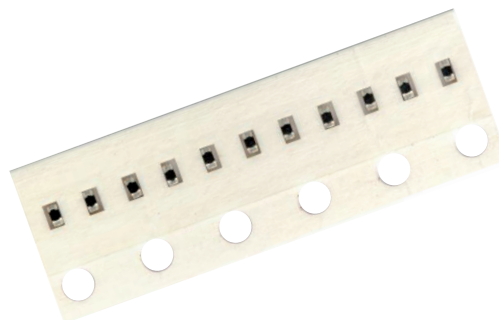


## Precision Thin Film Chip Resistors

### PFC Commercial Series

- High stability tantalum nitride film
- Available in 0402, 0603, 0805 and 1206
- Absolute TCR to  $\pm 10\text{ppm}/^\circ\text{C}$
- Sulfur resistant to ASTM B809-95



 All parts are Pb-free and comply with EU Directive 2011/65/EU amended by (EU) 2015/863 (RoHS3)

PFC chip resistor series provides the high precision and ultra stable performance of tantalum nitride resistive film system in 0402, 0603, 0805 and 1206 sizes. The unique characteristics of the passivated tantalum nitride film ensure long term life stability and reliability in most environments.

Qualified for resistance to sulfur bearing gases, the PFC series is an excellent solution for automotive and heavy equipment applications where precision, exceptional reliability with anti-sulfuration characteristics is imperative.

### Electrical Data

| Model | Power Rating (70°C) | Max Voltage Rating ( $\leq \sqrt{P \times R}$ ) | Temperature Range | ESD Sensitivity  | Noise  | Termination                                                | Substrate     |
|-------|---------------------|-------------------------------------------------|-------------------|------------------|--------|------------------------------------------------------------|---------------|
| W0402 | 50mW                | 75V                                             | -65°C to +150°C   | 2KV to 4KV (HBM) | <-25dB | 100% matte tin (RoHS compliant) plated over nickel barrier | 96.5% Alumina |
| W0603 | 100mW               | 75V                                             |                   |                  |        |                                                            |               |
| W0805 | 250mW               | 100V                                            |                   |                  |        |                                                            |               |
| W1206 | 333mW               | 200V                                            |                   |                  |        |                                                            |               |

### Environmental Data

| Environmental Test        | Test Method                                | Performance  |              |
|---------------------------|--------------------------------------------|--------------|--------------|
|                           |                                            | Typical      | Maximum      |
| Sulfuration Test          | ASTM B809 (Modified) 105°C Dry, 1000 Hours | $\pm 0.02\%$ | $\pm 0.05\%$ |
| Thermal Shock             | MIL-PRF-55342                              | $\pm 0.02\%$ | $\pm 0.10\%$ |
| Low Temperature Operation | MIL-PRF-55342                              | $\pm 0.01\%$ | $\pm 0.05\%$ |
| Short Time Overload       | MIL-PRF-55342                              | $\pm 0.01\%$ | $\pm 0.05\%$ |
| High Temperature Exposure | MIL-PRF-55342                              | $\pm 0.03\%$ | $\pm 0.10\%$ |
| Effects of Solder         | MIL-PRF-55342                              | $\pm 0.01\%$ | $\pm 0.10\%$ |
| Moisture Resistance       | MIL-PRF-55342                              | $\pm 0.03\%$ | $\pm 0.10\%$ |
| Life                      | MIL-PRF-55342                              | $\pm 0.03\%$ | $\pm 0.10\%$ |

