

DATA SHEET

WIREWOUND RESISTORS

Flameproof, Non-Inductive

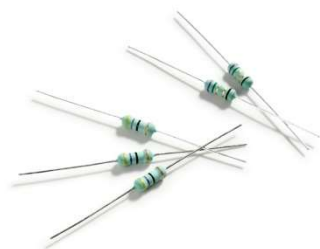
NKN Series

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

1/2W to 7W

RoHS compliant & Halogen Free





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

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

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

(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 = $\pm 2\%$	J = $\pm 5\%$
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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

(7) RESISTANCE VALUE

E24 Series

Example:

0R1= 0.1 Ω , 1R = 1 Ω , 10R = 10 Ω

DIMENSIONS

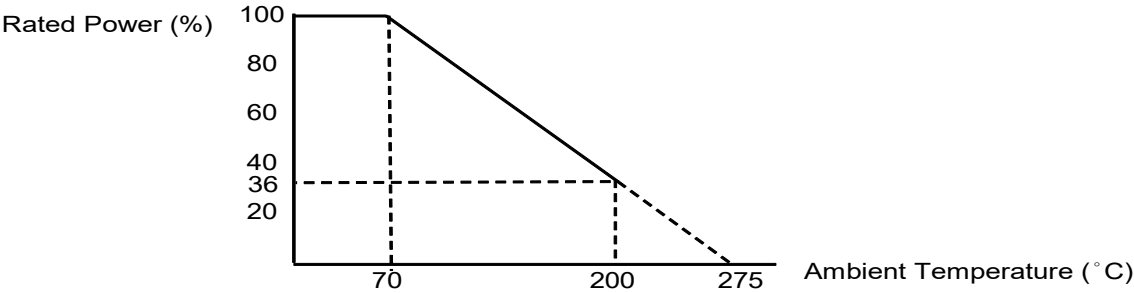
Unit: mm

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

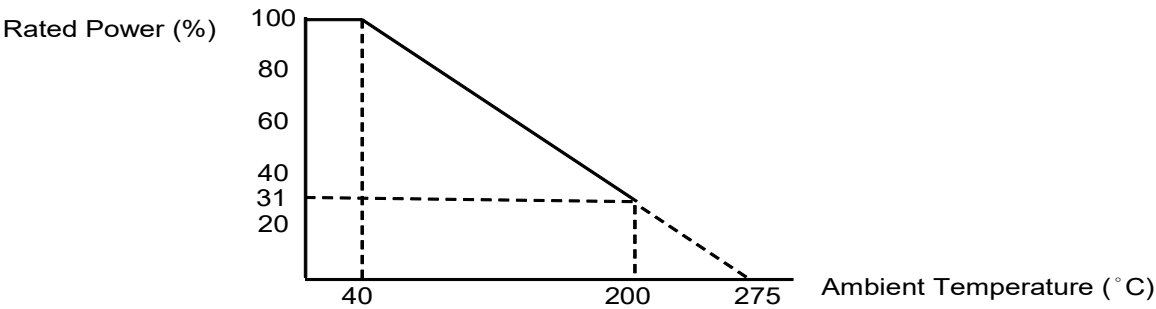


DERATING CURVE

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 REQUIREMENTS

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

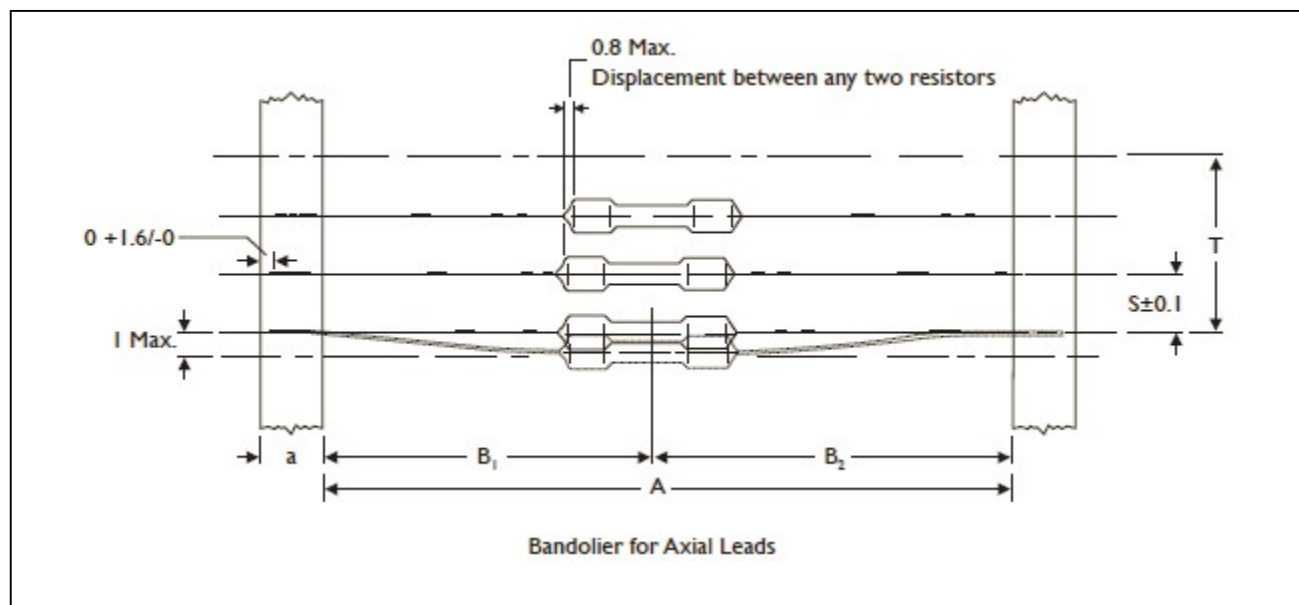
Where

V=Continuous rated DC or

AC (rms) working voltage (V)

P=Rated power (W)

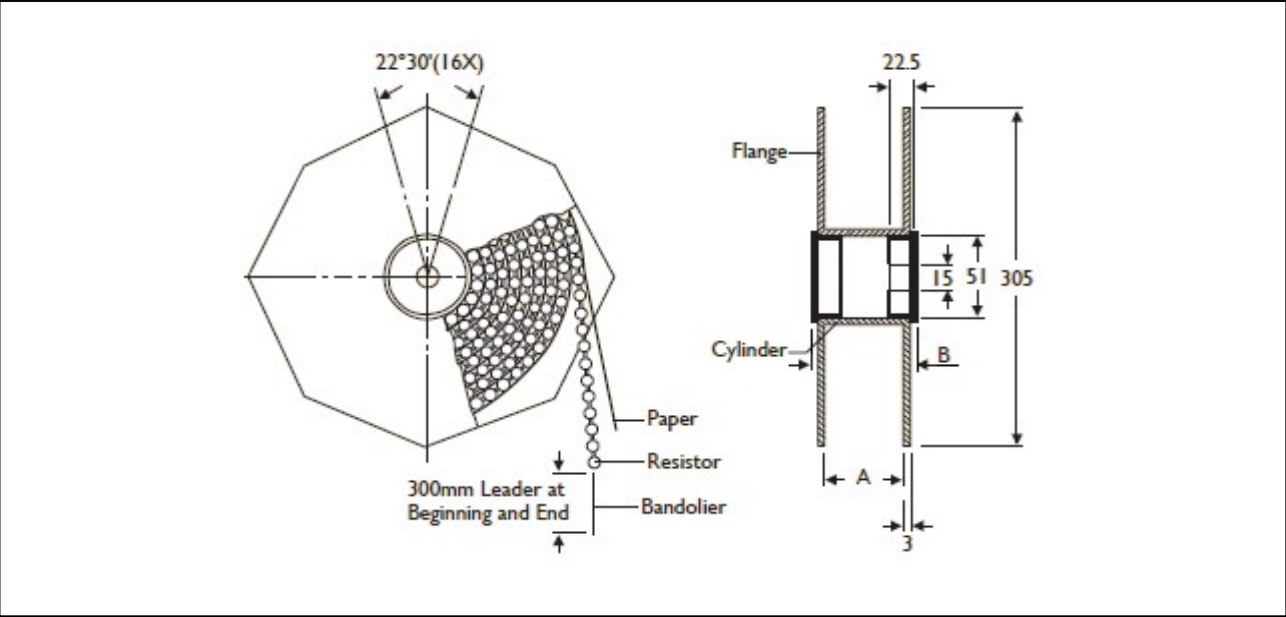
R=Resistance value (Ω)

