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# 90 Series



## Lead Free Vitreous Enamel Molded Axial Term. Wirewound, 5% Tolerance Standard



When you need the highest quality wirewound axial terminal resistors available, choose Ohmite's 90 Series resistors.

They are manufactured by a unique process that molds the vitreous enamel over the resistive element, helping to ensure consistent dimensions. This uniformity permits 90 Series resistors to be mounted in clips, creating a heat-sinking benefit (see next page).

The durable vitreous enamel coating, which is totally lead free, permits the 90 Series resistors to maintain a hard coating while operating at high temperatures. Mechanical integrity is enhanced by the all-welded construction.

### FEATURES

- Molded Construction provides consistent shape and size (Permits mounting in clips which extends power rating).
- Meets MIL-R-26 requirements for insulated resistors.
- All-welded construction.
- Flame resistant lead free vitreous enamel coating.
- Higher ratings in smaller sizes.
- Heat sink mounting clips available.
- RoHS compliant; add "E" suffix to part number to specify.

### SERIES SPECIFICATIONS

Series	Wattage*	Ohms	Voltage
91	1.5	0.1Ω-3.6K	150
92	2.25	0.1Ω-3.5K	85
93	3.25	0.1Ω-10.5K	200
95	5.0	0.1Ω-25K	495
96	6.5	0.1Ω-50K	625
90	11.0	0.1Ω-91K	1080

\* 2x power ratings by using heat-sink mounting clips shown on following page.

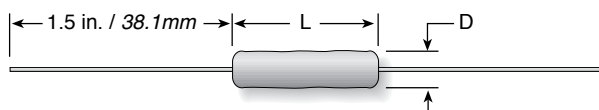
**Note:** Due to space restrictions, parts are stamped with wattage ratings reduced to the nearest whole number. The actual wattage ratings are as published in this catalog.

### CHARACTERISTICS

<b>Coating</b>	Molded lead free vitreous enamel
<b>Core</b>	Ceramic
<b>Terminals</b>	Solder-coated copper clad axial. RoHS solder composition is 96% Sn, 3.5% Ag, 0.5% Cu
<b>Derating</b>	Linearly from 100% @ +25°C to 0% @ +350°C
<b>Tolerance</b>	±5% (other tolerances available)
<b>Power rating</b>	Based on 25°C free air rating (other wattages available*)
<b>Maximum ohmic values</b>	See chart
<b>Overload</b>	Under 11 watts: 5 times rated wattage for 5 seconds. 11 watts: 10 times rated wattage for 5 seconds
<b>Temperature coefficient</b>	1 to 9.99Ω: ±100 ppm/°C; 10Ω and over: ±30 ppm/°C
<b>Dielectric withstanding voltage</b>	500 VAC: 1W rating; 1000 VAC: 2, 3, 5 and 11W

### DIMENSIONS

(in./mm max.)



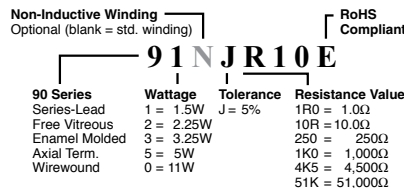
Series	Wattage	Length	Diameter	Lead gauge
91	1.5	0.452 / 11.5	0.140 / 3.6	24
92	2.25	0.405 / 10.3	0.219 / 5.6	20
93	3.25	0.577 / 14.7	0.234 / 5.9	20
95	5.0	0.968 / 24.6	0.265 / 6.7	20
96	6.5	0.952 / 24.2	0.343 / 8.7	20
90	11.0	1.811 / 46.0	0.343 / 8.7	20

(continued)

