

Approval Sheet

for

**Wire Wound Resistors
Flame-Proof Type**

KNP series

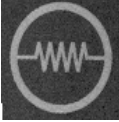
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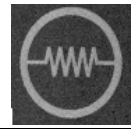
Tel: 886-2-6629-9999 **Fax:** 886-2-6628-8885

URL: www.yageo.com



Rev.	Description	Issue Date	Drawn	Approved
00	issue new spec.	Mar. 20, 2018	Mingfa Liu	Feng Ye
01	Revised the dimensions for LEQ type.	May 21, 2020	Mingfa Liu	Feng Ye
02	Revised the dimensions for LEQ type.	Aug. 20, 2020	Mingfa Liu	Feng Ye

Description	Wire Wound Resistors, Flame-Proof Type		
Series	KNP	Rev.	02



1. PRODUCT:

FLAME-PROOF WIRE WOUND RESISTORS

(Miniature Style)

Green body color

2. PART NUMBER:

Part number of the wire wound resistor is identified by the name, power, tolerance, packing, temperature coefficient, special type and resistance value.

Example :

KNP	2WS	J	B	-	LEQ	100R
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Series Name	Power Rating	Resistance Tolerance	Packing Style	Temperature Coefficient of Resistance	Special Type	Resistance Value

(1) Style: KNP SERIES

(2) Power Rating : 2WS=2W

(3) Tolerance: J=±5%

(4) Packaging Type: B=Bulk Packing

(5) Temperature Coefficient : “-“=base on spec.

(6) Special Type : LEQ= LEQ Type

(7) Resistance Value : E24 Series

Example: 0R1, 1R, 10R, 100R.....

3. BAND-CODE:



COLOR	1ST BAND	2ND BAND	3ND BAND	MULTIPLIER	TOLERANCE
BLACK	0	0	0	1Ω	
BROWN	1	1	1	10Ω	± 1 % (F)
RED	2	2	2	100Ω	± 2 % (G)
ORANGE	3	3	3	1KΩ	
YELLOW	4	4	4	10KΩ	
GREEN	5	5	5	100KΩ	
BLUE	6	6	6	1MΩ	
VIOLET	7	7	7	10MΩ	
GREY	8	8	8	0.001Ω	
WHITE	9	9	9	0.0001Ω	
GOLD				0.1Ω	± 5 % (J)
SILVER				0.01Ω	

* TOL: ± 1 % (F)--- 5 color band.

* TOL: ± 2 % (G)、± 5 % (J)--- 4 color band.(3ND BAND is not included)

Remark:

(1).Multiplier band for 2%& 5% types
 1R1-9R9: GOLD (0.1)
 0R1-0R99: SILVER (0.01)
 0R01-0R099: GREY (0.001)

(2).Multiplier band for 1% types
 1R1-9R9: SILVER (0.01)
 0R1-0R99: GREY (0.001)
 0R01-0R099: WHITE (0.0001)

