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# **DIRECT**

## **Electronics Tech.**

### **(UPSC)**

# **Ultra Precision Resistor Networks**

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**► Product Introduction****Direct's compact size ultra-precision resistor networks take accuracy pole position.****Features :**

- Precision tolerance tight to T( $\pm 0.01\%$ ).
- Superior TCR narrowed to C10 ( $\pm 2 \text{ ppm}/^\circ\text{C}$ ).
- Metal film precision networks, Lead (Pb)-free and RoHS compliant.
- Any value available within resistance range, excellent stability and reliability.

**Applications :**

- Precision Bypass.
- Simulation Equipment.
- Test and Measurement.
- Medical, Bridge Circuitry.
- Precision Amplifiers, Divider.
- High Precision Instrumentation.
- Audio (High End Stereo Equipment).
- Commercial Avionics, Data Convertors.

Following market demands for components to deliver ultra-precision applications in often very confined spaces, design engineers can now benefit from new technologies capable of Temperature Coefficient C10 ( $\pm 2 \text{ ppm}/^\circ\text{C}$ ), compact body size UPSC Networks.

Constructed with Direct EE/RE 1/10 series to form a stable, high precision and low temperature coefficient network resistor, the networks are protected from moisture by a proprietary passivation material.

Customer can specify Tolerance and Temperature Coefficient range designed to satisfy challenging and specific technical requirements. The resistance and TCR range makes these (UPSC) series ideal for a number of applications, including test and measurement devices, commercial avionics and medical equipment or devices.

The thin-film (UPSC) also can be designed with custom schematics to meet individual customer specifications. The networks provide excellent resistor precision and accuracy with resistor tolerances to  $\pm 0.01\%$ . They have TCR values to  $\pm 2 \text{ ppm}/^\circ\text{C}$ , providing superior performance over the military temperature range.

UPSC Series equate IRC, EBG Precision Devices with more competitive price and fast delivery. For non-standard technical requirements and special applications, please contact our manufacturer or sales representatives. Besides, you can link to Direct official website "[Precision Resistors](http://www.direct-token.com)" to get more information.

**UPR Versus UPSC Series:**

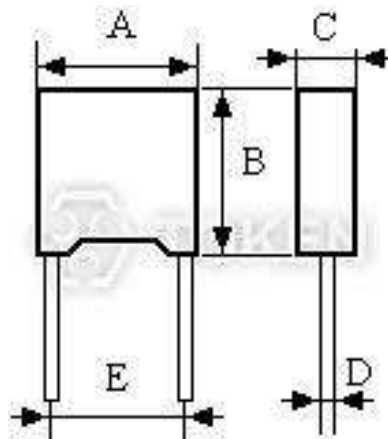
- UPSC Series have the advantage of compact body size.
- The electric characteristics of UPR and UPSC are the same.
- UPR Series have the advantage of wider resistance range  $10\Omega \sim 5\text{M}\Omega$ .



► **Dimensions & Technical Characteristics**

**Dimensions & Technical Characteristics (UPSC)**

<b>Dimensions (Unit: mm)</b>	A	7.65± 0.3
	B	8.6± 0.3
	C	2.6± 0.3
	D	0.6 ± 0.05
	E	3.81± 0.5
<b>Working Temperature (°C)</b>	-10 ~ +70	
<b>Rated Wattage at 70°C (W)</b>	0.2	
<b>Maximum Working Voltage (V)</b>	250	
<b>Nominal Resistance Range (Ω)</b>	40Ω ~ 5MΩ	200Ω ~ 500KΩ
<b>Nominal Resistance Tolerance (%)</b>	A2(±0.02), A5(±0.05), B(±0.1)	T(±0.01), A2(±0.02), A5(±0.05),B(±0.1)
<b>Temperature Coefficient (ppm/°C) [TCR: +25°C ~ +85°C]</b>	C9(±3), C7(±5), C6(±10), C5(±15), C3(±25)	C10(±2), C9(±3), C7(±5), C6(±10), C5(±15), C3(±25)



**Resistor Network (UPSC) Dimensions**

- Remark: 1. Customer can specify Tolerance and Temperature Coefficient range to meet your own needs.
- 2. It can be required to Direct's representatives if customer's requirement beyond the range of Direct's specifications.



