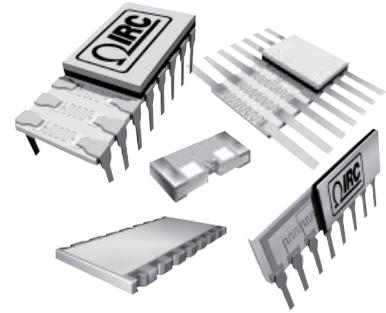


## Ultra Precision Networks

### Ultra Precision Series

- Custom schematics and values available
- Ultra-stable, high stability Tantalum Ultride™ film
- Ideal for medical instrumentation and process controls
- Superior biased moisture performance to Nichrome film
- No internal solder connections - Not susceptible to dendritic growth



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

The IRC Ultra-Precision Series utilizes our new Tantalum Ultride technology for superior long-term performance in harsh environments. Based on the proven performance of our TaNFilm® technology, our Ultra-Precision Networks maintain their characteristics resulting in the highest reliability and performance. Completely manufactured in our state-of-the-art, ISO qualified facility located in Texas, you can be assured consistent performance, reliability and delivery.

### Electrical Data

	DIP-U19xx	SIP-U47xx	FP-U89xx	SON-UN9xx	PFC-UD1206
<b>Resistance Range (W)</b>	1.00K - 100K	1.00K - 100K	1.00K - 50K	1.00K - 50K	1.00K - 50K
<b>Element Power @ 70°C (W)</b>	0.04	0.04	0.025	0.025	0.025
<b>Absolute Tolerance (%)</b>	To ±0.02				
<b>Ratio Tolerance (%)</b>	To ±0.01				
<b>Absolute TCR (ppm/°C)</b>	To ±10				
<b>Tracking TCR (ppm/°C)</b>	To ±1				
<b>Rated Voltage</b>	$\sqrt{P \times R}$ not to exceed 50V				
<b>Voltage Coefficient (ppm/Volt)</b>	<0.1				
<b>Operating Temperature Range (°C)</b>	-55 to +125				
<b>Film Technology</b>	Tantalum Ultride™				
<b>Substrate</b>	High Purity Alumina				

### Environmental Data

Test	Method	
<b>Noise</b>	MIL-STD - 202 Method 308	<-35 dB
<b>Absolute Thermal Shock</b>	MIL - STD - 202 Method 107, Cond B	ΔR ±0.01%
<b>Ratio Thermal Shock</b>		ΔR ±0.03%
<b>Absolute Humidity</b>	MIL - STD - 202 Method 106, With Bias Voltage Applied	ΔR ±0.02%
<b>Ratio Humidity</b>		ΔR ±0.005%
<b>Absolute Shelf Life</b>	1 year, 25 °C <65% RH	ΔR ±0.01%
<b>Ratio Shelf Life</b>		ΔR ±0.002%
<b>Absolute Stability</b>	70°C - 1000 hours, rated power	ΔR ±0.02%
<b>Ratio Stability</b>		ΔR ±0.005%

#### General Note

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Ultra Precision Series

Physical Data and Electrical Schematics - DIP

Lead Material:  
CDA 110 Copper ½ Hard (ETP)  
Plated 30-50 µm. Nickel, 25 µm. Minimum Gold

# of Leads	Dim A
8	0.400"
14	0.700"
16	0.800"

**U1959**  
8 7 6 5  
R1 R2 R3 R4  
1 2 3 4

**U1989**  
14 13 12 11 10 9 8  
R1 R2 R3 R4 R5 R6 R7  
1 2 3 4 5 6 7

**U1999**  
16 15 14 13 12 11 10 9  
R1 R2 R3 R4 R5 R6 R7 R8  
1 2 3 4 5 6 7 8

Physical Data and Electrical Schematics - SIP

Lead Material:  
CDA 110 Copper ½ Hard (ETP)  
Plated 30-50 µm. Nickel, 25 µm. Minimum Gold

