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DIRECT

Electronics Tech.

(UPRND) High Precision Network Voltage Divider

Web: www.direct-token.com

Email: rfq@direct-token.com

Direct Electronics Industry Co., Ltd.

China: 12F, Zhong Xing Industry Bld., Chuang Ye Road,
Nan Shan District, Shen Zhen City,
Guang Dong, China 518054
Tel: +86 755 26055363; Fax: +86 755 26055365

Taiwan: No.137, Sec. 1, Zhongxing Rd., Wugu District,
New Taipei City, Taiwan, R.O.C. 24872
Tel: +886 2981 0109 Fax: +886 2988 7487

► Product Introduction

Direct's (UPRND) high precision voltage divider networks sharpen the edge of application accuracy.

Features :

- UPRND: Parallel dip type; UPRNS: Serial dip type.
- Any value available within resistance range.
- Lead (Pb)-free and RoHS compliant.
- Precision tolerance tight to A2($\pm 0.02\%$).
- Metal film precision networks, excellent stability and reliability.
- Superior TCR narrowed to Absolute C7(± 5 ppm/ $^{\circ}\text{C}$), Relative C10(± 2 ppm/ $^{\circ}\text{C}$).

Applications :

- Industrial, Precision Bypass, Divider.
- Medical, Test and Measurement Equipment.
- Electron Beam (EB) Applications Scanning.
- Recording Equipment, Electron Microscopes.
- Military, airborne, High precision instrumentation.
- Precision Amplifiers, Audio (High End Stereo Equipment).

The Precision Thin-Film Network technology provides a significant reduction of the resistive component's sensitivity to ambient temperature variations (TCR).

Designers can now guarantee a high degree of stability and accuracy in fixed-resistor applications using solutions based on Direct's revolutionary Network technology. This technology allows customer orientated products, designed to satisfy challenging and specific technical requirements.

Precision Network Resistors UPRND Series meets Lead (Pb)-free and RoHS compliant. Known for providing design engineers with a comprehensive range of industrial-qualified resistive devices, Direct Electronics has further expanded its precision product capabilities in Serial UPRNS and Parallel UPRND Series.

Providing design engineers with an economical power resistor with high quality performance, Direct Electronics offers low cost industrial grade Parallel UPRND and Serial UPRNS Networks.

Direct's UPRND/UPRNS Series are assembled by EE/RE 1/10 series to form a stable, high precision thin-film network. Characteristic of UPRND Series meet extreme low temperature coefficient.

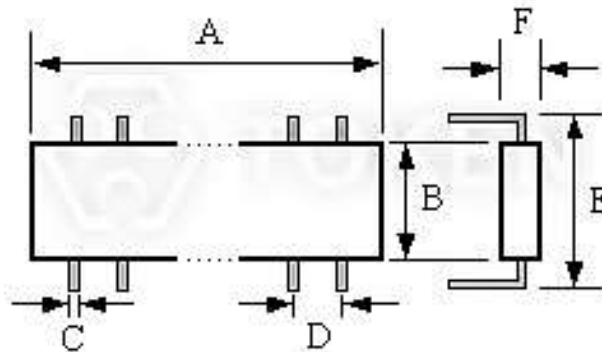
Parallel UPRND Series equate IRC, EBG Precision Devices with fast delivery and more competitive price. For non-standard technical requirements and special applications, please contact us. Besides, you can link to Direct official website "[Precision Resistors](http://www.direct-token.com)" to get more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



► **Dimensions & Technical Characteristics**

Dimensions & Technical Characteristics (UPRND)

UPRND A(mm)±0.5		5.08	11.8
Number of Resistors #		2	4
Dimensions(Unit: mm)	A	5.08±0.5 ~ 11.8±0.5	
	B	9.0±0.5	
	C	0.6±0.05	
	D	2.54±0.05	
	E	11.5±0.5	
	F	3.0±0.5	
Rated Wattage of one element unit at 70°C (W)		0.1	
Maximum Working Voltage (V)		200	
Nominal Resistance Range of component element unit (Ω)		10 ~ 1M	
Absolute Tolerance (%)		A2(±0.02), A5(±0.05), B(±0.1), C(±0.25), D(±0.5), F(±1.0)	
Relative Tolerance (%)		T(±0.01), A2(±0.02), A5(±0.05), B(±0.1)	
Absolute Temperature Coefficient (ppm/°C)		C7(±5), C6(±10), C5(±15), C3(±25), C2(±50)	
Relative Temperature Coefficient (ppm/°C)		C10(±2), C9(±3), C7(±5), C6(±10), C5(±15)	
Working Temperature (°C)		-10 ~ +70	



