



UPRNS21 SERIES

CUSTOMER ORIENTED RESISTOR NETWORKS

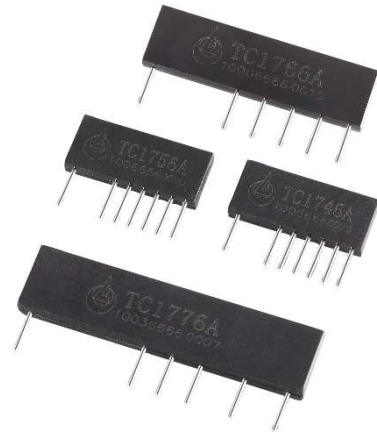
ULTRA-HIGH VOLTAGE RESISTOR NETWORKS

ULTRA-HIGH VOLTAGE RESISTORS

MOLD TYPE

Feature

- Advanced thin film technology
- Excellent overall stability: Class 0.025%
- Ultra-precision: up to $\pm 0.1\%$
- Very low TCR: up to $\pm 25\text{ppm/K}$
- Ultra-high voltage resistors: up to **20,000V**
- Very low noise and voltage coefficient





1. PART NUMBER:

Part number is identified by the series name, number of leads, number of resistors, layout profile, tolerance, temperature coefficient, match tolerance, match temperature coefficient, packing type and resistance value.

For Example:

UPRNS	2	1	S	B	3	T	1008
Series Name	Number of Leads	Number of Resistor	Layout Profile	Tol.	TCR	Packing	Resistances

- (1) Series name: UPRNS21
- (2) Number of the leads: 2 pins
- (3) Number of resistors: 1 pcs
- (4) S: resistors are series connected inside
- (5) Tolerance: B=±0.1%; C=±0.25%; D=±0.5%; F=±1.0%; J=±5.0%
- (6) TCR 3=±25ppm/°C; 2=±50ppm/°C; 1=±100ppm/°C; 0= >100ppm/°C;
- (7) Resistance value: 1001,1002, 3303, 1004, 2006, 1008

2. Marking:

Digital marking with part number and batch number and series number

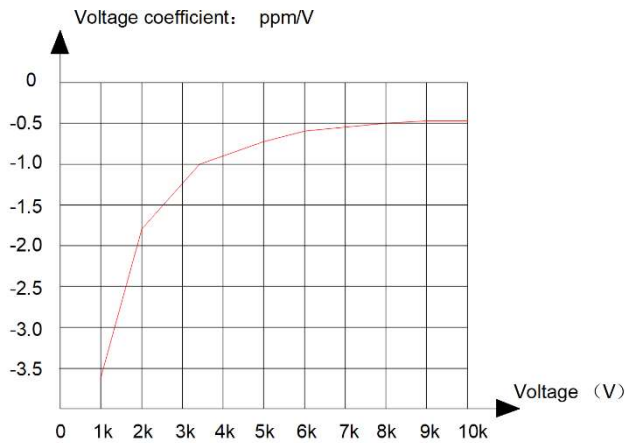


3. ELECTRICAL CHARACTERISTICS

Type	UPRNS21S	型号
Rated dissipation, P_{70}	2.5W	70°C下额定功率
Maximum operating voltage U_{ma}	20,000V _{DC}	U_{max} 额定工作电压
Resistance range	1k~1GΩ	标准阻值范围
Tolerance	F(±1.0%); D(±0.50%); C(±0.25%); B(±0.10%)	精度
Temperature coefficient	±25ppm/°C	温度系数
Operating Temperature range	-55°C~25°C; 25°C~125°C	工作环境温度
Dimension	±0.5(mm)	尺寸

- Unless otherwise specified, all values are tested at the following condition:
Temperature: 21°C to 25°C; Relative humidity: 45% to 60%
- All resistance calibrated at 100Vdc unless otherwise specified.

4. Voltage coefficient curve





5. ENVIRONMENTAL CHARACTERISTICS

(1) Insulation Resistance

IEC 60115-1, 4.6: in V-block for 60 seconds, the test resistance should be high than 10,000 M Ohm.

(2) Dielectric Withstanding Voltage

IEC 60115-1 4.7: Place resistors in V-block for 60 Seconds, no breakdown or flashover.