Dim A	# of PINS
0.598	6
0.798	8
0.998	10

**U4769**  
R1 R2 R3  
1 2 3 4 5 6

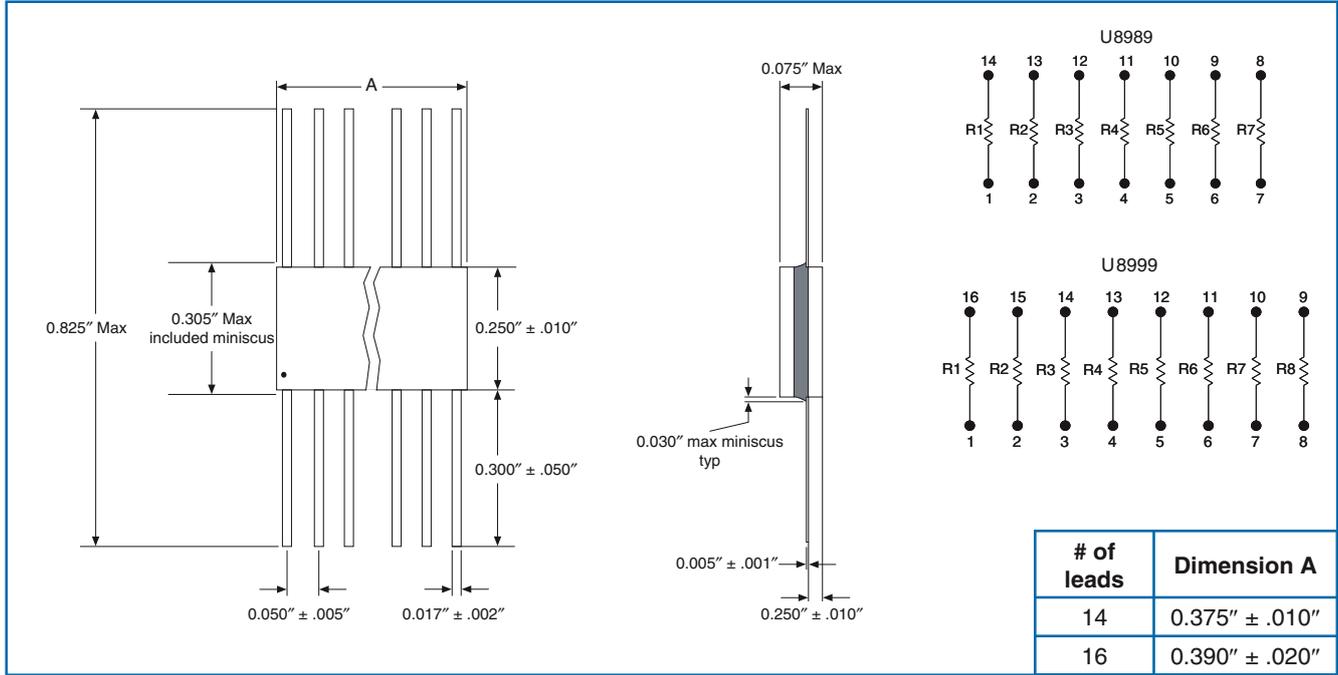
**U4789**  
R1 R2 R3 R4  
1 2 3 4 5 6 7 8