#### General Note

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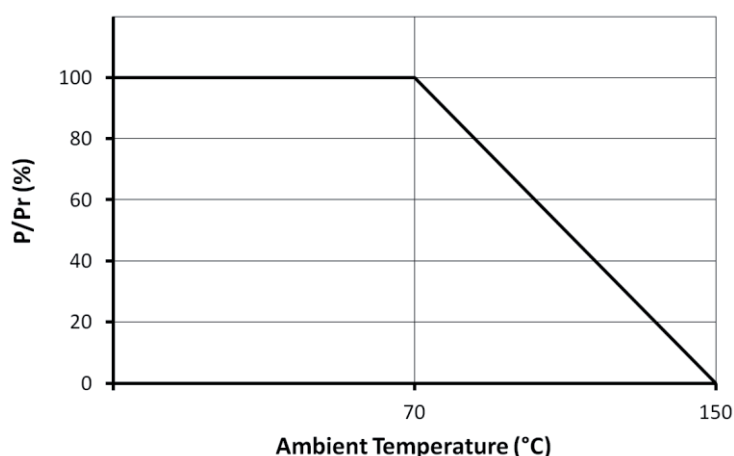
BI Technologies IRC Welwyn

[www.ttelectronics.com/resistors](http://www.ttelectronics.com/resistors)

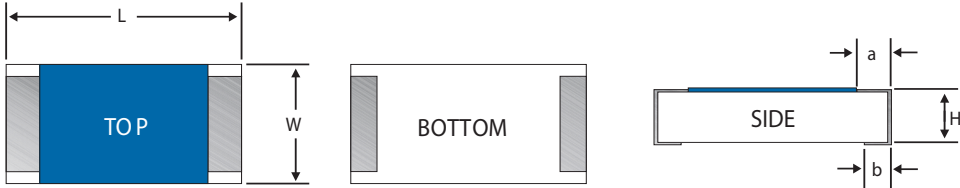
### Manufacturing Capabilities Data

| TCR<br>ppm/°C | Tolerance 0.1% to 5% |           |            |            |
|---------------|----------------------|-----------|------------|------------|
|               | W0402                | W0603     | W0805      | W1206      |
| 10            | 100Ω-16kΩ            | 100Ω-50kΩ | 100Ω-100kΩ | 100Ω-400kΩ |
| 15            | 50Ω-16kΩ             | 50Ω-50kΩ  | 50Ω-100kΩ  | 50Ω-400kΩ  |
| 25            | 15Ω-30kΩ             | 10Ω-100kΩ | 10Ω-267kΩ  | 10Ω-1MΩ    |
| 50, 100       | 15Ω-30kΩ             | 5Ω-100kΩ  | 5Ω-267kΩ   | 5Ω-1MΩ     |

### Power Derating Curve



### Physical Data

|  |                              |                              |                              |                                         |                              |
|--------------------------------------------------------------------------------------|------------------------------|------------------------------|------------------------------|-----------------------------------------|------------------------------|
| Model                                                                                | L                            | W                            | H                            | a                                       | b                            |
| W0402                                                                                | 0.04 ±0.003<br>(1.02 ±0.07)  | 0.021 ±0.005<br>(0.53 ±0.12) | 0.012 ±0.003<br>(0.3 ±0.08)  | 0.008 -0.004, +0.008<br>(0.2 -0.1/+0.2) | 0.01 ±0.006<br>(0.25 ±0.15)  |
| W0603                                                                                | 0.063 ±0.004<br>(1.6 ±0.1)   | 0.031 ±0.004<br>(0.79 ±0.11) | 0.02 ±0.006<br>(0.51 ±0.15)  | 0.012 ±0.008<br>(0.3 ±0.2)              | 0.015 ±0.009<br>(0.38 ±0.23) |
| W0805                                                                                | 0.081 ±0.006<br>(2.06 ±0.16) | 0.05 ±0.007<br>(1.27 ±0.18)  | 0.02 ±0.006<br>(0.51 ±0.14)  | 0.015 ±0.009<br>(0.38 ±0.23)            | 0.016 ±0.008<br>(0.41 ±0.21) |
| W1206                                                                                | 0.126 ±0.008<br>(3.2 ±0.2)   | 0.063 ±0.005<br>(1.6 ±0.13)  | 0.024 ±0.006<br>(0.61 ±0.16) | 0.025 ±0.017<br>(0.64 ±0.44)            | 0.025 ±0.017<br>(0.64 ±0.44) |

For PCB mounting pad recommendations see

<http://www.ttelectronics.com/TTElectronics/media/ProductFiles/Resistors/ApplicationNotes/TN006-Recommended-Layouts-for-SMD-Resistors.pdf>

### Construction

Conductors and tantalum nitride resistive element are applied to an alumina substrate. The product is laser trimmed to value, and a protective epoxy coat is applied. The product is then metallized and plated to provide a wrap-around solderable termination with a 100% matte tin finish on a nickel barrier layer. It is 100% tested and provided on standard paper carrier tape.