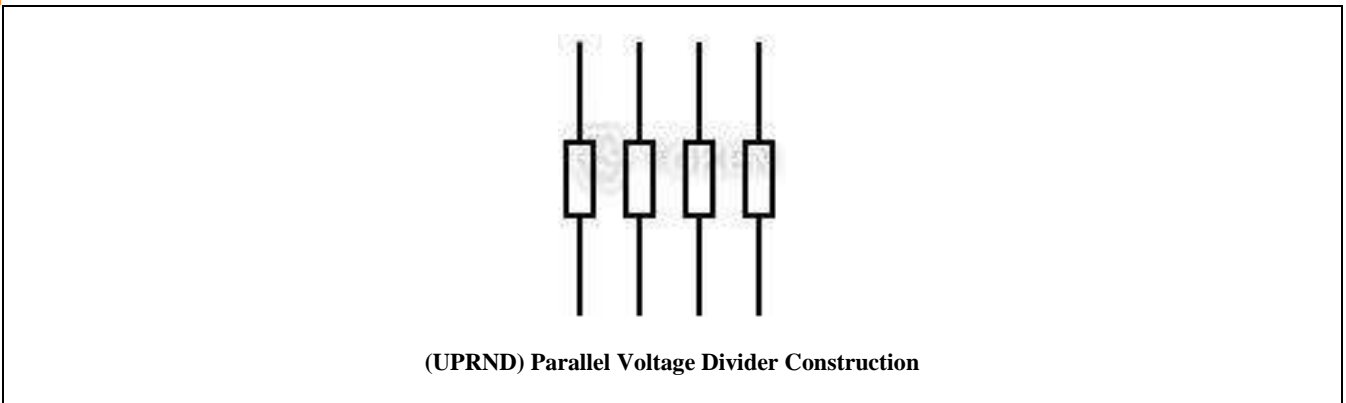
Parallel Voltage Divider (UPRND) Dimensions

- Remark: 1. Absolute value means all factors (Tolerance and Temperature Coefficient) of network component element units are independent.
- 2. Relative value means the maximum difference factor among component element units of Network Resistor.



► **Examples for Construction**

Construction Examples (UPRND)



- 1. There are no standard nominal resistances for UPRNS/UPRND Series.
- 2. It can be required to Direct's representatives if requirement beyond above specifications.
- 3. Customer can designate or specify the number of component elements of Network Resistor according with this specification of UPRNS/UPRND Series to meet your own needs.

► **UPRNS Versus UPRND Series**

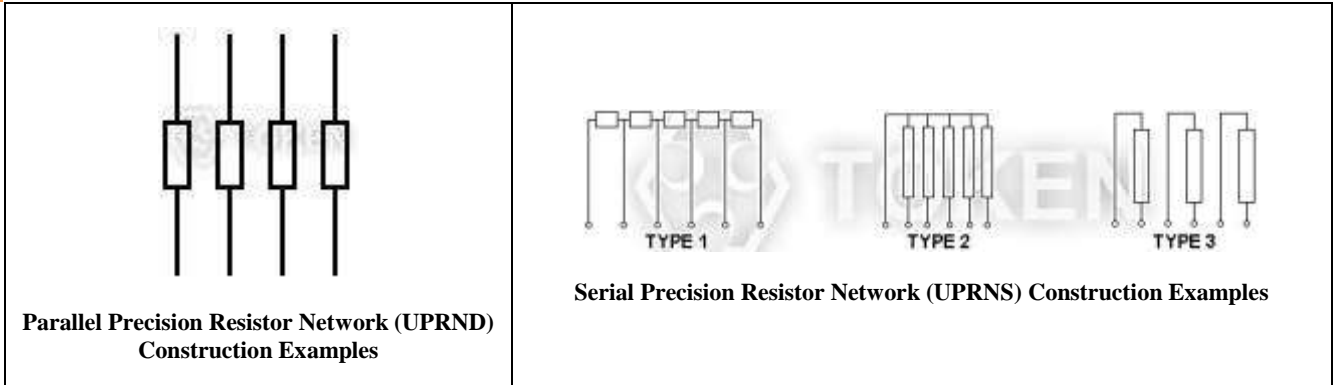
Precision Resistor Network Dimensions UPRND Versus UPRNS

<p style="text-align: center;">Parallel Precision Resistor Networks (UPRND) Dimensions</p>	(UPRND) Dimensions Unit: mm $A \pm 0.5$	Number of Resistors
	5.08	2
	11.8	4

<p style="text-align: center;">Serial Precision Resistor Networks (UPRNS) Dimensions</p>	(UPRNS) Voltage Divider Resistor Networks Dimensions Unit: mm $A \pm 0.5$	Pins
	14.20	5
	16.9	6
	21.9	8
	24.1	9
	35	13
	42.3	16
	50.8	19



Internal Connection UPRNS Versus UPRND



Order Codes

Order Codes (UPRND)

UPRND	4	100R	B		C5				
Part Number	Number of Resistors	Resistance Value (Ω)		Resistance Tolerance (%)		Temperature coefficient (PPM/ $^{\circ}$ C)			
UPRND									
	2	10R	10	Absolute	A2	± 0.02	Absolute	C7	± 5
	4	100R	100		A5	± 0.05		C6	± 10
		1K	1K		B	± 0.10		C5	± 15
		1M	1M		C	± 0.25		C3	± 25
					D	± 0.50		C2	± 50
			F		± 1.00	C10	± 2		
			T	± 0.01	Relative	C9	± 3		
			A2	± 0.02		C7	± 5		
			A5	± 0.05		C6	± 10		
			B	± 0.10		C5	± 15		



► 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.

