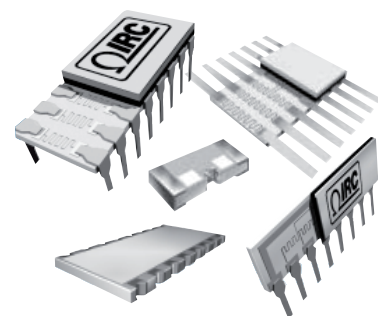


Ultra Precision Networks

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
Resistance Range (W)	1.00K - 100K	1.00K - 100K	1.00K - 50K	1.00K - 50K	1.00K - 50K
Element Power @ 70°C (W)	0.04	0.04	0.025	0.025	0.025
Absolute Tolerance (%)	To ±0.02				
Ratio Tolerance (%)	To ±0.01				
Absolute TCR (ppm/°C)	To ±10				
Tracking TCR (ppm/°C)	To ±1				
Rated Voltage	$\sqrt{PxR}$ not to exceed 50V				
Voltage Coefficient (ppm/Volt)	<0.1				
Operating Temperature Range (°C)	-55 to +125				
Film Technology	Tantalum Ultride™				
Substrate	High Purity Alumina				

Environmental Data

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

General Note

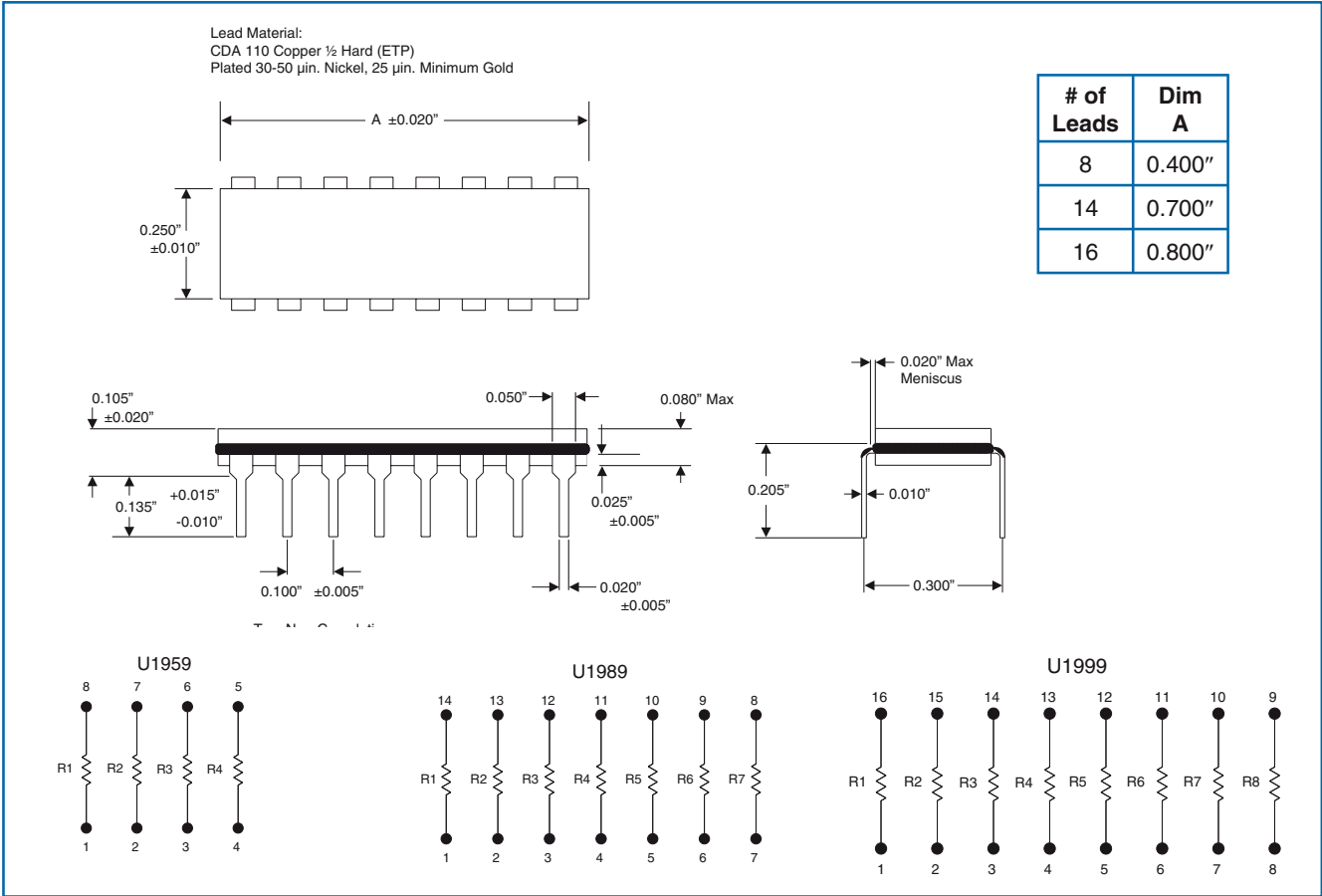
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All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

