



### FEATURES:

- Utilize a conductive Polymer termination to allow the capacitor to withstand high bending stresses
- 3mm minimum bending strength specification
- Capacitance range: 0.1pF to 47uF
- Voltage range: 6.3V to 3000V DC
- Terminations: 100% matte Tin (Sn)
- Ceramic monolithic structure provides excellent reliability



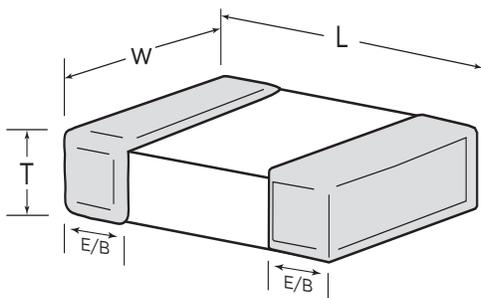
### PART NUMBER STRUCTURE

FTC Series	1206 Size	X7R Temperature Characteristic (Dielectric)	500 Rated Voltage	- 106 Capacitance (picofarads)	K Tolerance	N Termination	E Packaging										
0402	0603	0805	1206	1210	1808	1812	2220	COG	X7R	X5R	Y5V	1st two digits are significant followed by number of zeroes.	1st two digits are significant, followed by number of zeroes. R denotes decimal	e.g: 101 = 100pF 104 = 100nF 6R8 = 6.8pF	* B = ±0.1pF * C = ±0.25pF * D = ±0.5pF F ±1% G = ±2% J = ±5% K = ±10% M = ±20% Z = -20/+80% * For values below 10pF only.	N = 100% Matte Tin over Nickel over a conductive Polymer	E = Embossed Tape (7" reel)  P = Paper Tape (7" reel)

Example P/N: FTC1206X7R500-106KNE

Standard termination finish is 100% matte Tin (Sn) over Nickel.

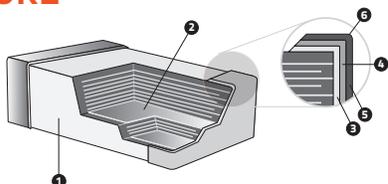
### DIMENSIONS



SIZE	L	W	T	E/B
0402	0.040 ± 0.002 (1.0 ± 0.05)	0.020 ± 0.002 (0.5 ± 0.05)	See Specific Value	0.004 (min.) (0.10)
0603	0.063 ± 0.006 (1.6 ± 0.15)	0.031 ± 0.0046 (0.8 ± 0.15)	See Specific Value	0.008 (min.) (0.20)
0805	0.08 ± 0.008 (2.0 ± 0.20)	0.050 ± 0.008 (1.25 ± 0.20)	See Specific Value	0.020 ± 0.010 (0.508 ± 0.254)
1206	0.126 ± 0.008 (3.2 ± 0.20)	0.063 ± 0.008 (1.6 ± 0.20)	See Specific Value	0.020 ± 0.010 (0.508 ± 0.254)
1210	0.126 ± 0.008 (3.2 ± 0.20)	0.098 ± 0.008 (2.50 ± 0.20)	See Specific Value	0.020 ± 0.010 (0.508 ± 0.254)
1808	0.18 ± 0.024/-0.16 (4.50 +0.6/-0.4)	0.0812 ± 0.010 (2.03 ± 0.25)	See Specific Value	0.020 ± 0.010 (0.50 ± 0.25)
1812	0.177 ± 0.012 (4.495 ± 0.30)	0.126 ± 0.012 (3.20 ± 0.30)	See Specific Value	0.024 ± 0.015 (0.6096 ± 0.381)
2220	0.225 ± 0.02 (5.70 ± 0.50)	0.200 ± 0.016 (5.00 ± 0.40)	See Specific Value	0.034 ± 0.014 (0.85 ± 0.35)

Unit: inches (mm)

### STRUCTURE

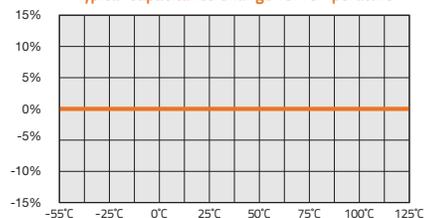


1	Ceramic Body (dielectric)	4	Silver Polymer
2	Inner Electrode	5	Nickel Plating
3	Inner Termination	6	100% Matte Tin (Sn)

### ELECTRICAL SPECIFICATION & RANGE

#### NPO/COG

Typical Capacitance Change vs. Temperature



**Operating Temperature Range:**  
-55°C to +125°C

**Temperature Coefficient:**  
0 ±30PPM/°C

**Temperature Voltage Coefficient:**  
0 ±30PPM/°C

**Insulation Resistance:**  
>1000Ω-F or 100GΩ, for values ≤ 0.047μF (whichever is less at 25°C, WDCV).  
For Capacitance values > 0.047μF, the 500 Ω-F rule applies.  
(The IR at 125°C is 10% of the value at 25°C)

**Ageing:** None

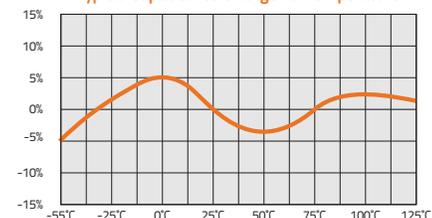
**Withstanding Voltage:** >2.5 times VDCW

**Capacitance Tolerance:** B,C,D,F,G,J,K

**Dissipation Factor:** 0.1% max

#### X7R

Typical Capacitance Change vs. Temperature



**Operating Temperature Range:**  
-55°C to +125°C

**Temperature Coefficient:**  
0 ±15%Δ°C MAX.

**Temperature Voltage Coefficient:**  
X7R not applicable

**Insulation Resistance:**  
>100Ω-F or 1GΩ, whichever is less at 25°C, VDCW. (10,000Ω at 125°C)

**Ageing:**  
2.5% per decade hour, typical

**Withstanding Voltage:**  
>2.5 times VDCW

**Capacitance Tolerance:**  
J,K,M

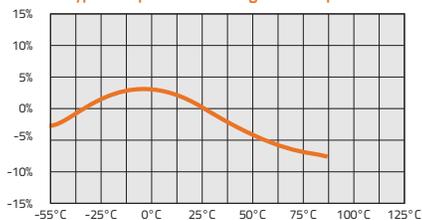
Rated Voltage	Insulation Resistance
100V: All X7R; 1210≥3.3μF	1GΩ or 100Ω-F Whichever is smaller
50V: 0402>0.01μF; 0603≥1μF; 0805≥1μF; 1206≥4.7μF; 1210≥4.7μF	
35V: 0603≥1μF; 0805≥2.2μF; 1206≥2.2μF; 1210≥10μF	
25V: 0402≥0.22μF; 0603≥2.2μF; 0805≥2.2μF; 1206≥10μF; 1210≥10μF	
16V: 0402≥0.22μF; 0603≥1μF; 0805≥2.2μF; 1206≥10μF; 1210≥47μF	
10V: 0402≥0.47μF; 0603≥0.47μF; 0805≥2.2μF; 1206≥4.7μF; 1210≥47μF	
6.3V ; 4V ; Size 1812	

Rated Voltage	D.F.≤	Exception of D.F.≤
≥100V	≤3%	1206≥0.47μF
	≤5%	0805>0.1μF; 0603≥0.068μF; 1206>1μF; 1210≥2.2μF
	≤10%	0805>0.22μF; 1210≥3.3μF
50V	≤3%	0201(50V); 0603≥0.047μF; 0805≥0.18μF; 1206≥0.47μF
	≤5%	201≥0.01μF; 1210≥4.7μF
	≤10%	0402≥0.012μF; 0603>0.1μF; 0805≥1μF; 1206≥2.2μF; 1210≥10μF
35V	≤3.5%	≤10% 0603≥1μF; 0805≥2.2μF; 1206≥2.2μF; 1210≥10μF
25V	≤5%	201≥0.01μF; 0805≥1μF; 1210≥10μF
	≤7%	0603≥0.33μF
	≤10%	201≥0.01μF; 0402≥0.10μF & (0402/X7R≥0.056μF); 0603≥0.47μF; 0805≥2.2μF; 1206≥4.7μF; 1210≥22μF
	≤12.5%	0402≥0.47μF
16V	≤5%	201≥0.01μF; 0402≥0.33μF; 0603≥0.15μF; 0805≥0.68μF; 1206≥2.2μF; 1210≥4.7μF
	≤10%	201≥0.01μF; (201/X7R≥0.022μF); 0402≥0.22μF; 0603≥0.68μF; 0805≥2.2μF; 1206≥4.7μF; 1210≥22μF
10V	≤5%	≤10% 201≥0.012μF; 0402≥0.33μF(0402/X7R≥0.22μF); 0603≥0.33μF; 0805≥2.2μF; 1206≥2.2μF; 1210≥22μF; 01R5
	≤15%	201≥0.1μF; 0402≥1μF
6.3V	≤10%	≤15% 201≥0.1μF; 0402≥1μF(0402/X6S≥0.47μF); 0603≥10μF; 0805≥4.7μF; 1206≥47μF; 1210≥100μF
	≤20%	0402≥2.2μF
4V	≤15%	-

### ELECTRICAL SPECIFICATION & RANGE

#### X5R

Typical Capacitance Change vs. Temperature



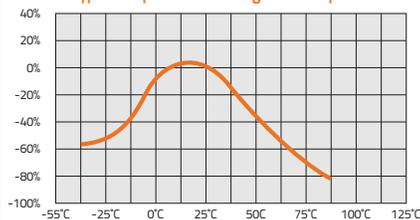
**Operating Temperature Range:**  
-55°C to +85°C  
**Temperature Coefficient:**  
0 ±15%Δ°C MAX.  
**Temperature Voltage Coefficient:**  
X5R not applicable  
**Insulation Resistance:**  
>100Ω-F or 1GΩ, whichever is less at 25°C, VDCW. (10,000 Ω at 125°C)  
**Ageing:**  
2.5% per decade hour, typical  
**Withstanding Voltage:**  
>2.5 times VDCW  
**Capacitance Tolerance:**  
K,M

