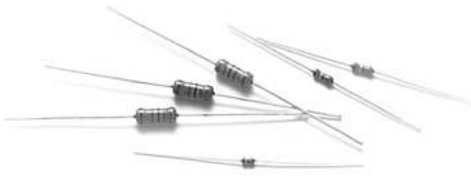


## Wirewound Resistors

# Flame-Proof & Non-Inductive Type

## Normal & Miniature Style [ NKN Series ]



### INTRODUCTION

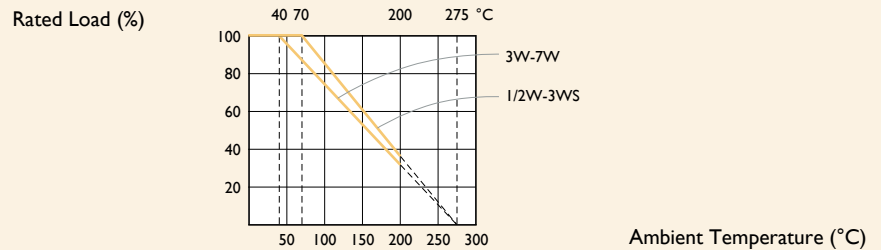
The resistor element is a resistive wire which is wound in a single layer on a ceramic rod, with tinned connecting wires of electrolytic copper welded to the end-caps. The ends of the resistive wire are connected to the caps by welding. The resistors are coated with layers of green color flame-proof lacquer. The 5th color band is black to represent NKN series.

### FEATURES

Power Rating	1/2W, 1W, 2W, 3W, 4W, 5W, 7W
Resistance Tolerance	±5%
T.C.R.	±300ppm/°C
Flameproof Multi-layer Coating Meets	UL-94V-0
Flameproof Feature Meets Overload Test	UL-1412

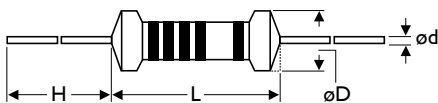
### DERATING CURVE

For resistors operated in ambient temperatures above 40°C, power rating must be derated in accordance with the curve below.



### DIMENSIONS

Unit: mm



5th color code: black

STYLE		DIMENSION			
Normal	Miniature	L	øD	H	ød
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

## ELECTRICAL CHARACTERISTICS

### NORMAL STYLE

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

Note: Special value is available on request

### MINIATURE STYLE

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

Note: Special value is available on request

## ENVIRONMENTAL CHARACTERISTICS

PERFORMANCE TEST	TEST METHOD		APPRAISE
Short Time Overload	IEC 60115-1 4.13	10 times rated power for 5 Sec.	±2.0%+0.05Ω
Voltage Proof on Insulation	IEC 60115-1 4.7	in V-block for 60 Sec., test voltage by type	By type
Temperature Coefficient	IEC 60115-1 4.8	-55°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	235±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	±5.0%+0.05Ω
Endurance at 70°C	IEC 60115-1 4.25	70±2°C at RCWV for 1,000 Hr. (1.5 Hr. on, 0.5 Hr. off)	±5.0%+0.05Ω
Temperature Cycling	IEC 60115-1 4.19	-55°C ⇌ Room Temp. ⇌ +155°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: Rated Continuous Working Voltage (RCWV) =  $\sqrt{\text{Power Rating} \times \text{Resistance Value}}$  or Max. working voltage listed above, whichever less.