



UPRNS SERIES

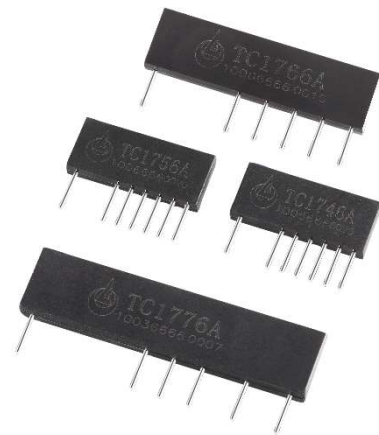
CUSTOMER ORIENTED RESISTOR NETWORKS

ULTRA-PRECISION RESISTOR NETWORKS

MOLD TYPE

Feature

- Advanced thin film technology
- Excellent overall stability: Class 0.025%
- Ultra-precision: up to $\pm 0.01\%$
- Match tolerance up to $\pm 0.01\%$
- Very low TCR: up to $\pm 1\text{ppm/K}$
- Match TCR up to $\pm 1\text{ppm/K}$
- Very low noise and voltage coefficient
- Compliant to RoHS directive 2011/65/EU
- Compliant to REACH (EC No. 1907/2006)) (last updated: 27/06/2018)



Description

Production is strictly controlled and follows an extensive set of instructions established in production procedure for reproducibility. A homogeneous film of metal alloy is deposited on the surface of **CeramTec**'s ceramic cores (96% Al_2O_3) and conditioned to achieve the desired stability and the temperature coefficients.

A professional laser is pressed on the metalized rods to not only achieve the target value but also perfect electronics performance by smoothly cutting a helical groove in the resistance layer on the ceramic rods without damaging the ceramics. The resistance layers are covered by a protective coating and hard Bakelite designed for electrical, mechanical and climatic protection.

The resistors are tested in accordance with MIL-R-10509F which refers to MIL-STD-202 or IEC60115.



1. PRODUCT: UPRNS series ultra-precision resistors networks

2. 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	6	5	S	B	7	L	9	T	2006
Series Name	Number of Leads	Number of Resistor	Layout Profile	Tol.	TCR	Match Tol.	Match TCR	Packing	Resistances

- (1) Series name: UPRNS
- (2) Number of the leads: 6 pins
- (3) Number of resistors: 5 pcs
- (4) S: resistors are series connected inside
- (5) Tolerance: L=±0.01%; P =±0.025%; W=±0.05%; B=±0.1%; C=±0.25%; D=±0.5%
- (6) TCR 10=±1ppm/°C; 9=±2ppm/°C; 8=±3ppm/°C; 7=±5ppm/°C; 6=±10ppm/°C;
- (7) Match Tolerance: L=±0.01%; P =±0.025%; W=±0.05%; B=±0.1%; C=±0.25%;
- (8) TCR 10=±1ppm/°C; 9=±2ppm/°C; 8=±3ppm/°C; 7=±5ppm/°C; 6=±10ppm/°C;
- (9) Resistance value: 1R00、20R0、1000、1001、1002、3303、1004

3. Marking:

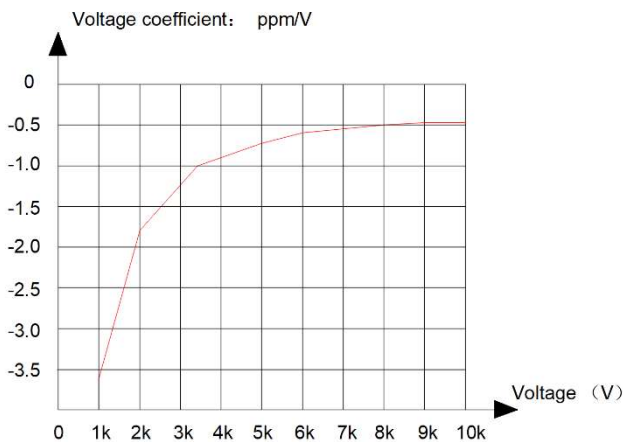
Digital marking with part number and batch number and series number



4. ELECTRICAL CHARACTERISTICS

Type	UPRNS		UPRND		型号				
Standard applied	Q/SLC003-2010				技术标准				
Resistance range	1Ω to 10MΩ				标准阻值范围				
Tolerance (%)	L(±0.01); P(±0.025); W(±0.05); B(±0.10)		(%)		精度				
Match tolerance (%)	L(±0.01); P(±0.025); W(±0.05); B(±0.10)		(%)		匹配精度				
TCR (ppm/°C)	C10(±1); C9(±2); C8(±3); C7(±5); C6(±10)		(ppm/°C)		温度系数				
Match TCR (ppm/°C)	C10(±1); C9(±2); C8(±3); C7(±5); C6(±10)		(ppm/°C)		匹配温度系数				
Operating Temperature range	-55°C~25°C; 25°C~125°C				工作环境温度				
Dimension ±0.5(mm)	L ₁ ~L _n =2.54~45.72		L ₁ ~L _{2n} =2.54~45.72		尺寸				
Layout configuration					外观				
Ordering code	UPRNS	8	4	P	B	7	B	7	产品代码
	TYPE	NUMBER of leads	NUMBER of resistors	LAYOUT	Tol	TCR	MATCH Tol.	MATCH TCR	

5. Voltage coefficient curve





6. 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 ±(0.01%+0.05 Ω) 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: $260 \pm 3^{\circ}\text{C}$ for 10 ± 1 Seconds, immersed to a point $3 \pm 0.5\text{mm}$ from the body. The change of the resistance value should be within $\pm(0.02\% + 0.05 \Omega)$ as compared with the value before the test.

(7) Climatic sequence

IEC 60115-1, 4.19: -55°C to Room Temp. to $+155^{\circ}\text{C}$ to Room Temp. (5 cycles). The change of the resistance value shall be within $\pm(0.025\% + 0.05 \Omega)$ 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 $\pm(0.025\% + 0.05 \Omega)$ 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 $\pm(0.025\% + 0.05 \Omega)$ 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.



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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