

## 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](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT

### STANDARD ELECTRICAL SPECIFICATIONS

GLOBAL MODEL	POWER RATING W	RESISTANCE RANGE Ω	TOLERANCE ± %	U <sub>LIM.</sub> 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 <sub>n</sub> 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

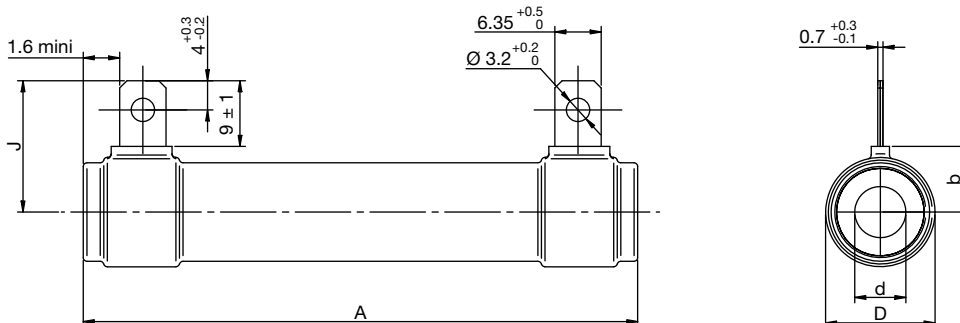
- Resistance maximum value: normal limits for wire with diameter of: 63 μ/38 μ minimum.

### 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**

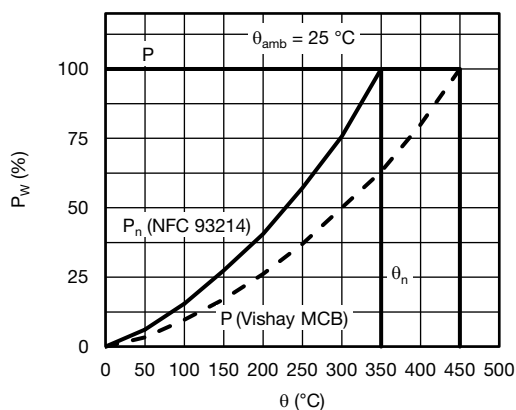
TYPE	30 x 250A	30 x 153A	25 x 168A	25 x 138A	25 x 110A	25 x 84A	20 x 265A	20 x 165A	20 x 140A	20 x 117A	20 x 102A
R <sub>min.</sub>	4.7 Ω	3.3 Ω	2.7 Ω	2.7 Ω	2.7 Ω	2.2 Ω	3.9 Ω	2.7 Ω	2.2 Ω	1.8 Ω	1.2 Ω
R <sub>max.</sub>	1.2 kΩ	680 Ω	820 Ω	560 Ω	470 Ω	330 Ω	1.2 kΩ	820 Ω	560 Ω	470 Ω	390 Ω

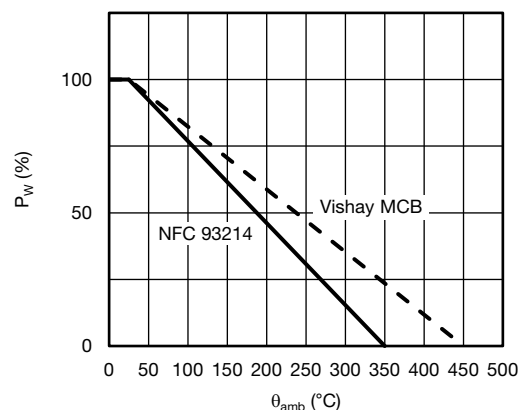
TYPE	20 x 90A	16 x 94A	16 x 70A	13 x 70A	12 x 102A	12 x 76A	12 x 51A	12 x 38A	10 x 52A	10 x 44A	8 x 45A
R <sub>min.</sub>	1.0 Ω	2.2 Ω	2.2 Ω	1.8 Ω	1.5 Ω	1.0 Ω	1.0 Ω	1.0 Ω	1.0 Ω	1.0 Ω	1.0 Ω
R <sub>max.</sub>	330 Ω	330 Ω	270 Ω	270 Ω	470 Ω	270 Ω	150 Ω	100 Ω	150 Ω	120 Ω	120 Ω

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

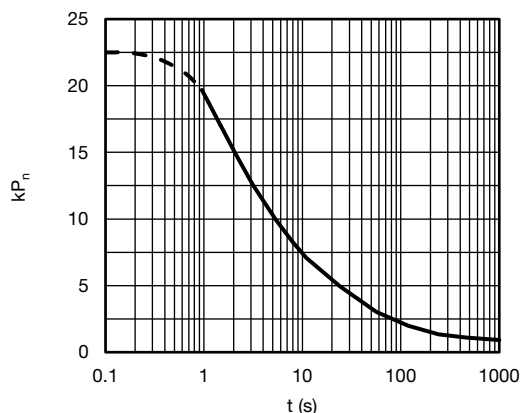
**Note**
<sup>(1)</sup> The higher of either value.

**DISSIPATION**


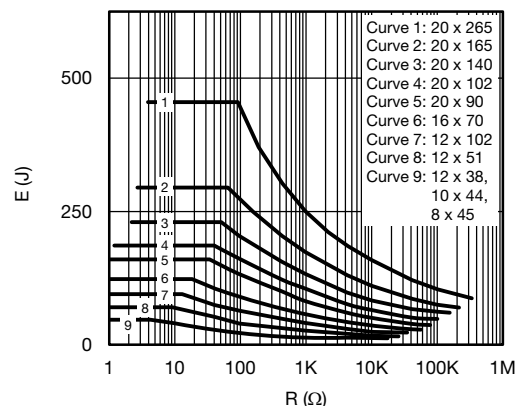
Power P<sub>W</sub> as a Function of Surface Temperature  
P(W) = f (Temperature Surface)



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<sub>n</sub>  
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 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	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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