Rated Voltage	Insulation Resistance
100V: All X7R; 1210≥3.3μF	1GΩ or 100Ω-F Whichever is smaller
50V: 0402>0.01μF; 0603≥1μF; 0805≥1μF; 1206≥4.7μF; 1210≥4.7μF	
35V: 0603≥1μF; 0805≥2.2μF; 1206≥2.2μF; 1210≥10μF	
25V: 0402≥0.22μF; 0603≥2.2μF; 0805≥2.2μF; 1206≥10μF; 1210≥10μF	
16V: 0402≥0.22μF; 0603≥1μF; 0805≥2.2μF; 1206≥10μF; 1210≥4.7μF	
10V: 0402≥0.47μF; 0603≥0.47μF; 0805≥2.2μF; 1206≥4.7μF; 1210≥4.7μF	
6.3V ; 4V ; Size 1812	

Rated Voltage	D.F.≤	Exception of D.F.≤
≥100V	≤3%	1206≥0.47μF
	≤5%	0805>0.1μF; 0603≥0.068μF; 1206>1μF; 1210≥2.2μF
	≤10%	0805>0.22μF; 1210≥3.3μF
50V	≤3%	0201(50V); 0603≥0.047μF; 0805≥0.18μF; 1206≥0.47μF
	≤5%	201≥0.01μF; 1210≥4.7μF
	≤10%	0402≥0.012μF; 0603>0.1μF; 0805≥1μF; 1206≥2.2μF; 1210≥10μF
35V	≤3.5%	≤10% 0603≥1μF; 0805≥2.2μF; 1206≥2.2μF; 1210≥10μF
25V	≤5%	201≥0.01μF; 0805≥1μF; 1210≥10μF
	≤7%	0603≥0.33μF
	≤10%	201≥0.01μF; 0402≥0.10μF & (0402/X7R≥0.056μF); 0603≥0.47μF; 0805≥2.2μF; 1206≥4.7μF; 1210≥22μF
	≤12.5%	0402≥0.47μF
16V	≤5%	201≥0.01μF; 0402≥0.33μF; 0603≥0.15μF; 0805≥0.68μF; 1206≥2.2μF; 1210≥4.7μF
	≤10%	201≥0.01μF; (201/X7R≥0.022μF); 0402≥0.22μF; 0603≥0.68μF; 0805≥2.2μF; 1206≥4.7μF; 1210≥22μF
10V	≤10%	201≥0.012μF; 0402≥0.33μF(0402/X7R≥0.22μF); 0603≥0.33μF; 0805≥2.2μF; 1206≥2.2μF; 1210≥22μF; 01R5
	≤15%	201≥0.1μF; 0402≥1μF
6.3V	≤10%	201≥0.1μF; 0402≥1μF(0402/X6S≥0.47μF); 0603≥10μF; 0805≥4.7μF; 1206≥4.7μF; 1210≥100μF
	≤20%	0402≥2.2μF
4V	≤15%	-

#### Y5V

Typical Capacitance Change vs. Temperature



**Operating Temperature Range:**  
-30°C to +85°C  
**Temperature Coefficient:**  
+22% - 82%Δ°C MAX.  
**Insulation Resistance:**  
>100Ω-F or 1GΩ, whichever is less at 25°C, WDCV. (The IR at 125°C is 10% of the value at 25°C)

**Ageing:**  
7% per decade hour, typical  
**Withstanding Voltage:**  
>2.5 times VDCW  
**Capacitance Tolerance:**  
M,Z

Rated Voltage	Insulation Resistance
100V: All X7R; 1210≥3.3μF	1GΩ or 100Ω-F Whichever is smaller
50V: 0402>0.01μF; 0603≥1μF; 0805≥1μF; 1206≥4.7μF; 1210≥4.7μF	
35V: 0603≥1μF; 0805≥2.2μF; 1206≥2.2μF; 1210≥10μF	
25V: 0402≥0.22μF; 0603≥2.2μF; 0805≥2.2μF; 1206≥10μF; 1210≥10μF	
16V: 0402≥0.22μF; 0603≥1μF; 0805≥2.2μF; 1206≥10μF; 1210≥4.7μF	
10V: 0402≥0.47μF; 0603≥0.47μF; 0805≥2.2μF; 1206≥4.7μF; 1210≥4.7μF	
6.3V ; 4V ; Size 1812	

Rated Voltage	D.F.≤	Exception of D.F.≤
≥50V	≤5%	≤7% 0603≥0.1μF; 0805≥0.47μF; 1206≥4.7μF
	≤12.5%	1210≥6.8μF
35V	≤7%	-
25V	≤5%	≤7% 0402≥0.047μF; 0603≥0.1μF; 0805≥0.33μF; 1206≥1μF; 1210≥4.7μF
	≤9%	0402≥0.068μF; 0603≥0.47μF; 1206≥4.7μF; 1210≥22μF
16V (C<1.0μF)	≤7%	≤9% 0402≥0.068μF; 0603≥0.68μF
16V (C≥1.0μF)	≤9%	≤12.5% 0402≥0.22μF
10V	≤12.5%	≤9% 0603≥2.2μF; 0805≥3.3μF; 1206≥10μF; 1210≥22μF; 1812≥4.7μF
	≤20%	0402≥0.47μF
6.3V	≤20%	-

**TEST PARAMETERS**

Test parameters for Multilayer Ceramic Capacitors - X7R, X5R and Y5V: 1KHz ± 100Hz at 1.0 ± 0.2 Vrms < 10uF (10 V min.)  
 1KHz ± 100Hz at 0.5 ± 0.1 Vrms < 10uF (6.3V max.)  
 120Hz ± 24Hz at 1.0 ± 0.1 Vrms ≥ 10uF

Test parameters for Multilayer Ceramic Capacitors - NPO/COG: 1MHz ± 100KHz at 1.0 ± 0.2 Vrms ≤ 1000pF, 25°C  
 1KHz ± 100Hz at 1.0 ± 0.2 Vrms > 1000pF, 25°C

**Note:** To ensure proper capacitance readings, the voltage level must be held constant. The HP4284 and Agilent E4980 has a “ALC” (Automatic Level Control) function and should be switched to the “ON” position for accurate capacitance readings.

**VOLTAGE AND CAPACITANCE RANGE**

**COG (NPO) DIELECTRIC (0402 - 0603)**

Values that are typically available. (Thickness in mm).

Size (inches)		0402					0603					
VDCW (MAX)		10V	16V	25V	50V	100V	10V	16V	50V	100V	200V	250V
CAPACITANCE CODE	OR1	0.1pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20						
	OR2	0.2pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20						
	OR3	0.3pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07			
	OR4	0.4pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07			
	OR5	0.5pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07
	OR6	0.6pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07
	OR7	0.7pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07
	OR8	0.8pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07
	OR9	0.9pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07
	1R0	1.0pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07
	1R2	1.2pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07
	1R5	1.5pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07
	1R8	1.8pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07
	2R2	2.2pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07
	2R7	2.7pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07
	3R3	3.3pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07
	3R9	3.9pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07
	4R7	4.7pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07
	471	5.6pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07
	5R6	6.8pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07
	8R2	8.2pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07
	100	10pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07
	120	12pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07
	150	15pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07
	180	18pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07
	220	22pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07
	270	27pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07
330	33pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	
390	39pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	
470	47pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	
560	56pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	
680	68pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	
820	82pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	
101	100pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	
121	120pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	
151	150pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	
181	180pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	
221	220pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	
271	270pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20		0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.30	

**Note:** Additional values may be available. Please contact us for more information. Due to demand and raw material fluctuations, specific values may not be available.

## VOLTAGE AND CAPACITANCE RANGE

### COG (NPO) DIELECTRIC (0402 - 0603)

Values that are typically available. (Thickness in mm).

SIZE (INCHES)		0402					0603						
VDCW (MAX)		10V	16V	25V	50V	100V	10V	16V	25V	50V	100V	200V	250V
CAPACITANCE CODE	331	330pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07		0.80±0.07	0.80±0.07	0.80±0.30	0.80±0.30
	391	390pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07		0.80±0.07	0.80±0.07	0.80±0.30	0.80±0.30
	471	470pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07		0.80±0.07	0.80±0.07	0.80±0.30	0.80±0.30
	561	560pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07		0.80±0.07	0.80±0.07	0.80±0.30	0.80±0.30
	681	680pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07		0.80±0.07	0.80±0.07		
	821	820pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07		0.80±0.07	0.80±0.07		
	102	1000pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07		0.80±0.07	0.80±0.07		
	122	1200pF					0.80±0.30	0.80±0.30		0.80±0.30			
	152	1500pF					0.80±0.30	0.80±0.30		0.80±0.30			
	182	1800pF					0.80±0.30	0.80±0.30	0.80±0.30	0.80±0.30			
	222	2200pF					0.80±0.30	0.80±0.30	0.80±0.30	0.80±0.30			
	272	2700pF					0.80±0.30	0.80±0.30	0.80±0.30	0.80±0.30			
	332	3300pF					0.80±0.30	0.80±0.30	0.80±0.30	0.80±0.30			

### COG (NPO) DIELECTRIC (0805)

Values that are typically available. (Thickness in mm).

