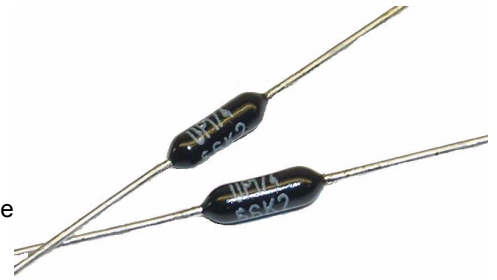


# UP Series — Ultra Precision Metal Film Resistors

## Features

- Highest stability metal film available
- Higher power options available
- Tolerances to  $\pm 0.01\%$  available
- 1W available, contact factory
- Cut and formed product is available on select sizes; contact factory for details
- TCRs as low as 5 ppm
- Matched sets available
- Low noise
- Non-standard resistance values available



## Electrical Specifications

Type / Code	Power Rating (Watts) @ 70°C	Maximum Working Voltage*	Maximum Pulse Voltage
UP 1/4	0.25W	350	500
UP 1/2	0.5W	350	500

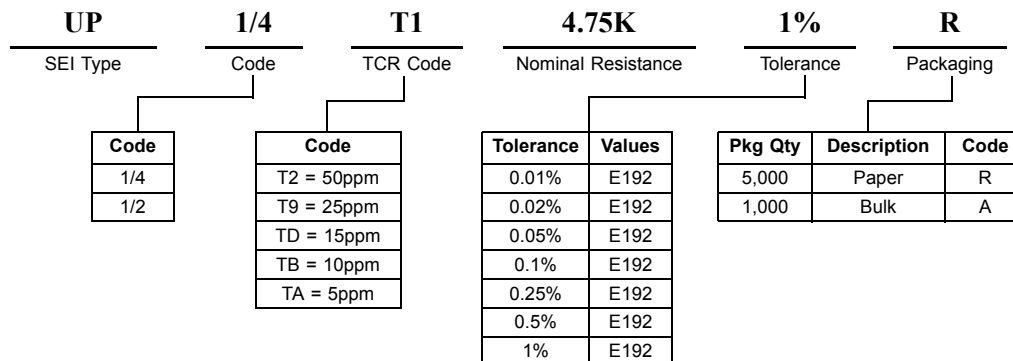
\* Lesser of  $\sqrt{PR}$  or maximum working voltage.

## Tolerance / TCR Combinations

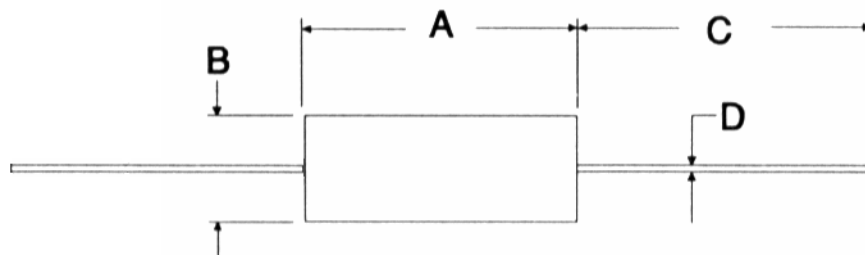
### Electrical (Operating Temperature Range -20°C to +85°C)

TCR Code	TCR	UP 1/4				UP 1/2			
		0.01–0.02%	0.05%	0.1–0.25%	0.5–1%	0.01–0.02%	0.05%	0.1–0.25%	0.5–1%
TA	5	51.1 $\Omega$ – 500K	10 $\Omega$ – 1M	10 $\Omega$ – 499K	1 $\Omega$ – 4M	51.1 $\Omega$ – 499K	10 $\Omega$ – 499K	10 $\Omega$ – 499K	10 $\Omega$ – 499K
TB	10	51.1 $\Omega$ – 500K	10 $\Omega$ – 1M	10 $\Omega$ – 4M	1 $\Omega$ – 4M	51.1 $\Omega$ – 499K	10 $\Omega$ – 499K	10 $\Omega$ – 1M	1 $\Omega$ – 1M
TD	15	51.1 $\Omega$ – 500K	10 $\Omega$ – 1M	10 $\Omega$ – 4M	1 $\Omega$ – 4M	51.1 $\Omega$ – 499K	10 $\Omega$ – 499K	5.11 $\Omega$ – 1M	1 $\Omega$ – 1M
T9	25	51.1 $\Omega$ – 294K	10 $\Omega$ – 1M	5.11 $\Omega$ – 2M	1 $\Omega$ – 2M	51.1 $\Omega$ – 499K	10 $\Omega$ – 499K	5.11 $\Omega$ – 2M	1 $\Omega$ – 2M
T2	50	51.1 $\Omega$ – 294K	10 $\Omega$ – 1M	5.11 $\Omega$ – 2M	1 $\Omega$ – 3.92M	51.1 $\Omega$ – 499K	10 $\Omega$ – 499K	5.11 $\Omega$ – 2M	1 $\Omega$ – 3.92M

## How to Order



# UP Series — Ultra Precision Metal Film Resistors



## Mechanical Specifications

Type / Code	A Body Length	B Body Width	C Lead Length	D Lead Diameter	Units
UP 1/4	0.28 max	0.10 max	1.18 min	0.024 ± 0.002	inches
	7.2 max	2.5 max	30.0 min	0.61 ± 0.05	mm
UP 1/2	0.39 max	0.145 max	1.18 min	0.024 ± 0.002	inches
	10.0 max	3.70 max	30.0 min	0.61 ± 0.05	mm

## Performance Characteristics

Environmental		Maximum	Typical
Load at commercial rating: 1,000 hours at 70°C	ΔR%	0.30	0.10
Load at CECC rating: 1,000 hours at 70°C	ΔR%	0.30	0.05
Dry Heat: 1,000 hours at 155°C	ΔR%	1.00	0.15
Shelf Life: 12 months at room temperature	ΔR%	0.10	0.03
Short term overload	ΔR%	0.10	0.02
Climatic	ΔR%	0.30	0.10
Climatic category		55/155/56	
Long term damp heat	ΔR%	0.50	0.10
Temperature rapid change	ΔR%	0.20	0.05
Resistance to solder heat	ΔR%	0.06	0.03
Vibration and bump	ΔR%	0.06	0.02
Noise (in a decade of frequency)	μV/V	1.00	0.10