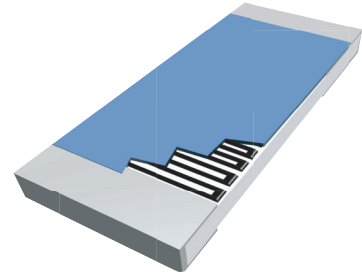


## Precision Thin Film Chip Resistors

### PFC Special Series

- Standard 60/40 Sn/Pb and Pb-free (RoHS compliant) terminations available
- Available in 0402, 0603, 0805 and 1206
- Tested for COTS applications
- Absolute TCR to  $\pm 10\text{ppm}/^\circ\text{C}$
- MIL screening available
- Superior anti-sulfuration characteristics



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

The TaNFilm<sup>®</sup> PFC chip resistor series provides the high precision and ultra stable performance of our 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.

Using the same manufacturing line as the PFC Military Series, these precision chips maintain the same superior environmental performance. Specially selected materials and processes ensure initial precision is maintained in the harshest surface mount soldering environment. Wrap-around terminations with leach-resistant nickel barriers ensure high integrity solder connections.

### 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 | 99.5% Alumina |
| W0603 | 100mW               | 75V                                             |                   |                  |        |                                                            |               |
| W0805 | 250mW               | 100V                                            |                   |                  |        |                                                            |               |
| W1206 | 333mW               | 200V                                            |                   |                  |        |                                                            |               |

### Environmental Data

| Environmental Test                        | Test Method                                 | Performance  |              |
|-------------------------------------------|---------------------------------------------|--------------|--------------|
|                                           |                                             | Typical      | Maximum      |
| Sulfuration Test (ASLF terminations only) | ASTM B-809 (Modified) 105°C Dry, 1000 Hours | $\pm 0.02\%$ | $\pm 0.05\%$ |
|                                           | EIA-977 Condition B, 105°C Dry, 750 Hours   |              |              |
| 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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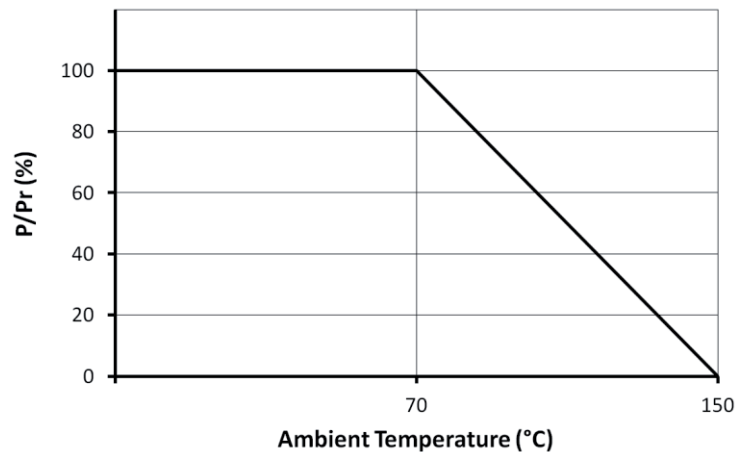
## Manufacturing Capabilities Data