AXIAL / REEL TAPE SPECIFICATION

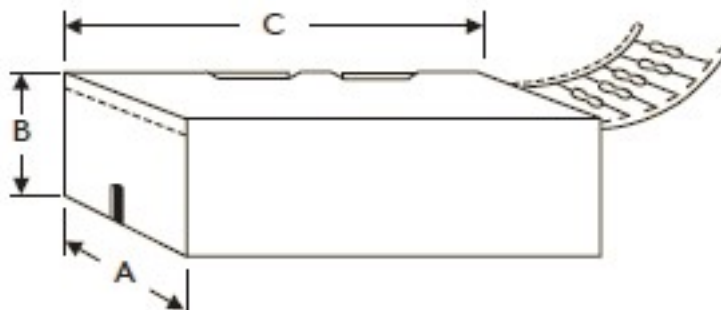
Unit: mm

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



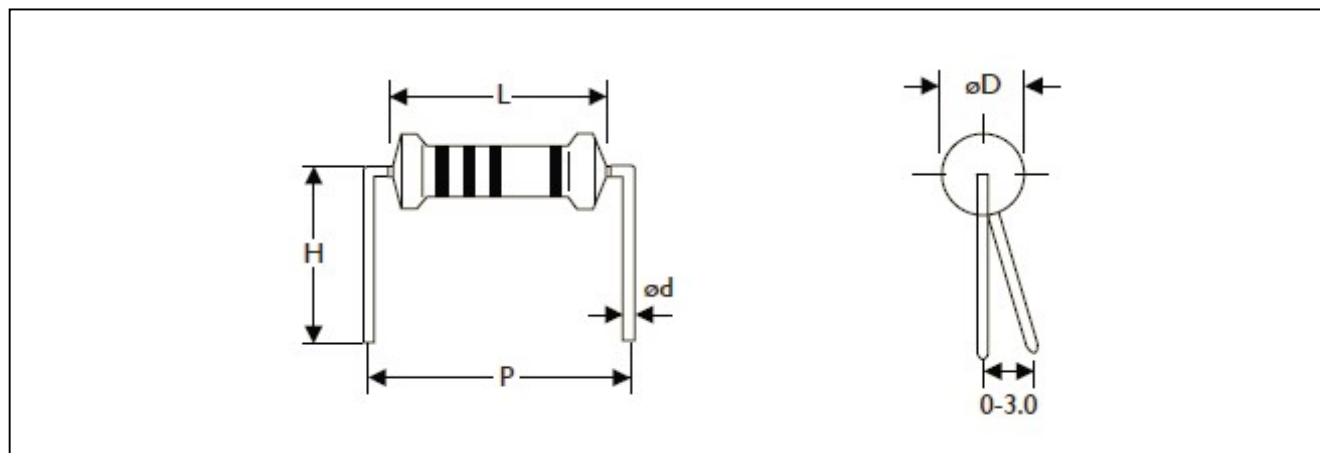
TYPE				Unit: mm/piece
Normal	Miniature	Across Flange(A)	B	Quantity Per Reel
NKN-50	NKN1WS	66.5	75.5	2,500
NKN100	NKN2WS	87	96	2,000
NKN200	NKN3WS	87	96	1,000
NKN300	NKN5WS	87	96	1,000
NKN400				

