

Carbon Film Resistors

Non-Inductive & Flame-Proof Type

Normal & Miniature Style [NCR Series]



INTRODUCTION

The NCR Series Carbon Film Non-Inductive & Flame-Proof Resistors are manufactured by coating a homogeneous film of pure carbon on high grade ceramic rods. Tinned connecting leads of electrolytic copper are welded to the end-caps. The inductance is $< 1 \mu\text{H}$.

The resistors are coated with layers of gray color lacquer for normal size & pink color lacquer for miniature size.

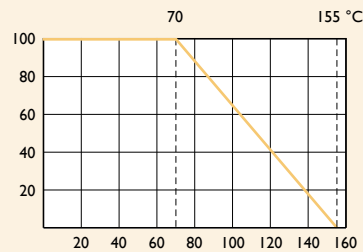
FEATURES

Power Rating	1/4W, 1/2W, 1W, 2W, 3W
Resistance Tolerance	$\pm 5\%$, $\pm 10\%$
T.C.R.	see Table I
Flameproof Multi-layer Coating Meets	UL-94V-0
Flameproof Feature Meets Overload Test	UL-1412

DERATING CURVE

For resistors operated in ambient temperatures above 70°C , power rating must be derated in accordance with the curve below.

Rated Load (%)

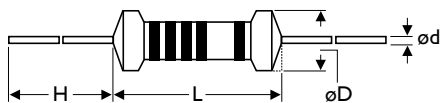


Ambient Temperature ($^\circ\text{C}$)

TABLE I TEMPERATURE COEFFICIENT

VALUE RANGE	MAX. VALUE OF TEMP. COEFFICIENT PPM/ $^\circ\text{C}$
Under $5\text{K } \Omega$	-500
$5\text{K} - 10\text{K } \Omega$	-800

DIMENSIONS



5th color code: green

Unit: mm

STYLE		DIMENSION			
Normal	Miniature	L	ϕD	H	ϕd
NCR-25	NCR50S	6.3 ± 0.5	2.4 ± 0.2	28 ± 2.0	0.55 ± 0.05
NCR-50	NCR1WS	9.0 ± 0.5	3.3 ± 0.3	26 ± 2.0	0.55 ± 0.05
NCR100	NCR2WS	11.5 ± 1.0	4.5 ± 0.5	35 ± 2.0	0.8 ± 0.05
NCR200	NCR3WS	15.5 ± 1.0	5.0 ± 0.5	33 ± 2.0	0.8 ± 0.05

Note:

ELECTRICAL CHARACTERISTICS

STYLE	NCR-25	NCR50S	NCR-50	NCRIWS	NCR100	NCR2WS	NCR200	NCR3WS
Power Rating at 70°C	1/4W	1/2W		1W		2W		3W
Maximum Working Voltage	250V	300V	350V	400V	500V			
Maximum Overload Voltage	500V	600V	700V	800V	1,000V			
Voltage Proof	500V		700V		1,000V			
Resistance Range	2.2 Ω - 10K Ω for E24 series value							
Operating Temp. Range	-55°C to +155°C							
Temperature Coefficient	see Table I							

Note: Special value is available on request

ENVIRONMENTAL CHARACTERISTICS

PERFORMANCE TEST	TEST METHOD	APPRAISE
Short Time Overload	IEC 60115-1 4.13 2.5 times RCWV for 5 Sec.	±0.75%+0.05 Ω for normal style ±2.0%+0.05 Ω for miniature style
Voltage Proof	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.	>1,000M Ω
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)
Periodic-pulse Overload	IEC 60115-1 4.39 4 times RCWV 10,000 cycles (1 Sec. on, 25 Sec. off)	±1.0%+0.05 Ω
Damp Heat Steady State	IEC 60115-1 4.24 40±2°C, 90-95% RH for 56 days, loaded with 0.1 times RCWV	±3.0%+0.05 Ω
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)	±3.0%+0.05 Ω
Temperature Cycling	IEC 60115-1 4.19 -55°C ⇌ Room Temp. ⇌ +155°C ⇌ Room Temp. (5 cycles)	±1.0%+0.05 Ω
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%+0.05 Ω
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) = $\sqrt{\text{Power Rating} \times \text{Resistance Value}}$