This is to indicate the wattage or power rating. To denote the size and the numbers,

- 2.3 For power of 1 watt to 16 watt, the 5th digit will be a number or a letter code and the 6th digit will be the letters of W, S or U.

- 2.4 For power of 20W to 99 watt, the 5th digit and 6th are indicate the wattage or power rating.

Example: 20=20W ; 60=60W

- 2.5 The 7th is to denote the Resistance Tolerance. The following letter code is to be used for indicating the standard Resistance Tolerance.

J=±5% K=±10%

- 2.6 The 8th to 11th digits is to denote the Resistance Value.

- 2.6.1 For the standard resistance values of E-24 series, the 8th digit is "0", the 9th & 10th digits are to denote the significant figures of the resistance and the 11th digit is the number; For the standard resistance values of E-96 series, the 8th digit to the 10th digits is to denote the significant figures of the resistance and the 11th digit is the 11th digit is the zeros following.

- 2.6.2 The following number s and the letter codes are to be used to indicate the number of zeros in the 11th digit:

J=10⁻¹ 0=10⁰ 1=10¹ 2=10² 3=10³

- 2.7 The 12th, 13th & 14th digits.

- 2.7.1 The 12th digit is to denote the Packaging Type with the following codes:

A=Tape/Box (Ammo pack) B=Bulk/Box

T=Tape/Reel P=Tape/Box of PT-26 products

- 2.7.2 The 13th digit is normally to indicate the Packing Quantity of Tape/Box & Tape/Reel packaging types. Using "0" to indicate the Bulk packaging types, the following letter codes is to be used for some packing quantities:

A=500pcs B=2500pcs C=10000pcs D=20000pcs G=25000pcs H=50000pcs

- 2.7.3 For some items, the 14th digit alone can use to denote special features of additional information with the following codes or standard product

Example: 0= standard product

3. Ordering Procedure

(Example: KNH0 60W ±5% 20 Ω)

K N H 0 6 0 J 0 2 0 0 B 0 0

Product Type:
KNH0=KNH0
KNHA=KNHA

Wattage:
20=20W
25=25W
30=30W
40=40W
50=50W
60=60W
80=80W
***00= the power over 100Watt, please indicate the power rating at the last 3 digits of the part No. (B/B) only

Tolerance:
J=±5%
K=±10%

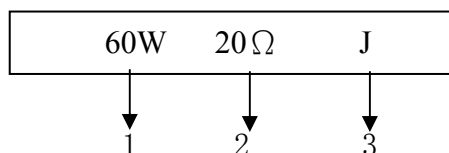
Resistance Value:
±5%、10% series:
The 1st digit will be "0"; the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digit denotes number of zeros following
J=10⁻¹; K=10⁻²; L=10⁻³

Packing Type:
1=1,000pcs
2=2,000pcs
3=3,000pcs
4=4,000pcs
5=5,000pcs
A=500pcs
B=2,500pcs
0= Bulk/Box

Packing Type:
A=Tape/Box
T=Tape/Reel
B=Bulk/Box

Additional Information:
0=NIL
P=Panaset type
1=Avisert type 1
2=Avisert type 2
3=Avisert type 3
8=PT-58mm
9=PT-64mm
7=Lead wire(H)38mm
A=PT-83mm
C=PT-73mm
D=PT-71mm

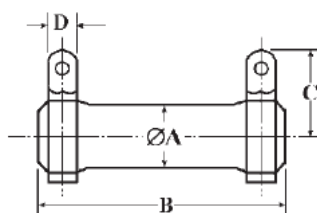
4. Marking



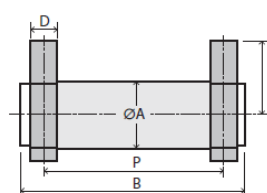
1. Wattage Rate
 2. Nominal Resistance Value
 3. Resistance Tolerance. J: $\pm 5\%$ K: $\pm 10\%$
- Color of marking: Black Ink

5. Ratings & Dimension

KNH0 Type:

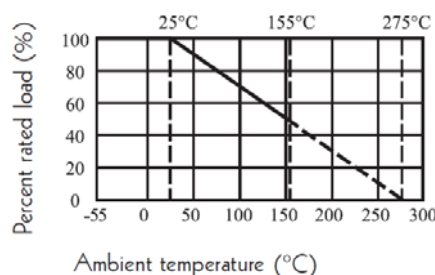


KNHA Type:



Type	Dimension(mm)				Tolerance	Resistance Range
	A ± 1.5	B ± 1.5	C ± 3.0	D ± 1.0		
KNH0 20W	19	50	19	5	$\pm 5\%$ 、 $\pm 10\%$	0.4 Ω ~10K Ω
KNH0 25W	19	60	19	5	$\pm 5\%$ 、 $\pm 10\%$	0.4 Ω ~10K Ω
KNH0 30W	19	75	19	5	$\pm 5\%$ 、 $\pm 10\%$	0.5 Ω ~15K Ω
KNH0 40W	19	90	19	5	$\pm 5\%$ 、 $\pm 10\%$	0.6 Ω ~20K Ω
KNH0 50W	31	75	31	8	$\pm 5\%$ 、 $\pm 10\%$	3 Ω ~25K Ω
	28					
KNH0 60W	31	90	31	8	$\pm 5\%$ 、 $\pm 10\%$	3 Ω ~30K Ω
	28					
KNH0 80W	31	115	31	8	$\pm 5\%$ 、 $\pm 10\%$	3 Ω ~40K Ω
	28					
KNH0 100W	31	140	31	8	$\pm 5\%$ 、 $\pm 10\%$	3 Ω ~50K Ω
	28					
KNHA 25W	21	41	24	5	$\pm 5\%$ 、 $\pm 10\%$	0.4 Ω ~10K Ω
KNHA 30W	21	42	24	5	$\pm 5\%$ 、 $\pm 10\%$	0.4 Ω ~10K Ω

