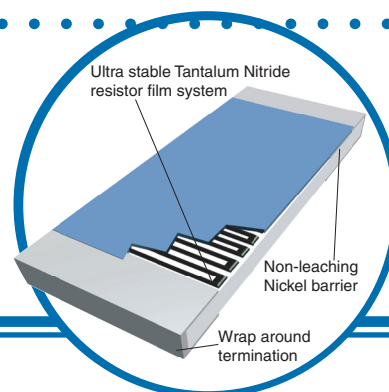


# Precision Thin Film Chip Resistors

## PFC Series

- Standard 60/40 Sn/Pb and Pb-free (RoHS compliant) terminations available
- Available in 0402, 0603, 0805, 1206, 1505, 2010 and 2512 chip sizes
- Tested for COTS applications
- Absolute TCR to  $\pm 10\text{ppm}/^\circ\text{C}$
- MIL screening available



The IRC TaNFilm® PFC chip resistor series provides the high precision and ultra stable performance of our Tantalum Nitride resistive film system in 0402, 0603, 0805, 1206, 1505, 2010 and 2512 sizes. The unique characteristics of the passivated Tantalum Nitride film insure long term life stability and stability in most environments.

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

## Electrical Data

| Model | Power Rating<br>(70°C) | Max Voltage<br>Rating ( $\leq \sqrt{P \times R}$ ) | Temperature<br>Range | ESD<br>Sensitivity  | Noise  | Termination                                                                        | Substrate        |
|-------|------------------------|----------------------------------------------------|----------------------|---------------------|--------|------------------------------------------------------------------------------------|------------------|
| W0402 | 50mW                   | 75V                                                | -55°C to +150°C      | 2KV to 4KV<br>(HBM) | <-25dB | 60/40 Sn/Pb<br>or 100% tin<br>(RoHS<br>compliant)<br>plated over<br>nickel barrier | 99.5%<br>Alumina |
| W0603 | 100mW                  | 75V                                                |                      |                     |        |                                                                                    |                  |
| W0805 | 250mW                  | 100V                                               |                      |                     |        |                                                                                    |                  |
| W1206 | 333mW                  | 200V                                               |                      |                     |        |                                                                                    |                  |
| W1505 | 350mW                  | 100V                                               |                      |                     |        |                                                                                    |                  |
| W2010 | 800mW                  | 175V                                               |                      |                     |        |                                                                                    |                  |
| W2512 | 1.0W                   | 200V                                               |                      |                     |        |                                                                                    |                  |

### General Note

IRC reserves the right to make changes in product specification without notice or liability.  
All information is subject to IRC's own data and is considered accurate at time of going to print.

© IRC Advanced Film Division • Corpus Christi Texas 78411 USA  
Telephone: 361 992 7900 • Facsimile: 361 992 3377 • Email: afdsales@ircct.com • Website: www.ircct.com



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# Precision Thin Film Chip Resistors

## Manufacturing Capabilities Data

|       |                             |  |  |  |  |                       |
|-------|-----------------------------|--|--|--|--|-----------------------|
| W0402 | ±5%, ±2%, ±1%, ±0.5%, ±0.1% |  |  |  |  | Tolerance             |
|       | 50Ω                         |  |  |  |  | 30KΩ Resistance Range |
|       | ±25, ±50 or ±100 ppm/°C     |  |  |  |  | TCR                   |

|                              |                                                                           |     |     |      |      |       |       |       |                  |
|------------------------------|---------------------------------------------------------------------------|-----|-----|------|------|-------|-------|-------|------------------|
| W0603<br>W0805<br>W1206      | $\pm 5\%, \pm 2\%, \pm 1\%, \pm 0.5\%, \pm 0.1\%, \pm 0.05\%, \pm 0.02\%$ |     |     |      |      |       |       |       | Tolerance        |
|                              | $\pm 5\%, \pm 2\%, \pm 1\%, \pm 0.5\%, \pm 0.1\%, \pm 0.05\%$             |     |     |      |      |       |       |       |                  |
|                              | $\pm 5\%, \pm 2\%, \pm 1\%, \pm 0.5\%, \pm 0.1\%$                         |     |     |      |      |       |       |       |                  |
|                              | 5Ω                                                                        | 10Ω | 50Ω | 100Ω | 200Ω | 50KΩ  | 75KΩ  | 100KΩ | Resistance Range |
|                              | 5Ω                                                                        | 10Ω | 50Ω | 100Ω | 200Ω | 100KΩ | 180KΩ | 267KΩ |                  |
|                              | 5Ω                                                                        | 10Ω | 50Ω | 100Ω | 200Ω | 400KΩ | 650KΩ | 1.0MΩ |                  |
| $\pm 50$ or $\pm 100$ ppm/°C |                                                                           |     |     |      |      |       |       | TCR   |                  |
| $\pm 25$ ppm/°C              |                                                                           |     |     |      |      |       |       |       |                  |
| $\pm 15$ ppm/°C              |                                                                           |     |     |      |      |       |       |       |                  |
| $\pm 10$ ppm/°C              |                                                                           |     |     |      |      |       |       |       |                  |

