

# DATA SHEET

## WIREWOUND RESISTORS

Flameproof, Non-Inductive  
NKN Series

$\pm 2\%$ ,  $\pm 5\%$

1/2W to 7W

RoHS compliant & Halogen Free





**ORDERING INFORMATION**

Part number of the flameproof, non-inductive wirewound resistor are identified by the series, power rating, tolerance, packing, temperature coefficient, forming and resistance value.

**PART NUMBER**

<b>NKN</b>	<b>200</b>	<b>J</b>	<b>T</b>	<b>-</b>	<b>73-</b>	<b>10R</b>
(1)	(2)	(3)	(4)	(5)	(6)	(7)

**APPLICATIONS**

- Power applications
- Home appliance
- Industry

**FEATURES**

- Higher power rating
- Non-inductive types
- High stable performance and high reliability
- Flameproof coating equivalent to UL-94V-0
- RoHS compliant & halogen free

**(1) SERIES**

NKN Series

**(2) POWER RATING**

-50 = 1/2W	300=3W
1WS = 1W	400=4W
100 = 1W	5WS=5W
2WS = 2W	500=5W
200 = 2W	7WS=7W
3WS = 3W	

**(3) TOLERANCE**

G = ±2%	J = ±5%
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**(4) PACKAGING**

R = Reel Pack	B = Bulk
T = Box Pack	

**(5) TEMPERATURE COEFFICIENT OF RESISTANCE**

- = Based on spec.

**(6) FORMING**

52- = 52.4mm	F = F Type
73- = 73mm	FK = FK Type
91- = 91mm	FFK = F-form Kink
M = M-Type Forming	FKK = FKK Type
MB = M-form W/flat	PN = PANAsert
FT = FT Type Forming	AV = AVIsert

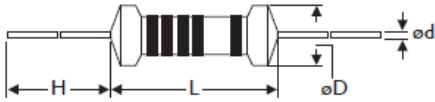
Note: 52.4mm, 73mm and 91mm represent dimension A of the axial type, please refer to the category of AXIAL/REEL TAPE SPECIFICATION for the detail.

**(7) RESISTANCE VALUE**

E24 Series  
 Example:  
 0R1= 0.1Ω, 1R = 1Ω, 10R = 10Ω

**DIMENSIONS**

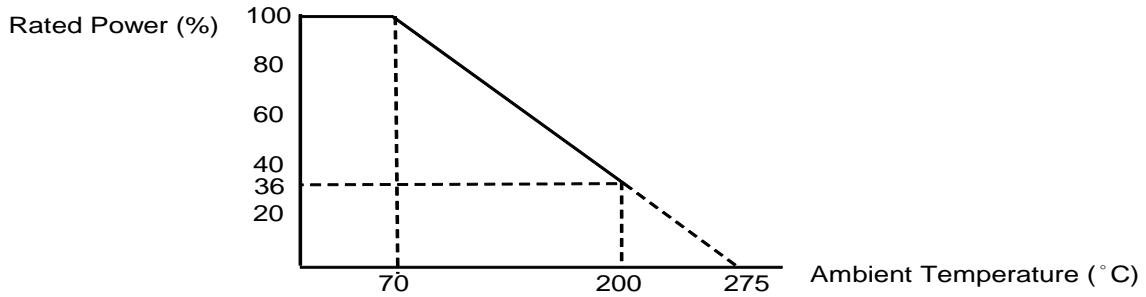
Unit: mm



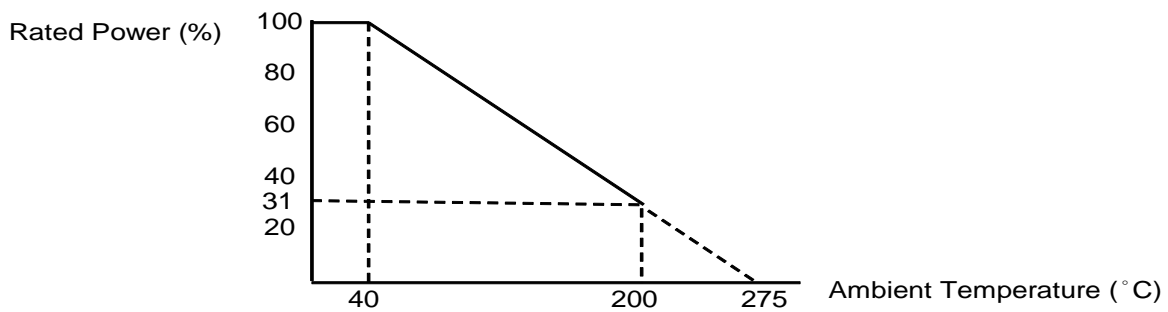
Normal	Miniature	L	$\psi D$	H	$\psi d$
NKN-50	NKN1WS	$9.0 \pm 0.5$	$3.5 \pm 0.3$	$26 \pm 2.0$	$0.55 \pm 0.05$
NKN100	NKN2WS	$11.5 \pm 1.0$	$4.8 \pm 0.5$	$35 \pm 2.0$	$0.8 \pm 0.05$
NKN200	NKN3WS	$15.5 \pm 1.0$	$5.3 \pm 0.5$	$33 \pm 2.0$	$0.8 \pm 0.05$
NKN300 NKN400	NKN5WS	$17.5 \pm 1.0$	$6.5 \pm 0.5$	$32 \pm 2.0$	$0.8 \pm 0.05$
NKN500	NKN7WS	$24.5 \pm 1.0$	$8.5 \pm 0.5$	$38 \pm 2.0$	$0.8 \pm 0.05$