BI Technologies IRC Welwyn

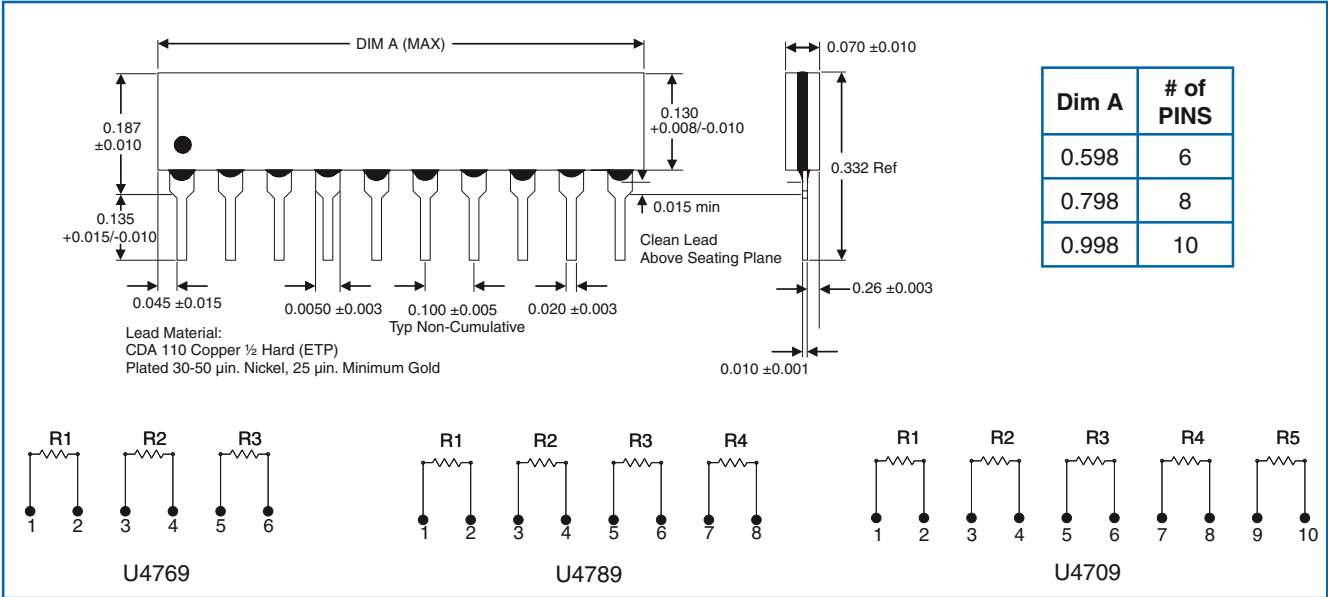
www.ttelectronics.com/resistors

Ultra Precision Series

Physical Data and Electrical Schematics - DIP



