

Vitreous Wirewound Power Resistors



FEATURES

- High dissipation
- Embedded collars
- Insulated mounting
- Applicable standard: NFC 93214
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


RoHS
COMPLIANT

STANDARD ELECTRICAL SPECIFICATIONS

| GLOBAL MODEL | POWER RATING W | RESISTANCE RANGE Ω | TOLERANCE ± % | U _{LIM.} V |
|--------------|-------------------|-----------------------|------------------|------------------------|
| VNC 30 x 250 | 320 | 4.7 to 470K | 5 | 3000 |
| VNC 30 x 153 | 200 | 3.3 to 330K | 5 | 1700 |
| VNC 25 x 168 | 180 | 2.7 to 270K | 5 | 1900 |
| VNC 25 x 138 | 145 | 2.7 to 220K | 5 | 1400 |
| VNC 25 x 110 | 120 | 2.7 to 220K | 5 | 1000 |
| VNC 25 x 84 | 85 | 2.2 to 150K | 5 | 650 |
| VNC 20 x 265 | 230 | 3.9 to 390K | 5 | 3000 |
| VNC 20 x 165 | 140 | 2.7 to 270K | 5 | 1700 |
| VNC 20 x 140 | 120 | 2.2 to 220K | 5 | 1400 |
| VNC 20 x 117 | 90 | 1.8 to 220K | 5 | 1100 |
| VNC 20 x 102 | 85 | 1.2 to 180K | 5 | 950 |
| VNC 20 x 90 | 70 | 1.0 to 120K | 5 | 900 |
| VNC 16 x 94 | 55 | 2.2 to 68K | 5 | 900 |
| VNC 16 x 70 | 45 | 2.2 to 100K | 5 | 650 |
| VNC 13 x 70 | 35 | 1.8 to 56K | 5 | 650 |
| VNC 12 x 102 | 50 | 1.5 to 100K | 5 | 950 |
| VNC 12 x 76 | 40 | 1.0 to 82K | 5 | 700 |
| VNC 12 x 51 | 25 | 1.0 to 56K | 5 | 450 |
| VNC 12 x 38 | 18 | 1.0 to 33K | 5 | 350 |
| VNC 10 x 52 | 22 | 1.0 to 39K | 5 | 450 |
| VNC 10 x 44 | 18 | 1.0 to 33K | 5 | 400 |
| VNC 8 x 45 | 15 | 1.0 to 27K | 5 | 400 |

NFC 93214 CHARACTERISTICS

| GLOBAL MODEL | P _n W | RESISTANCE RANGE Ω |
|---------------------|---------------------|-----------------------|
| VN 30 x 153 (RB 37) | 113 | 3.3 to 27K/82K |
| VN 20 x 102 (RB 35) | 55 | 1.2 to 12K/39K |
| VN 12 x 76 (RB 33) | 26 | 1.0 to 5.6K/18K |
| VN 12 x 51 | 22 | - |
| VN 12 x 38 (RB 31) | 14 | 1.0 to 2K/6.2K |
| VN 10 x 44 | 10 | - |

Note

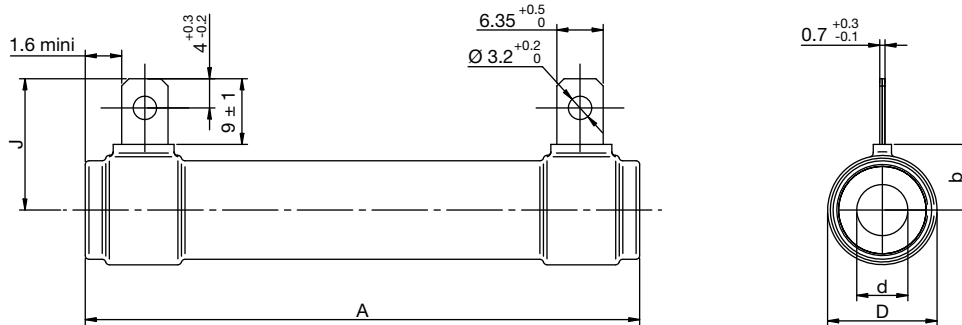
- Resistance maximum value: normal limits for wire with diameter of: 63 μ/38 μ minimum.