SIZE (INCHES)		0805									
VDCW (MAX)		10V	16V	25V	50V	100V	200V	250V	500V	630V	1000V
CAPACITANCE CODE	OR5	0.5pF	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	1.25±0.10
	OR6	0.6pF	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	1.25±0.10
	OR7	0.7pF	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	1.25±0.10
	OR8	0.8pF	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	1.25±0.10
	OR9	0.9pF	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	1.25±0.10
	1R0	1.0pF	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	1.25±0.10
	1R2	1.2pF	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	1.25±0.10
	1R5	1.5pF	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	1.25±0.10
	1R8	1.8pF	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	1.25±0.10
	2R2	2.2pF	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	1.25±0.10
	2R7	2.7pF	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	1.25±0.10
	3R3	3.3pF	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	1.25±0.10
	3R9	3.9pF	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	1.25±0.10
	4R7	4.7pF	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	1.25±0.10
	471	5.6pF	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	1.25±0.10
	5R6	6.8pF	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	1.25±0.10
	8R2	8.2pF	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	1.25±0.10
	100	10pF	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	1.25±0.10
	120	12pF	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	1.25±0.10
	150	15pF	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	1.25±0.10
180	18pF	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	1.25±0.10	
220	22pF	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	1.25±0.10	
270	27pF	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	1.25±0.10	
330	33pF	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	1.25±0.10	
390	39pF	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	1.25±0.10	
470	47pF	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	1.25±0.10	
560	56pF	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	1.25±0.10	
680	68pF	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	1.25±0.10	
820	82pF	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.80±0.10	0.80±0.10	1.25±0.10	
101	100pF	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.80±0.10	0.80±0.10	1.25±0.10	
121	120pF	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.80±0.10	1.25±0.10	1.25±0.10	
151	150pF	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.80±0.10	1.25±0.10	1.25±0.10	1.25±0.10	

Note: Additional values may be available. Please contact us for more information. Due to demand and raw material fluctuations, specific values may not be available.

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## VOLTAGE AND CAPACITANCE RANGE

### COG (NPO) DIELECTRIC (0805)

Values that are typically available. (Thickness in mm).

SIZE (INCHES)		0805										
VDCW (MAX)		10V	16V	25V	50V	100V	200V	250V	500V	630V	1000V	
CAPACITANCE CODE	181	180pF	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.80±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
	221	220pF	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
	271	270pF	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
	331	330pF	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	0.60±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
	391	390pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
	471	470pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	1.25±0.10	1.25±0.10	1.25±0.30	1.25±0.30	
	561	560pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	1.25±0.10	1.25±0.10	1.25±0.30	1.25±0.30	
	681	680pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	1.25±0.10	1.25±0.10	1.25±0.30	1.25±0.30	
	821	820pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	1.25±0.10	1.25±0.10	1.25±0.30	1.25±0.30	
	102	1000pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	1.25±0.10	1.25±0.10	1.25±0.30	1.25±0.30	
	122	1200pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	1.25±0.10	1.25±0.10			
	152	1500pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	1.25±0.10	1.25±0.10			
	182	1800pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	1.25±0.10	1.25±0.10			
	222	2200pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	1.25±0.10	1.25±0.10			
	272	2700pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10					
	332	3300pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10					
	392	3900pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10					
	472	4700pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10					
	562	5600pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10					
	682	6800pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10					
822	8200pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10							
103	0.010µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10							

### COG (NPO) DIELECTRIC (1206)

Values that are typically available. (Thickness in mm).

SIZE (INCHES)		1206											
VDCW (MAX)		10V	16V	25V	50V	100V	200V	250V	500V	630V	1000V	1500V	2000V
CAPACITANCE CODE	1R0	1.0pF											
	1R2	1.2pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10						
	1R5	1.5pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10
	1R8	1.8pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10
	2R2	2.2pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10
	2R7	2.7pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10
	3R3	3.3pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10
	3R9	3.9pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10
	4R7	4.7pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10
	471	5.6pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10
	5R6	6.8pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10
	8R2	8.2pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10
	100	10pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10
	120	12pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10
	150	15pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10
	180	18pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10
	220	22pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10
	270	27pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10
	330	33pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.95±0.10	0.95±0.10
	390	39pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.95±0.10	0.95±0.10
470	47pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.95±0.10	0.95±0.10	
560	56pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.95±0.10	1.25±0.10	
680	68pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.95±0.10	1.25±0.10	
820	82pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	1.25±0.10	1.25±0.10	
101	100pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	1.25±0.10	1.25±0.10	

Note: Additional values may be available. Please contact us for more information. Due to demand and raw material fluctuations, specific values may not be available.

**VOLTAGE AND CAPACITANCE RANGE**

**COG (NPO) DIELECTRIC (1206)**

Values that are typically available. (Thickness in mm).

SIZE (INCHES)		1206												
VDCW (MAX)		10V	16V	25V	50V	100V	200V	250V	500V	630V	1000V	1500V	2000V	
CAPACITANCE CODE	121	120pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	1.25±0.10	1.60±0.20	1.60±0.20	
	151	150pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	1.25±0.10	1.60±0.20	1.60±0.20	
	181	180pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	1.60±0.20	1.60±0.20	1.60±0.20	
	221	220pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	1.60±0.20	1.60±0.20	1.60±0.20	
	271	270pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.60±0.20	1.60±0.50	1.60±0.50
	331	330pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.60±0.20	1.60±0.50	1.60±0.50
	391	390pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.60±0.20	1.60±0.50	1.60±0.50
	471	470pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.60±0.20		
	561	560pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.95±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.60±0.20		
	681	680pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.95±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.60±0.20		
	821	820pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.95±0.10	1.60±0.20	1.60±0.20	1.60±0.20	1.60±0.20		
	102	1000pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.95±0.10	1.60±0.20	1.60±0.20	1.60±0.20	1.60±0.20		
	122	1200pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.95±0.10	1.60±0.20	1.60±0.20	1.60±0.20			
	152	1500pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	1.25±0.10	1.60±0.20	1.60±0.20	1.60±0.20			
	182	1800pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	1.25±0.10	1.60±0.20	1.60±0.20	1.60±0.20			
	222	2200pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	1.25±0.10	1.60±0.20	1.60±0.20	1.60±0.20			
	272	2700pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	1.25±0.10	1.60±0.20	1.60±0.20	1.60±0.20			
	332	3300pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	1.25±0.10	1.60±0.20	1.60±0.20	1.60±0.20			
	392	3900pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	1.25±0.10	1.60±0.20	1.60±0.20	1.60±0.20			
	472	4700pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	1.25±0.10	1.60±0.20	1.60±0.20	1.60±0.20			
	562	5600pF	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10	0.80±0.10							
	682	6800pF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10							
	822	8200pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10							
	103	0.010µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10							
	123	0.012µF	1.60±0.50	1.60±0.50	1.60±0.50	1.60±0.50	1.60±0.50							
	153	0.015µF	1.60±0.50	1.60±0.50	1.60±0.50	1.60±0.50	1.60±0.50							
	183	0.018µF	1.60±0.50	1.60±0.50	1.60±0.50	1.60±0.50	1.60±0.50							
	223	0.022µF	1.60±0.50	1.60±0.50	1.60±0.50	1.60±0.50	1.60±0.50							
	273	0.027µF	1.60±0.50	1.60±0.50	1.60±0.50	1.60±0.50								
	333	0.033µF	1.60±0.50	1.60±0.50	1.60±0.50	1.60±0.50								
	393	0.039µF	1.60±0.50	1.60±0.50	1.60±0.50	1.60±0.50								

**COG (NPO) DIELECTRIC (1210)**

Values that are typically available. (Thickness in mm).

SIZE (INCHES)		1210												
VDCW (MAX)		10V	16V	25V	50V	100V	200V	250V	500V	630V	1000V	1500V	2000V	
CAPACITANCE CODE	100	10pF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	
	120	12pF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	
	150	15pF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	
	180	18pF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	
	220	22pF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	
	270	27pF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	
	330	33pF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	
	390	39pF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	
	470	47pF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	
	560	56pF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.25±0.10	1.25±0.10	
	680	68pF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.25±0.10	1.25±0.10	
	820	82pF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.25±0.10	1.25±0.10	
	101	100pF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.25±0.10	1.25±0.10	1.25±0.10
	121	120pF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.25±0.10	1.25±0.10	1.25±0.10
	151	150pF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.25±0.10	1.60±0.20	1.60±0.20
	181	180pF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.25±0.10	1.60±0.20	1.60±0.20

**Note:** Additional values may be available. Please contact us for more information. Due to demand and raw material fluctuations, specific values may not be available.

**VOLTAGE AND CAPACITANCE RANGE**

**COG (NPO) DIELECTRIC (1210)**

Values that are typically available. (Thickness in mm).

SIZE (INCHES)		1210												
VDCW (MAX)		10V	16V	25V	50V	100V	200V	250V	500V	630V	1000V	1500V	2000V	
CAPACITANCE CODE	221	220pF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.60±0.20	1.60±0.20	1.60±0.20	
	271	270pF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.60±0.20	2.00±0.20	2.00±0.20	
	331	330pF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.60±0.20	2.00±0.20	2.00±0.20	
	391	390pF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.60±0.20	2.50±0.50	2.50±0.50	
	471	470pF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.60±0.20	2.50±0.50	2.50±0.50	
	561	560pF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.60±0.20			
	681	680pF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.60±0.20			
	821	820pF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.60±0.20			
	102	1000pF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.60±0.20		
	122	1200pF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.60±0.20		
	152	1500pF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20		
	182	1800pF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.50±0.50		
	222	2200pF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.50±0.50		
	272	2700pF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.50±0.50		
	332	3300pF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.50±0.50		
	392	3900pF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.50±0.50		
	472	4700pF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.60±0.20	1.60±0.20	1.60±0.20				
	562	5600pF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.60±0.20	1.60±0.20	1.60±0.20				
	682	6800pF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.60±0.20	1.60±0.20	1.60±0.20				
	822	8200pF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.60±0.20	1.60±0.20	1.60±0.20				
	103	0.010µF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.60±0.20	1.60±0.20	1.60±0.20				
	123	0.012µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10							
	153	0.015µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10							
	183	0.018µF												
	223	0.022µF												
	273	0.027µF												
	333	0.033µF												
	393	0.039µF												
473	0.047µF													

**COG (NPO) DIELECTRIC (1808)**

Values that are typically available. (Thickness in mm).

SIZE (INCHES)		1808					
VDCW (MAX)		500V	630V	1000V	1500V	2000V	3000V
CAPACITANCE CODE	2R0	2.0pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
	2R2	2.2pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
	2R7	2.7pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
	3R3	3.3pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
	3R9	3.9pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
	4R7	4.7pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
	471	5.6pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
	5R6	6.8pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
	8R2	8.2pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
	100	10pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
	120	12pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
	150	15pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
	180	18pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
	220	22pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
	270	27pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
	330	33pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
	390	39pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
	470	47pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10

Note: Additional values may be available. Please contact us for more information. Due to demand and raw material fluctuations, specific values may not be available.