Physical Data and Electrical Schematics - SIP



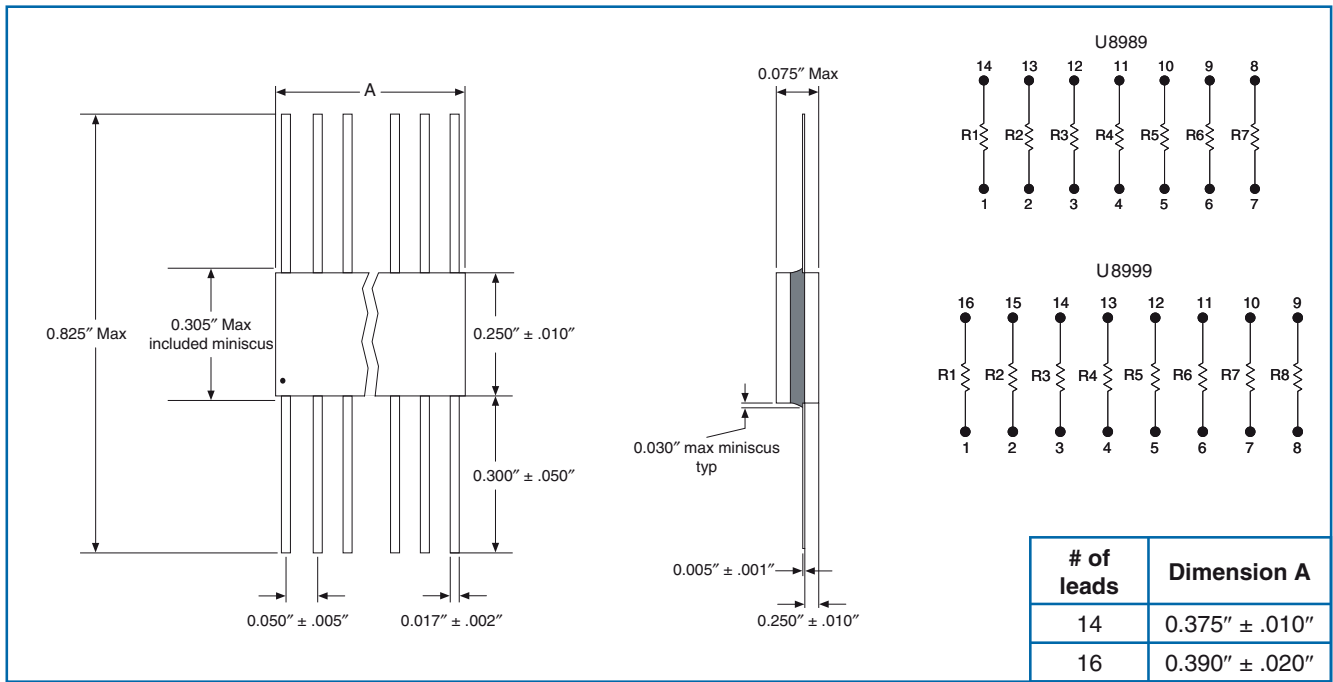
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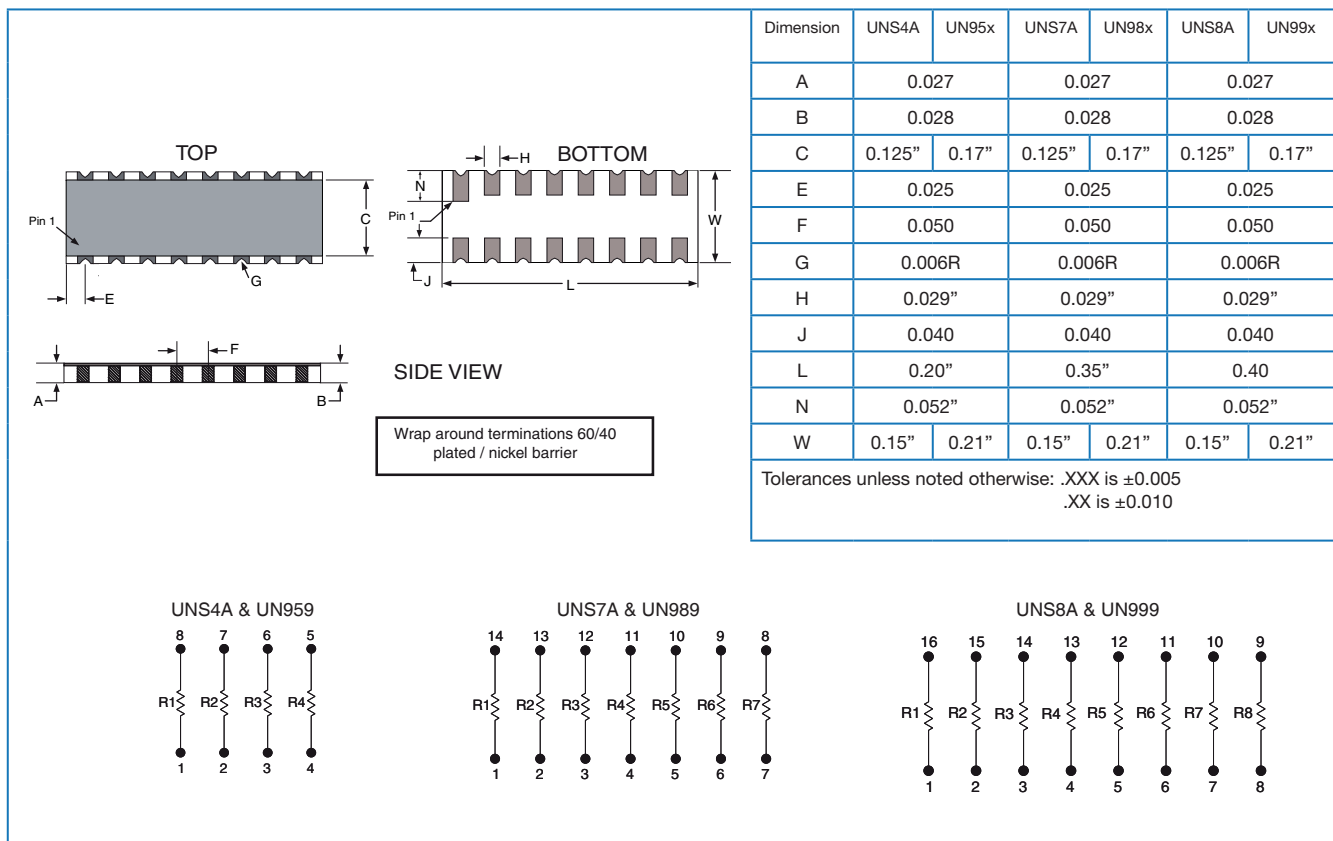
BI Technologies IRC Welwyn

