



## Precision High-Power Thin Film Chip Resistors



### KEY BENEFITS

- 0603 to 2512 case sizes available
- High-purity ceramic substrate
- Power rating to 2.5 W
- Resistance range: 10  $\Omega$  to 30.1 k $\Omega$
- Resistor tolerance to  $\pm 0.1\%$
- TCR to  $\pm 25$  ppm/ $^{\circ}\text{C}$
- Flame resistant UL 94 V-0
- Lead (Pb)-free and lead terminations available
- Compliant to RoHS Directive 2002/95/EC

### APPLICATIONS

- Industrial equipment
- Telecommunications
- Medical imaging
- Instrumentation
- Test and measurement equipment

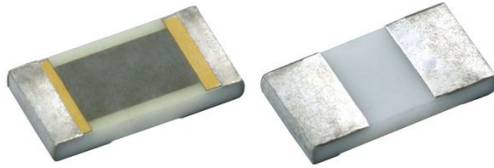
### RESOURCES

- Datasheet: PHP - [www.vishay.com/doc?60076](http://www.vishay.com/doc?60076)
- For technical questions contact [thinfilm@vishay.com](mailto:thinfilm@vishay.com)

One of the World's Largest Manufacturers of  
Discrete Semiconductors and Passive Components



## Precision High-Power Thin Film Chip Resistors



PHP series chip resistors are designed with enlarged backside terminations to reduce the thermal resistance between the topside resistor layer and the solder joint on the end users circuit board.

Actual power handling capability is limited by the end user mounting process. As with any high power chip resistor the ability to remove the generated heat is critical to the overall performance of the device.

### FEATURES

- High purity ceramic substrate
- Power rating to 2.5 W
- Resistance range 10  $\Omega$  to 30.1 k $\Omega$
- Resistor tolerance to  $\pm 0.1\%$
- TCR to  $\pm 25$  ppm/ $^{\circ}\text{C}$
- Flame resistant UL 94 V-0

### APPLICATIONS

- Power supplies
- Power switching
- Braking system
- Test and measurement equipment
- Motor deflection circuits

### TYPICAL PERFORMANCE

|      | ABSOLUTE |
|------|----------|
| TCR  | 25       |
| TOL. | 0.1      |

### STANDARD ELECTRICAL SPECIFICATIONS

| TEST                           | SPECIFICATIONS  | CONDITIONS  |
|--------------------------------|---|---|
| Material                       | Nichrome  | -   |
| Resistance Range               | 10 $\Omega$ to 30.1 k $\Omega$  | -   |
| TCR: Absolute                  | 25 ppm/ $^{\circ}\text{C}$ , 50 ppm/ $^{\circ}\text{C}$ (standard) and, 100 ppm/ $^{\circ}\text{C}$ | -55 $^{\circ}\text{C}$ to +125 $^{\circ}\text{C}$ |
| Tolerance: Absolute            | 0.1 %, 0.5 %, 1.0 % and, 5.0 %  | +25 $^{\circ}\text{C}$                            |
| Power Rating: Resistor         | 0.375 W - 2.5 W <sup>(1)</sup>  | Maximum at +70 $^{\circ}\text{C}$                 |
| Stability: Absolute            | $\Delta R$ 0.1 %  | 2000 h at +70 $^{\circ}\text{C}$                  |
| Stability: Ratio               | Not applicable  | -   |
| Voltage Coefficient            | < 0.1 ppm/V   | -   |
| Working Voltage                | 75 V to 200 V   | -   |
| Operating Temperature Range    | -55 $^{\circ}\text{C}$ to +125 $^{\circ}\text{C}$   | -   |
| Storage Temperature Range      | -55 $^{\circ}\text{C}$ to +150 $^{\circ}\text{C}$   | -   |
| Noise                          | < -30 dB  | -   |
| Shelf Life Stability: Absolute | $\pm 0.01\%$  | 1 year at +25 $^{\circ}\text{C}$                  |

### COMPONENT RATINGS

| CASE SIZE | POWER RATING (mW)   | WORKING VOLTAGE (V) | RESISTANCE RANGE ( $\Omega$ ) |
|-----------|---------------------|---------------------|-------------------------------|
| 0603      | 375 <sup>(1)</sup>  | 75                  | 10 to 30.1K                   |
| 0805      | 625 <sup>(1)</sup>  | 100                 | 10 to 30.1K                   |
| 1206      | 1000 <sup>(1)</sup> | 200                 | 10 to 30.1K                   |
| 2512      | 2500 <sup>(1)</sup> | 200                 | 10 to 30.1K                   |

#### Note

<sup>(1)</sup> Dependent on component mounting by user

### ENVIRONMENTAL TESTS (Vishay Performance vs. MIL-PRF-55342 Requirements)

| ENVIRONMENTAL TEST                            | LIMITS MIL-PRF-55342 CHARACTERISTIC "E" | TYPICAL VISHAY PERFORMANCE       |
|---|---|----------------------------------|
| Resistance Temperature Characteristic         | $\pm 25$ ppm/ $^{\circ}\text{C}$        | $\pm 15$ ppm/ $^{\circ}\text{C}$ |
| Maximum Ambient Temperature at Rated Wattage  | +70 $^{\circ}\text{C}$                  | +70 $^{\circ}\text{C}$           |
| Maximum Ambient Temperature at Power Derating | +150 $^{\circ}\text{C}$                 | +150 $^{\circ}\text{C}$          |
| Thermal Shock                                 | $\pm 0.1\%$                             | $\pm 0.04\%$                     |
| Low Temperature Operation                     | $\pm 0.1\%$                             | $\pm 0.001\%$                    |
| Short Time Overload                           | $\pm 0.1\%$                             | $\pm 0.003\%$                    |
| High Temperature Exposure                     | $\pm 0.1\%$                             | $\pm 0.030\%$                    |
| Resistance to Soldering Heat                  | $\pm 0.2\%$                             | $\pm 0.007\%$                    |
| Moisture Resistance                           | $\pm 0.2\%$                             | $\pm 0.002\%$                    |
| Life at +70 $^{\circ}\text{C}$ for 2000 h     | $\pm 0.5\%$                             | $\pm 0.100\%$                    |

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