## VOLTAGE AND CAPACITANCE RANGE

### COG (NPO) DIELECTRIC (1808)

Values that are typically available. (Thickness in mm).

SIZE (INCHES)		1808					
VDCW (MAX)		500V	630V	1000V	1500V	2000V	3000V
CAPACITANCE CODE	560	56pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
	680	68pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
	820	82pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
	101	100pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20
	121	120pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20
	151	150pF	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20	2.00±0.20
	181	180pF	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20	2.00±0.20
	221	220pF	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20	2.00±0.20
	271	270pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20
	331	330pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20
	391	390pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	
	471	470pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	
	561	560pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	
	681	680pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	
	821	820pF	2.00±0.20	2.00±0.20	2.00±0.20	1.25±0.10	1.25±0.10
	102	1000pF	2.00±0.20	2.00±0.20	2.00±0.20	1.60±0.20	1.60±0.20
	122	1200pF	2.00±0.20	2.00±0.20	1.60±0.20		
	152	1500pF	2.00±0.20	2.00±0.20	1.60±0.20		
	182	1800pF	2.00±0.20	2.00±0.20	2.00±0.20		
	222	2200pF	2.00±0.20	2.00±0.20	2.00±0.20		
272	2700pF	2.00±0.20	2.00±0.20				
332	3300pF	2.00±0.20	2.00±0.20				

### COG (NPO) DIELECTRIC (2220)

Values that are typically available. (Thickness in mm).

SIZE (INCHES)		2220											
VDCW (MAX)		25V	50V	100V	200V	250V	500V	630V	1000V	1500V	2000V	3000V	4000V
CAPACITANCE CODE	100	10pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20		2.00±0.20	2.00±0.20	
	120	12pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20		2.00±0.20	2.00±0.20	
	150	15pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	
	180	18pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	
	220	22pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	
	270	27pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20
	330	33pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20
	390	39pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20
	470	47pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20
	560	56pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20
	680	68pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20
	820	82pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20
	101	100pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20
	121	120pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20
	151	150pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20
	181	180pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20
	221	220pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20
	271	270pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.50±0.30
	331	330pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.50±0.30
	391	390pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	
471	470pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20		
561	560pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20		
681	680pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20		
821	820pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20		
102	1000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20		

Note: Additional values may be available. Please contact us for more information. Due to demand and raw material fluctuations, specific values may not be available.

Note: Additional values may be available. Please contact us for more information. Due to demand and raw material fluctuations, specific values may not be available.

## VOLTAGE AND CAPACITANCE RANGE

### COG (NPO) DIELECTRIC (2220)

Values that are typically available. (Thickness in mm).

SIZE (INCHES)		2220											
VDCW (MAX)		25V	50V	100V	200V	250V	500V	630V	1000V	1500V	2000V	3000V	4000V
122	1200pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	
152	1500pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	
182	1800pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20		
222	2200pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20		
272	2700pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20		
332	3300pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20		
392	3900pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20		
472	4700pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20		
562	5600pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20				
682	6800pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20				
822	8200pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.50±0.30				
103	10000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.50±0.30				
123	12000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20					
153	15000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20					
183	18000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20					
223	22000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20					
273	27000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20						
333	33000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20						
393	39000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20						
473	47000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.50±0.30	2.50±0.30	2.50±0.30						
563	56000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.50±0.30	2.50±0.30							
683	68000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.50±0.30	2.50±0.30							
823	82000pF	2.00±0.20	2.00±0.20	2.50±0.30									
104	100000pF	2.50±0.30	2.50±0.30	2.50±0.30									

### X7R DIELECTRIC (0402, 0603)

Values that are typically available. (Thickness in mm).

SIZE (INCHES)		0402					0603						
VDCW (MAX)		10V	16V	25V	50V	100V	10V	16V	25V	50V	100V	200V	250V
101	100pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.30	0.80±0.30
121	120pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.30	0.80±0.30
151	150pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.30	0.80±0.30
181	180pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.30	0.80±0.30
221	220pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.30	0.80±0.30
271	270pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.30	0.80±0.30
331	330pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.30	0.80±0.30
391	390pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.30	0.80±0.30
471	470pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.30	0.80±0.30
561	560pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.30	0.80±0.30
681	680pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.30	0.80±0.30
821	820pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.30	0.80±0.30
102	1000pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.30	0.80±0.30
122	1200pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.30	0.80±0.30
152	1500pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.30	0.80±0.30
182	1800pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.30	0.80±0.30
222	2200pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.30	0.80±0.30
272	2700pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.30	0.80±0.30
332	3300pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.30	0.80±0.30
392	3900pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.30	0.80±0.30
472	4700pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.30	0.80±0.30
562	5600pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20		0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.30	0.80±0.30
682	6800pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20		0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.30	0.80±0.30

Note: Additional values may be available. Please contact us for more information. Due to demand and raw material fluctuations, specific values may not be available.

**VOLTAGE AND CAPACITANCE RANGE**

**X7R DIELECTRIC (0402, 0603)**

Values that are typically available. (Thickness in mm).

SIZE (INCHES)		0402					0603						
VDCW (MAX)		10V	16V	25V	50V	100V	10V	16V	25V	50V	100V	200V	250V
822	8200pF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20		0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.30	0.80±0.30
103	0.010µF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20		0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.30	0.80±0.30
123	0.012µF	0.50±0.20	0.50±0.20	0.50±0.20			0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.30		
153	0.015µF	0.50±0.20	0.50±0.20	0.50±0.20			0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.30		
183	0.018µF	0.50±0.20	0.50±0.20	0.50±0.20			0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.30		
223	0.022µF	0.50±0.20	0.50±0.20	0.50±0.20			0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.30		
273	0.027µF	0.50±0.20	0.50±0.20	0.50±0.20			0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.30		
333	0.033µF	0.50±0.20	0.50±0.20				0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.30	0.80±0.30		
393	0.039µF	0.50±0.20	0.50±0.20				0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.30	0.80±0.30		
473	0.047µF	0.50±0.20	0.50±0.20				0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.30	0.80±0.30		
563	0.056µF	0.50±0.20	0.50±0.20				0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.30	0.80±0.30		
683	0.068µF	0.50±0.20	0.50±0.20				0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.30	0.80±0.30		
823	0.082µF	0.50±0.20	0.50±0.20				0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.30	0.80±0.30		
104	0.10µF	0.50±0.20	0.50±0.20				0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.30	0.80±0.30		
124	0.12µF						0.80±0.07	0.80±0.07	0.80±0.30				
154	0.15µF						0.80±0.07	0.80±0.07	0.80±0.30				
184	0.18µF						0.80±0.07	0.80±0.07	0.80±0.30				
224	0.22µF						0.80±0.07	0.80±0.07	0.80±0.30	0.80±0.30			
274	0.27µF						0.80±0.30	0.80±0.30	0.80±0.30				
334	0.33µF						0.80±0.30	0.80±0.30	0.80±0.30				
394	0.39µF						0.80±0.30	0.80±0.30	0.80±0.30				
474	0.47µF						0.80±0.30	0.80±0.30	0.80±0.30				
564	0.56µF						0.80±0.30	0.80±0.30					
684	0.68µF						0.80±0.30	0.80±0.30					
824	0.82µF						0.80±0.30	0.80±0.30					
105	1.0µF						0.80±0.30	0.80±0.30	0.80±0.30				

**X7R DIELECTRIC (0805)**

Values that are typically available. (Thickness in mm).

Size (inches)		0805									
VDCW (MAX)		10V	16V	25V	50V	100V	200V	250V	500V	630V	1000V
101	100pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	0.80±0.10	0.80±0.10	0.80±0.10
121	120pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	0.80±0.10	0.80±0.10	0.80±0.10
151	150pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	0.80±0.10	0.80±0.10	0.80±0.10
181	180pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	0.80±0.10	0.80±0.10	0.80±0.10
221	220pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	0.80±0.10	0.80±0.10	0.80±0.10
271	270pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	0.80±0.10	0.80±0.10	0.80±0.10
331	330pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	0.80±0.10	0.80±0.10	0.80±0.10
391	390pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	0.80±0.10	0.80±0.10	0.80±0.10
471	470pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	0.80±0.10	0.80±0.10	0.80±0.10
561	560pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	0.80±0.10	0.80±0.10	0.80±0.10
681	680pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	0.80±0.10	0.80±0.10	0.80±0.10
821	820pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	0.80±0.10	0.80±0.10	0.80±0.10
102	1000pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	0.80±0.10	0.80±0.10	0.80±0.10
122	1200pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	0.80±0.10	0.80±0.10	0.80±0.10
152	1500pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	0.80±0.10	0.80±0.10	1.25±0.10
182	1800pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	0.80±0.10	0.80±0.10	1.25±0.10
222	2200pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	0.80±0.10	0.80±0.10	1.25±0.10
272	2700pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	0.80±0.10	0.80±0.10	
332	3300pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	0.80±0.10	0.80±0.10	
392	3900pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	0.80±0.10	0.80±0.10	
472	4700pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	

Note: Additional values may be available. Please contact us for more information. Due to demand and raw material fluctuations, specific values may not be available.

## VOLTAGE AND CAPACITANCE RANGE

### X7R DIELECTRIC (0805)

Values that are typically available. (Thickness in mm).

