

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

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

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ORDERING INFORMATION



Standard part numbers for 90 series

| Wattage | | | | | | Wattage | | | | | | Wattage | | | | | | Wattage | | | | | | Wattage | | | | | |
|-------------|------------------------|-----|------|------|---|---------|-------------|------------------------|-----|------|------|---------|----|-------------|------------------------|-----|------|---------|---|----|-------------|------------------------|------|---------|----|-------------|------------------------|---|----|
| Ohmic value | Part No. Prefix Suffix | 1.5 | 2.25 | 3.25 | 5 | 11 | Ohmic value | Part No. Prefix Suffix | 1.5 | 2.25 | 3.25 | 5 | 11 | Ohmic value | Part No. Prefix Suffix | 1.5 | 2.25 | 3.25 | 5 | 11 | Ohmic value | Part No. Prefix Suffix | 3.25 | 5 | 11 | Ohmic value | Part No. Prefix 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.

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