6. Derating Curve



6.1 Voltage rating:

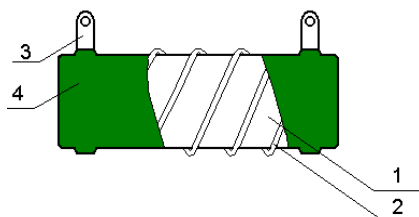
Resistors shall have a rated direct-current (DC) continuous working voltage or an approximate sine-wave root-mean-square (RMS) alternating-current (AC) continuous working voltage at commercial-line frequency and waveform corresponding to the power rating, as determined from the following formula:

$$RCWV = \sqrt{P \times R}$$

Where: RCWV = rated dc or RMS ac continuous working voltage at commercial-line frequency and waveform (VOLT.)

P = power rating (WATT.) R = nominal resistance (OHM)

7. Structure



No.	Name	Material
1	Basic body	Ceramics rod
2	Resistor	Alloy wire
3	Terminal lead	Iron ring
4	Coating	Insulated resin

8. Performance Specification

Characteristic	Limits	Test Methods (GB/T5729&JIS-C-5201&IEC60115-1)
Temperature Coefficient	$\geq 20\Omega$: $\pm 300\text{PPM}/^\circ\text{C}$ $< 20\Omega$: $\pm 400\text{PPM}/^\circ\text{C}$	4.8 Natural resistance changes per temp. Degree centigrade $\frac{R_2 - R_1}{R_1(t_2 - t_1)} \times 10^6 \text{ (PPM}/^\circ\text{C)}$ R_1 : Resistance Value at room temperature (t_1) ; R_2 : Resistance at test temperature (t_2) t_1 : $+25^\circ\text{C}$ or specified room temperature t_2 : Test temperature (-55°C or 125°C)
Short-time overload	Resistance change rate must be in $\pm(2\%+0.05\Omega)$, and no mechanical damage.	4.13 Permanent resistance change after the application of a potential of 2.5 times RCWV or Max. Overload Voltage whichever less for 5 seconds.
Resistance to soldering heat	Resistance change rate must be in $\pm(1\%+0.05\Omega)$, and no mechanical damage.	4.18 Permanent resistance change when leads immersed to a point 2.0-2.5mm from the body in $260^\circ\text{C} \pm 5^\circ\text{C}$ solder for 10 ± 1 seconds.
Solderability	95% coverage min.	4.17 The area covered with a new, smooth, clean, shiny and continuous surface free from concentrated pinholes. Test temp. Of solder: $245^\circ\text{C} \pm 3^\circ\text{C}$ Dwell time in solder: 2~3seconds.
Rapid change of temperature	Resistance change rate must be in $\pm(1\%+0.05\Omega)$, and no mechanical damage.	4.19 30 min at -55°C and 30 min at 155°C ; 100 cycles.
Load life	$\Delta R/R$: $\pm(5\%+0.05\Omega)$	4.25.1 Permanent Resistance change after 1000 hours operating at RCWV or Max. Working Voltage whichever less with duty cycle of 1.5 hours "ON", 0.5 hour "OFF" at $25 \pm 2^\circ\text{C}$ ambient.
Low Temperature Storage	$\Delta R/R$: $\pm(5\%+0.05\Omega)$	IEC 60068-2-1 (Aa) Lower limit temperature , for 2H.
High Temperature Exposure	$\Delta R/R$: $\pm(5\%+0.05\Omega)$	MIL-STD-202 108A Upper limit temperature , for 16H.

9. Label

Label shall be marked with following items:

- (1) Type and style
- (2) Nominal resistance
- (3) Resistance tolerance
- (4) Quantity
- (5) Lot number
- (6) PPM

Example:

CEMENT RESISTORS	
WATT: 60W	VAL: 20Ω
Q'TY: 100	TOL: 5%
LOT: 4021548	PPM:

10. Note

- 10.1. UNI-ROYAL recommend products store in warehouse with temperature between 15 to 35℃ under humidity between 25 to 75%RH.
Even under storage conditions recommended above, solder ability of products will be degraded stored over 1 year old.
- 10.2. Cartons must be placed in correct direction which indicated on carton, otherwise the reel or wire will be deformed.
- 10.3. Storage conditions as below are inappropriate:
 - a. Stored in high electrostatic environment
 - b. Stored in direct sunshine, rain, snow or condensation.
 - c. Exposed to sea wind or corrosive gases, such as Cl₂, H₂S, NH₃, SO₂, NO₂, Br etc.

11. Record

Version	Description	Page	Date	Amended by	Checked by
1	First version	1~5	Mar.20, 2018	Haiyan Chen	Nana Chen
2	Modify characteristic	4	Feb.19, 2019	Haiyan Chen	Yuhua Xu
3	Modify the temperature coefficient test conditions	4	Oct.28, 2022	Haiyan Chen	Yuhua Xu
4	1.Cancel load life in humidity test 2.Modify the load life test conditions	4	Sep.26, 2024	Haiyan Chen	Yuhua Xu

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