**DERATING CURVE**

NKN1/2W~3WS



NKN3W~7W



**ELECTRICAL CHARACTERISTICS**

CHARACTERISTICS	NKN-50	NKN100	NKN200	NKN300	NKN400	NKN500
Power Rating at 40 °C				3W	4W	5W
Power Rating at 70 °C	1/2W	1W	2W			
Resistance Range	0.08Ω~15Ω	0.05Ω~40Ω	0.03Ω~90Ω	0.1Ω~120Ω	0.1Ω~120Ω	0.18Ω~220Ω
Voltage Proof on Insulation	250V	400V	400V	400V	400V	400V
Maximum working voltage	$\sqrt{(P \times R)}$					
Maximum Inductance	0.15 μH					
Operating Temp. Range	- 40°C to +200°C					
Temperature Coefficient	±300ppm/°C					

CHARACTERISTICS	NKN1WS	NKN2WS	NKN3WS	NKN5WS	NKN7WS
Power Rating at 40 °C				5W	7W
Power Rating at 70 °C	1W	2W	3W		
Resistance Range	0.08Ω~15Ω	0.05Ω~40Ω	0.03Ω~90Ω	0.1Ω~120Ω	0.18Ω~220Ω
Voltage Proof on Insulation	250V	400V	400V	400V	400V
Maximum working voltage	$\sqrt{(P \times R)}$				
Maximum Inductance	0.15 μH				
Operating Temp. Range	- 40°C to +200°C				
Temperature Coefficient	±300ppm/°C				

Note: For resistance value out of above range is by request.

**TEST AND REQUIRMENTS**

TEST	TEST METHOD	PROCEDURE	APPRAISE
Short Time Overload	IEC 60115-1 4.13	10 times rated power for 5 Sec.	±2%+0.05Ω
Voltage Proof on Insulation	IEC 60115-1 4.7	In V-Block for 60 sec. test voltage as above table	No Breakdown
Temperature Coefficient	IEC 60115-1 4.8	Between -40°C to +155°C	By Type
Insulation Resistance	IEC 60115-1 4.6	In V-Block for 60 sec.	>100MΩ
Solderability	IEC 60115-1 4.17	245±5°C for 3±0.5 Sec.	95% Min. coverage
Solvent Resistance of Marking	IEC 60115-1 4.30	IPA for 5±0.5 Min. with ultrasonic	No deterioration of coatings and markings
Robustness of Terminations	IEC 60115-1 4.16	Direct load for 10 Sec. in the direction of the terminal leads	≥2.5Kg(24.5N)
Damp Heat Steady State	IEC 60115-1 4.24	40±2°C,90-95% RH for 56 days, loaded with 0.1 times RCWV(or Umax., whichever less)	±5.0%+0.05Ω
Endurance at 70°C	IEC 60115-1 4.25	70±2°C at RCWV(or Umax., whichever less) for 1,000 Hr.(1.5 Hr.on,0.5 Hr. off)	±5.0%+0.05Ω
Temperature Cycling	IEC 60115-1 4.19	-40°C → Room Temp. → +200°C → Room Temp.(5 cycles)	±1.0%+0.05Ω
Resistance to Soldering Heat	IEC 60115-1 4.18	260±3°C for 10±1 Sec., immersed to a point 3±0.5mm from the body	±1.0%+0.05Ω
Accidental Overload Test	IEC 60115-1 4.26	4 times RCWV for 1 Min.	No evidence of flaming or arcing

Note:

**RCWV (Rated Continuous Working Voltage):**

The DC or AC (rms) continuous working voltage corresponding to the rated power is determined by the following formula:

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

or max. working voltage whichever is less

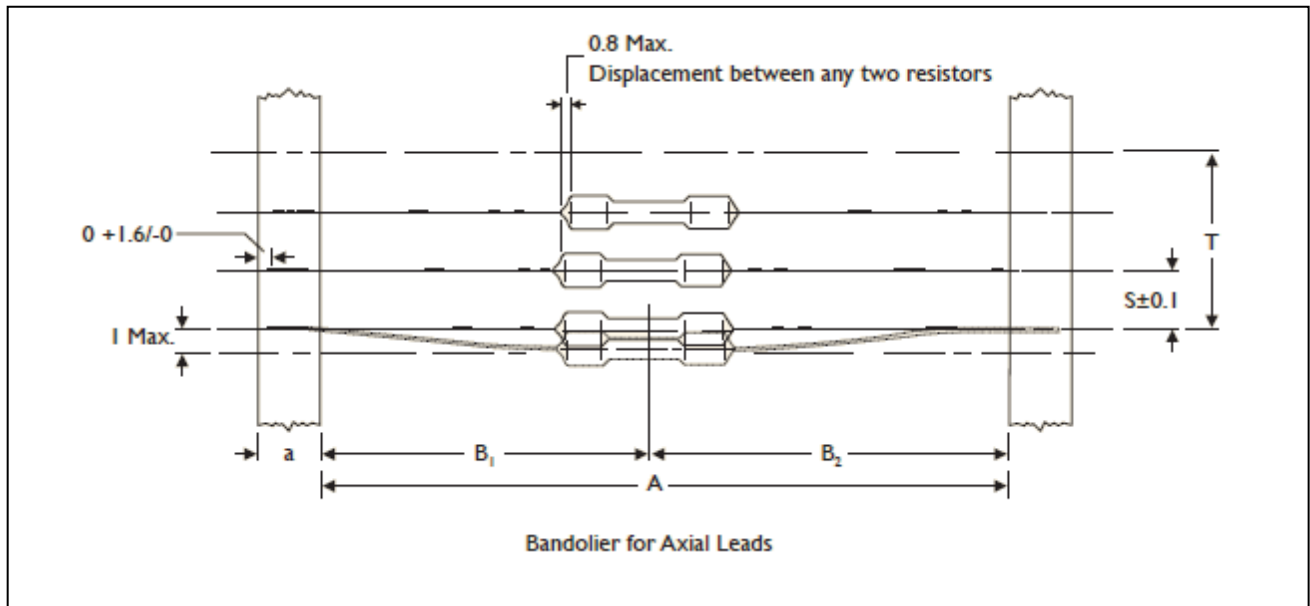
Where

V=Continuous rated DC or  
AC (rms) working voltage (V)

P=Rated power (W)

R=Resistance value (Ω)

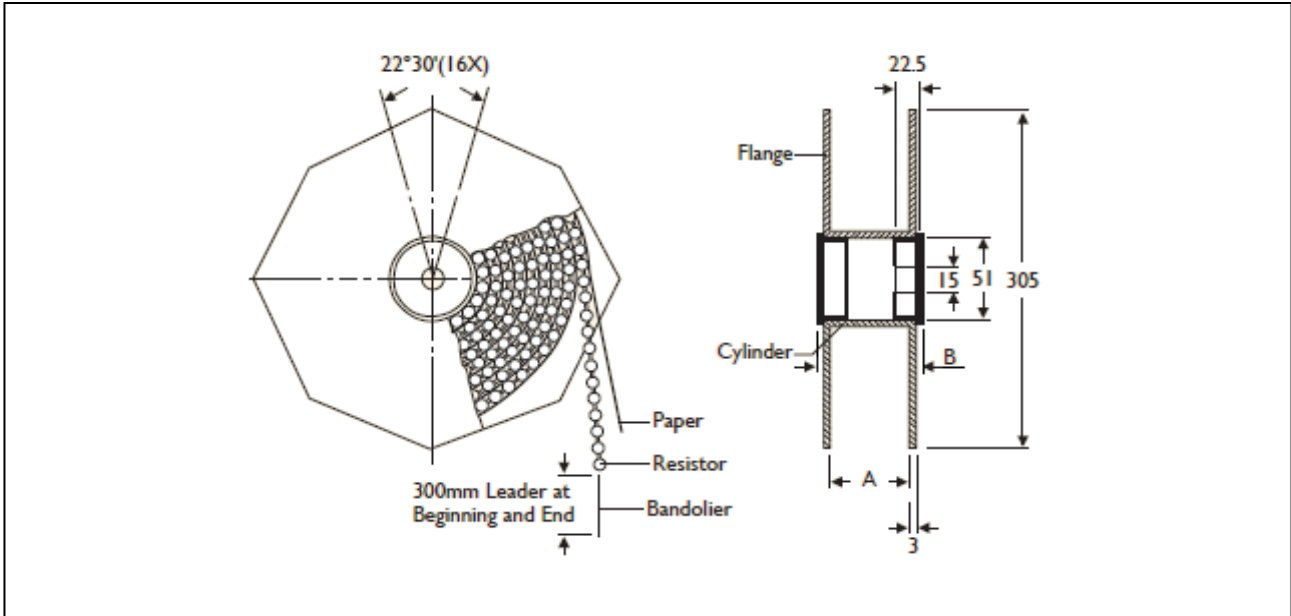
**AXIAL / REEL TAPE SPECIFICATION**



Unit: mm

Normal	Miniature	a	A	B1-B2 (Max.)	S (spacing)	T (max. deviation of spacing)
NKN-50	NKN1WS	6 ± 0.5	52.4 ± 1.5	1.2	5	1 mm per 10 spacing, 0.5 mm per 5 spacing
NKN100	NKN2WS	6 ± 0.5	73.0 ± 1.5	1.5	5	
NKN200			52.4 ± 1.5	1.2		
NKN300	NKN3WS	6 ± 0.5	73.0 ± 1.5	1.5	10	
NKN400	NKN5WS		52.4 ± 1.5	1.2		
NKN500	NKN7WS	6 ± 0.5	91.0 ± 1.5	1.5	10	