(3) Temperature Coefficient Test

IEC 60115-1, 4.8: Test of resistors at room temperature and 60°C or 100°C on request above room temperature. Then measure the resistance. The Temperature Coefficient is calculated by the following equation and its value should be within the range requested.

$$\text{Resistor Temperature Coefficient} = \frac{R - R_0}{R_0} \times \frac{1}{t - t_0} \times 10^6$$

R = Resistance value under the testing temperature

R₀ = Resistance value at the room temperature

t = the 2nd testing temperature

t₀ = Room temperature

(4) Short Time Over Load Test

IEC60115-1 4.13: At 10 times rated voltage or 2 times the maximum working voltage whichever is lower for 5 seconds, the resistor should be free from defects. The change of the resistance value should be within ±(0.5%) as compared with the value before the test.

(5) Solderability

IEC 60115-1, 4.17: 235±5°C for 3±0.5 Seconds, there are at least 95% solder coverage on the termination.

(6) Resistance to soldering heat:

IEC 60115-1, 4.18: 260±3°C for 10±1 Seconds, immersed to a point 3±0.5mm from the body. The change of the resistance value should be within ±(0.25%) as compared with the value before the test.



(7) Climatic sequence

IEC 60115-1, 4.19: -55°C to Room Temp. to +155°C to Room Temp. (5 cycles). The change of the resistance value shall be within $\pm(1.0\%)$ as compared with the value before the test.

(8) Damp Heat Steady State

IEC 60115-1, 4.24: $40\pm 2^\circ\text{C}$, 90-95% RH for 56 days, loaded with 0.1 times RCWV or the maximum working voltage whichever is lower. The change of the resistance value should be within $\pm(5.0\%)$ as compared with the value before the test.

(9) Load Life Test

IEC 60115-1, 4.25: $70\pm 2^\circ\text{C}$ at RCWV or the maximum working voltage whichever is lower for 1,000+48/-0 Hr. (1.5Hr. on, 0.5Hr. off). The resistors shall be arranged not much effected mutually by the temperature of others and the excessive ventilation shall not be performed. The change of the resistance value should be within $\pm(5.0\%)$ as compared with the value before the test.

(10) Accidental Overload Test

IEC 60115-1, 4.26: 4 times RCWV for 1 Minute. No evidence of flaming or arcing

(11) Resistance to Solvent

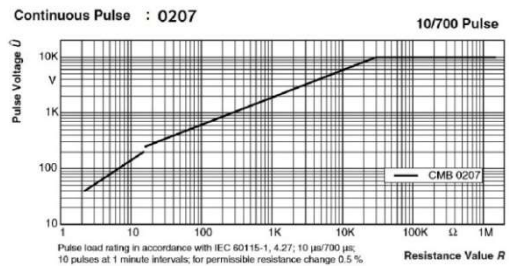
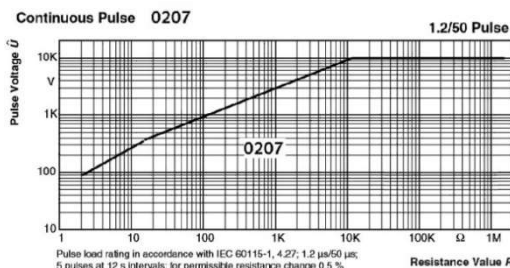
IEC 60115-1, 4.30: IPA for 5 ± 0.5 Min. with ultrasonic. No deterioration occurred.

(12) Surge compatibility test

IEC 60115-1, 4.27: Surge voltage capability up to maximum 10 kV 1.2/50 μs pulse, 5 pulses at 12 s intervals; for permissible resistance change $\pm (0.5 \%)$

IEC 60115-1, 4.27: Surge voltage capability up to maximum 10 kV 10/700 μs pulse, 10 pulses at 1 m intervals; for permissible resistance change $\pm (0.5 \%)$

The pulse loading voltage see the right graphs:





(13) High voltage high pulse overload

IEC 60115-1, 4.28: Apply 10 pulses with 10 times rated voltage or 2 times the maximum working voltage whichever is lower to the resistor, the pulses parameter is 10 μ s/700 μ s. The change of the resistance shall be within \pm (2.0%).

(14) Electrostatic discharge (ESD human body mode)

IEC 60115-1, 4.40: Apply 3 negative and 3 positive discharges on resistors, discharge voltage 6000V on 0204 size and 16,000V on 0207 size and 0411 size and 0617 size (equivalent to MIL-STD-883, method 3015). The change of the resistance value should be within \pm (0.50%) as compared with the value before the test.

Disclaimer

All products, product specifications and data are subject to change without notice to improve reliability, function or design or otherwise.

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