TAPE ON BOX PACKING

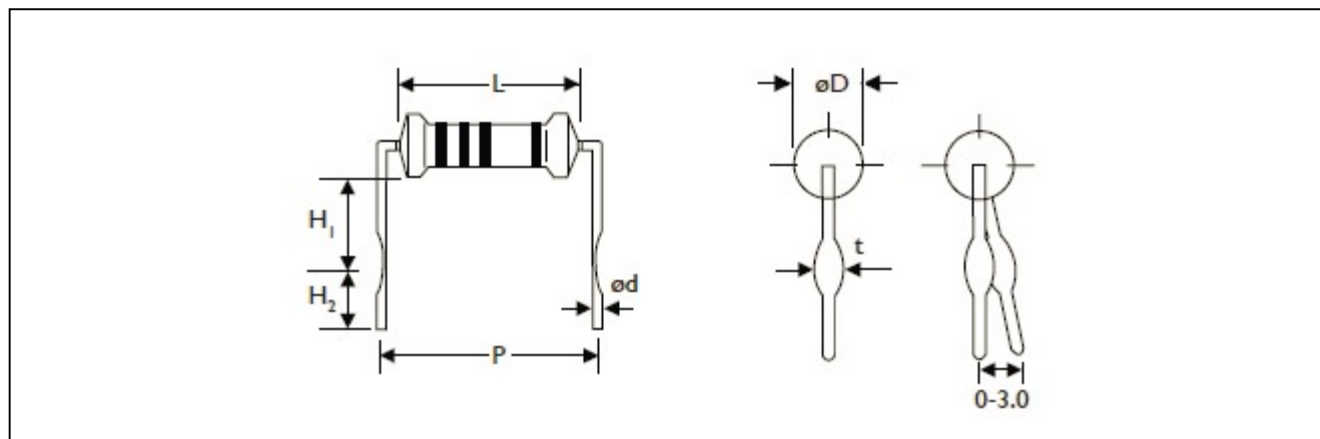
TYPE		DIMENSIONS			Unit: mm/piece
Normal	Miniature	A	B	C	Quantity Per Box
NKN-50	NKN1WS	73	45	258	1,000
NKN100	NKN2WS	81	91	260	1,000
NKN100	NKN2WS	103	78	260	1,000
NKN200	NKN3WS	81	91	260	1,000
NKN200	NKN3WS	103	94	260	1,000
NKN300 NKN400	NKN5WS	81	91	260	500
NKN300 NKN400	NKN5WS	103	78	260	500
NKN500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