**TAPE ON REEL PACKING**

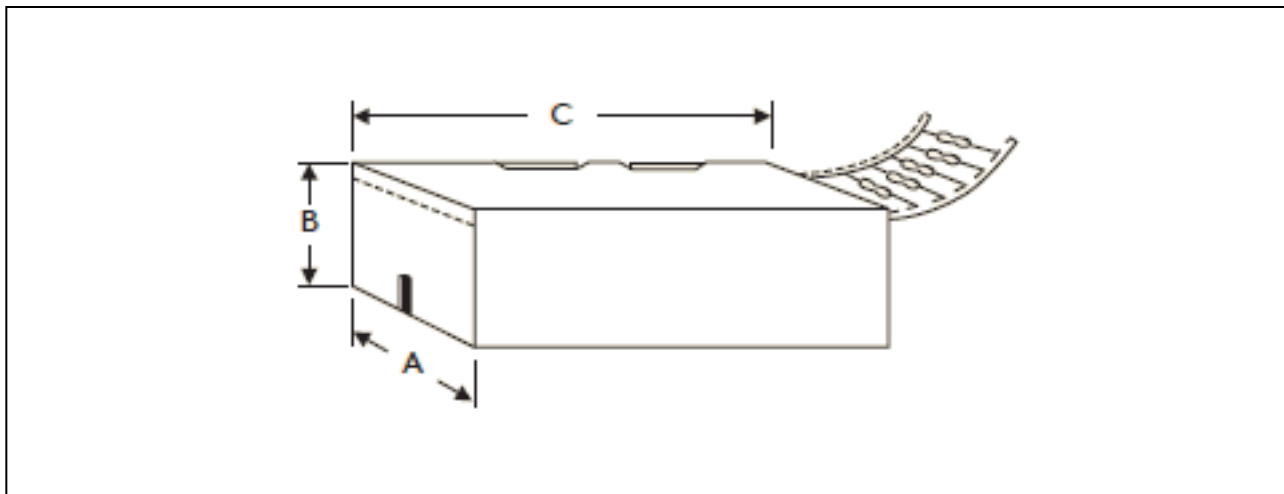


TYPE

Unit: mm/piece

Normal	Miniature	Across Flange(A)	B	Quantity Per Reel
NKN-50	NKN1WS	66.5	75.5	2,500
NKN100	NKN2WS	87	96	2,000
NKN200	NKN3WS	87	96	1,000
NKN300	NKN5WS	87	96	1,000
NKN400				

**TAPE ON BOX PACKING**



TYPE		DIMENSIONS			Unit: mm/piece
Normal	Miniature	A	B	C	Quantity Per Box
NKN-50	NKN1WS	73	45	258	1,000
NKN100	NKN2WS	81	91	260	1,000
NKN100	NKN2WS	103	78	260	1,000
NKN200	NKN3WS	81	91	260	1,000
NKN200	NKN3WS	103	94	260	1,000
NKN300 NKN400	NKN5WS	81	91	260	500
NKN300 NKN400	NKN5WS	103	78	260	500
NKN500	NKN7WS	116	79	255	250

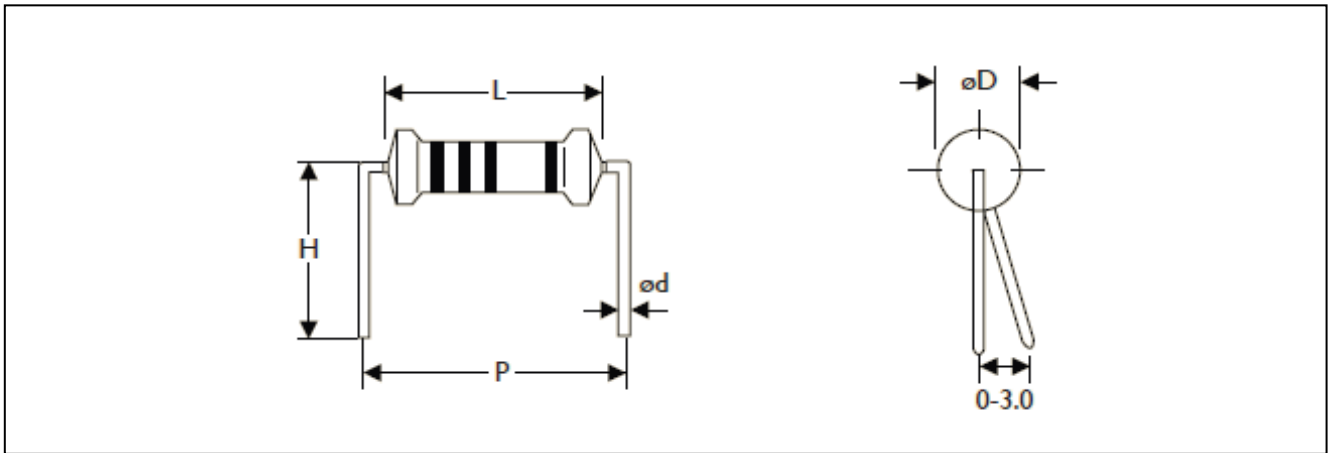
**BULK PACKING**

Normal	Miniature	Piece/Per Inner Box	Bag/Per Inner Box	Piece Per Bag
NKN-50	NKN1WS	5,000	5	1,000
NKN100	NKN2WS	2,000	4	500
NKN200	NKN3WS	1,000	2	500
NKN300 NKN400	NKN5WS	1,000	2	500
NKN500	NKN7WS	500	10	50



