

20 Series



Vitreous Enamel Conformal Axial Terminal Wirewound, 5% Tolerance Std.



The 20 Series axial terminal resistors are both durable and economical. They have all the electrical attributes of the more expensive 90 Series resistors, including all-welded construction.

They offer the durability of a lead free conformal vitreous enamel coating and are ideal for computer, communications and industrial applications in which cost, quality, and reliability are key considerations.

FEATURES

- Rugged vitreous enamel coating withstands high humidity and temperature cycling.
- Durable construction, recommended for industrial applications where reliability is paramount.
- All-welded construction.
- Flame resistant lead free vitreous enamel coating.
- RoHS compliant; Add "E" suffix to part number to specify.

SERIES SPECIFICATIONS

| Series | Wattage | Ohms | Max. Voltage* |
|--------|---------|----------|---------------|
| 21 | 1 | 1.0-3.0K | 75 |
| 22 | 2 | 1.0-3.0K | 65 |
| 23 | 3 | 0.1-10K | 135 |
| 25 | 5 | 0.1-28K | 330 |
| 27 | 7 | 0.1-25K | 450 |
| 20 | 10 | 0.1-100K | 720 |

12.5 watt size available on special order

*Maximum Voltage is based on Ohm's Law [$V=\sqrt{P \cdot R}$] as limited by the resistance value of specified product

CHARACTERISTICS

| | |
|--------------------------------|--|
| Coating | Conformal lead free vitreous enamel |
| Core | Ceramic. |
| Terminals | Solder-coated 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% standard; other tolerances available |
| Power rating | Based on 25°C free air rating (other wattages available) |
| Overload | Under 7 watts: 5 times rated wattage for 5 seconds; 7 watts and over: 10 times rated wattage for 5 seconds |
| Temperature coefficient | 1 to 9.99 ohms: ±50 ppm/°C; 10 ohms and over: ±30 ppm/°C |

DIMENSIONS

(in./mm max.)



| Series | Wattage | Length* (max.) | Diam.* (max.) | Lead ga. |
|--------|---------|----------------|---------------|----------|
| 21 | 1 | 0.421 / 10.7 | 0.156 / 4.0 | 24 |
| 22 | 2 | 0.421 / 10.7 | 0.219 / 5.6 | 20 |
| 23 | 3 | 0.515 / 13.1 | 0.220 / 5.6 | 20 |
| 25 | 5 | 1.015 / 25.8 | 0.276 / 7.0 | 20 |
| 27 | 7 | 1.265 / 32.1 | 0.394 / 10.0 | 20 |
| 20 | 10 | 1.859 / 47.2 | 0.394 / 10.0 | 20 |

*For units below 1Ω, add 15% to body diameter, 10% to body length.

(continued)