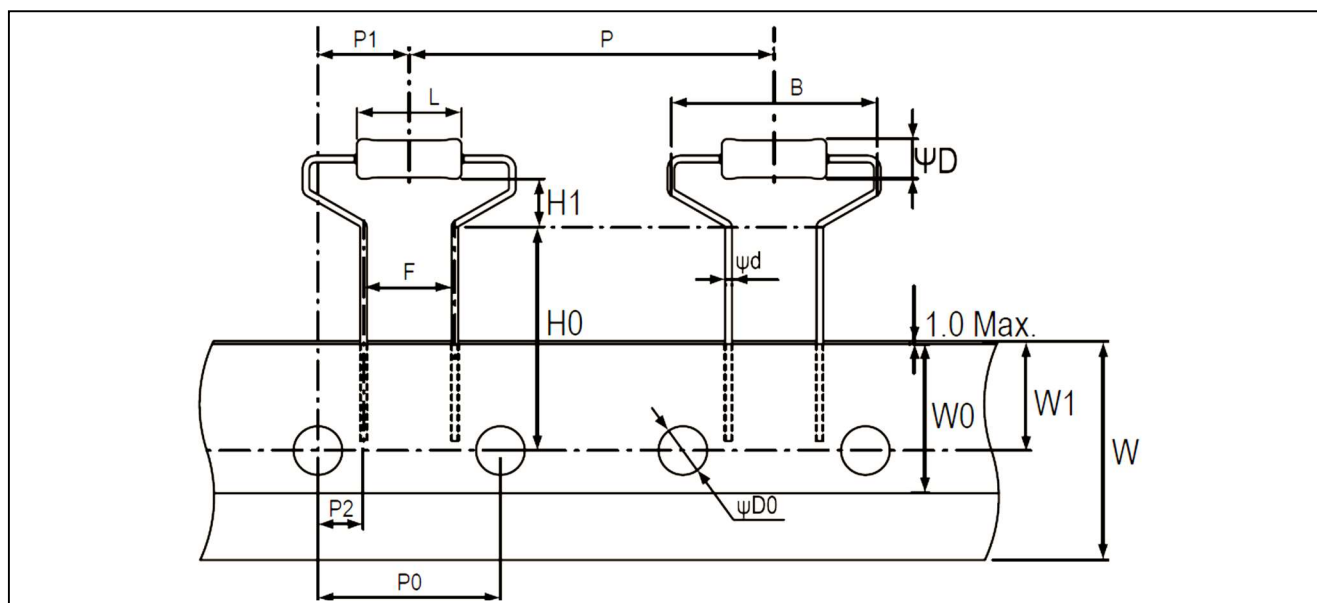
FORMING**M TYPE**

TYPE		DIMENSIONS				Unit: mm	
Normal	Miniature	L	ψD	ψd	P	H	
NKN-50	NKN1WS	9.0 ± 0.5	3.5 ± 0.3	0.55 ± 0.05	12.5 ± 1	10.0 ± 1	
NKN100	NKN2WS	11.5 ± 1.0	4.8 ± 0.5	0.8 ± 0.05	15.0 ± 1	12.5 ± 1	
NKN200	NKN3WS	15.5 ± 1.0	5.3 ± 0.5	0.8 ± 0.05	20.0 ± 1	15.0 ± 1	
NKN300 NKN400	NKN5WS	17.5 ± 1.0	6.5 ± 0.5	0.8 ± 0.05	25.0 ± 1	15.0 ± 1	
NKN500	NKN7WS	24.5 ± 1.0	8.5 ± 0.5	0.8 ± 0.05	30.0 ± 1	15.0 ± 1	