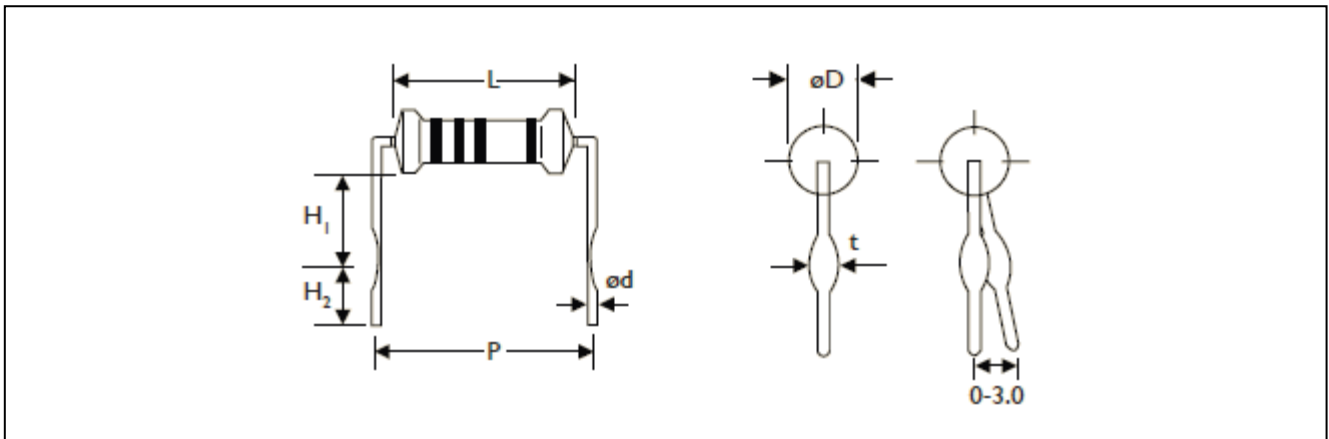
**FORMING**

**M TYPE**



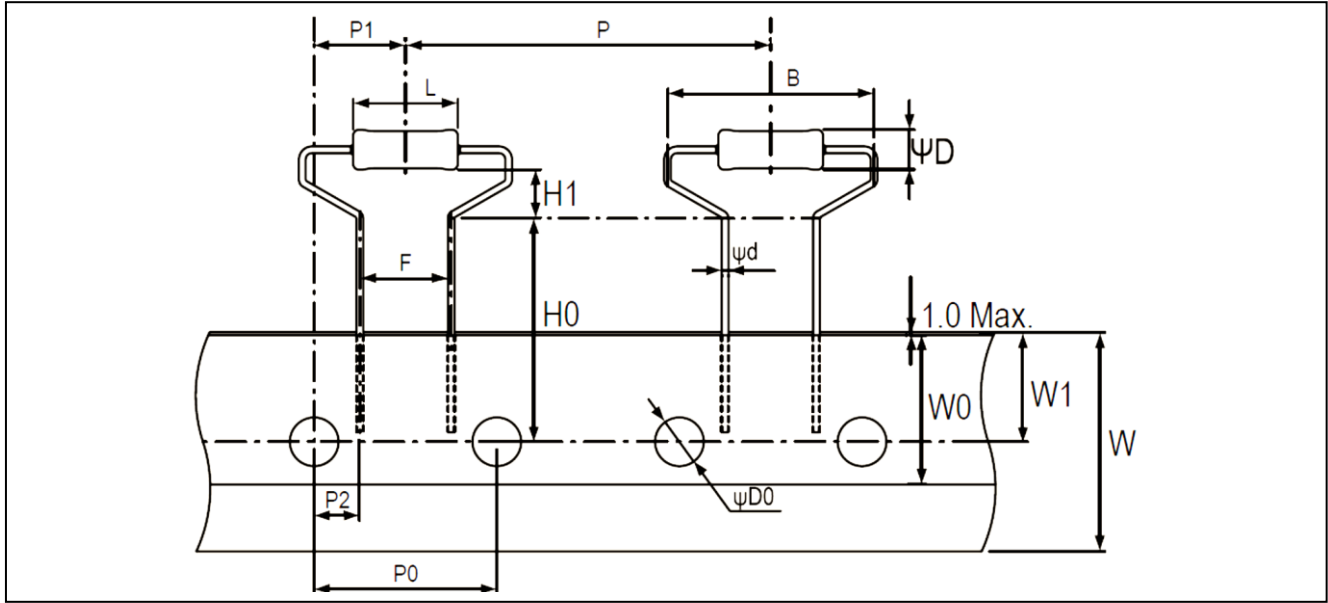
TYPE		DIMENSIONS					Unit: mm
Normal	Miniature	L	$\psi D$	$\psi d$	P	H	
NKN-50	NKN1WS	$9.0 \pm 0.5$	$3.5 \pm 0.3$	$0.55 \pm 0.05$	$12.5 \pm 1$	$10.0 \pm 1$	
NKN100	NKN2WS	$11.5 \pm 1.0$	$4.8 \pm 0.5$	$0.8 \pm 0.05$	$15.0 \pm 1$	$12.5 \pm 1$	
NKN200	NKN3WS	$15.5 \pm 1.0$	$5.3 \pm 0.5$	$0.8 \pm 0.05$	$20.0 \pm 1$	$15.0 \pm 1$	
NKN300 NKN400	NKN5WS	$17.5 \pm 1.0$	$6.5 \pm 0.5$	$0.8 \pm 0.05$	$25.0 \pm 1$	$15.0 \pm 1$	