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ORDERING INFORMATION

Standard part numbers

| Ohmic value | Part No. Prefix Suffix | Wattage | | | | | | Ohmic value | Part No. Prefix Suffix | Wattage | | | | | | Ohmic value | Part No. Prefix Suffix | Wattage | | | | | |
|-------------|------------------------------|---------|---|---|---|---|----|-------------|------------------------------|---------|---|---|---|---|----|-------------|------------------------------|---------|---|---|---|---|----|
| | | 1 | 2 | 3 | 5 | 7 | 10 | | | 1 | 2 | 3 | 5 | 7 | 10 | | | 1 | 2 | 3 | 5 | 7 | 10 |
| 0.10 | R10 | | | ✓ | ✓ | | ✓ | 62 | 62R | ✱ | ✱ | ✓ | ✓ | ✱ | ✓ | 1,800 | 1K8 | ✓ | ✓ | ✓ | ✱ | ✱ | ✱ |
| 0.13 | R13 | | | ✓ | ✓ | | ✓ | 68 | 68R | ✓ | ✓ | ✓ | ✓ | ✱ | ✓ | 2,000 | 2K0 | ✱ | ✓ | ✓ | ✓ | ✱ | ✓ |
| 0.15 | R15 | | | ✓ | ✓ | | ✓ | 75 | 75R | ✓ | ✓ | ✓ | ✓ | ✱ | ✓ | 2,200 | 2K2 | ✓ | ✓ | ✓ | ✓ | ✱ | ✓ |
| 0.20 | R20 | | | ✓ | ✓ | | ✓ | 82 | 82R | ✓ | ✓ | ✓ | ✓ | ✱ | ✓ | 2,500 | 2K5 | ✓ | ✓ | ✓ | ✓ | ✱ | ✓ |
| 0.25 | R25 | | | ✓ | ✓ | | ✓ | 100 | 100 | ✓ | ✱ | ✓ | ✓ | ✓ | ✓ | 2,700 | 2K7 | ✓ | ✓ | ✓ | ✱ | ✓ | ✓ |
| 0.30 | R30 | | | ✓ | ✓ | | ✓ | 120 | 120 | ✓ | ✓ | ✓ | ✓ | ✱ | ✓ | 3,000 | 3K0 | ✓ | ✓ | ✓ | ✓ | ✱ | ✓ |
| 0.33 | R33 | | | ✓ | ✓ | | ✓ | 125 | 125 | ✱ | ✱ | ✓ | ✓ | ✓ | ✓ | 3,300 | 3K3 | | | ✓ | ✓ | ✱ | ✓ |
| 0.50 | R50 | | | ✓ | ✓ | | ✓ | 150 | 150 | ✓ | ✓ | ✓ | ✓ | ✱ | ✓ | 3,500 | 3K5 | | | ✓ | ✓ | ✱ | ✓ |
| 0.75 | R75 | | | ✓ | ✓ | | ✓ | 180 | 180 | ✓ | ✓ | ✓ | ✓ | ✱ | ✓ | 3,900 | 3K9 | | | ✓ | ✓ | ✱ | ✓ |
| 1 | 1R0 | ✓ | ✓ | ✓ | ✓ | | ✓ | 200 | 200 | ✓ | ✱ | ✓ | ✓ | ✓ | ✓ | 4,000 | 4K0 | | | ✓ | ✓ | ✱ | ✓ |
| 1.5 | 1R5 | ✓ | ✓ | ✓ | ✓ | | ✓ | 220 | 220 | ✓ | ✓ | ✓ | ✓ | ✱ | ✓ | 4,500 | 4K5 | | | ✓ | ✓ | ✱ | ✓ |
| 2 | 2R0 | ✓ | ✓ | ✓ | ✓ | | ✓ | 225 | 225 | ✱ | ✱ | ✱ | ✱ | ✱ | ✓ | 4,700 | 4K7 | | | ✓ | ✓ | ✱ | ✓ |
| 2.2 | 2R2 | ✓ | ✓ | ✓ | ✓ | | ✓ | 250 | 250 | ✓ | ✓ | ✓ | ✓ | ✱ | ✓ | 5,000 | 5K0 | | | ✓ | ✓ | ✱ | ✓ |
| 3 | 3R0 | ✓ | ✓ | ✓ | ✓ | | ✓ | 270 | 270 | ✓ | ✓ | ✓ | ✓ | ✱ | ✓ | 6,000 | 6K0 | | | ✓ | ✓ | ✱ | ✓ |