MB TYPE

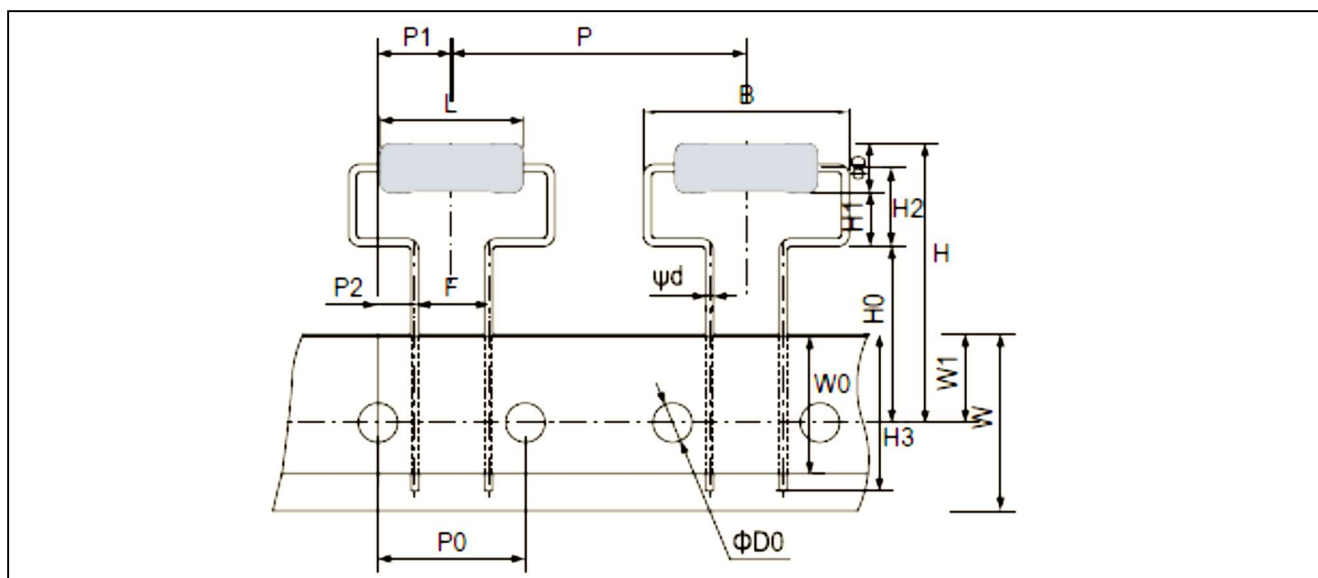
TYPE		DIMENSIONS				Unit: mm		
Normal	Miniature	L	ψD	ψd	P	H1	H2	t
NKN-50	-	9.0 ± 0.5	3.5 ± 0.3	0.55 ± 0.05	12.5 ± 1	6.0 ± 1	5.0 ± 1	1.2 ± 0.2
-	NKN1WS	9.0 ± 0.5	3.5 ± 0.3	0.8 ± 0.05	12.5 ± 1	6.0 ± 1	5.0 ± 1	1.4 ± 0.2
NKN100	NKN2WS	11.5 ± 1.0	4.8 ± 0.5	0.8 ± 0.05	15.0 ± 1	6.0 ± 1	5.0 ± 1	1.4 ± 0.2
NKN200	NKN3WS	15.5 ± 1.0	5.3 ± 0.5	0.8 ± 0.05	20.0 ± 1	10.0 ± 1	5.0 ± 1	1.4 ± 0.2
NKN500	NKN7WS	24.5 ± 1.0	8.5 ± 0.5	0.8 ± 0.05	30.0 ± 1	15.0 ± 1	5.0 ± 1	1.4 ± 0.2

MHA TYPE



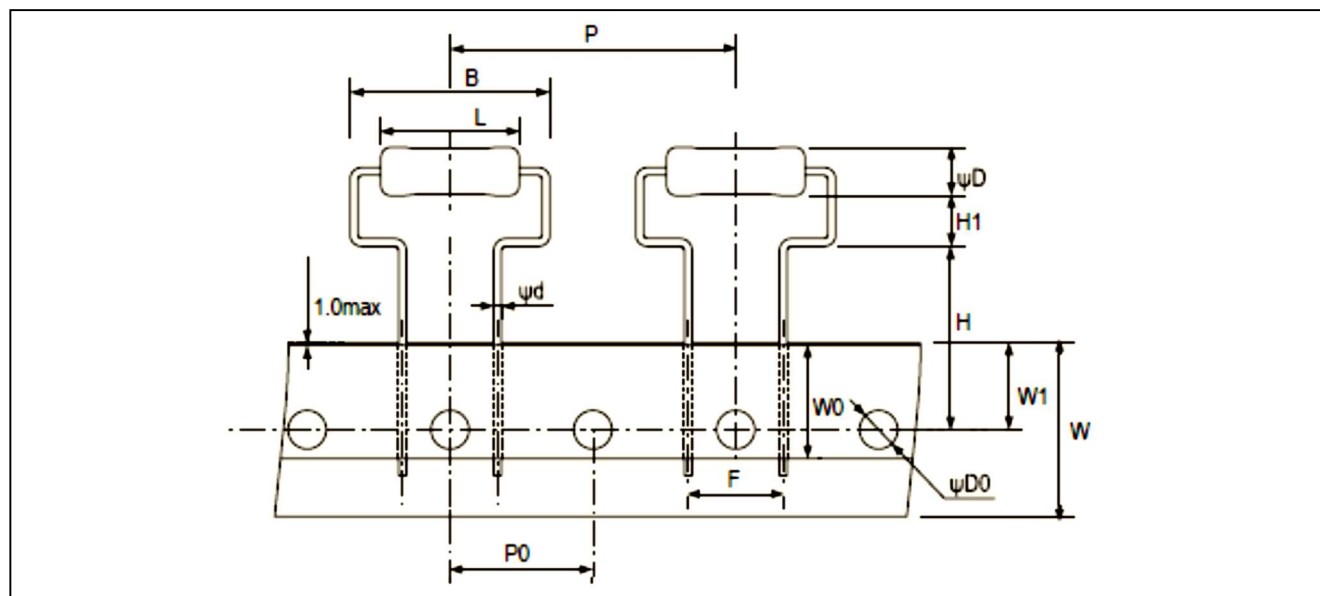
TYPE		DIMENSIONS								Unit: mm
Normal	Miniature	L	ΨD	Ψd	B	H0	H1	P	P0	
		9.0±0.5	3.5±0.3	0.55±0.05	17.5Max	19.0±1.0	4.0±1.0	30.0±1.0	15.0±0.3	
NKN-50	NKN1WS	P1	P2	F	W	W0	W1	$\Psi D0$		
		7.5±1.0	3.75±0.5	7.5±0.5	18.0±0.5	5.0Min	9.0±0.5	4.0±0.2		