**MB TYPE**



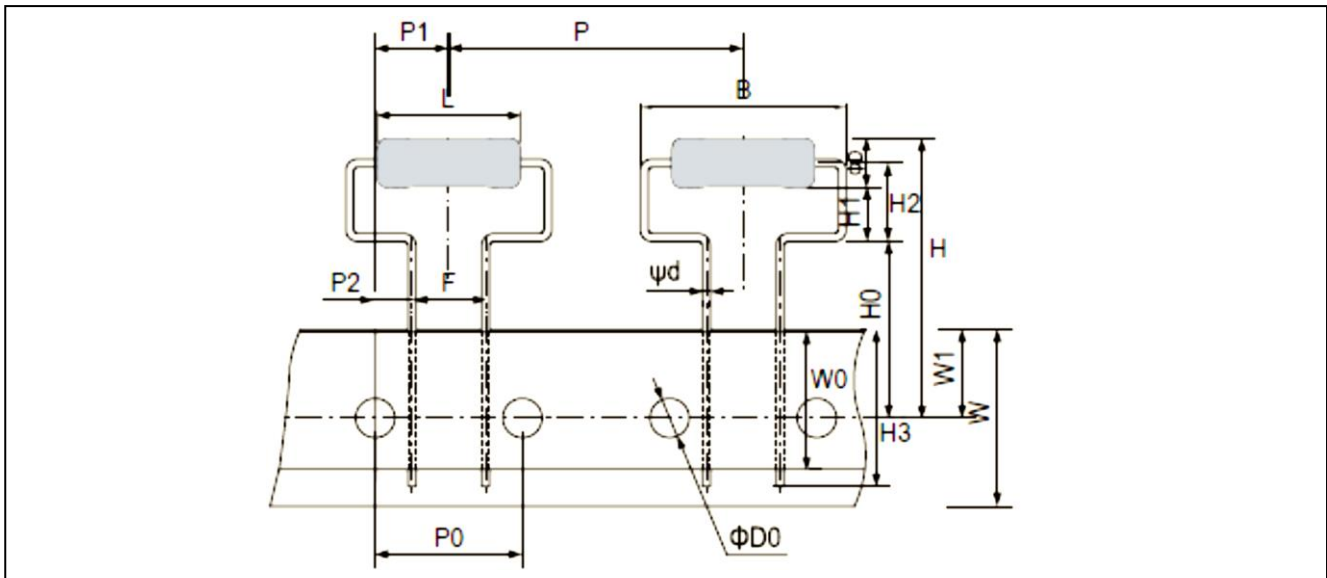
TYPE		DIMENSIONS							Unit: mm
Normal	Miniature	L	$\psi D$	$\psi d$	P	H1	H2	t	
NKN-50	-	$9.0 \pm 0.5$	$3.5 \pm 0.3$	$0.55 \pm 0.05$	$12.5 \pm 1$	$6.0 \pm 1$	$5.0 \pm 1$	$1.2 \pm 0.2$	
-	NKN1WS	$9.0 \pm 0.5$	$3.5 \pm 0.3$	$0.8 \pm 0.05$	$12.5 \pm 1$	$6.0 \pm 1$	$5.0 \pm 1$	$1.4 \pm 0.2$	
NKN100	NKN2WS	$11.5 \pm 1.0$	$4.8 \pm 0.5$	$0.8 \pm 0.05$	$15.0 \pm 1$	$6.0 \pm 1$	$5.0 \pm 1$	$1.4 \pm 0.2$	
NKN200	NKN3WS	$15.5 \pm 1.0$	$5.3 \pm 0.5$	$0.8 \pm 0.05$	$20.0 \pm 1$	$10.0 \pm 1$	$5.0 \pm 1$	$1.4 \pm 0.2$	

**MHA TYPE**



TYPE		DIMENSIONS								Unit: mm
<b>Normal</b>	<b>Miniature</b>	<b>L</b>	<b>ψD</b>	<b>ψd</b>	<b>B</b>	<b>H0</b>	<b>H1</b>	<b>P</b>	<b>P0</b>	
		9.0±0.5	3.5±0.3	0.55±0.05	17.5Max	19.0±1.0	4.0±1.0	30.0±1.0	15.0±0.3	
NKN-50	NKN1WS	<b>P1</b>	<b>P2</b>	<b>F</b>	<b>W</b>	<b>W0</b>	<b>W1</b>	<b>ψD0</b>		
		7.5±1.0	3.75±0.5	7.5±0.5	18.0±0.5	5.0Min	9.0±0.5	4.0±0.2		