**U4709**  
R1 R2 R3 R4 R5  
1 2 3 4 5 6 7 8 9 10

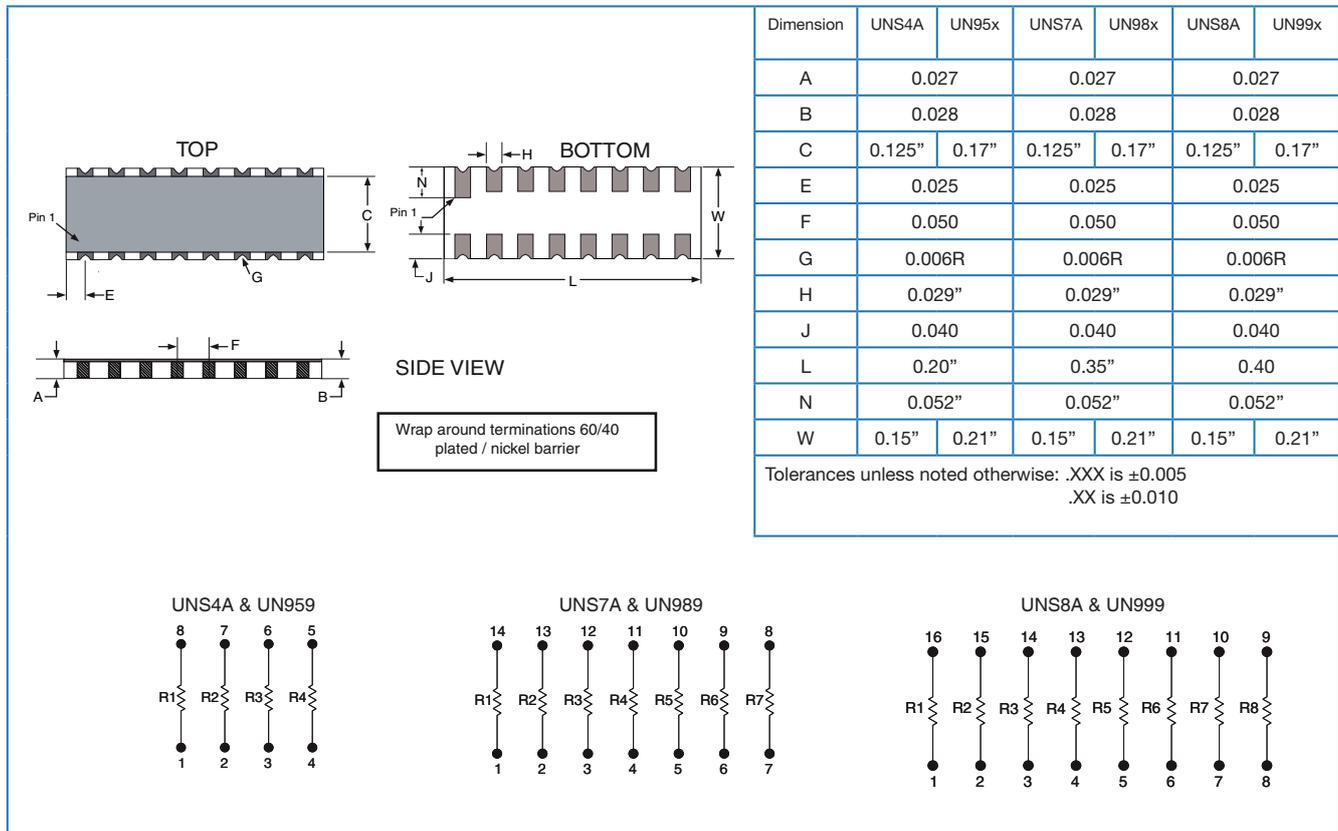
General Note

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## Physical Data and Electrical Schematics - Flat Pack



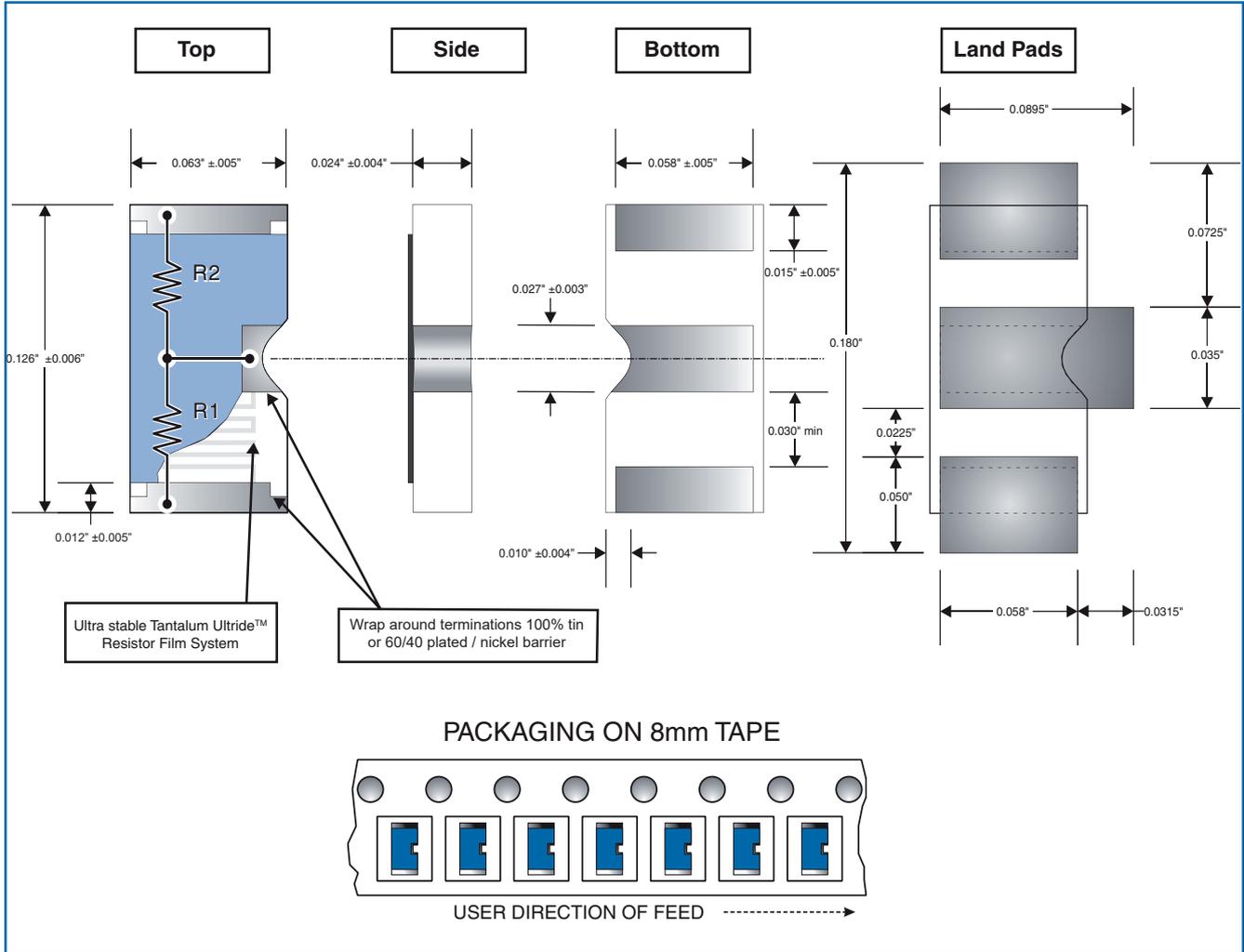
## Physical Data and Electrical Schematics - SON



