



FEATURES:

- TCR as low as $\pm 2\text{ppm}$
- Excellent characteristics at higher frequencies
- Tolerance as low as $\pm 0.01\%$



PART NUMBER STRUCTURE

UPTF Series	0805 Size	10W Power Rating	P TCR	1001 Resistance Code	A Tolerance	T Packaging	Optional Reel Identifier
0402	16W = 0.063W	2 = $\pm 2\text{ppm}/^\circ\text{C}$	1001 = 1k Ω	U = $\pm 0.01\%$	T = Tape & Reel	Leave blank for standard quantity.	
0603	10W = 0.10W	3 = $\pm 3\text{ppm}/^\circ\text{C}$	39R9 = 39.9 Ω	A = $\pm 0.05\%$			
0805	8W = 0.125W	P = $\pm 5\text{ppm}/^\circ\text{C}$	49R9 = 49.9 Ω	B = $\pm 0.1\%$		Add "-1K" if 1000 piece reel is required	
1206	5W = 0.20W	N = $\pm 10\text{ppm}/^\circ\text{C}$		C = $\pm 0.25\%$			
1210	4W = 0.25W	E = $\pm 25\text{ppm}/^\circ\text{C}$		D = $\pm 0.50\%$			
2010	2W = 0.50W						
2512							

Example P/N: UPTF0805-10W-P-1001AT

Standard Termination is 100% matte Tin over Nickel.

DIMENSIONS

Unit: inches (mm)

SIZE (INCHES)	L	W	T	l1	l2
0402	0.040 \pm 0.002 (1.0 \pm 0.05)	0.020 \pm 0.002 (0.5 \pm 0.05)	0.014 \pm 0.002 (0.35 \pm 0.05)	0.008 \pm 0.004 (0.2 \pm 0.10)	0.008 \pm 0.004 (0.2 \pm 0.10)
0603	0.063 \pm 0.008 (1.6 \pm 0.20)	0.031 \pm 0.008 (0.8 \pm 0.2)	0.017 \pm 0.004 (0.45 \pm 0.10)	0.010 \pm 0.006 (0.25 \pm 0.15)	0.010 \pm 0.006 (0.25 \pm 0.15)
0805	0.079 \pm 0.008 (2.0 \pm 0.20)	0.050 \pm 0.008 (1.25 \pm 0.20)	0.021 \pm 0.004 (0.55 \pm 0.10)	0.016 \pm 0.008 (0.4 \pm 0.20)	0.012 \pm 0.008 (0.3 \pm 0.20)
1206	0.126 \pm 0.008 (3.2 \pm 0.20)	0.063 \pm 0.008 (1.6 \pm 0.20)	0.021 \pm 0.004 (0.55 \pm 0.10)	0.018 \pm 0.008 (0.45 \pm 0.20)	0.012 \pm 0.008 (0.3 \pm 0.20)
1210	0.126 \pm 0.008 (3.2 \pm 0.20)	0.098 \pm 0.006 (2.50 \pm 0.15)	0.021 \pm 0.004 (0.55 \pm 0.10)	0.018 \pm 0.008 (0.45 \pm 0.20)	0.012 \pm 0.008 (0.3 \pm 0.20)
2010	0.197 \pm 0.008 (5.0 \pm 0.20)	0.098 \pm 0.006 (2.50 \pm 0.15)	0.021 \pm 0.004 (0.55 \pm 0.10)	0.236 \pm 0.012 (0.60 \pm 0.30)	0.02 \pm 0.010 (0.50 \pm 0.25)
2512	0.248 \pm 0.008 (6.30 \pm 0.20)	0.122 \pm 0.006 (3.10 \pm 0.15)	0.021 \pm 0.004 (0.55 \pm 0.10)	0.236 \pm 0.012 (0.60 \pm 0.30)	0.02 \pm 0.010 (0.50 \pm 0.25)

STRUCTURE

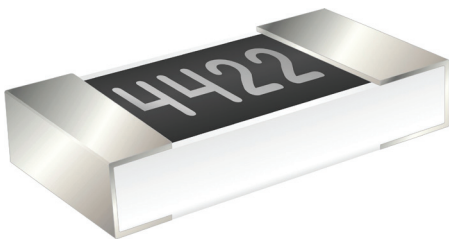
1	Ceramic Substrate	5	Nickel Plating
2	Backside Electrode	6	Tin Plating
3	Top Electrode	7	Resistive layer
4	Edge Electrode	8	Overcoat