TECHNICAL SPECIFICATIONS

| PARAMETER | UNIT | RESISTOR CHARACTERISTICS |
|-----------------------------|--------|--------------------------|
| Temperature coefficient | ppm/°C | 75 ppm/°C (typical) |
| Operating temperature range | °C | -55 to +450 |

| GENERAL CHARACTERISTICS | |
|-------------------------|-----------------|
| Core | Ceramic |
| Winding | NiCr alloy |
| Coating | Vitreous enamel |
| Ohmic values | E12 |
| Insulated mounting (PS) | On request |

DIMENSIONS in millimeters **AND WEIGHT** in g



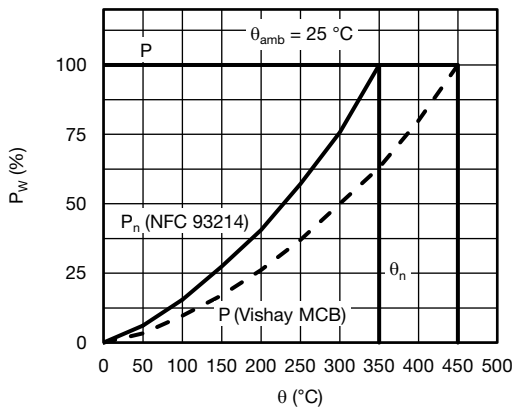
| TYPE | 30 x 250 | 30 x 153 | 25 x 168 | 25 x 138 | 25 x 110 | 25 x 84 | 20 x 265 | 20 x 165 | 20 x 140 | 20 x 117 | 20 x 102 |
|--------|----------|-------------|-----------|-----------|-----------|-----------|----------|----------|----------|----------|-------------|
| A | 250 ± 2 | 152.5 ± 1.5 | 168 ± 2 | 138 ± 2 | 110 ± 2 | 84 ± 2 | 265 ± 2 | 163 ± 2 | 140 ± 2 | 117 ± 2 | 101.5 ± 1.5 |
| b max. | 18.3 | 18.3 | 15.8 | 15.8 | 15.8 | 15.8 | 13.2 | 13.2 | 13.2 | 13.2 | 13.2 |
| D max. | 33 | 33 | 28 | 28 | 28 | 28 | 23 | 23 | 23 | 23 | 23 |
| d | 20 ± 0.4 | 20 ± 0.4 | 17 ± 0.35 | 17 ± 0.35 | 17 ± 0.35 | 17 ± 0.35 | 12 ± 0.5 | 12 ± 0.5 | 12 ± 0.5 | 12 ± 0.5 | 12 ± 0.5 |
| J max. | 31 | 31 | 28 | 28 | 28 | 28 | 24 | 24 | 24 | 24 | 24 |
| Mass | 300 | 200 | 180 | 130 | 100 | 70 | 220 | 135 | 115 | 80 | 70 |
| TYPE | 20 x 90 | 16 x 94 | 16 x 70 | 13 x 70 | 12 x 102 | 12 x 76 | 12 x 51 | 12 x 38 | 10 x 52 | 10 x 44 | 8 x 45 |
| A | 88 ± 1.5 | 94 ± 2 | 70 ± 1.5 | 70 ± 1.5 | 100 ± 2 | 76 ± 1.5 | 50 ± 1 | 38 ± 1.5 | 52 ± 1 | 44 ± 0.9 | 45 ± 1 |
| b max. | 13.2 | 11.2 | 11.2 | 9.7 | 9.2 | 9.2 | 9.2 | 9.2 | 9.2 | 8.2 | 7.2 |
| D max. | 23 | 19 | 19 | 16 | 15 | 15 | 15 | 15 | 13 | 13 | 11 |
| d | 12 ± 0.5 | 10 ± 0.3 | 10 ± 0.3 | 7 ± 0.21 | 7 ± 0.21 | 7 ± 0.21 | 7 ± 0.21 | 7 ± 0.21 | 6 ± 0.18 | 6 ± 0.18 | 5 ± 0.15 |
| J max. | 24 | 22 | 22 | 20 | 19 | 19 | 19 | 19 | 18 | 18 | 17 |
| Mass | 70 | 35 | 25 | 22 | 27 | 20 | 15 | 10 | 12 | 10 | 8 |