| TCR<br>ppm/°C | Tolerance %          |      |                        |                      |      |                        |                        |      |                         |                        |      |                         |
|---------------|----------------------|------|------------------------|----------------------|------|------------------------|------------------------|------|-------------------------|------------------------|------|-------------------------|
|               | W0402                |      |                        | W0603                |      |                        | W0805                  |      |                         | W1206                  |      |                         |
|               | 0.02                 | 0.05 | 0.1-5                  | 0.02                 | 0.05 | 0.1-5                  | 0.02                   | 0.05 | 0.1-5                   | 0.02                   | 0.05 | 0.1-5                   |
| 10            | 100Ω-16kΩ            |      | 100Ω-16kΩ <sup>1</sup> | 100Ω-50kΩ            |      | 100Ω-50kΩ <sup>1</sup> | 100Ω-100kΩ             |      | 100Ω-125kΩ <sup>3</sup> | 100Ω-400kΩ             |      | 100Ω-400kΩ <sup>1</sup> |
| 15            | 50Ω-16kΩ             |      | 50Ω-16kΩ <sup>1</sup>  | 50Ω-50kΩ             |      | 50Ω-50kΩ <sup>1</sup>  | 50Ω-100kΩ              |      | 50Ω-125kΩ <sup>3</sup>  | 50Ω-400kΩ              |      | 50Ω-400kΩ <sup>1</sup>  |
| 25            | 50Ω-16kΩ    10Ω-24kΩ |      | 10Ω-30kΩ <sup>2</sup>  | 50Ω-50kΩ    10Ω-75kΩ |      | 10Ω-100kΩ <sup>1</sup> | 50Ω-100kΩ    10Ω-180kΩ |      | 10Ω-267kΩ <sup>1</sup>  | 50Ω-400kΩ    10Ω-650kΩ |      | 10Ω-1MΩ <sup>1</sup>    |
| 50, 100       |                      |      | 7.5Ω-30kΩ <sup>2</sup> |                      |      | 5Ω-100kΩ <sup>1</sup>  |                        |      | 5Ω-267kΩ <sup>1</sup>   |                        |      | 5Ω-1MΩ <sup>1</sup>     |

### Notes

1. For Pb-free, unscreened PFC chips see separate PFC Commercial Series datasheet
2. For Pb-free, unscreened PFC chips at values  $\geq 15R$  see separate PFC Commercial Series datasheet
3. For Pb-free, unscreened PFC chips at values  $\leq 100K$  see separate PFC Commercial Series datasheet
4. The anti-sulfur (AS / ASLF) option is only available at values of 100R and higher.

## Power Derating Curve



## Physical Data

| Model | L                            | W                            | H                           | a                           | b                            | c (min.)        |
|-------|------------------------------|------------------------------|-----------------------------|-----------------------------|------------------------------|-----------------|
| W0402 | 0.04 ±0.002<br>(1.02 ±0.05)  | 0.021 ±0.002<br>(0.53 ±0.05) | 0.012 ±0.003<br>(0.3 ±0.08) | 0.008 ±0.002<br>(0.2 ±0.05) | 0.01 ±0.002<br>(0.25 ±0.05)  | 0.017<br>(0.43) |
| W0603 | 0.063 ±0.004<br>(1.6 ±0.1)   | 0.031 ±0.004<br>(0.79 ±0.1)  | 0.02 ±0.006<br>(0.51 ±0.15) | 0.012 ±0.005<br>(0.3 ±0.13) | 0.015 ±0.005<br>(0.38 ±0.13) | 0.03<br>(0.76)  |
| W0805 | 0.081 ±0.005<br>(2.06 ±0.13) | 0.05 ±0.005<br>(1.27 ±0.13)  | 0.02 ±0.006<br>(0.51 ±0.15) | 0.015 ±0.008<br>(0.38 ±0.2) | 0.016 ±0.008<br>(0.41 ±0.2)  | 0.046<br>(1.17) |
| W1206 | 0.126 ±0.006<br>(3.2 ±0.15)  | 0.063 ±0.005<br>(1.6 ±0.13)  | 0.024 ±0.004<br>(0.61 ±0.1) | 0.025 ±0.01<br>(0.64 ±0.25) | 0.025 ±0.01<br>(0.64 ±0.25)  | 0.085<br>(2.16) |

## MIL Screened Precision Chip Resistors

IRC's PFC chip resistors are available with MIL screening. These chips are manufactured on the same production line as our Mil-qualified chip resistors and screened in accordance with MIL-PRF-55342. These chips are identified with IRC's ordering information and not with MIL marking.

See separate MIL-CHIP datasheet.

