

Vitreous Wirewound Power Resistors



FEATURES

- High dissipation
- Applicable standard: NFC 93214
- 3 models:
 - VNF traction lug
 - VNB rings
 - VNN collars
- 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 \pm % | $U_{LIM.}$ V |
|--------------|-------------------|------------------------------|----------------------|-----------------|
| VN 42 x 362 | 600 | 8.2 to 470K | 5 | 4500 |
| VN 30 x 250 | 320 | 4.7 to 390K | 5 | 3000 |
| VN 30 x 153 | 200 | 3.3 to 270K | 5 | 1700 |
| VN 25 x 168 | 180 | 2.7 to 270K | 5 | 1900 |
| VN 25 x 138 | 145 | 2.7 to 180K | 5 | 1400 |
| VN 25 x 110 | 120 | 2.7 to 120K | 5 | 1000 |
| VN 25 x 84 | 85 | 2.2 to 82K | 5 | 650 |
| VN 20 x 117 | 90 | 2.2 to 120K | 5 | 1100 |
| VN 16 x 94 | 55 | 2.2 to 68K | 5 | 900 |
| VN 13 x 70 | 35 | 2.2 to 56K | 5 | 650 |
| VN 10 x 52 | 22 | 1.0 to 33K | 5 | 450 |

NFC 93214 CHARACTERISTICS

| GLOBAL MODEL | P_n W | RESISTANCE RANGE Ω | |
|---------------------------|------------|------------------------------|------------------------|
| | | \varnothing 63 μ (1) | \varnothing 38 μ |
| VN 30 x 250 (RB 30 x 250) | 240 | 4.7 to 56K | 4.7 to 180K |
| VN 25 x 168 (RB 25 x 168) | 140 | 2.7 to 33K | 2.7 to 100K |
| VN 20 x 117 (RB 20 x 117) | 72 | 2.7 to 15K | 2.7 to 47K |
| VN 13 x 70 (RB 13 x 70) | 28 | 2.2 to 4.7K | 2.2 to 15K |

Note

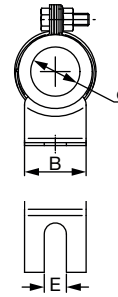
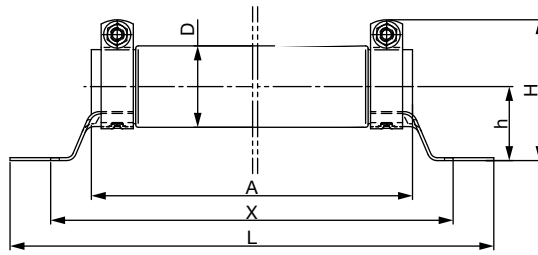
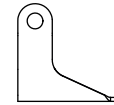
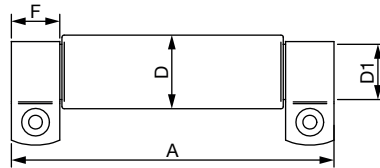
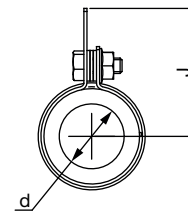
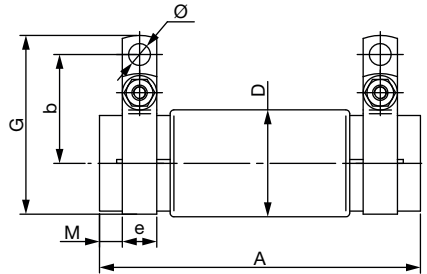
(1) Wire diameter set by standard

TECHNICAL SPECIFICATIONS

| PARAMETER | UNIT | RESISTOR CHARACTERISTICS |
|-----------------------------|-------------------|--------------------------------|
| Temperature coefficient | ppm/ $^{\circ}$ C | 75 ppm/ $^{\circ}$ C (typical) |
| Operating temperature range | $^{\circ}$ C | -55 to +450 |

GENERAL CHARACTERISTICS

| | |
|--------------|------------|
| Core | Ceramic |
| Winding | NiCr alloy |
| Coating | Vitreous |
| Ohmic values | E12 |