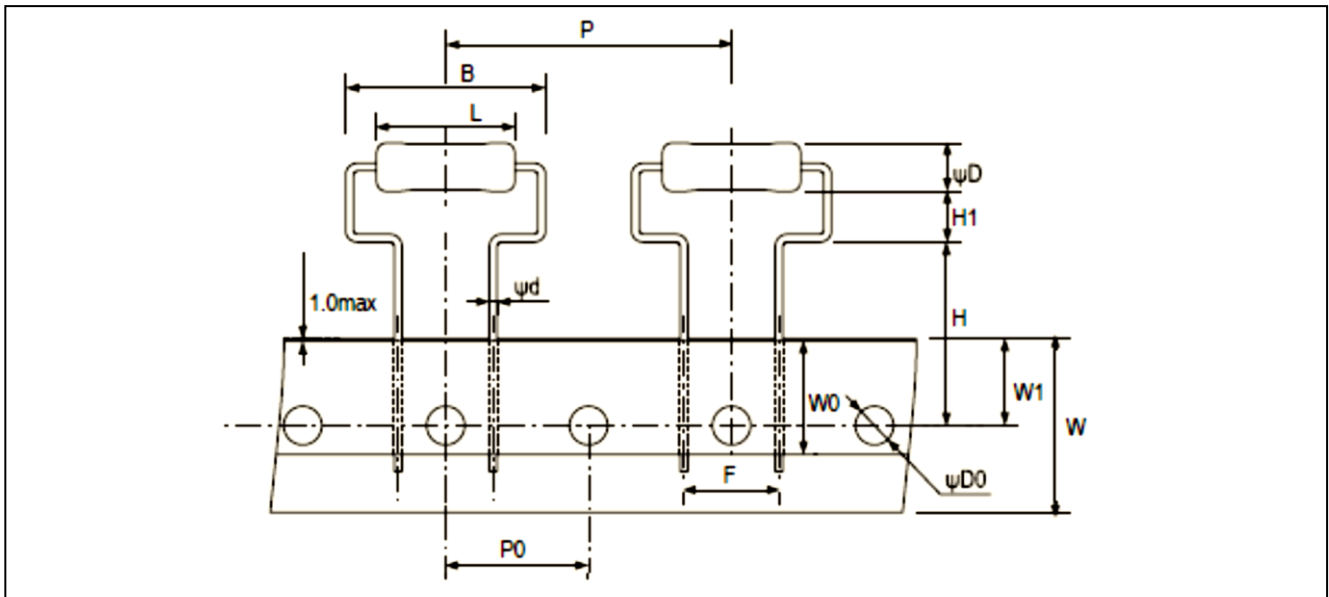
**MHB TYPE**



TYPE		DIMENSIONS									Unit: mm
<b>Normal</b>	<b>Miniature</b>	<b>L</b>	<b>ψD</b>	<b>ψd</b>	<b>B</b>	<b>H</b>	<b>H0</b>	<b>H1</b>	<b>H2</b>	<b>H3</b>	
		15.5±1.0	5.3±0.5	0.8±0.05	21.0Max.	30Max.	18.0±1.0	5.5(Ref.)	8.0±1.5	16Max.	
NKN200	NKN3WS	<b>P</b>	<b>P0</b>	<b>P1</b>	<b>P2</b>	<b>F</b>	<b>W</b>	<b>W0</b>	<b>W1</b>	<b>ψD0</b>	
		30.0±1.0	15.0±0.3	7.5±1.0	3.75±0.8	7.5±0.5	18.0±0.5	5.0Min.	9.0±0.5	4.0±0.3	

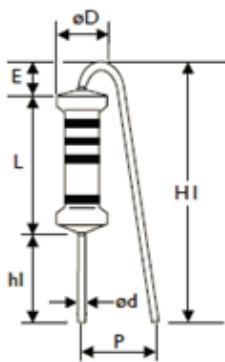


**MHC TYPE**

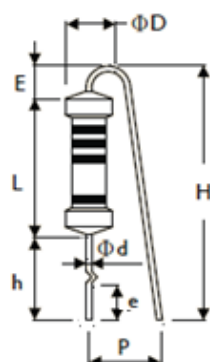


TYPE		DIMENSIONS								Unit: mm
<b>Normal</b>	<b>Miniature</b>	L	ψD	ψd	B	H	H1	P	P0	
		15.5±1.0	5.3±0.5	0.8±0.05	21.0Max.	19.0±1.0	5.25±1.0	30.0±1.0	15.0±0.3	
NKN200	NKN3WS	F	W	W0	W1	ψD0				
		10.0±0.5	18.0±0.5	5.0Min.	9.0±0.5	4.0±0.2				

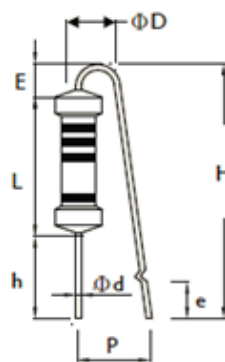
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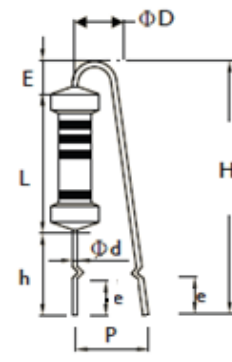
**FK TYPE**