# 90 Series

## Lead Free Vitreous Enamel Molded Axial Term. Wirewound, 5% Tolerance Standard

### ORDERING INFORMATION



### Standard part numbers for 90 series

Wattage						Wattage						Wattage						Wattage						Wattage																	
Ohmic value	Part No. Prefix Suffix	91J	1.5	92J	2.25	93J	3.25	95J	5	90J	11	Ohmic value	Part No. Prefix Suffix	91J	1.5	92J	2.25	93J	3.25	95J	5	90J	11	Ohmic value	Part No. Prefix Suffix	93J	3.25	95J	5	90J	11	Ohmic value	Part No. Prefix Suffix	95J	5	90J	11				
1	1R0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	22	22R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	350	350	✓	✓	✓	✓	✓	✓	3,500	3K5	✓	✓	✓	✓	13,000	13K	✓	✓
1.1	1R1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	24	24R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	360	360	✓	✓	✓	✓	✓	✓	3,600	3K6	✓	✓	✓	✓	14,000	14K	✓	✓
1.2	1R2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	25	25R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	390	390	✓	✓	✓	✓	✓	✓	3,900	3K9	✓	✓	✓	✓	15,000	15K	✓	✓
1.3	1R3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	27	27R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	400	400	✓	✓	✓	✓	✓	✓	4,000	4K0	✓	✓	✓	✓	16,000	16K	✓	✓
1.5	1R5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	30	30R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	430	430	✓	✓	✓	✓	✓	✓	4,300	4K3	✓	✓	✓	✓	17,000	17K	✓	✓
1.6	1R6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	33	33R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	450	450	✓	✓	✓	✓	✓	✓	4,500	4K5	✓	✓	✓	✓	18,000	18K	✓	✓
1.8	1R8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	35	35R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	470	470	✓	✓	✓	✓	✓	✓	4,700	4K7	✓	✓	✓	✓	20,000	20K	✓	✓
2	2R0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	36	36R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	500	500	✓	✓	✓	✓	✓	✓	5,000	5K0	✓	✓	✓	✓	22,000	22K	✓	✓
2.2	2R2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	39	39R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	510	510	✓	✓	✓	✓	✓	✓	5,100	5K1	✓	✓	✓	✓	24,000	24K	✓	✓
2.4	2R4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	40	40R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	560	560	✓	✓	✓	✓	✓	✓	5,600	5K6	✓	✓	✓	✓	25,000	25K	✓	✓
2.7	2R7	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	43	43R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	600	600	✓	✓	✓	✓	✓	✓	6,000	6K0	✓	✓	✓	✓	27,000	27K	✓	✓
3	3R0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	47	47R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	620	620	✓	✓	✓	✓	✓	✓	6,200	6K2	✓	✓	✓	✓	30,000	30K	✓	✓
3.3	3R3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	50	50R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	680	680	✓	✓	✓	✓	✓	✓	6,800	6K8	✓	✓	✓	✓	33,000	33K	✓	✓
3.6	3R6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	51	51R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	700	700	✓	✓	✓	✓	✓	✓	7,000	7K0	✓	✓	✓	✓	35,000	35K	✓	✓
3.9	3R9	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	56	56R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	750	750	✓	✓	✓	✓	✓	✓	7,500	7K5	✓	✓	✓	✓	36,000	36K	✓	✓
4	4R0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	62	62R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	800	800	✓	✓	✓	✓	✓	✓	8,000	8K0	✓	✓	✓	✓	39,000	39K	✓	✓
4.3	4R3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	68	68R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	820	820	✓	✓	✓	✓	✓	✓	8,200	8K2	✓	✓	✓	✓	40,000	40K	✓	✓
4.7	4R7	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	75	75R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	900	900	✓	✓	✓	✓	✓	✓	9,000	9K0	✓	✓	✓	✓	43,000	43K	✓	✓
5	5R0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	82	82R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	910	910	✓	✓	✓	✓	✓	✓	9,100	9K1	✓	✓	✓	✓	45,000	45K	✓	✓
5.1	5R1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	91	91R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1,000	1K0	✓	✓	✓	✓	✓	✓	10,000	10K	✓	✓	✓	✓	47,000	47K	✓	✓
5.6	5R6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	100	100	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1,100	1K1	✓	✓	✓	✓	✓	✓	11,000	11K	✓	✓	✓	✓	50,000	50K	✓	✓
6.2	6R2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	110	110	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1,200	1K2	✓	✓	✓	✓	✓	✓	12,000	12K	✓	✓	✓	✓	51,000	51K	✓	✓
6.8	6R8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	120	120	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1,300	1K3	✓	✓	✓	✓	✓	✓	1,300	1K3	✓	✓	✓	✓				
7.5	7R5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	130	130	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1,400	1K4	✓	✓	✓	✓	✓	✓	1,400	1K4	✓	✓	✓	✓				
8.2	8R2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	150	150	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1,500	1K5	✓	✓	✓	✓	✓	✓	1,500	1K5	✓	✓	✓	✓				
9.1	9R1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	160	160	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1,600	1K6	✓	✓	✓	✓	✓	✓	1,600	1K6	✓	✓	✓	✓				
10	10R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	180	180	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1,800	1K8	✓	✓	✓	✓	✓	✓	1,800	1K8	✓	✓	✓	✓				
11	11R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	200	200	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	2,000	2K0	✓	✓	✓	✓	✓	✓	2,000	2K0	✓	✓	✓	✓				
12	12R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	220	220	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	2,200	2K2	✓	✓	✓	✓	✓	✓	2,200	2K2	✓	✓	✓	✓				
13	13R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	240	240	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	2,400	2K4	✓	✓	✓	✓	✓	✓	2,400	2K4	✓	✓	✓	✓				
15	15R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	250	250	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	2,500	2K5	✓	✓	✓	✓	✓	✓	2,500	2K5	✓	✓	✓	✓				
16	16R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	270	270	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	2,700	2K7	✓	✓	✓	✓	✓	✓	2,700	2K7	✓	✓	✓	✓				
18	18R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	300	300	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	3,000	3K0	✓	✓	✓	✓	✓	✓	3,000	3K0	✓	✓	✓	✓				
20	20R	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	330	330	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	3,300	3K3	✓	✓	✓	✓	✓	✓	3,300	3K3	✓	✓	✓	✓				