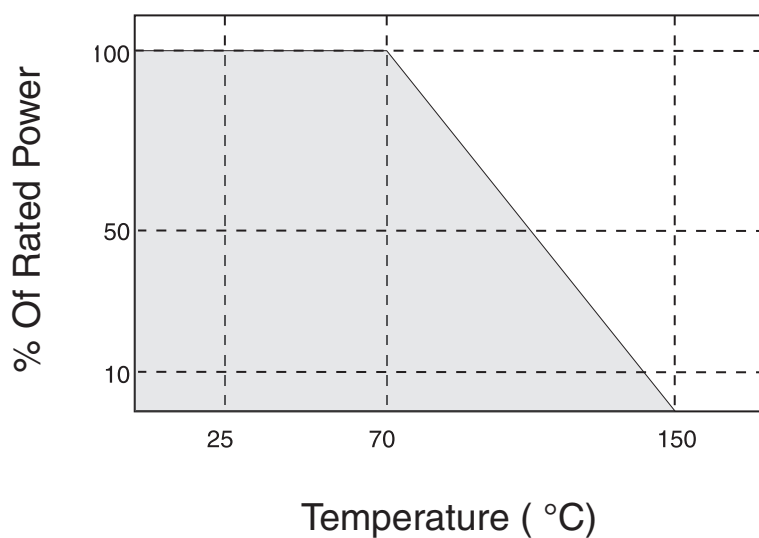
|                                                                           |    |     |     |  |       |       |           |                  |
|---------------------------------------------------------------------------|----|-----|-----|--|-------|-------|-----------|------------------|
| $\pm 5\%, \pm 2\%, \pm 1\%, \pm 0.5\%, \pm 0.1\%, \pm 0.05\%, \pm 0.02\%$ |    |     |     |  |       |       | Tolerance |                  |
| $\pm 5\%, \pm 2\%, \pm 1\%, \pm 0.5\%, \pm 0.1\%$                         |    |     |     |  |       |       |           |                  |
| $\pm 5\%, \pm 2\%, \pm 1\%, \pm 0.5\%$                                    |    |     |     |  |       |       |           |                  |
| W1505                                                                     | 5Ω | 10Ω | 50Ω |  | 400KΩ | 650KΩ | 1.0MΩ     | Resistance Range |
| W2010                                                                     | 5Ω | 10Ω | 50Ω |  | 400KΩ | 650KΩ | 1.0MΩ     |                  |
| W2512                                                                     | 5Ω | 10Ω | 50Ω |  | 400KΩ | 650KΩ | 1.0MΩ     |                  |
| $\pm 50$ or $\pm 100$ ppm/°C                                              |    |     |     |  |       |       | TCR       |                  |
| $\pm 25$ ppm/°C                                                           |    |     |     |  |       |       |           |                  |

# Precision Thin Film Chip Resistors

## Environmental Data

| Environmental Test MIL-PRF-55342 | Maximum $\Delta R$ per Characteristic E | Performance  |              |
|----------------------------------|-----------------------------------------|--------------|--------------|
|                                  |                                         | Typical      | Maximum      |
| Thermal Shock                    | $\pm 0.10\%$                            | $\pm 0.02\%$ | $\pm 0.10\%$ |
| Low Temperature Operation        | $\pm 0.10\%$                            | $\pm 0.01\%$ | $\pm 0.05\%$ |
| Short Time Overload              | $\pm 0.10\%$                            | $\pm 0.01\%$ | $\pm 0.05\%$ |
| High Temperature Exposure        | $\pm 0.10\%$                            | $\pm 0.03\%$ | $\pm 0.10\%$ |
| Effects of Solder                | $\pm 0.20\%$                            | $\pm 0.01\%$ | $\pm 0.10\%$ |
| Moisture Resistance              | $\pm 0.20\%$                            | $\pm 0.03\%$ | $\pm 0.10\%$ |
| Life                             | $\pm 0.50\%$                            | $\pm 0.03\%$ | $\pm 0.10\%$ |

