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# 10 Series

## Axial Wire Element Current Sense Two Terminal Axial



### FEATURES

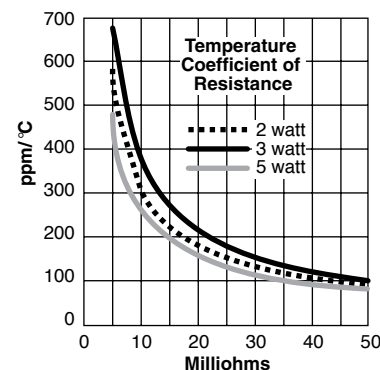
- Ideal for current sensing applications
- 1% Tolerance standard, others available
- Fixed resistance measuring point "M"
- Low inductance (non-inductive below 0.25Ω)
- RoHS compliant product available; add "E" suffix to part number to specify

### SERIES SPECIFICATIONS

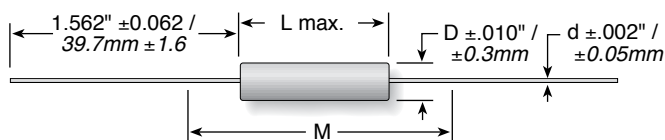
| Series | Wattage | Ohms       |
|--------|---------|------------|
| 12     | 2       | 0.005-0.10 |
| 13     | 3       | 0.005-0.20 |
| 15     | 5       | 0.005-0.25 |

### CHARACTERISTICS

|                                        |                                                                                                                       |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| <b>Terminals</b>                       | Solder-plated copper terminals or copper clad steel depending on ohmic value. RoHS solder is 96% Sn, 3.5% Ag, 0.5% Cu |
| <b>Encapsulation</b>                   | Silicone molding compound                                                                                             |
| <b>Derating</b>                        | Linearly from 100% @ +25°C to 0% @ +275°C                                                                             |
| <b>Tolerance</b>                       | ±1% standard; Others available                                                                                        |
| <b>Power rating</b>                    | Based on 25°C free air rating                                                                                         |
| <b>Overload</b>                        | 5 times rated wattage for 5 seconds                                                                                   |
| <b>Dielectric withstanding voltage</b> | 1000 VRMS for 3 and 5 watt; 500 VRMS for 2 watt                                                                       |
| <b>Insulation resistance</b>           | Not less than 1000MΩ                                                                                                  |
| <b>Thermal EMF</b>                     | Less than ±2μV/°C                                                                                                     |
| <b>Temperature range</b>               | -55°C to 275°C                                                                                                        |



### DIMENSIONS



| Series | Wattage | Length "L"   | Diam. "D"   | "M"          | "d" (lead ga.) |
|--------|---------|--------------|-------------|--------------|----------------|
| 12     | 2       | 0.416 / 10.6 | 0.094 / 2.4 | 1.156 / 29.4 | 20             |
| 13     | 3       | 0.570 / 14.5 | 0.205 / 5.2 | 1.310 / 33.3 | 20             |
| 15     | 5       | 0.935 / 23.8 | 0.330 / 8.4 | 1.675 / 42.5 | 18             |

### ORDERING INFORMATION

#### Standard part numbers

| Ohmic value | 2 watt   | 3 watt   | 5 watt   |
|-------------|----------|----------|----------|
| 0.005       | 12FR005E | 13FR005E | 15FR005E |
| 0.010       | 12FR010E | 13FR010E | 15FR010E |
| 0.015       | 12FR015E | 13FR015E | 15FR015E |
| 0.020       | 12FR020E | 13FR020E | 15FR020E |
| 0.025       | 12FR025E | 13FR025E | 15FR025E |
| 0.030       | 12FR030E | 13FR030E | 15FR030E |
| 0.040       | 12FR040E | 13FR040E | 15FR040E |
| 0.050       | 12FR050E | 13FR050E | 15FR050E |
| 0.060       | 12FR060E | 13FR060E | 15FR060E |
| 0.070       | 12FR070E | 13FR070E | 15FR070E |
| 0.080       | 12FR080E | 13FR080E | 15FR080E |
| 0.090       | 12FR090E | 13FR090E | 15FR090E |
| 0.100       | 12FR100E | 13FR100E | 15FR100E |
| 0.150       |          | 13FR150E | 15FR150E |
| 0.200       |          | 13FR200E | 15FR200E |
| 0.250       |          |          | 15FR250E |

| Wattage         | RoHS Compliant                        |
|-----------------|---------------------------------------|
| 1 3 F R 0 5 0 E |                                       |
| 10 Series       | Tolerance<br>F = 1%<br>D = 0.5%       |
|                 | Ohm Value<br>Example:<br>R050 = 0.05Ω |

(continued)

# 10 Series

## Axial Wire Element Current Sense Four Terminal Axial



Ohmite's Four-terminal Current-sense Resistors are specifically designed for low-resistance applications requiring the highest accuracy and temperature stability. This four-terminal version of Ohmite's 10 Series resistor is specially designed for use in a Kelvin configuration, in which a current is applied through two opposite terminals and sensing voltage is measured across the other two terminals.