SIZE (INCHES)		0805									
VDCW (MAX)		10V	16V	25V	50V	100V	200V	250V	500V	630V	1000V
562	5600pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	
682	6800pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	
822	8200pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	
103	0.010µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	
123	0.012µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	
153	0.015µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	
183	0.018µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	
223	0.022µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	
273	0.027µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	
333	0.033µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10		
393	0.039µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10			
473	0.047µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10			
563	0.056µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10			
683	0.068µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10			
823	0.082µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10				
104	0.10µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10				
124	0.12µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.30					
154	0.15µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.30					
184	0.18µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.30					
224	0.22µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.30					
274	0.27µF	1.25±0.30	1.25±0.30	1.25±0.30	1.25±0.30						
334	0.33µF	1.25±0.30	1.25±0.30	1.25±0.30	1.25±0.30						
394	0.39µF	1.25±0.30	1.25±0.30	1.25±0.30	1.25±0.30						
474	0.47µF	1.25±0.30	1.25±0.30	1.25±0.30	1.25±0.30						
564	0.56µF	1.25±0.30	1.25±0.30	1.25±0.30							
684	0.68µF	1.25±0.30	1.25±0.30	1.25±0.30							
824	0.82µF	1.25±0.30	1.25±0.30	1.25±0.30							
105	1.0µF	1.25±0.25	1.25±0.25	1.25±0.25	1.25±0.30						
155	1.5µF	1.25±0.30	1.25±0.30	1.25±0.30							
225	2.2µF	1.25±0.30	1.25±0.30	1.25±0.30							
475	4.7µF		1.25±0.30	1.25±0.30							
155	1.5µF	1.25±0.30	1.25±0.30	1.25±0.30							
225	2.2µF	1.25±0.30	1.25±0.30	1.25±0.30							
475	4.7µF		1.25±0.30	1.25±0.30							

### X7R DIELECTRIC (1206)

Values that are typically available. (Thickness in mm).

SIZE (INCHES)		1206													
VDCW (MAX)		10V	16V	25V	50V	100V	200V	250V	400V	450V	500V	630V	1000V	1500V	2000V
101	100pF						1.25±0.10	1.25±0.10			1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
121	120pF						1.25±0.10	1.25±0.10			1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
151	150pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10			1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
181	180pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10			1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
221	220pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10			1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
271	270pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10			1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
331	330pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10			1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
391	390pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10			1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
471	470pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10			1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
561	560pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10			1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
681	680pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10			1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
821	820pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10			1.25±0.10	1.25±0.10	1.25±0.10	1.60±0.20	1.60±0.20
102	1000pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10			1.25±0.10	1.25±0.10	1.25±0.10	1.60±0.20	1.60±0.20

Note: Additional values may be available. Please contact us for more information. Due to demand and raw material fluctuations, specific values may not be available.

**VOLTAGE AND CAPACITANCE RANGE**

**X7R DIELECTRIC (1206)**

Values that are typically available. (Thickness in mm).

SIZE (INCHES)		1206													
VDCW (MAX)		10V	16V	25V	50V	100V	200V	250V	400V	450V	500V	630V	1000V	1500V	2000V
122	1200pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10			1.25±0.10	1.25±0.10	1.25±0.10	1.60±0.20	1.60±0.20
152	1500pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10			1.25±0.10	1.25±0.10	1.25±0.10	1.60±0.20	1.60±0.20
182	1800pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10			1.25±0.10	1.25±0.10	1.25±0.10	1.60±0.20	1.60±0.20
222	2200pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10			1.25±0.10	1.25±0.10	1.25±0.10	1.60±0.20	1.60±0.20
272	2700pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10			1.25±0.10	1.25±0.10	1.25±0.10	1.60±0.20	1.60±0.20
332	3300pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10			1.25±0.10	1.25±0.10	1.25±0.10	1.60±0.20	1.60±0.20
392	3900pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10			1.25±0.10	1.25±0.10	1.25±0.10	1.60±0.20	
472	4700pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10			1.25±0.10	1.25±0.10	1.25±0.10	1.60±0.20	
562	5600pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10			1.25±0.10	1.25±0.10	1.25±0.10	1.60±0.20	
682	6800pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10			1.25±0.10	1.25±0.10	1.25±0.10	1.60±0.20	
822	8200pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10			1.25±0.10	1.25±0.10	1.25±0.10	1.60±0.20	
103	0.010µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10			1.25±0.10	1.25±0.10	1.25±0.10	1.60±0.20	
123	0.012µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10			1.25±0.10	1.25±0.10	1.60±0.20		
153	0.015µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10			1.25±0.10	1.25±0.10	1.60±0.20		
183	0.018µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10			1.25±0.10	1.25±0.10			
223	0.022µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10			1.60±0.20	1.60±0.20			
273	0.027µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10			1.60±0.20	1.60±0.20			
333	0.033µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.60±0.20	1.60±0.20			1.60±0.20	1.60±0.20			
393	0.039µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.60±0.20	1.60±0.20			1.60±0.20	1.60±0.20			
473	0.047µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.60±0.20	1.60±0.20			1.60±0.20	1.60±0.20			
563	0.056µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.60±0.20	1.60±0.20			1.60±0.20	1.60±0.20			
683	0.068µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.60±0.20	1.60±0.20	1.60±0.20	1.60±0.20					
823	0.082µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.60±0.20	1.60±0.20	1.60±0.20	1.60±0.20					
104	0.10µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.60±0.20	1.60±0.20	1.60±0.20	1.60±0.20					
124	0.12µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10									
154	0.15µF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.60±0.20									
184	0.18µF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.60±0.20									
224	0.22µF	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.60±0.20									
274	0.27µF	0.95±0.10	0.95±0.10	0.95±0.10	1.25±0.10	1.60±0.20									
334	0.33µF	0.95±0.10	0.95±0.10	0.95±0.10	1.25±0.10	1.60±0.20									
394	0.39µF	0.95±0.10	0.95±0.10	1.15±0.15	1.60±0.50	1.60±0.20									
474	0.47µF	1.15±0.15	1.15±0.15	1.15±0.15	1.60±0.50	1.60±0.20									
564	0.56µF	1.15±0.15	1.15±0.15	1.15±0.15	1.60±0.50	1.60±0.50									
684	0.68µF	1.15±0.15	1.15±0.15	1.15±0.15	1.60±0.50	1.60±0.50									
824	0.82µF	1.15±0.15	1.15±0.15	1.15±0.15	1.60±0.50	1.60±0.50									
105	1.0µF	1.15±0.15	1.15±0.15	1.15±0.15	1.60±0.50	1.60±0.50									
155	1.5µF	1.15±0.15	1.15±0.15	1.60±0.50											
225	2.2µF	1.15±0.15	1.15±0.15	1.60±0.50	1.60±0.50	1.60±0.30									
475	4.7µF	1.60±0.50	1.60±0.50	1.60±0.50											
106	10µF	1.60±0.50	1.60±0.50	1.60±0.50											
226	22µF	1.60±0.50													

Note: Additional values may be available. Please contact us for more information. Due to demand and raw material fluctuations, specific values may not be available.

## VOLTAGE AND CAPACITANCE RANGE

### X7R DIELECTRIC (1210)

Values that are typically available. (Thickness in mm).

SIZE (INCHES)		1210														
VDCW (MAX)		6.3V	10V	16V	25V	50V	100V	200V	250V	400V	450V	500V	630V	1000V	1500V	2000V
101	100pF											1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
121	120pF											1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
151	150pF											1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
181	180pF											1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
221	220pF											1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
271	270pF											1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
331	330pF											1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
391	390pF											1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
471	470pF											1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
561	560pF											1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
681	680pF											1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
821	820pF											1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
102	1000pF		0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10			1.25±0.10	1.25±0.10	1.25±0.10	2.50±0.50	2.50±0.50
122	1200pF		0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10			1.25±0.10	1.25±0.10	1.25±0.10	2.50±0.50	2.50±0.50
152	1500pF		0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10			1.25±0.10	1.25±0.10	1.25±0.10	2.50±0.50	2.50±0.50
182	1800pF		0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10			1.25±0.10	1.25±0.10	1.25±0.10	2.50±0.50	2.50±0.50
222	2200pF		0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10			1.25±0.10	1.25±0.10	1.25±0.10	2.50±0.50	2.50±0.50
272	2700pF		0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10			1.25±0.10	1.25±0.10	1.25±0.10	2.50±0.50	2.50±0.50
332	3300pF		0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10			1.25±0.10	1.25±0.10	1.25±0.10	2.50±0.50	2.50±0.50
392	3900pF		0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10			1.25±0.10	1.25±0.10	1.60±0.20	2.50±0.50	2.50±0.50
472	4700pF		0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10			1.25±0.10	1.25±0.10	1.60±0.20	2.50±0.50	2.50±0.50
562	5600pF		0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10			1.25±0.10	1.25±0.10	1.60±0.20	2.50±0.50	2.50±0.50
682	6800pF		0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10			1.25±0.10	1.25±0.10	1.60±0.20	2.50±0.50	2.50±0.50
822	8200pF		0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10			1.25±0.10	1.25±0.10	1.60±0.20	2.50±0.50	2.50±0.50
103	0.010µF		0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10			1.25±0.10	1.25±0.10	1.60±0.20		
123	0.012µF		0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10			1.25±0.10	1.25±0.10	1.60±0.20		
153	0.015µF		0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10			1.25±0.10	1.25±0.10	1.60±0.20		
183	0.018µF		0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10			1.25±0.10	1.25±0.10	1.60±0.20		
223	0.022µF		0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10			1.25±0.10	1.25±0.10	1.60±0.20		
273	0.027µF		0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10			1.60±0.20	1.60±0.20	1.60±0.20		
333	0.033µF		0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10			1.60±0.20	1.60±0.20	1.60±0.20		
393	0.039µF		0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10			1.60±0.20	1.60±0.20			
473	0.047µF		0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.25±0.10	1.25±0.10			1.60±0.20	1.60±0.20	2.50±0.50		
563	0.056µF		0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.25±0.10	1.25±0.10			1.60±0.20	1.60±0.20			
683	0.068µF		0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.60±0.20	1.60±0.20			2.00±0.20	2.00±0.20			
823	0.082µF		0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.60±0.20	1.60±0.20			2.00±0.20	2.00±0.20			
104	0.10µF		0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.60±0.20	1.60±0.20			2.00±0.20	2.00±0.20			
124	0.12µF		0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.60±0.20	1.60±0.20	2.50±0.50	2.50±0.50					
154	0.15µF		0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.25±0.10	2.50±0.50	2.50±0.50	2.50±0.50	2.50±0.50	2.50±0.50				
184	0.18µF		0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.25±0.10	2.50±0.50	2.50±0.50	2.50±0.50	2.50±0.50	2.50±0.50				
224	0.22µF		0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.25±0.10	2.50±0.50	2.50±0.50	2.50±0.50	2.50±0.50	2.50±0.50				
274	0.27µF		0.95±0.10	0.95±0.10	0.95±0.10	0.95±0.10	1.60±0.20	2.50±0.50	2.50±0.50	2.50±0.50	2.50±0.50	2.50±0.50				
334	0.33µF		0.95±0.10	0.95±0.10	0.95±0.10	1.25±0.10	1.60±0.20	2.50±0.50	2.50±0.50	2.50±0.50	2.50±0.50	2.50±0.50				
394	0.39µF		0.95±0.10	0.95±0.10	0.95±0.10	1.25±0.10	2.50±0.50	2.50±0.50	2.50±0.50							
474	0.47µF		0.95±0.10	0.95±0.10	0.95±0.10	1.25±0.10	2.50±0.50	2.50±0.50	2.50±0.50							
564	0.56µF		1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.50±0.50	2.50±0.50	2.50±0.50							
684	0.68µF		1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20	2.50±0.50	2.50±0.50							
824	0.82µF		1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20									
105	1.0µF		1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20									
155	1.5µF			2.00±0.20	1.60±0.20	2.50±0.50	2.50±0.50									

Note: Additional values may be available. Please contact us for more information. Due to demand and raw material fluctuations, specific values may not be available.

