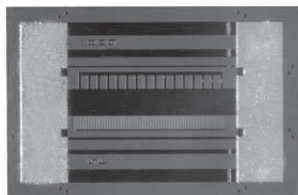


## Thin Film Power Resistors



Product may not be to scale

The PWA series resistor chips offer a 500 mW power rating in a small size. These offer one of the best combinations of size and power available.

The PWAs are manufactured using Vishay Electro-Films (EFI) sophisticated thin film equipment and manufacturing technology. The PWAs are 100 % electrically tested and visually inspected to MIL-STD-883, method 2032, class H or class K.

### FEATURES

- Wire bondable
- 500 mW power
- Chip size: 0.030" x 0.045"
- Case: 0503
- Resistance range 0.3  $\Omega$  to 1 M $\Omega$
- Oxidized silicon substrate for good power dissipation
- Resistor material: Tantalum nitride, self-passivating
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
**GREEN**  
(5-2008)

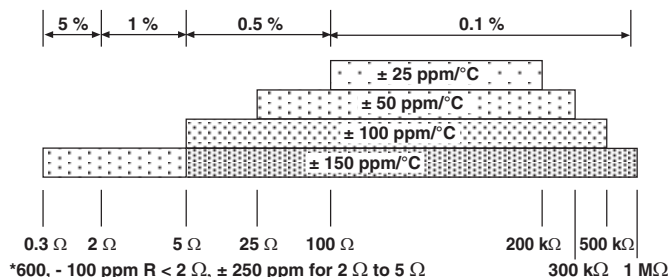
### APPLICATIONS

The PWA resistor chips are used mainly in higher power circuits of amplifiers where increased power loads require a more specialized resistor.

### TEMPERATURE COEFFICIENT OF RESISTANCE, VALUES, AND TOLERANCES

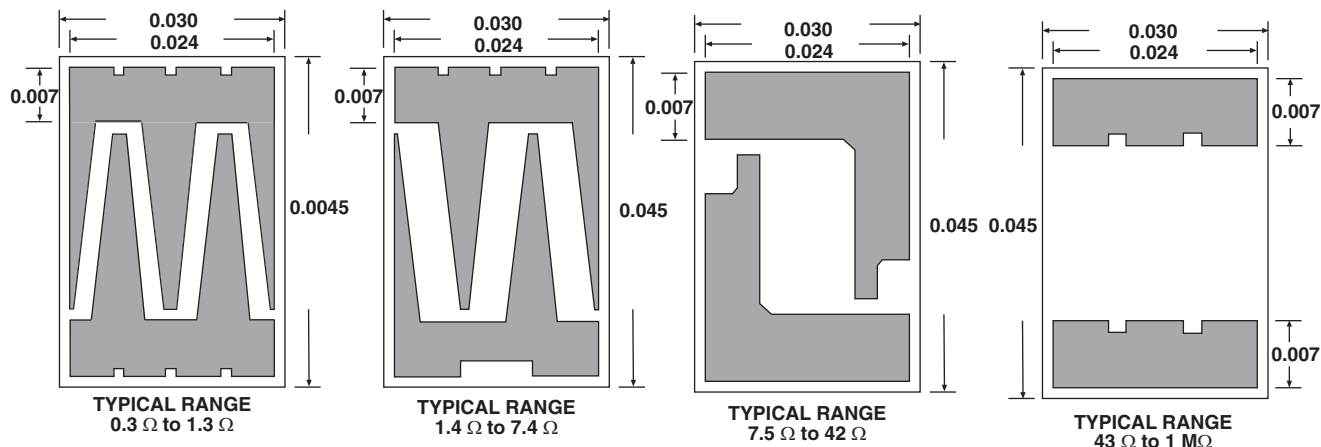
| PARAMETER              | VALUE                                       | UNIT              |
|------------------------|---------------------------------------------|-------------------|
| Total Resistance Range | 0.3 to 1M                                   | $\Omega$          |
| Standard Tolerances    | $\pm 0.1$ , $\pm 0.5$ , $\pm 1$ , $\pm 5$   | %                 |
| TCR                    | $\pm 25$ , $\pm 50$ , $\pm 100$ , $\pm 150$ | ppm/ $^{\circ}$ C |