ELECTRICAL SPECIFICATION & RANGE

SIZE	0402	0603	0805	1206	1210	2010	2512
Power Rating at 70°C (W)	0.063W (1/16W)	0.063W (1/16W)	0.10W (1/10W)	0.125W (1/8W)	0.20W (1/5W)	0.25W (1/4W)	0.50W (1/2W)
Max. Working Voltage	25V	50V	100V	150V	150V	150V	150V
Max. Overload Voltage	50V	100V	200V	300V	300V	300V	300V
Operating Temp. Range	-55°C to +155°C	-55°C to +155°C	-55°C to +155°C	-55°C to +155°C	-55°C to +155°C	-55°C to +155°C	-55°C to +155°C
Tolerance	TCR	Resistance Range	Resistance Range	Resistance Range	Resistance Range	Resistance Range	Resistance Range
0.01% (U)	±2ppm (2)	49.9Ω - 4.99KΩ	24.9Ω - 15KΩ	24.9Ω - 30KΩ	24.9Ω - 49.9KΩ	24.9Ω - 49.9KΩ	24.9Ω - 100KΩ
	±3ppm (3)	49.9Ω - 4.99KΩ	24.9Ω - 15KΩ	24.9Ω - 30KΩ	24.9Ω - 49.9KΩ	24.9Ω - 49.9KΩ	24.9Ω - 100KΩ
	±5ppm (P)	49.9Ω - 20KΩ	24.9Ω - 60KΩ	24.9Ω - 150KΩ	24.9Ω - 300KΩ	24.9Ω - 300KΩ	24.9Ω - 300KΩ
	±10ppm (N)	49.9Ω - 20KΩ	24.9Ω - 100KΩ	24.9Ω - 200KΩ	24.9Ω - 499KΩ	24.9Ω - 499KΩ	24.9Ω - 499KΩ
0.05% (A)	±2ppm (2)	49.9Ω - 20KΩ	24.9Ω - 15KΩ	24.9Ω - 30KΩ	24.9Ω - 49.9KΩ	24.9Ω - 49.9KΩ	24.9Ω - 100KΩ
	±3ppm (3)	49.9Ω - 4.99KΩ	24.9Ω - 15KΩ	24.9Ω - 30KΩ	24.9Ω - 49.9KΩ	24.9Ω - 49.9KΩ	24.9Ω - 100KΩ
	±5ppm (P)	49.9Ω - 4.99KΩ	24.9Ω - 60KΩ	2.49Ω - 150KΩ	24.9 - 300KΩ	24.9Ω - 300KΩ	24.9Ω - 300KΩ
	±10ppm (N)	49.9Ω - 20KΩ	4.7Ω - 332KΩ	4.7Ω - 1MΩ	4.7Ω - 1.5MΩ	4.7Ω - 1MΩ	4.7Ω - 1MΩ
	±25ppm (E)	49.9Ω - 20KΩ	4.7Ω - 511KΩ	4.7Ω - 1MΩ	4.7Ω - 1.5MΩ	4.7 - 1MΩ	4.7Ω - 1MΩ
0.10% (B)	±2ppm (2)	49.9Ω - 4.99KΩ	24.9Ω - 15KΩ	24.9Ω - 30KΩ	24.9Ω - 49.9KΩ	24.9Ω - 49.9KΩ	24.9Ω - 100KΩ
	±3ppm (3)	49.9Ω - 4.99KΩ	24.9Ω - 15KΩ	24.9Ω - 30KΩ	24.9Ω - 49.9KΩ	24.9Ω - 49.9KΩ	24.9Ω - 100KΩ
	±5ppm (P)	49.9Ω - 20KΩ	24.9Ω - 60KΩ	24.9Ω - 150KΩ	24.9 - 300KΩ	24.9Ω - 300KΩ	24.9Ω - 300KΩ
	±10ppm (N)	49.9Ω - 100KΩ	4.7Ω - 511KΩ	4.7Ω - 1MΩ	4.7Ω - 1.5MΩ	4.7Ω - 1MΩ	4.7Ω - 1MΩ
0.25% (C)	±5ppm (P)	49.9Ω - 20KΩ	24.9Ω - 60KΩ	24.9Ω - 150KΩ	24.9 - 300KΩ	24.9Ω - 300KΩ	24.9Ω - 300KΩ
	±10ppm (N)	49.9Ω - 100KΩ	4.7Ω - 511KΩ	4.7Ω - 1MΩ	4.7Ω - 1.5MΩ	4.7Ω - 1MΩ	4.7Ω - 1MΩ
0.50% (D)	±5ppm (P)	49.9Ω - 20KΩ	24.9Ω - 60KΩ	24.9Ω - 150KΩ	24.9 - 300KΩ	24.9Ω - 300KΩ	24.9Ω - 300KΩ
	±10ppm (N)	49.9Ω - 100KΩ	4.7Ω - 511KΩ	4.7Ω - 1MΩ	4.7Ω - 1.5MΩ	4.7Ω - 1MΩ	4.7Ω - 1MΩ