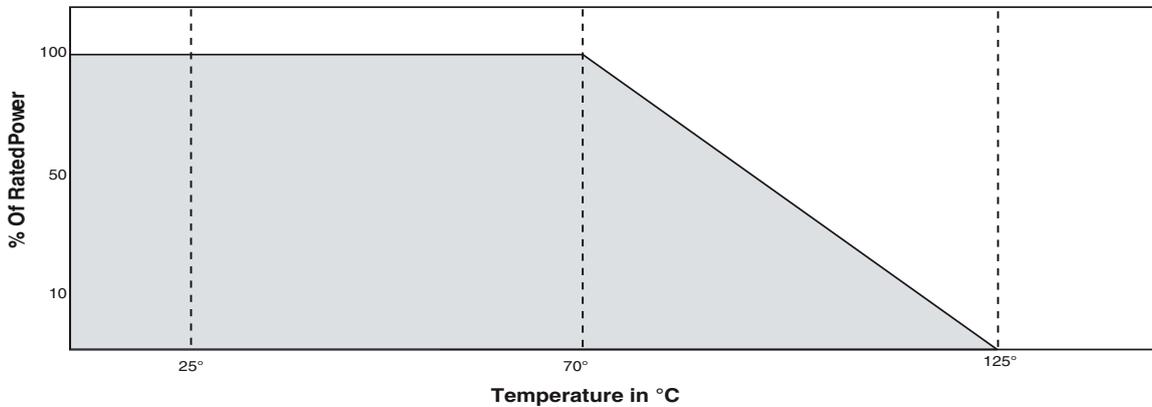
**General Note**

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### Physical Data and Electrical Schematics - PFC Divider