## VOLTAGE AND CAPACITANCE RANGE

### X7R DIELECTRIC (1210)

Values that are typically available. (Thickness in mm).

SIZE (INCHES)		1210														
VDCW (MAX)		6.3V	10V	16V	25V	50V	100V	200V	250V	400V	450V	500V	630V	1000V	1500V	2000V
<CAPACITANCE CODE>	225	2.2µF		2.00±0.20	1.60±0.20	2.50±0.50	2.50±0.50									
	335	3.3µF		2.00±0.20	1.60±0.20	2.50±0.50										
<CAPACITANCE VALUE>	475	4.7µF	2.00±0.20	2.00±0.20	2.00±0.20	2.50±0.50	2.50±0.50									
	106	10µF	2.00±0.20	2.00±0.20	2.50±0.50	2.50±0.50	2.50±0.50									
	226	22µF		2.50±0.50	2.50±0.50											
	476	47µF	2.50±0.50													

### X7R DIELECTRIC (1808)

Values that are typically available. (Thickness in mm).

SIZE (INCHES)		1808					
VDCW (MAX)		500V	630V	1000V	1500V	2000V	3000V
CAPACITANCE CODE	151	150pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
	181	180pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
	221	220pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
	271	270pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10
	331	330pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20
	391	390pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20
	471	470pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20
	561	560pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20
	681	680pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20
	821	820pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20
	102	1000pF	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20	2.00±0.20
	122	1200pF	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20	2.00±0.20
	152	1500pF	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20	2.00±0.20
	182	1800pF	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20	2.00±0.20
	222	2200pF	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20	2.00±0.20
	272	2700pF	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20	2.00±0.20
	332	3300pF	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20	2.00±0.20
	392	3900pF	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20	2.00±0.20
	472	4700pF	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20	2.00±0.20
	562	5600pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20
	682	6800pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20
	822	8200pF	2.00±0.20	2.00±0.20	2.00±0.20		
	103	0.010µF	2.00±0.20	2.00±0.20	2.00±0.20		
	123	0.012µF	2.00±0.20	2.00±0.20	2.00±0.20		
	153	0.015µF	2.00±0.20	2.00±0.20	2.00±0.20		
	183	0.018µF	2.00±0.20	2.00±0.20	2.00±0.20		
	223	0.022µF	2.00±0.20	2.00±0.20	2.00±0.20		
	273	0.027µF	2.00±0.20	2.00±0.20	2.00±0.20		
333	0.033µF	2.00±0.20	2.00±0.20	2.00±0.20			
393	0.039µF	2.00±0.20	2.00±0.20	2.00±0.20			
473	0.047µF	2.00±0.20	2.00±0.20	2.00±0.20			
563	0.056µF	2.00±0.20	2.00±0.20	2.00±0.20			
683	0.068µF	2.00±0.20	2.00±0.20				
823	0.082µF	2.00±0.20	2.00±0.20				

Note: Additional values may be available. Please contact us for more information. Due to demand and raw material fluctuations, specific values may not be available.

**VOLTAGE AND CAPACITANCE RANGE**

**X7R DIELECTRIC (1812)**

Values that are typically available. (Thickness in mm).

SIZE (INCHES)		1812												
VDCW (MAX)		10V	16V	25V	50V	100V	200V	250V	500V	630V	1000V	1500V	2000V	3000V
271	270pF						1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20
331	330pF						1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20
391	390pF						1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20
471	470pF						1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20
561	560pF						1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20
681	680pF						1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20
821	820pF						1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20
102	1000pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20
122	1200pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20
152	1500pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20
182	1800pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.60±0.20	1.60±0.20	2.50±0.50
222	2200pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.60±0.20	1.60±0.20	2.50±0.50
272	2700pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.60±0.20	1.60±0.20	2.50±0.50
332	3300pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20	2.00±0.20	2.50±0.50
392	3900pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20	2.00±0.20	2.50±0.50
472	4700pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20	2.00±0.20	2.50±0.50
562	5600pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.50±0.50	2.50±0.50	2.50±0.50
682	6800pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.50±0.50	2.50±0.50	2.50±0.50
822	8200pF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.50±0.50	2.50±0.50	
103	0.010µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.50±0.50	2.50±0.50	
123	0.012µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20			
153	0.015µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20			
183	0.018µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.50±0.50			
223	0.022µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.50±0.50			
273	0.027µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.50±0.50			
333	0.033µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.50±0.50			
393	0.039µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.50±0.50			
473	0.047µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.50±0.50			
563	0.056µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20	2.00±0.20	2.50±0.50			
683	0.068µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20	2.00±0.20	2.50±0.50			
823	0.082µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20	2.00±0.20	2.50±0.50			
104	0.10µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20	2.00±0.20	2.50±0.50			
124	0.12µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.50±0.50	2.50±0.50				
154	0.15µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20	2.00±0.20	2.50±0.50	2.50±0.50				
184	0.18µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20	2.00±0.20	2.50±0.50	2.50±0.50				
224	0.22µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20	2.00±0.20	2.50±0.50	2.50±0.50				
274	0.27µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20	2.00±0.20	2.50±0.50					
334	0.33µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20	2.00±0.20	2.50±0.50					
394	0.39µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20	2.00±0.20	2.50±0.50					
474	0.47µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20	2.00±0.20	2.00±0.20	2.50±0.50					
564	0.56µF	1.25±0.10	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20	2.50±0.50	2.50±0.50						
684	0.68µF	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20	2.00±0.20	2.50±0.50	2.50±0.50						
824	0.82µF	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20	2.00±0.20	2.50±0.50	2.50±0.50						
105	1.0µF	1.25±0.10	1.25±0.10	1.25±0.10	2.00±0.20	2.00±0.20	2.50±0.50	2.50±0.50						
155	1.5µF					2.00±0.20								
225	2.2µF				2.50±0.50	2.50±0.50								

Note: Additional values may be available. Please contact us for more information. Due to demand and raw material fluctuations, specific values may not be available.

**VOLTAGE AND CAPACITANCE RANGE**

**X7R DIELECTRIC (2220)**

Values that are typically available. (Thickness in mm).

SIZE (INCHES)		2220													
VDCW (MAX)		25V	50V	100V	200V	250V	400V	500V	630V	1000V	1500V	2000V	3000V	4000V	
101	100pF														
121	120pF														
151	150pF														
181	180pF														
221	220pF													1.25±0.20	
271	270pF													1.25±0.20	
331	330pF													1.25±0.20	
391	390pF													1.25±0.20	
471	470pF													1.25±0.20	
561	560pF													1.25±0.20	
681	680pF													1.25±0.20	
821	820pF													1.25±0.20	
102	1000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	1.25±0.20	1.25±0.20	1.25±0.20	1.25±0.20	1.25±0.20	
122	1200pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	1.25±0.20	1.25±0.20	1.25±0.20	1.25±0.20	1.25±0.20	
152	1500pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	1.25±0.20	1.25±0.20	1.25±0.20	1.25±0.20	1.25±0.20	
182	1800pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	1.25±0.20	1.25±0.20	1.25±0.20	1.25±0.20	1.25±0.20	
222	2200pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	1.25±0.20	1.25±0.20	1.25±0.20	1.25±0.20	1.60±0.20	
272	2700pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	1.25±0.20	1.25±0.20	1.25±0.20	1.25±0.20	1.60±0.20	
332	3300pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	1.25±0.20	1.25±0.20	1.25±0.20	1.25±0.20	1.60±0.20	
392	3900pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	1.25±0.20	1.25±0.20	1.25±0.20	1.25±0.20	1.60±0.20	
472	4700pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	1.25±0.20	1.25±0.20	1.25±0.20	2.00±0.20	2.00±0.20	
562	5600pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	1.25±0.20	1.25±0.20	1.25±0.20	2.00±0.20	2.00±0.20	
682	6800pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	1.25±0.20	1.25±0.20	1.25±0.20	2.00±0.20	2.00±0.20	
822	8200pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	1.25±0.20	1.25±0.20	1.25±0.20	2.00±0.20	2.40±0.30	
103	10000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	1.25±0.20	1.25±0.20	1.25±0.20	2.00±0.20	2.80±0.30	
123	12000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	1.25±0.20	1.25±0.20	1.25±0.20			
153	15000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	1.25±0.20	1.25±0.20	1.25±0.20			
183	18000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	1.25±0.20	1.60±0.20	1.60±0.20			
223	22000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	1.25±0.20	1.60±0.20	1.60±0.20			
273	27000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	1.25±0.20	1.60±0.20	1.60±0.20			
333	33000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	1.25±0.20	2.00±0.20	2.00±0.20			
393	39000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	1.25±0.20	2.00±0.20	2.00±0.20			
473	47000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	1.25±0.20	2.40±0.30	2.40±0.30			
563	56000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	1.25±0.20					
683	68000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	1.25±0.20					
823	82000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	1.25±0.20					
104	100000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	1.60±0.20					
124	120000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	1.60±0.20					
154	150000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.30					
184	180000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.30					
224	220000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.30					
274	270000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20						
334	330000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20						
394	390000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20						
474	470000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20						
564	560000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20									
684	680000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20									
824	820000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20									
105	1000000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.00±0.20	2.80±0.30	2.80±0.30							
125	1200000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.50±0.30	2.50±0.30									

**Note:** Additional values may be available. Please contact us for more information. Due to demand and raw material fluctuations, specific values may not be available.  
\*Provided with surface coating.