| 4 | 4R0 | ✓ | ✱ | ✓ | ✓ | | ✓ | 300 | 300 | ✓ | ✓ | ✓ | ✓ | ✱ | ✓ | 6,800 | 6K8 | | | ✓ | ✓ | ✱ | ✓ |
| 5 | 5R0 | ✓ | ✓ | ✓ | ✓ | | ✓ | 330 | 330 | ✓ | ✓ | ✓ | ✓ | ✱ | ✓ | 7,000 | 7K0 | | | ✓ | ✓ | ✱ | ✓ |
| 7.5 | 7R5 | ✓ | ✓ | ✓ | ✓ | | ✓ | 350 | 350 | ✱ | ✓ | ✱ | ✓ | ✱ | ✓ | 7,500 | 7K5 | | | ✓ | ✓ | ✱ | ✓ |
| 10 | 10R | ✓ | ✓ | ✓ | ✓ | | ✓ | 390 | 390 | ✓ | ✱ | ✱ | ✱ | ✱ | ✓ | 8,000 | 8K0 | | | ✓ | ✓ | ✱ | ✓ |
| 12 | 12R | ✱ | ✱ | ✓ | ✓ | | ✓ | 400 | 400 | ✱ | ✱ | ✓ | ✓ | ✱ | ✓ | 9,000 | 9K0 | | | ✓ | ✓ | ✱ | ✓ |
| 15 | 15R | ✓ | ✱ | ✓ | ✱ | | ✓ | 450 | 450 | ✱ | ✱ | ✱ | ✓ | ✱ | ✓ | 10,000 | 10K | | | ✓ | ✓ | ✱ | ✓ |
| 18 | 18R | ✓ | ✱ | ✓ | ✓ | | ✓ | 470 | 470 | ✓ | ✓ | ✓ | ✓ | ✱ | ✓ | 12,000 | 12K | | | ✓ | ✓ | ✱ | ✓ |
| 20 | 20R | ✓ | ✓ | ✓ | ✓ | | ✓ | 500 | 500 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 13,000 | 13K | | | ✓ | ✓ | ✱ | ✓ |
| 22 | 22R | ✓ | ✓ | ✓ | ✓ | | ✓ | 560 | 560 | ✓ | ✓ | ✓ | ✓ | ✱ | ✓ | 15,000 | 15K | | | ✓ | ✓ | ✱ | ✓ |
| 25 | 25R | ✱ | ✓ | ✓ | ✓ | | ✓ | 600 | 600 | ✓ | ✓ | ✓ | ✓ | ✱ | ✓ | 17,000 | 17K | | | ✓ | ✓ | ✱ | ✓ |
| 27 | 27R | ✓ | ✓ | ✓ | ✓ | | ✓ | 680 | 680 | ✓ | ✱ | ✓ | ✓ | ✱ | ✓ | 20,000 | 20K | | | ✓ | ✓ | ✱ | ✓ |
| 30 | 30R | ✓ | ✓ | ✓ | ✓ | | ✓ | 750 | 750 | ✓ | ✓ | ✓ | ✓ | ✱ | ✓ | 22,000 | 22K | | | ✓ | ✓ | ✱ | ✓ |
| 33 | 33R | ✓ | ✓ | ✓ | ✓ | | ✓ | 800 | 800 | ✓ | ✱ | ✓ | ✓ | ✱ | ✓ | 25,000 | 25K | | | ✓ | ✓ | ✱ | ✓ |
| 35 | 35R | ✱ | ✱ | ✱ | ✱ | | ✓ | 820 | 820 | ✓ | ✓ | ✓ | ✓ | ✱ | ✓ | 30,000 | 30K | | | ✓ | ✓ | ✱ | ✓ |
| 39 | 39R | ✓ | ✓ | ✓ | ✓ | | ✓ | 900 | 900 | ✱ | ✓ | ✓ | ✓ | ✱ | ✓ | 33,000 | 33K | | | ✓ | ✓ | ✱ | ✓ |
| 40 | 40R | ✓ | ✱ | ✓ | ✓ | | ✓ | 1,000 | 1K0 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | 35,000 | 35K | | | ✓ | ✓ | ✱ | ✓ |
| 47 | 47R | ✓ | ✓ | ✓ | ✓ | | ✓ | 1,100 | 1K1 | ✱ | ✱ | ✓ | ✓ | ✱ | ✓ | 40,000 | 40K | | | ✓ | ✓ | ✱ | ✓ |
| 50 | 50R | ✓ | ✓ | ✓ | ✓ | | ✓ | 1,200 | 1K2 | ✓ | ✓ | ✓ | ✓ | ✱ | ✓ | 50,000 | 50K | | | ✓ | ✓ | ✱ | ✓ |
| 56 | 56R | ✱ | ✓ | ✓ | ✓ | | ✓ | 1,500 | 1K5 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | ✓ | ✓ | ✱ | ✓ |

✓ = 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.

