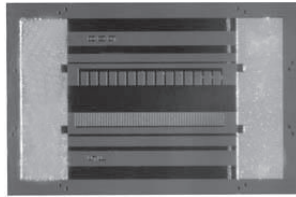


## Thin Film Power Resistors



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

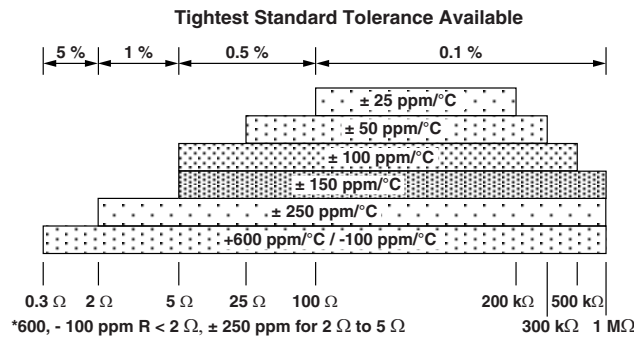
- Wire bondable
- 500 mW power
- Chip size: 0.030" x 0.045"
- Case: 0503
- Resistance range 0.3  $\Omega$  to 1 M $\Omega$
- Oxidized silicon substrate for good power dissipation
- Resistor material: tantalum nitride, self-passivating
- Material categorization: for definitions of compliance please see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



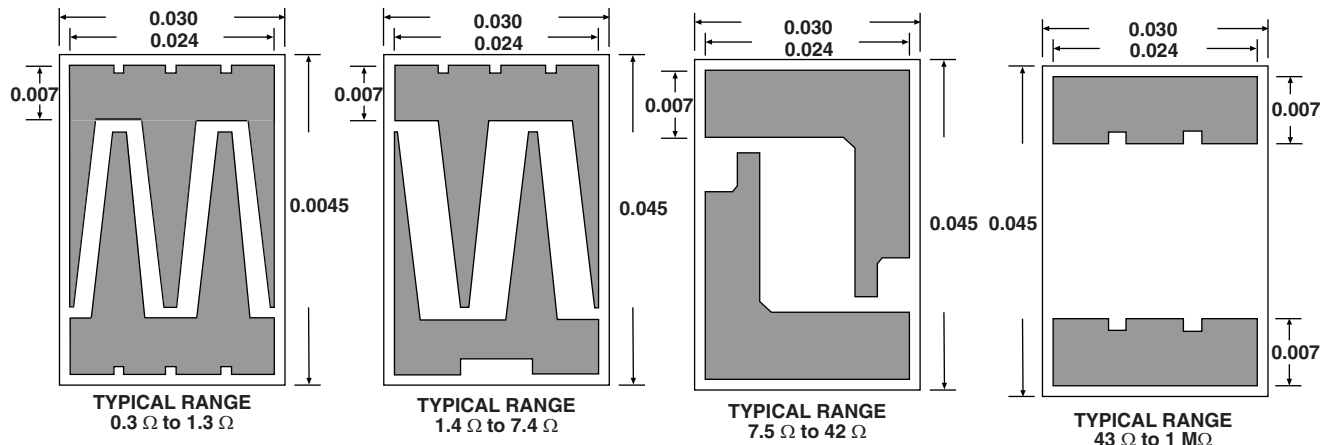
### APPLICATIONS

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 |



| 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" ± 0.002" (0.762 mm x 1.143 mm ± 0.5 mm) |
| Chip Thickness            | 0.010" ± 0.002" (0.254 mm ± 0.05 mm)                    |
| Chip Substrate Material   | Oxidized silicon, 10 kÅ 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 kÅ 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                                | F  | K  | A | N | H | W | S |
| MODEL  | RESISTANCE   | RESISTANCE MULTIPLIER CODE   | TOLERANCE CODE (%)   | TCR (ppm/°C)   | TERMINATION                    | BACK METAL                       | VISUAL CLASS                             | PACKAGING CODE                                 |   |   |   |   |   |
| <b>PWA</b><br>30 x 45 size<br>Power resistor                   | First 4 digits are significant figures of resistance | <b>D</b> = 0.0001<br><b>C</b> = 0.001<br><b>B</b> = 0.01<br><b>A</b> = 0.1<br><b>0</b> = 1<br><b>1</b> = 10<br><b>2</b> = 100<br><b>3</b> = 1000 | <b>B</b> = 0.1<br><b>C</b> = 0.25<br><b>D</b> = 0.5<br><b>F</b> = 1.0<br><b>G</b> = 2.0<br><b>H</b> = 2.5<br><b>J</b> = 5.0<br><b>K</b> = 10 | <b>E</b> = ± 25<br><b>C</b> = ± 50<br><b>K</b> = ± 100<br><b>V</b> = ± 150<br><b>L</b> = ± 200<br><b>M</b> = ± 250<br><b>Z</b> = +600 / -100 | <b>G</b> = Au<br><b>A</b> = Al | <b>G</b> = Au<br><b>N</b> = none | <b>H</b> = class H<br><b>K</b> = class K | <b>WS</b> =<br>waffle pack<br>100 min, 1 mult. |   |   |   |   |   |



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