### Power Derating Curve



**General Note**

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## Ultra Precision Series

### Ordering Data DIP

Family ..... **DIP** - **U1999** - **03** - **1001** - **B** - **S** - **2**

**Model Number** .....  
 U1959: 8-Pin Schematic A  
 U1989: 14-Pin Schematic A  
 U1999: 16-Pin Schematic A

**TCR Characteristic** .....  
 Code      TCR (ppm/°C)  
 03          ±25  
 11          ±15  
 12          ±10

**Resistance Code** .....  
 Standard Four Digit MIL Resistance Code  
 Example: 1002 = 10KΩ

**TCR Tracking to R<sub>1</sub>**  
 1 = ±1 ppm/°C; 2 = ±2 ppm/°C; 5 = ±5 ppm/°C

**Ratio Tolerance to R<sub>1</sub> Code**  
 B = ±0.1%; A = ±0.05%; Q = ±0.02%; S = ±0.025%; T = ±0.01%

**Absolute Tolerance Code**  
 F = ±1.0%; D = ±0.5%; C = ±0.25%;  
 B = ±0.1%; A = ±0.05%; Q = ±0.02%

**Packaging**  
 Standard Packaging: Shipping Magazines

### SIP

Family ..... **SIP** - **U4709** - **12** - **1001** - **Q** - **S** - **2**

**Model Number** .....  
 U4769: 6-Pin Schematic G  
 U4789: 8-Pin Schematic G  
 U4709: 10-Pin Schematic G

**TCR Characteristic** .....  
 Code      TCR (ppm/°C)  
 03          ±25  
 11          ±15  
 12          ±10

**Resistance Code** .....  
 Standard Four Digit MIL Resistance Code  
 Example: 1002 = 10KΩ

**TCR Tracking to R<sub>1</sub>**  
 1 = ±1 ppm/°C; 2 = ±2 ppm/°C; 5 = ±5 ppm/°C

**Ratio Tolerance to R<sub>1</sub> Code**  
 B = ±0.1%; A = ±0.05%; Q = ±0.02%; S = ±0.025%; T = ±0.01%

**Absolute Tolerance Code**  
 F = ±1.0%; D = ±0.5%; C = ±0.25%;  
 B = ±0.1%; A = ±0.05%; Q = ±0.02%

**Packaging**  
 Standard Packaging: Shipping Magazines

### Flat Pack

Family ..... **FP** - **U8999** - **05** - **1001** - **Q** - **S** - **2**

**Model Number** .....  
 8989: 14-Pin Schematic A  
 8999: 16-Pin Schematic A

**TCR Code (ppm/°C)** .....  
 Code      TCR (ppm/°C)  
 03          ±25  
 11          ±15  
 12          ±10

**Resistance Code** .....  
 Standard Four Digit MIL Resistance Code  
 Example: 1002 = 10KΩ

**TCR Tracking to R<sub>1</sub>**  
 1 = ±1 ppm/°C; 2 = ±2 ppm/°C; 5 = ±5 ppm/°C

**Ratio Tolerance to R<sub>1</sub> Code**  
 B = ±0.1%; A = ±0.05%; Q = ±0.02%; S = ±0.025%; T = ±0.01%

**Absolute Tolerance Code**  
 F = ±1.0%; D = ±0.5%; C = ±0.25%;  
 B = ±0.1%; A = ±0.05%; Q = ±0.02%

**Packaging**  
 Standard Packaging: Shipping Magazines

#### General Note

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Ultra Precision Series

Ordering Data (continued)

SON

Family ..... **SON** - **UN989** - **03** - **1001** - **B** - **S** - **2**

**Model Number** .....  
 UNS4A & UN959: 8-Pin Schematic A  
 UNS7A & UN989: 14-Pin Schematic A  
 UNS8A & UN999: 16-Pin Schematic A

**TCR Characteristic** .....  
 Code      TCR (ppm/°C)  
 03          ±25  
 11          ±15  
 12          ±10

**Resistance Code** .....  
 Standard Four Digit MIL Resistance Code  
 1002 = 10KΩ

**TCR Tracking to R<sub>1</sub>**  
 1 = ±1 ppm/°C; 2 = ±2 ppm/°C; 5 = ±5 ppm/°C

**Ratio Tolerance to R<sub>1</sub> Code**  
 B = ±0.1%; A = ±0.05%; Q = ±0.02%; S = ±0.025%; T = ±0.01%

**Absolute Tolerance Code**  
 F = ±1.0%; D = ±0.5%; C = ±0.25%;  
 B = ±0.1%; A = ±0.05%; Q = ±0.02%

**Packaging**  
 Standard Packaging: Shipping Magazines

PFC-Divider

Family ..... **PFC** - **UD1206** - **03** - **1002** - **3301** - **B** - **S** - **1**

**Model Number** .....  
 UD1206: Sn/Pb terminations  
 UD1206LF: 100% tin (Pb-free) terminations

**TCR Characteristic** .....  
 Code      TCR (ppm/°C)  
 03          ±25  
 11          ±15  
 12          ±10

**R1 Resistance Code** .....  
 Standard Four Digit MIL Code  
 Ex: 1002 = 10KΩ

**TCR Tracking**  
 1 = ±1 ppm/°C; 2 = ±2 ppm/°C; 5 = ±5 ppm/°C

**Ratio Tolerance to R<sub>1</sub> Code**  
 B = ±0.1%; A = ±0.05%; Q = ±0.02%; S = ±0.025%; T = ±0.01%

**Absolute Tolerance Code**  
 F = ±1.0%; D = ±0.5%; C = ±0.25%;  
 B = ±0.1%; A = ±0.05%; Q = ±0.02%

**R2 Resistance Code**  
 Standard Four-Digit MIL Code

**Packaging**  
 See physical data for Tape & Reel details.

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

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