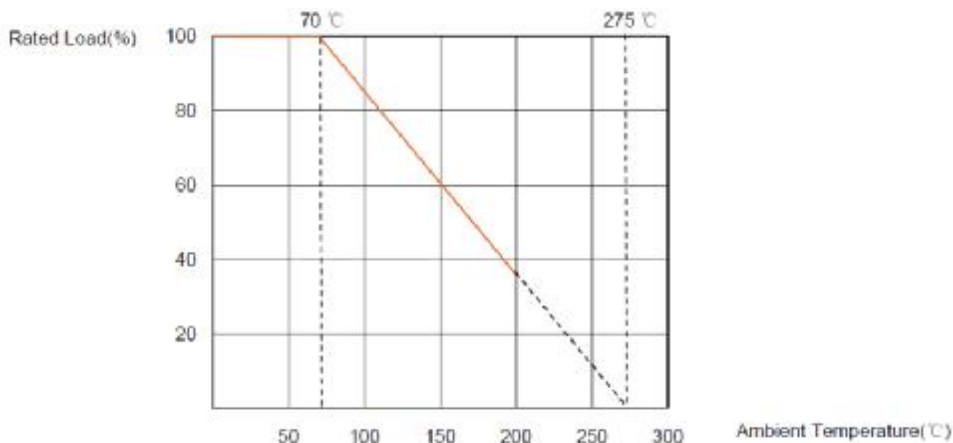
4. ELECTRICAL CHARACTERISTICS

Miniature Style

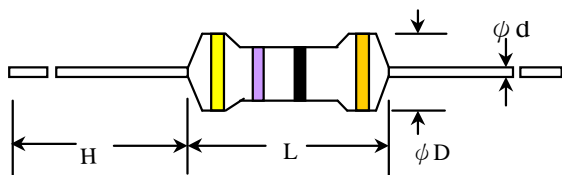
STYLE	KNP2WS
Power Rating at 70 °C	2W
Dielectric Withstanding Voltage	400V
Resistance Range (±1%)	0.1Ω~1.5kΩ
Resistance Range (±2%&±5%)	0.1Ω~2.2kΩ
Operating Temp. Range	- 40°C to + 200°C
Temperature Coefficient	±300ppm/°C

* Below or over this resistance range on request.

5. DERATING CURVE



6. DIMENSIONS



STYLE	DIMENSION(mm)			
Miniature	L	ψD	H	ψd
KNP2WS	11.5±1.0	4.6±0.5	35±2.0	0.8±0.05

7. ENVIRONMENTAL CHARACTERISTICS

(1) Short Time Over Load Test

At 10 times of the rated power applied for 5 seconds, the resistor should be free from defects after the resistor is released from load for about 30 minutes

$$\text{Short Time Overload Voltage} = \sqrt{10 * \text{Power Rating} \cdot \text{Resistance Value}}$$

The change of the resistance value should be within $\pm 2.0 \% + 0.05\Omega$

(2) Voltage Proof

The resistor shall be clamped in the trough of a 90° metal V Block. Apply the insulation voltage specified in the "Table I & II" between the terminals connected together with the block for about 60 seconds.

The resistor shall be able to withstand without breakdown or flashover.

(3) Temperature Coefficient Test

Test of resistors above room temperature $100^{\circ}\text{C} \pm 2^{\circ}\text{C}$ (Testing Temperature 115°C to 130°C) at the constant temperature silicon plate for over 5 minutes. Then measure the resistance value. The Temperature Coefficient is calculated by the following equation and its value should be within the range of requested.

$$\text{Resistor Temperature Coefficient} = \frac{R - R_0}{R_0} \cdot \frac{1}{t - t_0} \cdot 10^6$$

R = Resistance value under the testing temperature

R₀ = Resistance value at the room temperature

t = The testing temperature

t₀ = Room temperature

(4) Insulation Resistance

Apply "measuring voltage" between protective coating and termination for 1 min., then measure. The measuring voltage shall be either 100V±15V d.c. for resistors with an insulation voltage lower than 500V or 500V±50V d.c. for resistors with an insulation voltage equal to or greater than 500V. The test resistance should be high than 100M ohm.

(5) Solderability

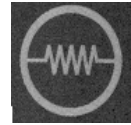
Immerse the specimen into the solder pot at $245 \pm 5^{\circ}\text{C}$ for 3 ± 0.5 seconds.

At least 95% solder coverage on the termination.

(6) Solvent Resistance of Marking

The specimen into the appropriate solvent of IPA condition of ultrasonic machine for 5 ± 0.5 minutes.

The specimen is no deterioration of coatings and color code.



(7) Robustness of Terminations

Direct Load – Resistors shall be held by one terminal and the load shall be gradually applied in the direction of the longitudinal axis of the resistor unit the applied load reached the requirement.

The load shall be held for 10 seconds. The load of weight shall be $\geq 2.5 \text{ kg}$ (24.5N).

(8) Damp Heat Steady State

Place the specimen in a test chamber at $40 \pm 2 \text{ }^\circ\text{C}$ and 90 ~ 95 % relative humidity. Apply the 0.1 times rated voltage to the specimen at the 1.5 hours on and 0.5 hour off cycle. The total length of test is 56 days.

The change of the resistance value shall be within $\pm 5 \% + 0.05 \Omega$

(9) Endurance at 70 °C

Placed in the constant temperature chamber of $70 \pm 3 \text{ }^\circ\text{C}$ the resistor shall be connected to the lead wire at the point of 25mm. Length with each terminal, the resistors shall be arranged not much effected mutually by the temperature of the resistors and the excessive ventilation shall not be performed, for 90 minutes on and 30 minutes off under this condition the rated D.C. voltage is applied continuously for 1000+48/-0 hours then left at no-load for 1hour, measured at this time the resistance value.