✓ = Standard values  
 ✦ = Non-standard values subject to minimum handling charge per item

Shaded values involve very fine resistance wire and should not be used in critical applications without burn-in and/or thermal cycling.

### MOUNTING CLIP



### FEATURES

- Prevents severe vibration or mechanical shock to resistor
- Increases resistor wattage up to 100% when mounted on metal surface (1.5 sq. in. by 0.040 in. thick min. per watt dissipated)
- Holes in clip base permit fastening to chassis surface with machine screws, eyelets or rivets
- Sold in bags of ten (10)

### Standard part numbers for mounting clip

Part No.	Resistor rating (watts)	Clip length (in./mm)	Clip width (in./mm)	Clip height (in./mm)	No. of holes	Hole centers (in./mm)	Hole diameter (in./mm)
✓ 5900	1.5	0.40 / 10.319	0.150 / 3.810	0.250 / 6.350	1		0.71 / 1.803
✓ 5902	2.25	0.35 / 8.890	0.217 / 5.500	0.275 / 6.980	2	0.156 / 3.969	0.71 / 1.803
✦ 5904	3.25	0.50 / 12.700	0.257 / 6.500	0.319 / 8.103	2	0.250 / 6.350	0.093 / 2.362
✦ 5906	5.0	0.90 / 22.860	0.237 / 6.019	0.284 / 7.214	2	0.400 / 10.160	0.103 / 2.616
✦ 5908	11.0	1.75 / 44.450	0.333 / 8.458	0.377 / 9.576	2	0.800 / 20.320	0.103 / 2.616

✦ = Most popular standard values  
 ✓ = Standard values  
 ✦ = Non-standard values subject to minimum handling charge per item