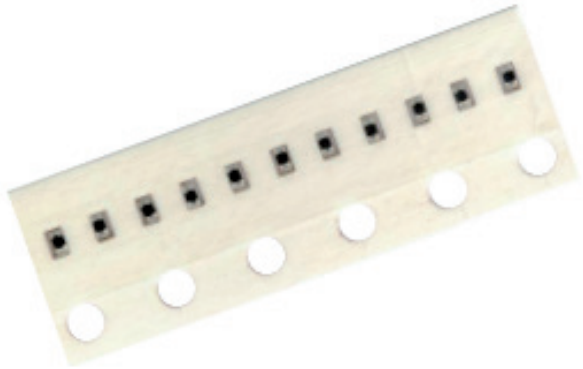
Precision Thin Film Chip Resistors

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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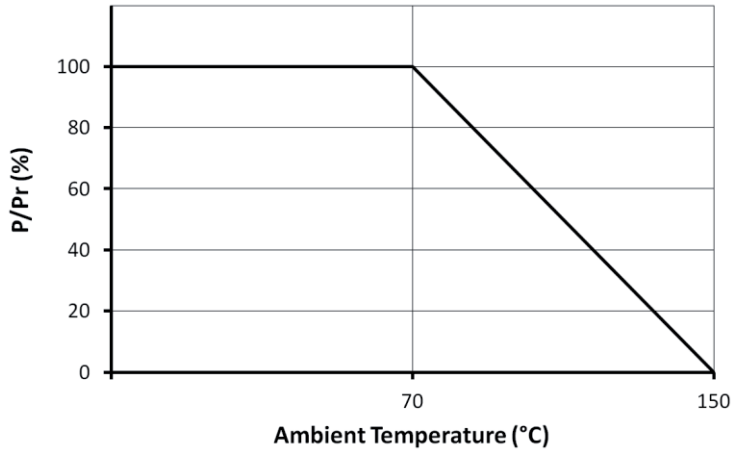
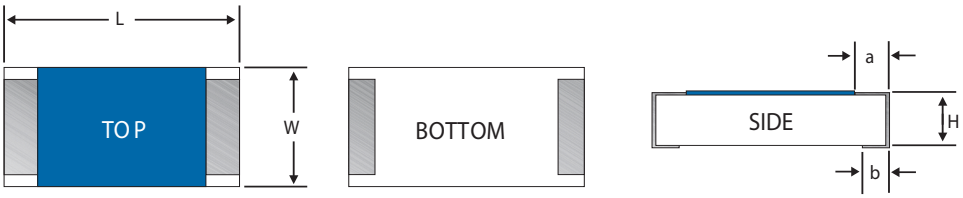
Manufacturing Capabilities Data

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 Type	2 Size	3 TCR	4 Value	5 Tolerance	6 Termination & Packing	
W=PFC	0402	R-12 = ±10ppm/°C	E24 = 3/4 characters E96 = 3/4 characters R = ohms K = kilohms 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 Family	2 Model	3 Termination	4 TCR	5 Value	6 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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