MHB TYPE



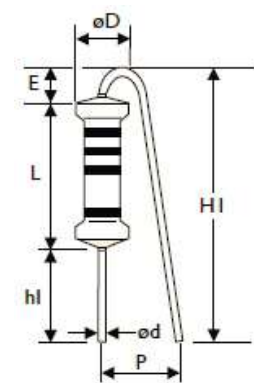
TYPE		DIMENSIONS								Unit: mm
Normal	Miniature	L	ΨD	Ψd	B	H	H0	H1	H2	H3
		15.5±1.0	5.3±0.5	0.8±0.05	21.0Max.	30Max.	18.0±1.0	5.5(Ref.)	8.0±1.5	16Max.
NKN200	NKN3WS	P	P0	P1	P2	F	W	W0	W1	$\Psi D0$
		30.0±1.0	15.0±0.3	7.5±1.0	3.75±0.8	7.5±0.5	18.0±0.5	5.0Min.	9.0±0.5	4.0±0.3

MHC TYPE

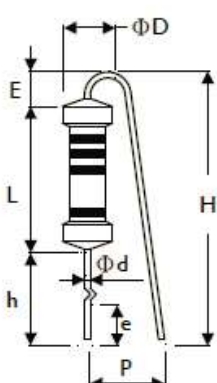


TYPE		DIMENSIONS								Unit: mm
Normal	Miniature	L	ψD	ψd	B	H	H1	P	P0	
		15.5±1.0	5.3±0.5	0.8±0.05	21.0Max.	19.0±1.0	5.25±1.0	30.0±1.0	15.0±0.3	
NKN200	NKN3WS	F	W	W0	W1	$\psi D0$				
		10.0±0.5	18.0±0.5	5.0Min.	9.0±0.5	4.0±0.2				

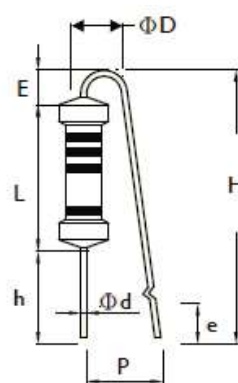
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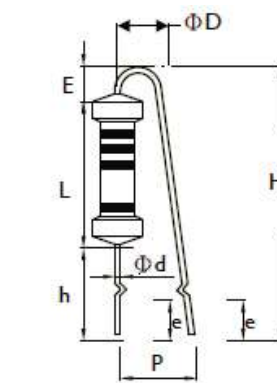
FK TYPE