www.ttelectronics.com/resistors

Physical Data and Electrical Schematics - Flat Pack



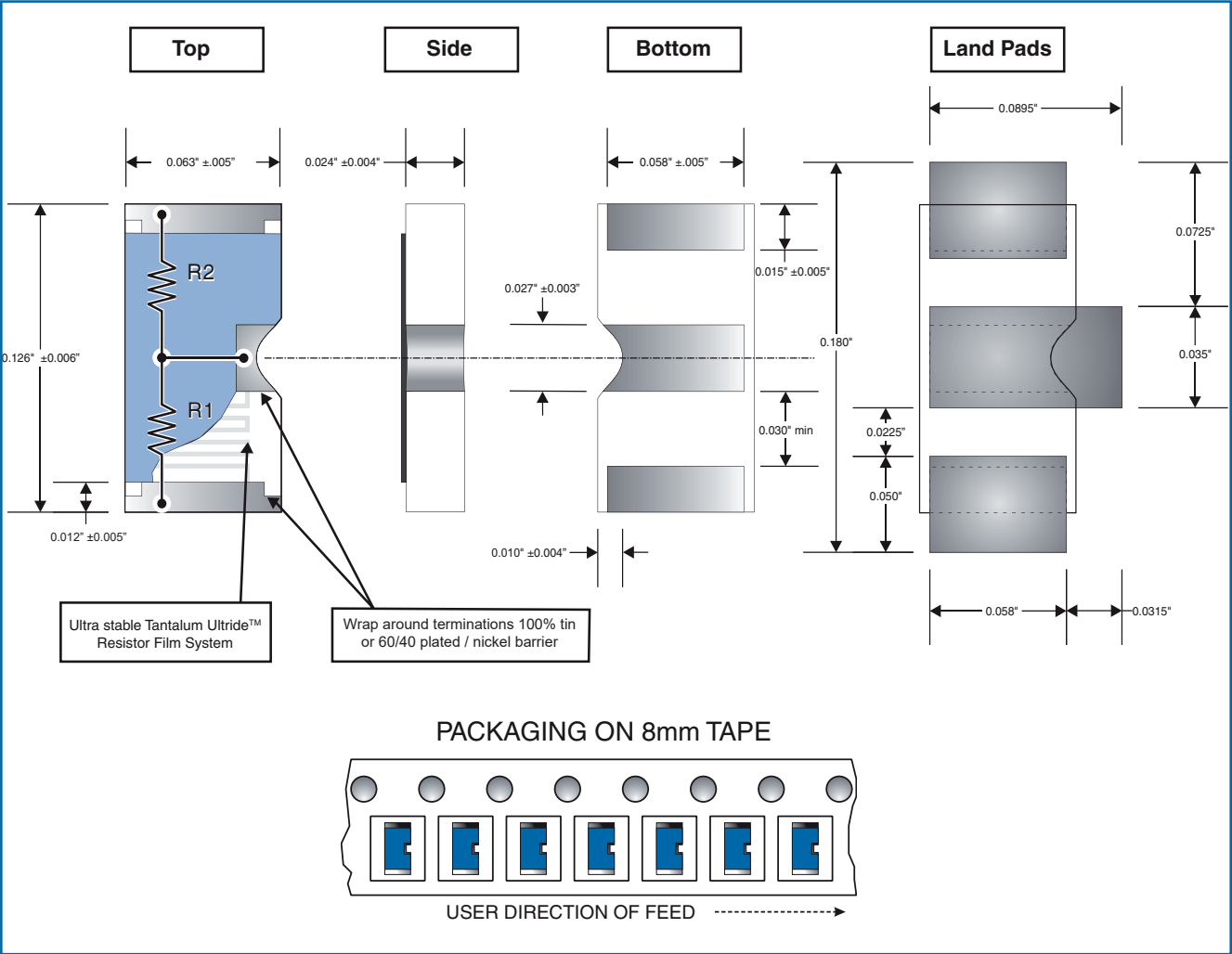
Physical Data and Electrical Schematics - SON