## VOLTAGE AND CAPACITANCE RANGE

### X7R DIELECTRIC (2220)

Values that are typically available. (Thickness in mm).

SIZE (INCHES)		2220												
VDCW (MAX)		25V	50V	100V	200V	250V	400V	500V	630V	1000V	1500V	2000V	3000V	4000V
CAPACITANCE CODE	155	1500000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.50±0.30	2.50±0.30							
	185	1800000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.50±0.30	2.50±0.30							
	225	2200000pF	2.00±0.20	2.00±0.20	2.00±0.20	2.50±0.30	2.50±0.30							
	275	2700000pF	2.00±0.20	2.00±0.20	2.00±0.20									
	335	3300000pF	2.00±0.20	2.00±0.20	2.00±0.20									
	395	3900000pF	2.00±0.20	2.00±0.20	2.00±0.20									
	475	4700000pF	2.00±0.20	2.00±0.20	2.00±0.20									
	565	5600000pF	2.00±0.20	2.00±0.20	2.00±0.20									
	685	6800000pF	2.00±0.20	2.00±0.20	2.00±0.20									
	825	8200000pF	2.50±0.30	2.50±0.30	2.50±0.30									
	106	10000000pF	2.50±0.30	2.50±0.30	2.50±0.30									
	126	12000000pF	2.80±0.30	2.80±0.30										
	156	15000000pF	2.80±0.30	2.80±0.30										
	186	18000000pF	2.80±0.30	2.80±0.30										
	226	22000000pF	2.80±0.30	2.80±0.30										

### X5R DIELECTRIC (0402, 0603, 0805)

Values that are typically available. (Thickness in mm).

SIZE (INCHES)		0402				0603					0805				
VDCW (MAX)		6.3V	10V	16V	25V	6.3V	10V	16V	25V	50V	6.3V	10V	16V	25V	50V
CAPACITANCE CODE	273	0.027µF		0.50±0.20											
	333	0.033µF		0.50±0.20											
	393	0.039µF		0.50±0.20											
	473	0.047µF		0.50±0.20											
	563	0.056µF	0.50±0.20	0.50±0.20											
	683	0.068µF	0.50±0.20	0.50±0.20											
	823	0.082µF	0.50±0.20	0.50±0.20	0.50±0.20										
	104	0.10µF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20									
	154	0.15µF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20									
	224	0.22µF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20			0.80±0.30	0.80±0.30					
	274	0.27µF					0.80±0.30	0.80±0.30	0.80±0.30	0.80±0.30					
	334	0.33µF	0.50±0.20	0.50±0.20			0.80±0.30	0.80±0.30	0.80±0.30	0.80±0.30					
	394	0.39µF					0.80±0.30	0.80±0.30	0.80±0.30	0.80±0.30	0.80±0.30				
	474	0.47µF	0.50±0.20	0.50±0.20			0.80±0.30	0.80±0.30	0.80±0.30	0.80±0.30	0.80±0.30				
	684	0.68µF	0.50±0.20	0.50±0.20			0.80±0.30	0.80±0.30	0.80±0.30	0.80±0.30	0.80±0.30				
	824	0.82µF					0.80±0.30	0.80±0.30	0.80±0.30						
	105	1.0µF	0.50±0.20	0.50±0.20			0.80±0.30	0.80±0.30	0.80±0.30	0.80±0.30					
	155	1.5µF					0.80±0.30				1.25±0.30	1.25±0.30	1.25±0.30	1.25±0.30	
	225	2.2µF					0.80±0.30	0.80±0.30	0.80±0.30		1.25±0.30	1.25±0.30	1.25±0.30	1.25±0.30	
	335	3.3µF					0.80±0.30				1.25±0.30	1.25±0.30	1.25±0.30	1.25±0.30	
475	4.7µF					0.80±0.30						1.25±0.30	1.25±0.30		

**Note:** Additional values may be available. Please contact us for more information. Due to demand and raw material fluctuations, specific values may not be available.

## VOLTAGE AND CAPACITANCE RANGE

### X5R DIELECTRIC (1206, 1210)

Values that are typically available. (Thickness in mm).

SIZE (INCHES)		1206					1210				
VDCW (MAX)		6.3V	10V	16V	25V	50V	6.3V	10V	16V	25V	50V
CAPACITANCE CODE	224	0.22μF									
	274	0.27μF									
	334	0.33μF									
	394	0.39μF									
	474	0.47μF									
	684	0.68μF									
	824	0.82μF									
	105	1.0μF									
	155	1.5μF		1.15±0.15	1.15±0.15				2.00±0.20	2.00±0.20	
	225	2.2μF		1.15±0.15	1.15±0.15	1.60±0.60			2.00±0.20	2.00±0.20	
	335	3.3μF		1.60±0.60	1.60±0.60	1.60±0.60					
	475	4.7μF	1.60±0.60	1.60±0.60	1.60±0.60	1.60±0.60			2.00±0.20	2.00±0.20	2.00±0.20
	685	6.8μF	1.60±0.60	1.60±0.60							
	106	10μF	1.60±0.60	1.60±0.60	1.60±0.60	1.60±0.60	1.60±0.60	2.00±0.20	2.00±0.20	2.00±0.20	

### Y5V DIELECTRIC (0402, 0603)

Values that are typically available. (Thickness in mm).

SIZE (INCHES)		0402					0603			
VDCW (MAX)		6.3V	10V	16V	25V	50V	10V	16V	25V	50V
CAPACITANCE CODE	103	0.010μF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07
	153	0.015μF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07
	223	0.022μF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07
	333	0.033μF	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07
	473	0.047μF	0.50±0.20	0.50±0.20	0.50±0.20		0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07
	683	0.068μF	0.50±0.20	0.50±0.20	0.50±0.20		0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07
	104	0.10μF	0.50±0.20	0.50±0.20	0.50±0.20		0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07
	154	0.15μF	0.50±0.20				0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07
	224	0.22μF	0.50±0.20	0.50±0.20			0.80±0.07	0.80±0.07	0.80±0.07	0.80±0.07
	334	0.33μF	0.50±0.20	0.50±0.20			0.80±0.07	0.80±0.07	0.80±0.07	
	474	0.47μF					0.80±0.07	0.80±0.07		
	684	0.68μF					0.80±0.07	0.80±0.30		
	105	1.0μF					0.80±0.07	0.80±0.30		
	225	2.2μF					0.80±0.07			
475	4.7μF									

**Note:** Additional values may be available. Please contact us for more information. Due to demand and raw material fluctuations, specific values may not be available.