SPECIFIC NON-INDUCTIVE "A" VNC MODEL CHARACTERISTICS

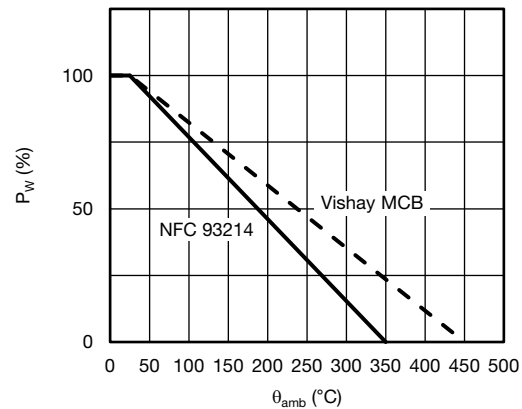
| TYPE | 30 x 250A | 30 x 153A | 25 x 168A | 25 x 138A | 25 x 110A | 25 x 84A | 20 x 265A | 20 x 165A | 20 x 140A | 20 x 117A | 20 x 102A |
|-------------------|-----------|-----------|-----------|-----------|-----------|----------|-----------|-----------|-----------|-----------|-----------|
| R _{min.} | 4.7 Ω | 3.3 Ω | 2.7 Ω | 2.7 Ω | 2.7 Ω | 2.2 Ω | 3.9 Ω | 2.7 Ω | 2.2 Ω | 1.8 Ω | 1.2 Ω |
| R _{max.} | 1.2 kΩ | 680 Ω | 820 Ω | 560 Ω | 470 Ω | 330 Ω | 1.2 kΩ | 820 Ω | 560 Ω | 470 Ω | 390 Ω |
| TYPE | 20 x 90A | 16 x 94A | 16 x 70A | 13 x 70A | 12 x 102A | 12 x 76A | 12 x 51A | 12 x 38A | 10 x 52A | 10 x 44A | 8 x 45A |
| R _{min.} | 1.0 Ω | 2.2 Ω | 2.2 Ω | 1.8 Ω | 1.5 Ω | 1.0 Ω | 1.0 Ω | 1.0 Ω | 1.0 Ω | 1.0 Ω | 1.0 Ω |
| R _{max.} | 330 Ω | 330 Ω | 270 Ω | 270 Ω | 470 Ω | 270 Ω | 150 Ω | 100 Ω | 150 Ω | 120 Ω | 120 Ω |

| PERFORMANCES | | | |
|-----------------------|--|--------------------------------|----------------|
| TESTS | CONDITIONS | NFC 93214 REQUIREMENTS | TYPICAL VALUES |
| Overloads | 10 P _n (temp. nom.), 5 s | 3 % or 0.05 Ω ⁽¹⁾ | 0.4 % |
| Climatic | -55 °C, 5 cycles, +200 °C | 3 % or 0.05 Ω ⁽¹⁾ | 0.2 % |
| Damp heat | 56 days 95 % HR | 2 % or 0.05 Ω ⁽¹⁾ | 0.1 % |
| Thermal shocks | P _n -55 °C | 2 % or 0.05 Ω ⁽¹⁾ | 0.2 % |
| Shocks | Severity 50 A | 0.5 % or 0.05 Ω ⁽¹⁾ | 0.25 % |
| Vibrations | Severity 55/10 | 0.5 % or 0.05 Ω ⁽¹⁾ | 0.25 % |
| Strength of terminals | 40 N collar | 1 % or 0.05 Ω ⁽¹⁾ | 0.1 % |
| Endurance | 500 cycles P _n 90 min / 30 min | 5 % | 1 % |