The change of the resistance value shall be within $\pm 5 \% + 0.05 \Omega$.

There shall be no remarkable change in the appearance and the color code shall be legible after the test.

(10) Temperature Cycling Test

The temperature cycle shown in the following table shall be repeated 5 times consecutively. The measurement of the resistance value is done before the first cycle and after ending the fifth cycle, leaving in the room temperature for about 1 hour.

Temperature Cycling Conditions:

Step	Temperature($^\circ\text{C}$)	Time (minute)
1	-40 ± 3	30
2	25 ± 3	10 ~ 15
3	200 ± 3	30
4	25 ± 3	10 ~ 15

The change of the resistance value shall be within $\pm 1.0 \% + 0.05 \Omega$

After the test the resistor shall be free from the electrical or mechanical damage.

(11) Resistance to Soldering Heat

The terminal lead shall be dipped into the solder pot at $260 \pm 3 \text{ }^\circ\text{C}$ for 10 ± 1.0 seconds up to 2.5 ~ 3.5 mm.

The change of the resistance value shall be within $\pm 1.0 \% + 0.05 \Omega$

(12) Overload Flame Retardant

At 4 times of the rated voltage (If the voltage exceeds the maximum load voltage, the maximum load voltage will be used as the rated voltage) applied for 1 minute

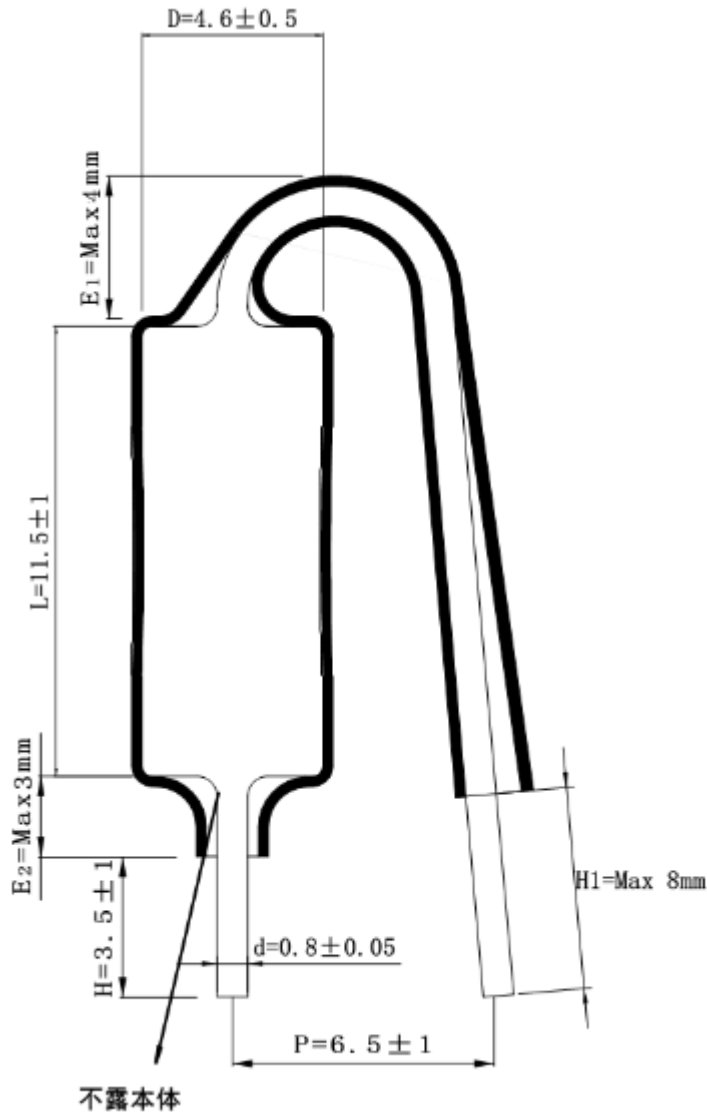
$$\text{Overload Test Voltage} = 4 * \sqrt{\text{Power Rating} \cdot \text{Resistance Value}}$$

The resistor shall be able to no evidence of flaming or arcing.

8. SPECIAL TYPE

LEQ TYPE

Unit: mm



9. Plant Address

- A. China Dongguan Plant
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- B. China Mudu Plant
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Mudu New District, Suzhou, Kiangsu, China
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