DIMENSIONS in millimeters AND WEIGHT in g
VNF

 Terminal for
 $\varnothing 10, \varnothing 13$

VNB

VNN


| TYPE | 42 x 362 | 30 x 250 | 30 x 153 | 25 x 168 | 25 x 138 | 25 x 110 | 25 x 84 | 20 x 117 | 16 x 94 | 13 x 70 | 10 x 52 |
|-----------|-------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|------------------|------------------|------------------|
| A | 362 ± 7 | 250 ± 2 | 152.5 ± 2 | 168 ± 2 | 138 ± 2 | 110 ± 2 | 84 ± 2 | 117 ± 2 | 94 ± 2 | 70 ± 2 | 52 ± 1 |
| B +0.5/-0 | 30 | 25 | 25 | 24 | 24 | 24 | 24 | - | - | 13 | 6 |
| b | 43 ± 1.5 | 33 ± 1 | 33 ± 1 | 28.5 ± 1 | 28.5 ± 1 | 28.5 ± 1 | 28.5 ± 1 | 26 ± 0.7 | 22 ± 0.5 | 20 ± 0.5 | 18 ± 0.5 |
| D max. | 46 | 33 | 33 | 28 | 28 | 28 | 28 | 23 | 19 | 16 | 13 |
| D1 | - | 31 ± 1 | 31 ± 1 | 26 ± 0.9 | 26 ± 0.9 | 26 ± 0.9 | 26 ± 0.9 | 21 ± 0.7 | 17 ± 0.6 | 13 ± 0.5 | 11 ± 0.6 |
| d | 26 ± 0.5 | 17 min. | 17 min. | 17 ± 0.35 | 17 ± 0.35 | 17 ± 0.35 | 17 ± 0.35 | 12 ± 0.5 | 10 ± 0.3 | 7 ± 0.21 | 6.2 +0/-2 |
| E | 9 ± 0.5 | 9 ± 0.5 | 9 ± 0.5 | 6.5 ± 0.2 | 6.5 ± 0.2 | 6.5 ± 0.2 | 6.5 ± 0.2 | - | - | 4.2 ± 0.2 | 3 ± 0.2 |
| e ± 1 | 18 | 13 | 13 | 9 | 9 | 9 | 9 | 9 | 8 | 7 | 7 |
| F | - | 18 +0.5/-0 | 18 +0.5/-0 | 15 +0.5/-0 | 15 +0.5/-0 | 15 +0.5/-0 | 15 +0.5/-0 | 14 +0.5/-0 | 12 +0.5/-0 | 10.5 +0.5/-0 | 8 ± 0.5 |
| g max. | 88 | 63 | 63 | 55 | 55 | 55 | 55 | 48.5 | 40 | 37 | 34 |
| H max. | 72 | 62 | 62 | 53 | 53 | 53 | 53 | - | - | 20.5 | 18 |
| h ± 2 | 45 | 30 | 30 | 27 | 27 | 27 | 27 | - | - | 7 | 6 |
| J | 52 ± 1.5 | 39 ± 1 | 39 ± 1 | 33.5 ± 1 | 33.5 ± 1 | 33.5 ± 1 | 33.5 ± 1 | 31 ± 0.7 | 26.5 ± 0.5 | 24 ± 0.5 | 22 ± 0.5 |
| L max. | 440 | 320 | 222.5 | 230 | 200 | 171 | 145 | - | - | 93 | 70 |
| M | 10 +3/-0 | 5 ± 1.5 | 5 ± 1.5 | 6 ± 1.5 | 6 ± 1.5 | 6 ± 1.5 | 6 ± 1.5 | 5 ± 1.5 | 4 ± 1.5 | 3.5 ± 1.5 | 2 ± 1.5 |
| Ø | 6.2 ± 0.5 | 5.7 ± 0.5 | 5.7 ± 0.5 | 5 ± 0.8 | 5 ± 0.8 | 5 ± 0.8 | 5 ± 0.8 | 5 ± 0.8 | 4.2 +0.3/-0.1 | 4.2 +0.3/-0.1 | 4.2 +0.3/-0.1 |
| X ± 2 | 398 | 285 | 187.5 | 198 | 168 | 141 | 115 | - | - | 81 | 62 |
| Mass | 1300 | 380 | 250 | 250 | 200 | 160 | 75 | 85 | 40 | 25 | 16 |

SPECIFIC NON-INDUCTIVE "A" VN MODEL CHARACTERISTICS

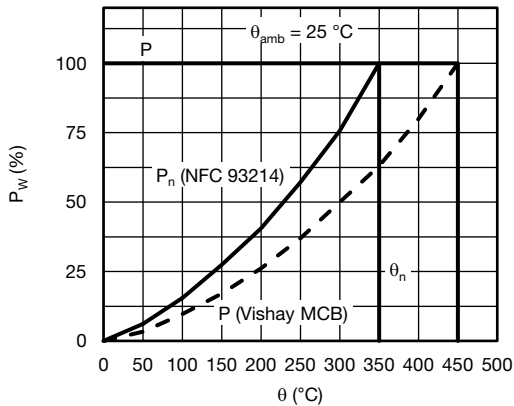
| TYPE | 42 x 362A | 30 x 250A | 30 x 153A | 28 x 168A | 25 x 138A | 25 x 110A | 25 x 84A | 20 x 117A | 16 x 94A | 13 x 70A | 10 x 52A |
|-------------------|-----------|-----------|-----------|-----------|-----------|-----------|----------|-----------|----------|----------|----------|
| R _{min.} | 8.2 Ω | 4.7 Ω | 3.3 Ω | 2.7 Ω | 2.7 Ω | 2.7 Ω | 2.2 Ω | 2.2 Ω | 2.2 Ω | 2.2 Ω | 1.0 Ω |
| R _{max.} | 1.5 kΩ | 820 Ω | 560 Ω | 680 Ω | 470 Ω | 330 Ω | 180 Ω | 390 Ω | 270 Ω | 220 Ω | 150 Ω |

| PERFORMANCES | | | |
|-----------------------|--|--------------------------------|---|
| TESTS | CONDITIONS | NFC 93214 REQUIREMENTS | TYPICAL VALUES |
| Overloads | 10 P _n (temp. nom.), 5 s | 2 % or 0.05 Ω ⁽¹⁾ | 0.5 % |
| Climatic | -55 °C, 5 cycles, +200 °C | 3 % or 0.05 Ω ⁽¹⁾ | Insulated mounting > 10 ² MΩ |
| Damp heat | 56 days 95 % HR | | |
| 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 60 Ncm rings | 1 % or 0.05 Ω ⁽¹⁾ | 0.1 % |
| Endurance | 500 cycles P _n 90 min / 30 min | 5 % | 1.5 % |