### General Note

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## Ordering Procedure

This product has two valid part numbers:

**European (Welwyn) Part Number: W1206R-01-1K0AI** (1206, 100ppm/°C, 1 kilohm ±0.05%, Pb-free)

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W | 1 | 2 | 0 | 6 | R | - | 0 | 1 | - | 1 | K | 0 | A | I |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |   |   |   |   |   |   |   |   |

| 1<br>Type | 2<br>Size | 3<br>Option         | 4<br>TCR          | 5<br>Value           | 6<br>Tolerance | 7<br>Termination & Packing                   |
|-----------|-----------|---------------------|-------------------|----------------------|----------------|----------------------------------------------|
| W=PFC     | 0402      | R=Standard          | -12 = ±10ppm/°C   | E24 = 3/4 characters | Q = ±0.02%     | I <sup>1</sup> = Pb-free, Standard pack      |
|           | 0603      | AS=Anti-sulfur      | -11 = ±15ppm/°C   | E96 = 3/4 characters | A = ±0.05%     | PB <sup>2</sup> = SnPb finish, Standard pack |
|           | 0805      | (values ≥100R only) | Blank = ±25ppm/°C | R = ohms             | B = ±0.1%      | All sizes                                    |
|           | 1206      |                     | -02 = ±50ppm/°C   | K = kilohms          | D = ±0.5%      | 1000/reel                                    |
|           |           |                     | -01 = ±100ppm/°C  | M = megohms          | F = ±1%        | Note 1 – Alternative code PI is also valid   |
|           |           |                     |                   |                      | G = ±2%        | Note 2 – Alternative code PP is also valid   |
|           |           |                     |                   |                      | J = ±5%        |                                              |

**USA (IRC) Commercial Part Number: PFC-W1206LF-01-1001-A** (1206, 100ppm/°C, 1 kilohm ±0.05%, Pb-free)

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | F | C | - | W | 1 | 2 | 0 | 6 | L | F | - | 0 | 1 | - | 1 | 0 | 0 | 1 | - | A |
| 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 <sup>1</sup> = SnPb (60/40)      | 12 = ±10ppm/°C  | 3 digits + multiplier | Q = ±0.02%     | All sizes |
|             | W0603      | LF <sup>2</sup> = Pb-free (100%Sn) | 11 = ±15ppm/°C  | R = ohms for          | A = ±0.05%     | 1000/reel |
|             | W0805      | ASLF=Anti-sulfur & Pb-free         | 03 = ±25ppm/°C  | values <100 ohms      | B = ±0.1%      |           |
|             | W1206      | (100%Sn) (values ≥100R only)       | 02 = ±50ppm/°C  |                       | D = ±0.5%      |           |
|             |            |                                    | 01 = ±100ppm/°C |                       | F = ±1%        |           |
|             |            |                                    |                 |                       | G = ±2%        |           |
|             |            |                                    |                 |                       | J = ±5%        |           |

Note 1 – Alternative code PR is also valid  
Note 2 – Alternative code PLF is also valid

**USA (IRC) Mil Screened Part Number\*: PFC-W1206R-05-1001-B** (1206, 100ppm/°C, 1 kilohm ±0.1%,)

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | F | C | - | W | 1 | 2 | 0 | 6 | R | - | 0 | 5 | - | 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) | 16 = ±10ppm/°C  | 3 digits + multiplier | B = ±0.1%      | All sizes |
|             | W0603      |                  | 15 = ±15ppm/°C  | R = ohms for          | D = ±0.5%      | 1000/reel |
|             | W0805      |                  | 14 = ±20ppm/°C  | values <100 ohms      | F = ±1%        |           |
|             | W1206      |                  | 07 = ±25ppm/°C  |                       | G = ±2%        |           |
|             |            |                  | 06 = ±50ppm/°C  |                       | J = ±5%        |           |
|             |            |                  | 05 = ±100ppm/°C |                       |                |           |
|             |            |                  | 04 = ±300ppm/°C |                       |                |           |

\* Please refer to the MIL-CHIP datasheet to order parts qualified to MIL-PRF-55342.

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