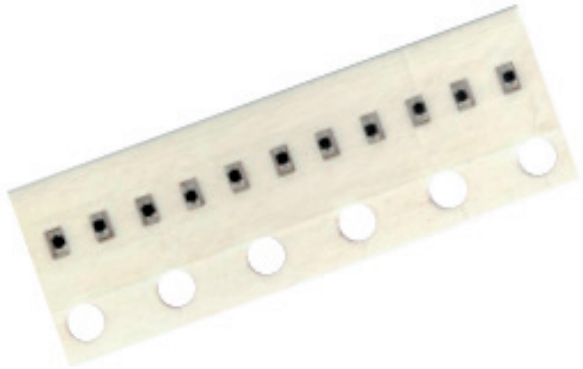
# Precision Thin Film Chip Resistors

## PFC Commercial Series



### Features

- High stability tantalum nitride film
- Available in 0402, 0603, 0805 and 1206
- Absolute TCR to ±10ppm/°C
- Sulfur resistant to ASTM B809-95
- Both Pb-free and SnPb finish available

All Pb-free parts 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 or 60/40 SnPb 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 | ±0.02% | ±0.05% |
| **Thermal Shock** | MIL-PRF-55342 | ±0.02% | ±0.10% |
| **Low Temperature Operation** | MIL-PRF-55342 | ±0.01% | ±0.05% |
| **Short Time Overload** | MIL-PRF-55342 | ±0.01% | ±0.05% |
| **High Temperature Exposure** | MIL-PRF-55342 | ±0.03% | ±0.10% |
| **Effects of Solder** | MIL-PRF-55342 | ±0.01% | ±0.10% |
| **Moisture Resistance** | MIL-PRF-55342 | ±0.03% | ±0.10% |
| **Life** | MIL-PRF-55342 | ±0.03% | ±0.10% |

General Note
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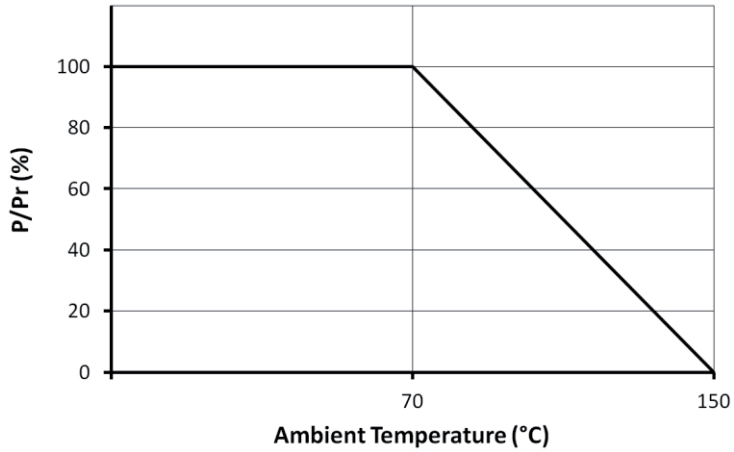
# Precision Thin Film Chip Resistors

## PFC Commercial Series

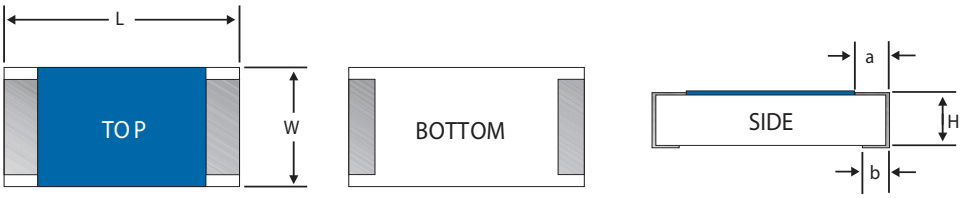
## Manufacturing Capabilities Data

| TCR 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 (1.02 ±0.07) | 0.021 ±0.005 (0.53 ±0.12) | 0.012 ±0.003 (0.3 ±0.08) | 0.008 -0.004, +0.008 (0.2 -0.1/+0.2) | 0.01 ±0.006 (0.25 ±0.15) |
| **W0603** | 0.063 ±0.004 (1.6 ±0.1) | 0.031 ±0.004 (0.79 ±0.11) | 0.02 ±0.006 (0.51 ±0.15) | 0.012 ±0.008 (0.3 ±0.2) | 0.015 ±0.009 (0.38 ±0.23) |
| **W0805** | 0.081 ±0.006 (2.06 ±0.16) | 0.05 ±0.007 (1.27 ±0.18) | 0.02 ±0.006 (0.51 ±0.14) | 0.015 ±0.009 (0.38 ±0.23) | 0.016 ±0.008 (0.41 ±0.21) |
| **W1206** | 0.126 ±0.008 (3.2 ±0.2) | 0.063 ±0.005 (1.6 ±0.13) | 0.024 ±0.006 (0.61 ±0.16) | 0.025 ±0.017 (0.64 ±0.44) | 0.025 ±0.017 (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 or a 60/40 SnPb finish on a nickel barrier layer. It is 100% tested then packed in carrier tape. Pb-free parts use paper carrier tape, whilst SnPb parts use plastic carrier tape.

## Special Variants

For PFC resistors with tighter tolerances 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 ±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 = ±10ppm/°C | E24 = 3/4 characters<br>E96 = 3/4 characters<br>R = ohms<br>K = kilohms<br>M = megohms | B = ±0.1% | I = Pb-free, Standard pack | |
| | 0603 | R-11 = ±15ppm/°C | | D = ±0.5% | PB = SnPb finish, Standard Pack | |
| | 0805 | R = ±25ppm/°C | | F = ±1% | All sizes | Up to 5000/reel |
| | 1206 | R-02 = ±50ppm/°C | | G = ±2% | | |
| | | R-01 = ±100ppm/°C | | J = ±5% | | |

**USA (IRC) Commercial Part Number: PFC-W1206LF-01-1001-B** (1206, 100ppm/°C, 1 kilohm ±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 | R = SnPb (60/40) | 12 = ±10ppm/°C | 3 digits + multiplier | B = ±0.1% | All sizes | Up to 5000/reel |
| | W0603 | LF = Pb-free (100%Sn) | 11 = ±15ppm/°C | R = ohms for values <100 ohms | D = ±0.5% | | |
| | W0805 | | 03 = ±25ppm/°C | | F = ±1% | | |
| | W1206 | | 02 = ±50ppm/°C | | G = ±2% | | |
| | | | 01 = ±100ppm/°C | | J = ±5% | | |

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

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