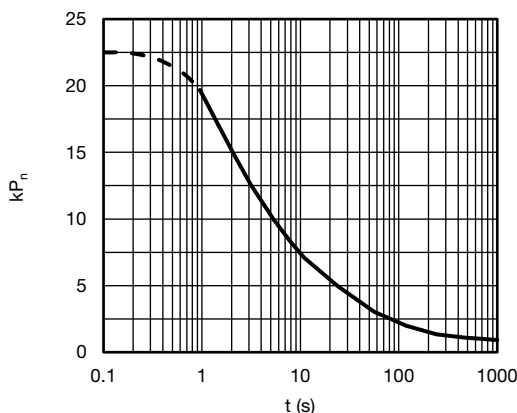
Note
⁽¹⁾ The higher of either value.

DISSIPATION


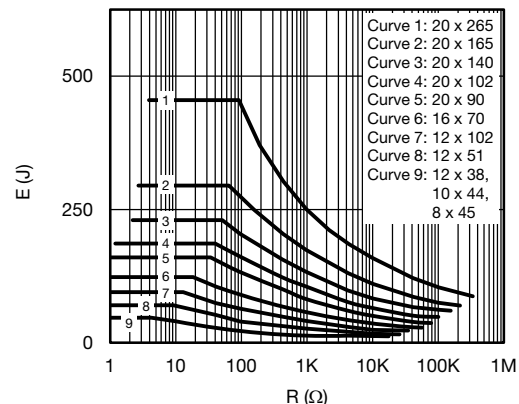
Power P_W as a Function of Surface Temperature
P(W) = f(Temperature Surface)



Derating in Power as a Function of Ambient Temperature

OVERLOADS


Intermittent Overloads
Exceptional Operation
Initial Temperature < 70 °C
 $k \times P_n = f(t)$

PERMISSIBLE ENERGY


Repetitive Operation
Energy as a Function of R_n
Pulse Duration < 100 ms
 $E = f(R)$



OPTIONS (Consult us)

- Other values than E12 series
- Intermediate terminals

| ORDERING INFORMATION | | | | | | |
|----------------------|----------|-----------------------|------------------|-------------------------------------|--|-----------|
| VNC | 30 x 250 | A | 10K | ± 5 % | XXX | BO4 |
| MODEL | STYLE | NON-INDUCTIVE WINDING | RESISTANCE VALUE | TOLERANCE | CUSTOM DESIGN | PACKAGING |
| | | Optional | | ± 5 % ± 10 % Other on request | Optional On request: special value, tolerance, terminals, etc. | |

| GLOBAL PART NUMBER INFORMATION | | | | | | | | | | | | | | | | | |
|--------------------------------|---|---------------------------|---|---------------------|---|-----------------------------------|---|---|---|---|---|---|---|---|---|---|---|
| V | N | C | 2 | 0 | 2 | 6 | 5 | A | 4 | 7 | R | 0 | J | B | 2 | 4 | 7 |
| 1 | | | 2 | | | | 3 | 4 | | | | 5 | 6 | 7 | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | | | | | | | | | | | |
| PRODUCT TYPE | SIZE | OPTION (if applicable) | RESISTANCE VALUE | TOLERANCE | PACKAGING | INDUSTRIALIZATION NUMBER | | | | | | | | | | | |
| VNC | 08045 10044 10052 12038 12051 12076 12102 13070 16070 16094 20090 20102 20117 20140 20165 20265 25084 25110 25138 25168 30153 30250 42362 | A = non-inductive winding | The first three digits are significant figures and the last specifies the number of zeros to follow, R designates decimal point. 4702 = 47 kΩ 47R0 = 47 Ω | J = 5 % K = 10 % | B = box Box quantity depends of model and size | 3 specific digits (if applicable) | | | | | | | | | | | |

| EXAMPLES | | |
|----------|-------------------------------|--------------------|
| MODEL | DESCRIPTION | PART NUMBER |
| VNC | VNC 30X250 A 500U 5 % 999 BO4 | VNC30250A5000JB999 |
| VNC | VNC 25X168 100U 5 % BO5 | VNC251681000JB |



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