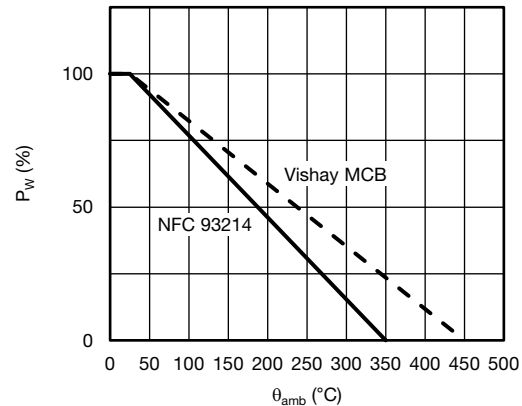
Note

(1) The higher of either value.

DISSIPATION

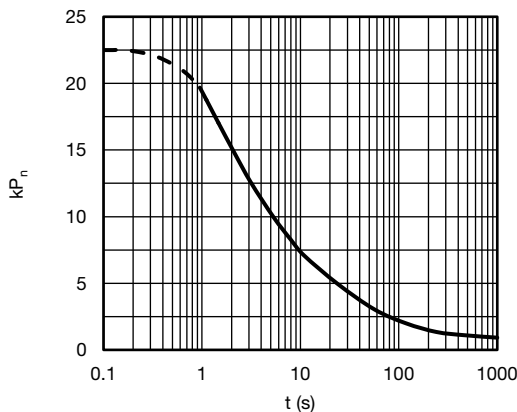


Power P_w as a Function of Surface Temperature
P(W) = f(Temperature Surface)



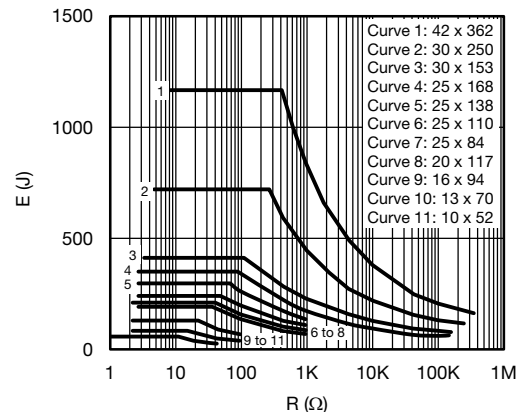
Derating in Power as a Function of Ambient Temperature

OVERLOADS



Intermittent Overloads
Exceptional Operation
Initial Temperature < 70 °C
k × 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 | | | | | | | |
|----------------------|-------------|-----------------|-----------------------------------|------------------|--|---|-------------|
| VN | F | 30 x 250 | A | 1K2 | ± 5 % | XXX | BO12 |
| MODEL | CONNECTIONS | STYLE | NON-INDUCTIVE WINDING Optional | RESISTANCE VALUE | TOLERANCE ± 5 % ± 10 % Other on request | CUSTOM DESIGN Optional On request: special value, tolerance, terminals, etc. | PACKAGING |

GLOBAL PART NUMBER INFORMATION

| V | N | F | 3 | 0 | 2 | 5 | 0 | A | 1 | 5 | R | 0 | J | B | 8 | 7 | 9 | |
|--------------|----------|---|----------------------------------|---|-----------------------------|---|--|---|---|---|---|---|---|---|---|---|---|--|
| 1 | 2 | | | | 3 | | | 4 | | 5 | | | 6 | | 7 | | 8 | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | | | | | | | | |
| PRODUCT TYPE | LEADS | SIZE | OPTION (if applicable) | RESISTANCE VALUE | TOLERANCE | PACKAGING | INDUSTRIALIZATION NUMBER | | | | | | | | | | | |
| VN | B | 10052 13070 16070 16094 20117 25084 25110 25138 25168 30153 30250 | 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) | | | | | | | | | | | |
| | F | 10052 13070 25084 25110 25138 25168 30153 30250 42362 | | | | | | | | | | | | | | | | |
| | N | 10052 13070 16070 16094 20117 25084 25110 25138 25168 30153 42362 | | | | | | | | | | | | | | | | |

EXAMPLES

| MODEL | DESCRIPTION | PART NUMBER |
|-------|------------------------------|--------------------|
| VNN | VNN 10X52 1K2 5 % BO100 | VNN100521201JB |
| VNF | VNF 30X250 A 15U 5 % 879 BO1 | VNF30250A15R0JB879 |



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