### Special Variants

For PFC resistors with tighter tolerances, SnPb terminations or MIL screening, refer to the separate PFC Special Series datasheet.

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### Ordering Procedure

This product has two valid part numbers:

**European (Welwyn) Part Number: W1206R-01-1K0BI** (1206, 100ppm/°C, 1 kilohm  $\pm 0.1\%$ , Pb-free)

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W | 1 | 2 | 0 | 6 | R | - | 0 | 1 | - | 1 | K | 0 | B | I |
| 1 | 2 |   | 3 |   | 4 |   | 5 |   | 6 |   |   |   |   |   |

| 1<br>Type | 2<br>Size | 3<br>TCR                                  | 4<br>Value           | 5<br>Tolerance  | 6<br>Termination & Packing |
|-----------|-----------|-------------------------------------------|----------------------|-----------------|----------------------------|
| W=PFC     | 0402      | R-12 = $\pm 10\text{ppm}/^\circ\text{C}$  | E24 = 3/4 characters | B = $\pm 0.1\%$ | I = Pb-free, Standard pack |
|           | 0603      | R-11 = $\pm 15\text{ppm}/^\circ\text{C}$  | E96 = 3/4 characters | D = $\pm 0.5\%$ | All sizes Up to 5000/reel  |
|           | 0805      | R = $\pm 25\text{ppm}/^\circ\text{C}$     | R = ohms             | F = $\pm 1\%$   |                            |
|           | 1206      | R-02 = $\pm 50\text{ppm}/^\circ\text{C}$  | K = kilohms          | G = $\pm 2\%$   |                            |
|           |           | R-01 = $\pm 100\text{ppm}/^\circ\text{C}$ | M = megohms          | J = $\pm 5\%$   |                            |

**USA (IRC) Commercial Part Number: PFC-W1206LF-01-1001-B** (1206, 100ppm/°C, 1 kilohm  $\pm 0.1\%$ , Pb-free)

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | F | C | - | W | 1 | 2 | 0 | 6 | L | F | - | 0 | 1 | - | 1 | 0 | 0 | 1 | - | B |
| 1 |   | 2 |   | 3 |   | 4 |   | 5 |   | 6 |   |   |   |   |   |   |   |   |   |   |

| 1<br>Family | 2<br>Model | 3<br>Termination      | 4<br>TCR                                | 5<br>Value            | 6<br>Tolerance  | Packing                   |
|-------------|------------|-----------------------|-----------------------------------------|-----------------------|-----------------|---------------------------|
| PFC         | W0402      | LF = Pb-free (100%Sn) | 12 = $\pm 10\text{ppm}/^\circ\text{C}$  | 3 digits + multiplier | B = $\pm 0.1\%$ | All sizes Up to 5000/reel |
|             | W0603      |                       | 11 = $\pm 15\text{ppm}/^\circ\text{C}$  | R = ohms for          | D = $\pm 0.5\%$ |                           |
|             | W0805      |                       | 03 = $\pm 25\text{ppm}/^\circ\text{C}$  | values <100 ohms      | F = $\pm 1\%$   |                           |
|             | W1206      |                       | 02 = $\pm 50\text{ppm}/^\circ\text{C}$  |                       | G = $\pm 2\%$   |                           |
|             |            |                       | 01 = $\pm 100\text{ppm}/^\circ\text{C}$ |                       | J = $\pm 5\%$   |                           |

\* Non-standard pack quantity 1000/reel may be available by special request – contact factory.

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