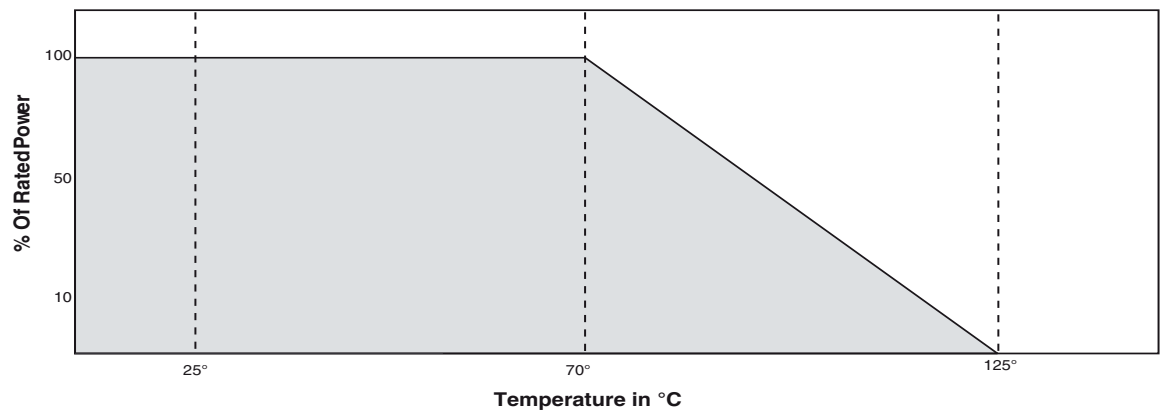
General Note

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Physical Data and Electrical Schematics - PFC Divider



Power Derating Curve



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BI Technologies IRC Welwyn

www.ttelectronics.com/resistors

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_1
1 = ±1 ppm/°C; 2 = ±2 ppm/°C; 5 = ±5 ppm/°C

Ratio Tolerance to R_1 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_1
1 = ±1 ppm/°C; 2 = ±2 ppm/°C; 5 = ±5 ppm/°C

Ratio Tolerance to R_1 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_1
1 = ±1 ppm/°C; 2 = ±2 ppm/°C; 5 = ±5 ppm/°C

Ratio Tolerance to R_1 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

CodeTCR (ppm/°C)
03±25
11±15
12±10

Resistance Code

Standard Four Digit MIL Resistance Code
1002 = 10KΩ

TCR Tracking to R₁

1 = ±1 ppm/°C; 2 = ±2 ppm/°C; 5 = ±5 ppm/°C

Ratio Tolerance to R₁ 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

CodeTCR (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 R₁ 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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