NOTE: Overload Voltage=2.5*√(P*R).

MARKING CODE



E-24 values for 0603 size maybe marked with the standard 3 digit marking code.
E-96 values for 0805 size and larger, will be marked with standard 4 digit marking code.

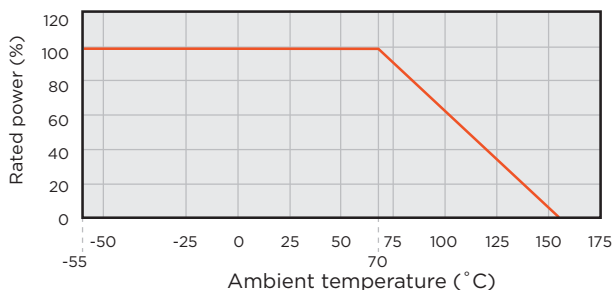
E-24 values for 0603 size and larger, will be marked with standard 3 digit marking code.

0603 - E-96 values will be marked with a standard 3 digit alpha numeric code

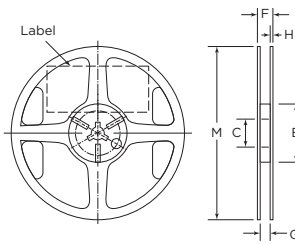
Please see 0603 marking codes PDF.

Note: 0402 cannot be marked.

DERATING CURVE



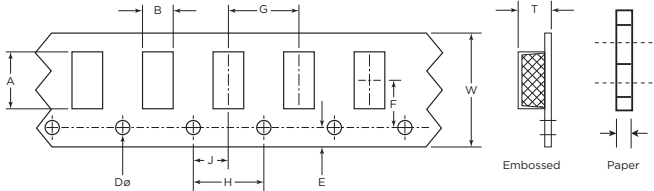
REEL SPECIFICATIONS



Unit: mm (inch)					
C	E	F	G	H	M
13.0 ± 0.2 (0.51 ± 0.008)	60.0 ± 1.0 (2.36 ± 0.03)	11.4 ± 1.0 (0.45 ± 0.04)	9.0 ± .3 (0.35 ± 0.012)	1.5 ± .3 (0.06 ± 0.012)	180 ± 2.0 (7.09 ± 0.08)

Minimum of 30 empty pockets at the beginning of reel, 65 minimum empty pockets at the end.

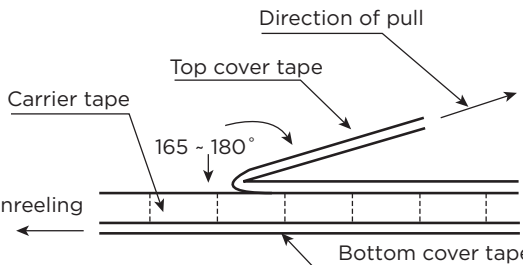
TAPE SPECIFICATIONS



Units: mm (inches).