**FFK TYPE**

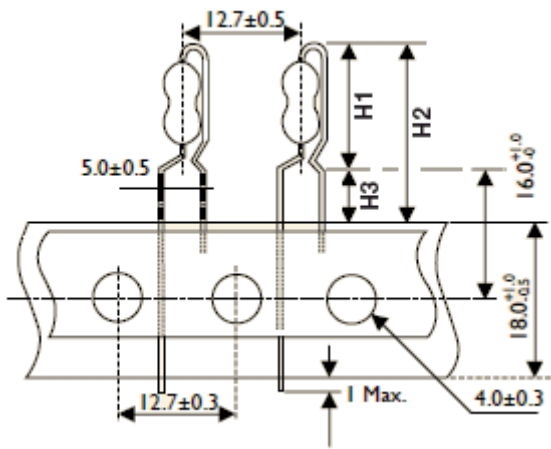


**FKK TYPE**

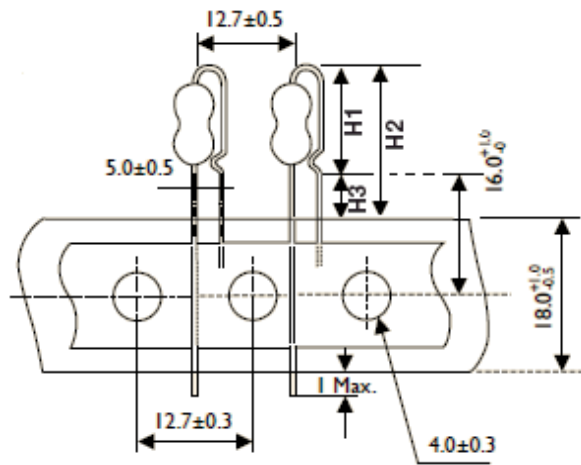


TYPE		DIMENSIONS										Unit: mm
<b>Normal</b>	<b>Miniature</b>	L	ψD	ψd	P	h	H Max.	h1	H1 Max.	E Max.	e	
NKN100	NKN2WS	11.5±1	4.8±0.5	0.8±0.05	6±1	8±1	24	5±1	20	3.5	3.5±1	
NKN200	NKN3WS	15.5±1	5.3±0.5	0.8±0.05	8±1	8±1	28	5±1	25	3.5	3.5±1	

**PN TYPE ( Taping Pack )**



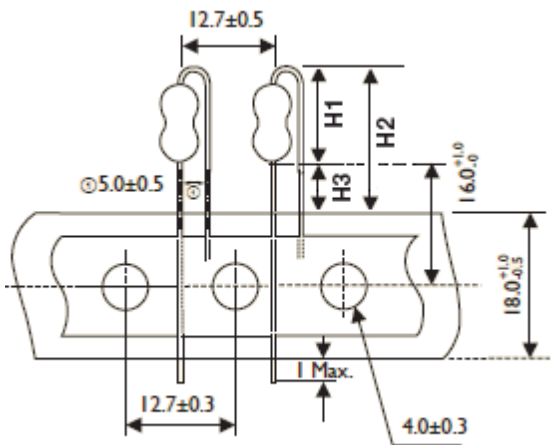
**AV TYPE ( Taping Pack )**



TYPE		DIMENSIONS			Unit: mm
Normal	Miniature	H1 Max.	H2 Max.	H3 Max.	
NKN-50	NKN1WS	17	25.5	8.5	
NKN100	NKN2WS	19	27.5	8.5	

TYPE		DIMENSIONS			Unit: mm
Normal	Miniature	H1 Max.	H2 Max.	H3 Max.	
NKN-50	NKN1WS	14.5	23	8.5	
NKN100	NKN2WS	17.5	26	8.5	

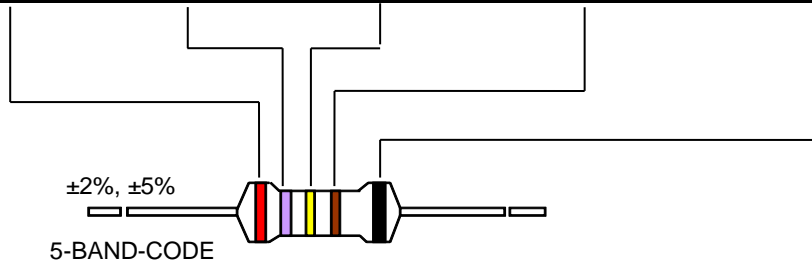
**FT TYPE ( Taping Pack )**



TYPE		DIMENSIONS			Unit: mm
Normal	Miniature	H1 Max.	H2 Max.	H3 Max.	
NKN-50	NKN1WS	13	21.5	8.5	
NKN100	NKN2WS	16	24.5	8.5	

**MARKING**

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



**REVISION HISTORY**

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version 5	Apr.1, 2024	-	- Added forming code description for part number
Version 4	Mar.27, 2024	-	- Remove M type of NKN500&NKN7WS
Version 3	Nov.14, 2023	-	- Remove MB type of NKN500&NKN7WS
Version 2	Sep.6, 2023	-	- Updated legal disclaimer and footer versions numbers
Version 1	Mar.9, 2023	-	- Add PN, AV, FT type forming to explanations of part number
Version 0	Aug.2, 2021	-	- First issue of this specification

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