

# 90 Series

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



95J1K6E  
160001

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.

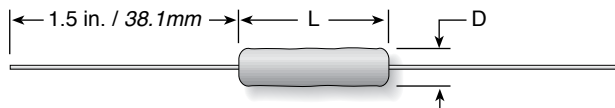
**Note:** Due to space restrictions, parts are stamped with wattage ratings reduced to the nearest whole number. The actual wattage ratings are as published in this catalog.

### 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.)



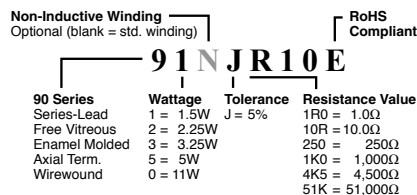
| Series | Wattage | Length       | Diameter    | Lead gauge |
|--------|---------|--------------|-------------|------------|
| 91     | 1.5     | 0.452 / 11.5 | 0.140 / 3.6 | 24         |
| 92     | 2.25    | 0.405 / 10.3 | 0.219 / 5.6 | 20         |
| 93     | 3.25    | 0.577 / 14.7 | 0.234 / 5.9 | 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.<br>Prefix<br>Suffix | 1.5 | 2.25 | 3.25 | 5 | 11 | Ohmic value | Part No.<br>Prefix<br>Suffix | 1.5 | 2.25 | 3.25 | 5 | 11 | Ohmic value | Part No.<br>Prefix<br>Suffix | 1.5 | 2.25 | 3.25 | 5 | 11 | Ohmic value | Part No.<br>Prefix<br>Suffix | 3.25 | 5 | 11 | Ohmic value | Part No.<br>Prefix<br>Suffix | 5       | 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                          | ✓   | ✓    | ✓    | ✓ | ✓  |             |                              |      |   |    |             |                              |         |    |  |  |  |  |  |
| 7.5         | 7R5                          | ✓   | ✓    | ✓    | ✓ | ✓  | 130         | 130                          | ✱   | ✓    | ✓    | ✓ | ✓  | 1,400       | 1K4                          | ✓   | ✓    | ✓    | ✓ | ✓  |             |                              |      |   |    |             |                              |         |    |  |  |  |  |  |
| 8.2         | 8R2                          | ✱   | ✓    | ✓    | ✓ | ✓  | 150         | 150                          | ✓   | ✓    | ✓    | ✓ | ✓  | 1,500       | 1K5                          | ✓   | ✓    | ✓    | ✓ | ✓  |             |                              |      |   |    |             |                              |         |    |  |  |  |  |  |
| 9.1         | 9R1                          | ✱   | ✓    | ✓    | ✓ | ✓  | 160         | 160                          | ✓   | ✓    | ✓    | ✓ | ✓  | 1,600       | 1K6                          | ✱   | ✓    | ✓    | ✓ | ✓  |             |                              |      |   |    |             |                              |         |    |  |  |  |  |  |
| 10          | 10R                          | ✓   | ✓    | ✓    | ✓ | ✓  | 180         | 180                          | ✓   | ✓    | ✓    | ✓ | ✓  | 1,800       | 1K8                          | ✓   | ✓    | ✓    | ✓ | ✓  |             |                              |      |   |    |             |                              |         |    |  |  |  |  |  |
| 11          | 11R                          | ✓   | ✓    | ✓    | ✓ | ✓  | 200         | 200                          | ✓   | ✓    | ✓    | ✓ | ✓  | 2,000       | 2K0                          | ✓   | ✓    | ✓    | ✓ | ✓  |             |                              |      |   |    |             |                              |         |    |  |  |  |  |  |
| 12          | 12R                          | ✓   | ✓    | ✓    | ✓ | ✓  | 220         | 220                          | ✓   | ✓    | ✓    | ✓ | ✓  | 2,200       | 2K2                          | ✓   | ✓    | ✓    | ✓ | ✓  |             |                              |      |   |    |             |                              |         |    |  |  |  |  |  |
| 13          | 13R                          | ✱   | ✓    | ✓    | ✓ | ✓  | 240         | 240                          | ✱   | ✓    | ✓    | ✓ | ✓  | 2,400       | 2K4                          | ✓   | ✓    | ✓    | ✓ | ✓  |             |                              |      |   |    |             |                              |         |    |  |  |  |  |  |
| 15          | 15R                          | ✓   | ✓    | ✓    | ✓ | ✓  | 250         | 250                          | ✓   | ✓    | ✓    | ✓ | ✓  | 2,500       | 2K5                          | ✓   | ✓    | ✓    | ✓ | ✓  |             |                              |      |   |    |             |                              |         |    |  |  |  |  |  |
| 16          | 16R                          | ✓   | ✓    | ✓    | ✓ | ✓  | 270         | 270                          | ✓   | ✓    | ✓    | ✓ | ✓  | 2,700       | 2K7                          | ✱   | ✓    | ✓    | ✓ | ✓  |             |                              |      |   |    |             |                              |         |    |  |  |  |  |  |
| 18          | 18R                          | ✓   | ✓    | ✓    | ✓ | ✓  | 300         | 300                          | ✓   | ✓    | ✓    | ✓ | ✓  | 3,000       | 3K0                          | ✓   | ✓    | ✓    | ✓ | ✓  |             |                              |      |   |    |             |                              |         |    |  |  |  |  |  |
| 20          | 20R                          | ✓   | ✓    | ✓    | ✓ | ✓  | 330         | 330                          | ✓   | ✓    | ✓    | ✓ | ✓  | 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.

✓ = 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           | ✦ = Most popular standard values                                    |
| ✓ 5902   | 2.25                    | 0.35 / 8.890         | 0.217 / 5.500       | 0.275 / 6.980        | 2            | 0.156 / 3.969         | 0.71 / 1.803           | ✓ = Standard values                                                 |
| ✦ 5904   | 3.25                    | 0.50 / 12.700        | 0.257 / 6.500       | 0.319 / 8.103        | 2            | 0.250 / 6.350         | 0.093 / 2.362          | ✦ = Non-standard values subject to minimum handling charge per item |
| ✦ 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          |                                                                     |