TAPE	SIZE	A	B	W	E	F	T	G	H	J	DØ
Paper	0402	1.16 ±0.10	0.70 ±0.10	8.0 ±0.10	1.75 ±0.05	3.50 ±0.05	0.40 ±0.03	2.00 ±0.05	4.00 ±0.10	2.00 ±0.05	1.55 ±0.05
	0603	1.90 ±0.10	1.10 ±0.05	8.0 ±0.10	1.75 ±0.05	3.50 ±0.05	0.60 ±0.03	4.00 ±0.10	4.00 ±0.10	2.00 ±0.05	1.55 ±0.05
	0805	2.37 ±0.20	1.60 ±0.05	8.0 ±0.10	1.75 ±0.05	3.50 ±0.05	0.75 ±0.05	4.00 ±0.10	4.00 ±0.10	2.00 ±0.05	1.55 ±0.05
	1206	3.55 ±0.05	2.00 ±0.05	8.0 ±0.10	1.75 ±0.05	3.50 ±0.05	0.75 ±0.05	4.00 ±0.10	4.00 ±0.10	2.00 ±0.05	1.55 ±0.05
	1210	3.40 ±0.05	2.75 ±0.05	8.0 ±0.10	1.75 ±0.05	3.50 ±0.05	0.75 ±0.05	4.00 ±0.10	4.00 ±0.05	2.00 ±0.05	1.60 ±0.10
Embossed	2010	5.45 ±0.10	2.85 ±0.10	12.00 ±0.10	1.75 ±0.10	5.50 ±0.05	1.00 +0.20, -0	4.00 ±0.10	4.00 ±0.05	2.00 ±0.05	1.50 +0.1, -0
	2512	6.65 ±0.10	3.40 ±0.10	12.00 ±0.10	1.75 ±0.10	5.50 ±0.05	1.00 +0.20, -0	4.00 ±0.10	4.00 ±0.05	2.00 ±0.05	1.50 +0.1, -0

PEEL BACK FORCE AND DIRECTION DIAGRAM



Peel back force and direction of peel back angle should follow EIA481-1-A. Peel back force should be between 0.1N - 1.3N and peel back angle of 165° - 180°.

ENVIRONMENTAL CHARACTERISTICS

TEST	REQUIREMENT		TEST METHOD
	Tol. $\leq 0.05\%$	Tol. $> 0.05\%$	
Temperature Coefficient of Resistance (T.C.R.)	As Spec.		MIL-STD-202 Method 304 +25/-55/+125/+25°C
Short Time Overload	$\Delta R \pm 0.05\%$	$\Delta R \pm 0.2\%$	JIS-C-5201-1 4.13 RCWV*2.5 or Max. Overload Voltage whichever is lower for 5 seconds
	$\Delta R \pm 0.2\%$ for high power rating		
Insulation Resistance	$> 9999M\Omega$		MIL-STD-202 Method 302 Apply 100VDC for 1 minute
Endurance	$\Delta R \pm 0.05\%$	$\Delta R \pm 0.2\%$	MIL-STD-202 Method 108A 70 $\pm 2^\circ\text{C}$ RCWV for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
	$\Delta R \pm 0.5\%$ for high power rating		
	O201:	$> 7k\Omega \rightarrow \Delta R \pm 0.5\%$ $\leq 7k\Omega \rightarrow \Delta R \pm 0.2\%$	
Damp Heat with Load	$\Delta R \pm 0.05\%$	$\Delta R \pm 0.3\%$	MIL-STD-202 Method 103B 40 $\pm 2^\circ\text{C}$ 90-95% R.H. RCWV for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
	$\Delta R \pm 0.5\%$ for high power rating		
Bending Strength	$\Delta R \pm 0.05\%$	$\Delta R \pm 0.1\%$	JIS-C-5201-1 4.33 Bending amplitude 3mm for 10 seconds 2010 / 2512 sizes: 2mm Other sizes: 3mm
Solderability	95% min. coverage		MIL-STD-202 Method 208H 245 $\pm 5^\circ\text{C}$ for 3 seconds
Resistance to Soldering Heat	$\Delta R \pm 0.05\%$	$\Delta R \pm 0.1\%$	MIL-STD-202 Method 210E 260 $\pm 5^\circ\text{C}$ for 10 seconds
Dielectric Withstanding Voltage	By Type		MIL-STD-202 Method 301 Max. Overload Voltage for 1 minute
Low Temperature Operation	$\Delta R \pm 0.05\%$	$\Delta R \pm 0.2\%$	JIS-C-5201-1 4.36 1 hour, -65°C, followed by 45 minutes of RCWV
	$\Delta R \pm 0.5\%$ for high power rating		
High Temperature Exposure	$\Delta R \pm 0.5\%$		MIL-STD-202 Method 108 at +155°C for 1000 hrs

RCWV (Rated Continuous Working Voltage)= $\sqrt{P \cdot R}$ or Max. Operating Voltage whichever is lower.

Storage Temperature: 15-28°C; Humidity: < 80%RH