FFK TYPE

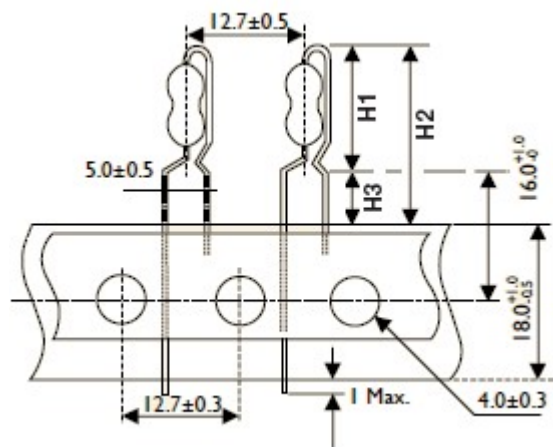


FKK TYPE



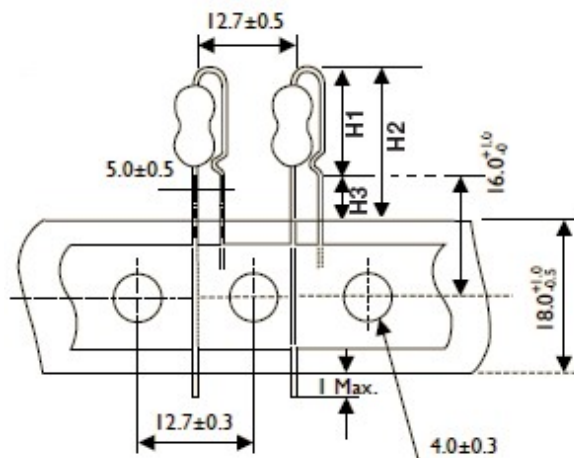
TYPE		DIMENSIONS										Unit: mm
Normal	Miniature	L	ψD	ψd	P	h	H Max.	h1	H1 Max.	E Max.	e	
NKN100	NKN2WS	11.5±1	4.8±0.5	0.8±0.05	6±1	8±1	24	5±1	20	3.5	3.5±1	
NKN200	NKN3WS	15.5±1	5.3±0.5	0.8±0.05	8±1	8±1	28	5±1	25	3.5	3.5±1	

PN TYPE (Taping Pack)



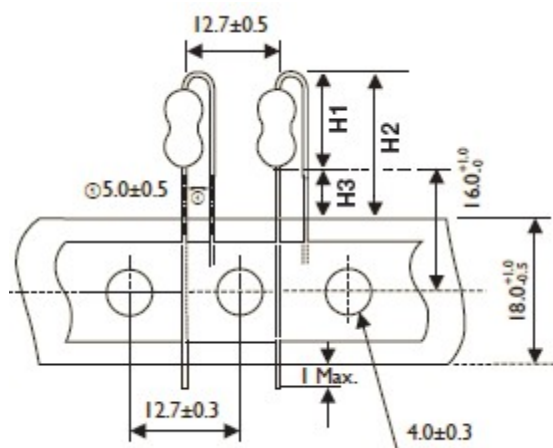
TYPE		DIMENSIONS			Unit: mm
Normal	Miniature	H1 Max.	H2 Max.	H3 Max.	
NKN-50	NKN1WS	17	25.5	8.5	
NKN100	NKN2WS	19	27.5	8.5	

AV TYPE (Taping Pack)



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	

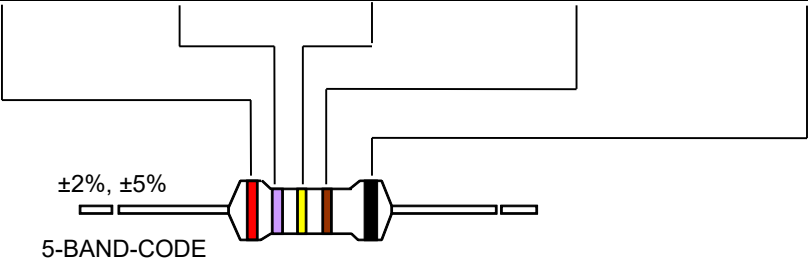
FT TYPE (Taping Pack)



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 0	Aug.2, 2021	-	- First issue of this specification
Version 1	Mar.9, 2023	-	- Add PN, AV, FT type forming to explanations of part number

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