

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

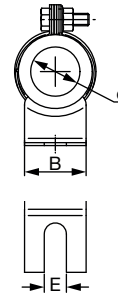
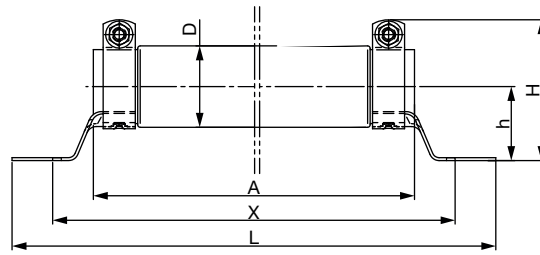
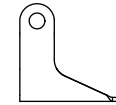
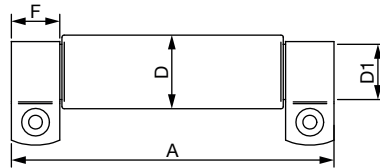
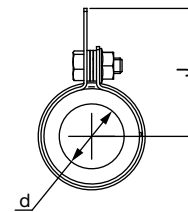
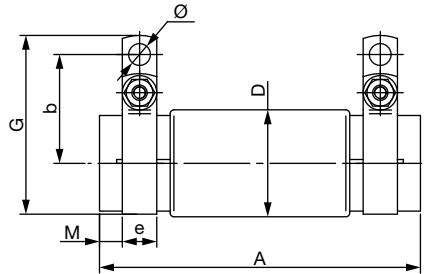
(1) Wire diameter set by standard

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

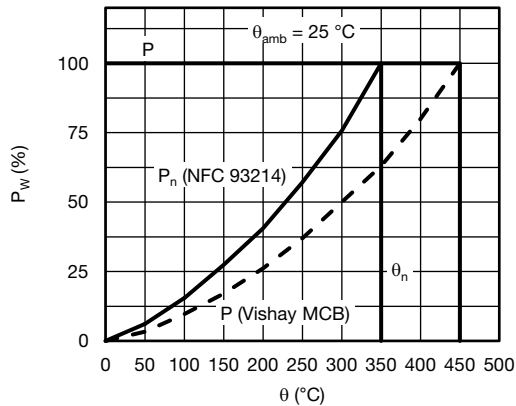
SPECIFIC NON-INDUCTIVE "A" VN MODEL CHARACTERISTICS

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

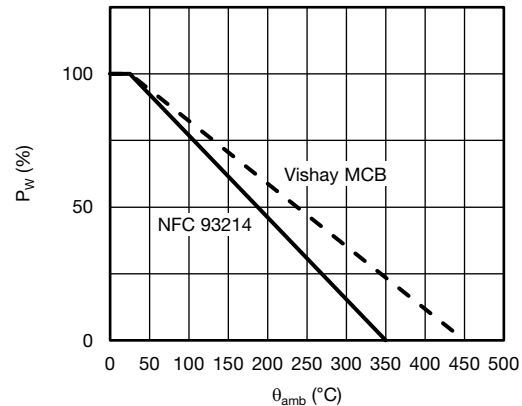
PERFORMANCES			
TESTS	CONDITIONS	NFC 93214 REQUIREMENTS	TYPICAL VALUES
Overloads	10 P _n (temp. nom.), 5 s	2 % or 0.05 Ω ⁽¹⁾	0.5 %
Climatic	-55 °C, 5 cycles, +200 °C	3 % or 0.05 Ω ⁽¹⁾	0.2 %
Damp heat	56 days 95 % HR	2 % or 0.05 Ω ⁽¹⁾	
Thermal shocks	P _n -55 °C	2 % or 0.05 Ω ⁽¹⁾	0.2 %
Shocks	Severity 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 60 Ncm rings	1 % or 0.05 Ω ⁽¹⁾	0.1 %
Endurance	500 cycles P _n 90 min / 30 min	5 %	1.5 %

Note

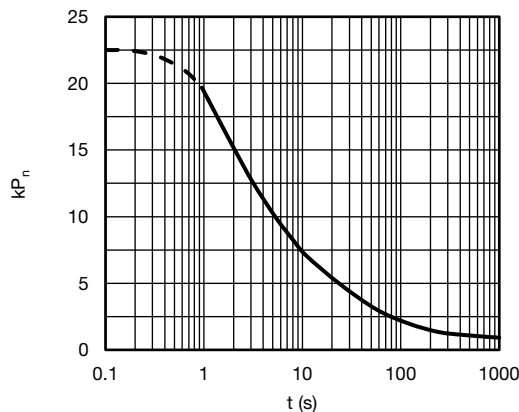
⁽¹⁾ The higher of either value.

DISSIPATION


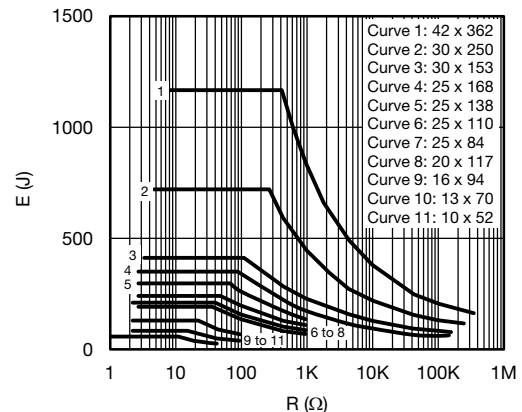
Power P_W as a Function of Surface Temperature
P(W) = f(Temperature Surface)



Derating in Power as a Function of Ambient Temperature

OVERLOADS


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

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							
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



Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.