Tightest Standard Tolerance Available



### STANDARD ELECTRICAL SPECIFICATIONS

| PARAMETER                                                                                                                        | VALUE                       | UNIT         |
|----------------------------------------------------------------------------------------------------------------------------------|-----------------------------|--------------|
| Noise, MIL-STD-202, Method 308<br>100 $\Omega$ to 250 k $\Omega$<br>< 100 $\Omega$ or > 251 k $\Omega$                           | -35 typ.<br>-20 typ.        | dB           |
| Moisture Resistance, MIL-STD-202, Method 106                                                                                     | $\pm 0.5$ max. $\Delta R/R$ | %            |
| Stability, 1000 h, +125 $^{\circ}$ C, 250 mW                                                                                     | $\pm 0.5$ max. $\Delta R/R$ | %            |
| Operating Temperature Range                                                                                                      | -55 to +125                 | $^{\circ}$ C |
| Thermal Shock, MIL-STD-202, Method 107, Test Condition F                                                                         | $\pm 0.1$ max. $\Delta R/R$ | %            |
| High Temperature Exposure, +150 $^{\circ}$ C, 100 h                                                                              | $\pm 0.2$ max. $\Delta R/R$ | %            |
| Dielectric Voltage Breakdown                                                                                                     | 200                         | V            |
| Insulation Resistance                                                                                                            | $10^{12}$ min.              | $\Omega$     |
| Operating Voltage<br>Steady State<br>5 x Rated Power                                                                             | 100 max.<br>200 max.        | V            |
| DC Power Rating at +70 $^{\circ}$ C (Derated to zero at +175 $^{\circ}$ C)<br>(Conductive epoxy die attach to alumina substrate) | 0.5                         | W            |
| 5 x Rated Power Short-Time Overload, +25 $^{\circ}$ C, 5 s                                                                       | $\pm 0.1$ max. $\Delta R/R$ | %            |

**DIMENSIONS** in inches

**SCHEMATIC**


| MECHANICAL SPECIFICATIONS |                                                                 |
|---------------------------|-----------------------------------------------------------------|
| PARAMETER                 | VALUE                                                           |
| Chip Size                 | 0.030" x 0.045" $\pm$ 0.002" (0.762 mm x 1.143 mm $\pm$ 0.5 mm) |
| Chip Thickness            | 0.010" $\pm$ 0.002" (0.254 mm $\pm$ 0.05 mm)                    |
| Chip Substrate Material   | Oxidized silicon, 10 k $\text{\AA}$ minimum SiO <sub>2</sub>    |
| Resistor Material         | Tantalum nitride, self-passivating                              |
| Bonding Pad Size          | 0.007" x 0.024" (0.1778 mm x 0.6096 mm)                         |
| Number of Pads            | 2                                                               |
| Pad Material              | 10 k $\text{\AA}$ minimum aluminum (Au optional)                |
| Backing                   | None, lapped semiconductor silicon (Au back optional)           |

| GLOBAL PART NUMBER INFORMATION                                  |                                                      |                                                                                          |   |                                                                                      |   |                                                                                                 |   |                  |   |                    |   |                            |   |                                     |  |
|-----------------------------------------------------------------|------------------------------------------------------|------------------------------------------------------------------------------------------|---|--------------------------------------------------------------------------------------|---|-------------------------------------------------------------------------------------------------|---|------------------|---|--------------------|---|----------------------------|---|-------------------------------------|--|
| Global Part Number: PWA50000FKANHWS                             |                                                      |                                                                                          |   |                                                                                      |   |                                                                                                 |   |                  |   |                    |   |                            |   |                                     |  |
| Global Part Number Description: PWA 5K 1 % 100 ppm Al None H WS |                                                      |                                                                                          |   |                                                                                      |   |                                                                                                 |   |                  |   |                    |   |                            |   |                                     |  |
| P                                                               | W                                                    | A                                                                                        | 5 | 0                                                                                    | 0 | 0                                                                                               | 0 | F                | K | A                  | N | H                          | W | S                                   |  |
| MODEL                                                           | RESISTANCE                                           | RESISTANCE MULTIPLIER CODE                                                               |   | TOLERANCE CODE (%)                                                                   |   | TCR (ppm/°C)                                                                                    |   | TERMINATION      |   | BACK METAL         |   | VISUAL CLASS               |   | PACKAGING CODE                      |  |
| PWA<br><br>30 x 45 size<br>Power resistor                       | First 4 digits are significant figures of resistance | D = 0.0001<br>C = 0.001<br>B = 0.01<br>A = 0.1<br>0 = 1<br>1 = 10<br>2 = 100<br>3 = 1000 |   | B = 0.1<br>C = 0.25<br>D = 0.5<br>F = 1.0<br>G = 2.0<br>H = 2.5<br>J = 5.0<br>K = 10 |   | E = ± 25<br>C = ± 50<br>K = ± 100<br>V = ± 150<br>L = ± 200<br>M = ± 250<br>Z = + 600/<br>- 100 |   | G = Au<br>A = Al |   | G = Au<br>N = None |   | H = Class H<br>K = Class K |   | WS = Waffle pack<br>100 min, 1 mult |  |



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