## Power Derating Curve



# Precision Thin Film Chip Resistors

## Physical Data

| Model        | L             | W             | H             | a             | b             |
|--------------|---------------|---------------|---------------|---------------|---------------|
| <b>W0402</b> | 0.040" ±0.002 | 0.021" ±0.002 | 0.012" ±0.003 | 0.008" ±0.002 | 0.010" ±0.002 |
| <b>W0603</b> | 0.063" ±0.004 | 0.031" ±0.004 | 0.020" ±0.004 | 0.012" ±0.005 | 0.015" ±0.005 |
| <b>W0805</b> | 0.081" ±0.005 | 0.050" ±0.005 | 0.020" ±0.006 | 0.015" ±0.008 | 0.016" ±0.008 |
| <b>W1206</b> | 0.126" ±0.006 | 0.063" ±0.005 | 0.024" ±0.004 | 0.025" ±0.010 | 0.025" ±0.010 |
| <b>W1505</b> | 0.155" ±0.007 | 0.050" ±0.005 | 0.024" ±0.004 | 0.020" ±0.010 | 0.020" ±0.010 |
| <b>W2010</b> | 0.203" ±0.007 | 0.103" ±0.005 | 0.024" ±0.004 | 0.020" ±0.008 | 0.020" ±0.008 |
| <b>W2512</b> | 0.255" ±0.007 | 0.124" ±0.005 | 0.024" ±0.004 | 0.020" ±0.008 | 0.020" ±0.008 |

## 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.

## Commercial Ordering Data

|                              |                                                                                      |
|------------------------------|--------------------------------------------------------------------------------------|
| <b>Prefix</b> .....          | <b>PFC</b> - <b>W1206</b> <b>R</b> - <b>01</b> - <b>1001</b> - <b>B</b>              |
| <b>Model</b> .....           | W0402; 0603; W0805; W1206<br>W1505; W2010; W2512                                     |
| <b>Termination</b> .....     | R = 60/40 Sn/Pb plated solder<br>LF = 100% tin plated (Pb-free)                      |
| <b>TCR Code</b> .....        | 01 = ±100ppm/°C; 02 = ±50ppm/°C; 03 = ±25ppm/°C<br>11 = ±15ppm/°C; 12 = ±10ppm/°C    |
| <b>Resistance Code</b> ..... | 4-Digit resistance code.<br>Ex: 10R0 = 10Ω; 1000 = 100Ω<br>1001 = 1000Ω; 1002 = 10KΩ |
| <b>Tolerance Code</b> .....  | J = ±5%; G = ±2%; F = ±1%; D = ±0.5%<br>B = ±0.1%; A = ±0.05%; Q = ±0.02%            |

For additional information or to discuss your specific requirements, please contact our Applications Team using the contact details below.

## Mil Screened Ordering Data\*

|                                    |                                                                                                                      |
|------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| <b>Prefix</b> .....                | <b>PFC</b> - <b>W1206</b> <b>R</b> - <b>04</b> - <b>1001</b> - <b>B</b>                                              |
| <b>Model</b> .....                 | W0402; W0603; W0805; W1206<br>W1505; W2010; W2512                                                                    |
| <b>Termination</b> .....           | R = 60/40 Sn/Pb plated solder                                                                                        |
| <b>MIL-Screened TCR Code</b> ..... | 04 = ±300ppm/°C; 05 = ±100ppm/°C; 06 = ±50ppm/°C<br>07 = ±25ppm/°C; 14 = ±20ppm/°C; 15 = ±15ppm/°C<br>16 = ±10ppm/°C |
| <b>Resistance Code</b> .....       | 4-Digit resistance code.<br>Ex: 10R0 = 10Ω; 1000 = 100Ω<br>1001 = 1000Ω; 1002 = 10KΩ                                 |
| <b>Tolerance Code</b> .....        | J = ±5%; G = ±2%; F = ±1%; D = ±0.5%<br>B = ±0.1%; A = ±0.05%; Q = ±0.02%                                            |

\*Please refer to our MIL-Chip Series datasheet to order parts qualified to MIL-PRF-55342.