► **UPSC Versus UPR Series**

**UPSC Versus UPR Series**

Nominal Resistance Range ( $\Omega$ )		Nominal Resistance Tolerance (%)	Temperature Coefficient (ppm/ $^{\circ}$ C) [TCR: +25 $^{\circ}$ C ~ +85 $^{\circ}$ C]
UPSC	UPR		
40 $\Omega$ ~ 5M $\Omega$	10 $\Omega$ ~ 5M $\Omega$	A2 $\pm$ 0.02 A5 $\pm$ 0.05 B $\pm$ 0.1	C9 $\pm$ 3ppm/ $^{\circ}$ C C7 $\pm$ 5ppm/ $^{\circ}$ C C6 $\pm$ 10ppm/ $^{\circ}$ C C5 $\pm$ 15ppm/ $^{\circ}$ C C3 $\pm$ 25ppm/ $^{\circ}$ C
200 $\Omega$ ~ 500K $\Omega$	100 $\Omega$ ~ 500K $\Omega$	T $\pm$ 0.01 A2 $\pm$ 0.02 A5 $\pm$ 0.05 B $\pm$ 0.1	C10 $\pm$ 2ppm/ $^{\circ}$ C C9 $\pm$ 3ppm/ $^{\circ}$ C C7 $\pm$ 5ppm/ $^{\circ}$ C C6 $\pm$ 10ppm/ $^{\circ}$ C C5 $\pm$ 15ppm/ $^{\circ}$ C C3 $\pm$ 25ppm/ $^{\circ}$ C
<p>(UPSC) Compact Size Networks Dimensions (Unit: mm)</p>		<p>(UPR) Wider Ohmic Range Networks Dimensions (Unit: mm)</p>	

**Order Codes**

**Order Codes (UPSC) Resistance Value 40Ω ~ 5MΩ**

UPSC	530R		A5		C6		P	
Part Number	Resistance Value (Ω)		Resistance Tolerance (%)		Temperature coefficient (PPM/°C)		Package	
UPSC							P	Bulk
53R	53	A2	±0.02	C3	±25			
530R	530	A5	±0.05	C5	±15			
5K3	5.3K	B	±0.10	C6	±10			
53K	53K			C7	±5			
530K	530K			C9	±3			

**Order Codes (UPSC) Resistance Value 200Ω ~ 500KΩ**

UPSC	10K		T		C6		P	
Part Number	Resistance Value (Ω)		Resistance Tolerance (%)		Temperature coefficient (PPM/°C)		Package	
UPSC							P	Bulk
200R	200	T	±0.01	C3	±25			
10K	10K	A2	±0.02	C5	±15			
100K	100K	A5	±0.05	C6	±10			
		B	±0.10	C7	±5			
				C9	±3			
				C10	±2			

## ► General Information

### **High Precision Devices Made in Direct**

Direct is equipped to design and produce custom components to meet many design and reliability demands.

Direct's line of high-reliability and precision products reflects a long-term commitment to our industrial and military customers. In addition to standard industry-grade resistor products, we also have many resistive products designed to meet various military source-controlled drawings.

We continually strive to meet the changing application requirements of the markets by developing new products and manufacturing technologies on an on-going basis.

### **Enhanced Precision and Stability for Low-Cost Uses**

Every component Direct provides to the commercial, industrial, and military markets for cost-efficiency uses is backed by the comprehensive testing and failure analysis capabilities of our own technical staff, whom are industrial experts in understanding and meeting the requirements of the environment.

### **Low TCR - Fast Approach to a Steady State**

Direct Electronics provides a precision Temperature Coefficient of Resistance TCR as low as 2 ppm/°C, If you must guarantee a smaller resistance change in your application. TCR is the best known parameter used to specify a resistor's stability, and is used to depict the resistive element's sensitivity to temperature change due to ambient temperature variations.

A resistor's TCR tells how much its value changes as its temperature changes. It is usually expressed in ppm/°C (parts per million per degree Centigrade) units.

### **Long-Term Proven Service**

Our technical expertise, our knowledge of the industry, our broad product offering, and our ability to work long-term are all part of Direct's ongoing commitment to meeting the changing requirements of our most reliability-conscious customer, today and in the future.