The Kelvin configuration enables the resistance and temperature coefficient of the terminals to be effectively eliminated. The four terminal design also results in a lower temperature coefficient of resistance and lower self-heating drift which may be experienced on two-terminal resistors. The requirement to connect to the terminals at precise test points is eliminated, allowing for tighter tolerancing on the end application.

### CHARACTERISTICS

|                                              |                                                            |
|----------------------------------------------|------------------------------------------------------------|
| <b>Terminals</b>                             | Tinned Copper Leads                                        |
| <b>Encapsulation</b>                         | Silicone Molding Compound                                  |
| <b>Derating</b>                              | Linearly from 100% at +25°C to 0% at +200°C                |
| <b>Resistance Range</b>                      | 0.005Ω to 0.100Ω standard                                  |
| <b>Standard Tolerance</b>                    | ±1%; others available                                      |
| <b>Operating Temp. Range</b>                 | -55°C to +200°C                                            |
| <b>Temperature Coefficient of Resistance</b> | (0°C to 85°C) ≥0.015Ω: ±50 PPM/°C;<br><0.015Ω: ±100 PPM/°C |
| <b>Environmental Performance</b>             | Exceeds the requirements of MIL-PRF-49465                  |
| <b>Power rating</b>                          | Based on 25°C free air rating.                             |
| <b>Overload</b>                              | 5 times rated wattage for 5 seconds                        |
| <b>Max. Current</b>                          | 22 amps                                                    |
| <b>Dielectric withstanding voltage</b>       | 1500 VAC for 4.5 and 7 watt; 1000 VAC for 3 watt           |
| <b>Insulation resistance</b>                 | Not less than 1000 MΩ                                      |
| <b>Thermal EMF</b>                           | Less than ±2μV/°C                                          |

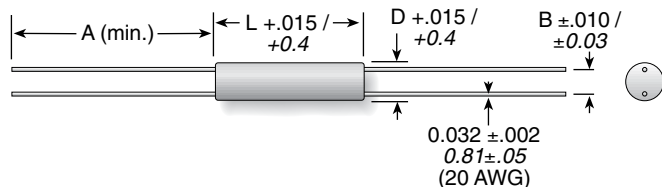
### FEATURES

- Ideal for current sensing applications
- 1% Tolerance standard, others available
- Low Inductance (non-inductive below 0.25Ω)
- Tinned Copper Leads
- RoHS Compliant

### SERIES SPECIFICATIONS

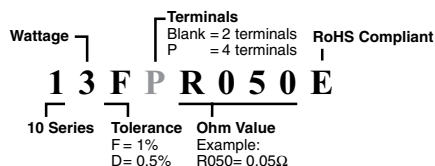
| Series | Wattage | Ohms      |
|--------|---------|-----------|
| 13     | 3       | 0.005-0.1 |
| 14     | 4.5     | 0.005-0.1 |
| 17     | 7       | 0.005-0.1 |

### DIMENSIONS



| Series | Wattage | Length     | Diam.      | A         | B          |
|--------|---------|------------|------------|-----------|------------|
| 13     | 3       | 0.625/15.9 | 0.200/5.08 | 1.25/31.8 | 0.125/3.18 |
| 14     | 4.5     | 1.060/26.9 | 0.335/8.51 | 1.50/38.1 | 0.200/5.08 |
| 17     | 7       | 1.500/38.1 | 0.375/9.53 | 1.50/38.1 | 0.200/5.08 |

### ORDERING INFORMATION



### Standard part numbers

| Ohmic value | 3 watt    | 4.5 watt  | 7 watt    |
|-------------|-----------|-----------|-----------|
| 0.005       | 13FPR005E | 14FPR005E | 17FPR005E |
| 0.010       | 13FPR010E | 14FPR010E | 17FPR010E |
| 0.015       | 13FPR015E | 14FPR015E | 17FPR015E |
| 0.020       | 13FPR020E | 14FPR020E | 17FPR020E |
| 0.025       | 13FPR025E | 14FPR025E | 17FPR025E |
| 0.030       | 13FPR030E | 14FPR030E | 17FPR030E |
| 0.040       | 13FPR040E | 14FPR040E | 17FPR040E |
| 0.050       | 13FPR050E | 14FPR050E | 17FPR050E |
| 0.060       | 13FPR060E | 14FPR060E | 17FPR060E |
| 0.070       | 13FPR070E | 14FPR070E | 17FPR070E |
| 0.075       | 13FPR075E | 14FPR075E | 17FPR075E |
| 0.080       | 13FPR080E | 14FPR080E | 17FPR080E |
| 0.090       | 13FPR090E | 14FPR090E | 17FPR090E |
| 0.100       | 13FPR100E | 14FPR100E | 17FPR100E |