## RELIABILITY TEST CONDITIONS & REQUIREMENTS

ITEM	TEST CONDITION	REQUIREMENTS																																																																																																				
1. Visual and Mechanical		* No remarkable defect. * Dimensions to conform to individual specification sheet.																																																																																																				
2. Capacitance	<b>Class I: (NPO)</b> C≤1000pF, 1.0±0.2Vrms, 1MHz±10% C>1000pF, 1.0±0.2Vrms, 1KHz±10% <b>Class II: (X7R, X6S, X5R, X7S, Y5V)</b> C≤10μF, 1.0±0.2Vrms, 1KHz±10% ** C>10μF, 0.5±0.2Vrms, 120Hz±20% ** Test condition: 0.5±0.2Vrms, 1KHz±10%	* Shall not exceed the limits given in the detailed spec. NPO: Cap30pF, Q1000; Cap<30pF, Q400+20C X7R, X5R, X6S, X7S:																																																																																																				
3. Q/ D.F. (Dissipation Factor)	<b>X7R:</b> 0805=106(6.3V), 0603/475(6.3V) <b>X5R:</b> 0201≥224 (6.3V,10V,16V)#1, 0402≥475 (6.3V,16V), 0402≥225(10V), 0603=106 (6.3V,10V), <b>X6S:</b> 0201/474(4V),0201≥104 (6.3V,10V#1), 0402≥225 (6.3V), 0402/475 (10V), 0603/106 (6.3V), <b>X7S:</b> 0402/225(6.3V)#1 Excluding X5R/0201/105(6.3V);225(10V), X6S/0201/104(10V) (1.0±0.2Vrms, 1KHz±10%)  *Before initial measurement (Class II only): To apply de-aging at 150°C for 1hr then set for 24±2 hrs at room temp.	<table border="1"> <thead> <tr> <th>RATED VOL.</th> <th>D.F.≤</th> <th colspan="2">EXCEPTION OF D.F.≤</th> </tr> </thead> <tbody> <tr> <td rowspan="3">≥100V</td> <td rowspan="3">≤2.5%</td> <td>≤3%</td> <td>1206≥0.47μF</td> </tr> <tr> <td>≤5%</td> <td>0805&gt;0.1μF;0603≥0.068μF;1206&gt;1μF;1210≥2.2μF</td> </tr> <tr> <td>≤10%</td> <td>0805&gt;0.22μF;1210≥3.3μF</td> </tr> <tr> <td rowspan="3">50V</td> <td rowspan="3">≤2.5%</td> <td>≤3%</td> <td>0201(50V);0603≥0.047μF;0805≥0.18μF;1206≥0.47μF</td> </tr> <tr> <td>≤5%</td> <td>0201≥0.01μF;1210≥4.7μF</td> </tr> <tr> <td>≤10%</td> <td>0402≥0.012μF;0603&gt;0.1μF;0805≥1μF;1206≥2.2μF;1210≥10μF</td> </tr> <tr> <td>35V</td> <td>≤3.5%</td> <td>≤10%</td> <td>0603≥1μF;0805≥2.2μF;1206≥2.2μF;1210≥10μF</td> </tr> <tr> <td rowspan="4">25V</td> <td rowspan="4">≤3.5%</td> <td>≤5%</td> <td>0201≥0.01μF;0805≥1μF;1210≥10μF</td> </tr> <tr> <td>≤7%</td> <td>0603≥0.33μF</td> </tr> <tr> <td>≤10%</td> <td>0201≥0.1μF;0402≥0.10μF&amp;(0402/X7R≥0.056μF) 0603≥0.47μF;0805≥2.2μF;1206≥4.7μF;1210≥22μF</td> </tr> <tr> <td>≤12.5%</td> <td>0402≥0.47μF</td> </tr> <tr> <td rowspan="2">16V</td> <td rowspan="2">≤3.5%</td> <td>≤5%</td> <td>0201≥0.01μF;0402≥0.033μF;0603≥0.15μF; 0805≥0.68μF;1206≥2.2μF;1210≥4.7μF</td> </tr> <tr> <td>≤10%</td> <td>0201≥0.1μF(0201/X7R≥0.022μF);0402≥0.22μF 0603≥0.68μF;0805≥2.2μF;1206≥4.7μF;1210≥22μF</td> </tr> <tr> <td rowspan="2">10V</td> <td rowspan="2">≤5%</td> <td>≤10%</td> <td>0201≥0.012μF;0402≥0.33μF(0402/X7R≥0.22μF) 0603≥0.33μF;0805≥2.2μF;1206≥2.2μF;1210≥22μF;01R5</td> </tr> <tr> <td>≤15%</td> <td>0201≥0.1μF; 0402≥1μF</td> </tr> <tr> <td rowspan="2">6.3V</td> <td rowspan="2">≤10%</td> <td>≤15%</td> <td>0201≥0.1μF;0402≥1μF(0402/X6S≥0.47μF);0603≥10μF; 0805≥4.7μF;1206≥47μF;1210≥100μF</td> </tr> <tr> <td>≤20%</td> <td>0402≥2.2μF</td> </tr> <tr> <td>4V</td> <td>≤15%</td> <td>-</td> <td>-</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="4">X7R, X5R, X6S, X7S:</th> </tr> <tr> <th>Rated vol.</th> <th>D.F.≤</th> <th colspan="2">Exception of D.F.≤</th> </tr> </thead> <tbody> <tr> <td rowspan="2">≥50V</td> <td rowspan="2">≤5%</td> <td>≤7%</td> <td>0603≥0.1μF; 0805≥0.47μF; 1206≥4.7μF;</td> </tr> <tr> <td>≤12.5%</td> <td>1210≥6.8μF</td> </tr> <tr> <td>35V</td> <td>≤7%</td> <td>-</td> <td>-</td> </tr> <tr> <td rowspan="2">25V</td> <td rowspan="2">≤5%</td> <td>≤7%</td> <td>0402≥0.047μF;0603≥0.1μF; 0805≥0.33μF; 1206≥1μF; 1210≥4.7μF</td> </tr> <tr> <td>≤9%</td> <td>0402≥0.068μF;0603≥0.47μF; 1206≥4.7μF; 1210≥22μF</td> </tr> <tr> <td rowspan="2">16V (C&lt;1.0μF)</td> <td rowspan="2">≤7%</td> <td>≤9%</td> <td>0402≥0.068μF; 0603≥0.68μF</td> </tr> <tr> <td>≤12.5%</td> <td>0402≥0.22μF</td> </tr> <tr> <td rowspan="2">16V (C≥1.0μF)</td> <td rowspan="2">≤9%</td> <td>≤12.5%</td> <td>0603≥2.2μF; 0805≥3.3μF;1206≥10μF; 1210≥22μF; 1812≥47μF</td> </tr> <tr> <td>≤20%</td> <td>0402≥0.47μF</td> </tr> <tr> <td>10V</td> <td>≤12.5%</td> <td>≤20%</td> <td>0402≥0.47μF</td> </tr> <tr> <td>6.3V</td> <td>≤20%</td> <td>-</td> <td>-</td> </tr> </tbody> </table>	RATED VOL.	D.F.≤	EXCEPTION OF D.F.≤		≥100V	≤2.5%	≤3%	1206≥0.47μF	≤5%	0805>0.1μF;0603≥0.068μF;1206>1μF;1210≥2.2μF	≤10%	0805>0.22μF;1210≥3.3μF	50V	≤2.5%	≤3%	0201(50V);0603≥0.047μF;0805≥0.18μF;1206≥0.47μF	≤5%	0201≥0.01μF;1210≥4.7μF	≤10%	0402≥0.012μF;0603>0.1μF;0805≥1μF;1206≥2.2μF;1210≥10μF	35V	≤3.5%	≤10%	0603≥1μF;0805≥2.2μF;1206≥2.2μF;1210≥10μF	25V	≤3.5%	≤5%	0201≥0.01μF;0805≥1μF;1210≥10μF	≤7%	0603≥0.33μF	≤10%	0201≥0.1μF;0402≥0.10μF&(0402/X7R≥0.056μF) 0603≥0.47μF;0805≥2.2μF;1206≥4.7μF;1210≥22μF	≤12.5%	0402≥0.47μF	16V	≤3.5%	≤5%	0201≥0.01μF;0402≥0.033μF;0603≥0.15μF; 0805≥0.68μF;1206≥2.2μF;1210≥4.7μF	≤10%	0201≥0.1μF(0201/X7R≥0.022μF);0402≥0.22μF 0603≥0.68μF;0805≥2.2μF;1206≥4.7μF;1210≥22μF	10V	≤5%	≤10%	0201≥0.012μF;0402≥0.33μF(0402/X7R≥0.22μF) 0603≥0.33μF;0805≥2.2μF;1206≥2.2μF;1210≥22μF;01R5	≤15%	0201≥0.1μF; 0402≥1μF	6.3V	≤10%	≤15%	0201≥0.1μF;0402≥1μF(0402/X6S≥0.47μF);0603≥10μF; 0805≥4.7μF;1206≥47μF;1210≥100μF	≤20%	0402≥2.2μF	4V	≤15%	-	-	X7R, X5R, X6S, X7S:				Rated vol.	D.F.≤	Exception of D.F.≤		≥50V	≤5%	≤7%	0603≥0.1μF; 0805≥0.47μF; 1206≥4.7μF;	≤12.5%	1210≥6.8μF	35V	≤7%	-	-	25V	≤5%	≤7%	0402≥0.047μF;0603≥0.1μF; 0805≥0.33μF; 1206≥1μF; 1210≥4.7μF	≤9%	0402≥0.068μF;0603≥0.47μF; 1206≥4.7μF; 1210≥22μF	16V (C<1.0μF)	≤7%	≤9%	0402≥0.068μF; 0603≥0.68μF	≤12.5%	0402≥0.22μF	16V (C≥1.0μF)	≤9%	≤12.5%	0603≥2.2μF; 0805≥3.3μF;1206≥10μF; 1210≥22μF; 1812≥47μF	≤20%	0402≥0.47μF	10V	≤12.5%	≤20%	0402≥0.47μF	6.3V	≤20%	-	-
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**Note:** Additional values may be available. Please contact us for more information. Due to demand and raw material fluctuations, specific values may not be available.

## RELIABILITY TEST CONDITIONS & REQUIREMENTS

ITEM	TEST CONDITION	REQUIREMENTS																													
4. Dielectric Strength	<p>*To apply voltage:                      ≤100V: 250% of rated voltage. 200V - 300V: 200% of rated voltage.                      400V - 450V: 120% of rated voltage.                      500V - 999V: 150% of rated voltage.                      1000V - 3000V: 120% of rated voltage.                      4000V: 110% of rated voltage.</p> <p>*Duration: 1 to 5 sec.                      *Charge &amp; discharge current less than 50mA.</p>	* No evidence of damage or flash over during test.																													
5. Insulation Resistance	To apply rated voltage for MAX. 120sec.	10GΩ or 500Ω-F whichever is smaller. Class II (X7R, X5R, X6S, X7S, Y5V):																													
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7. Adhesive Strength of Termination	<p>* Pressurizing force: 2N (0201) and 5N (0603) and 10N (&gt;0603) * Test time: 10±1 sec.</p>	* No remarkable damage or removal of the terminations.																																																								
8. Vibration Resistance	<p>* Vibration frequency: 10-55 Hz/min. * Total amplitude: 1.5mm * Test time: 6 hrs. (Two hrs each in three mutually perpendicular directions.) *Before initial measurement (Class II only): To apply de-aging at 150°C for 1hr then set for 24± 2 hrs at room temp. *Cap./DF(Q) Measurement to be made after de-aging at 150°C for 1hr then set for 24±2 hrs at room temp.</p>	<p>* No remarkable damage. * Cap change and Q/D.F.: To meet initial spec.</p>																																																								
9. Solderability	<p>* Solder temperature: 235±5°C * Dipping time: 2±0.5 sec.</p>	75% min. coverage of all metalized area.																																																								
10. Bending Test	<p>* The middle part of substrate shall be pressurized by means of the pressurizing rod at a rate of about 1 mm per second until the deflection becomes 3mm and then the pressure shall be maintained for 5±1 sec. * Before initial measurement (Class II only): To apply de-aging at 150°C for 1hr then set for 24± 2 hrs at room temp. * Measurement to be made after keeping at room temp. for 24±2 hrs.</p>	<p>* No remarkable damage. * Cap change: NPO: within ±5% or 0.5pF whichever is larger X7R, X5R, X6S, X7S: within ±12.5%; Y5V: within ±30% (This capacitance change means the change of capacitance under specified flexure of substrate from the capacitance measured before the test.)</p>																																																								

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## RELIABILITY TEST CONDITIONS & REQUIREMENTS

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11.	Resistance to Soldering Heat	<ul style="list-style-type: none"> <li>* Solder temperature: 260±5°C</li> <li>* Dipping time: 10±1 sec</li> <li>* Preheating: 120 to 150°C for 1 minute before immerse the capacitor in a eutectic solder.</li> <li>* Before initial measurement (Class II only): To apply de-aging at 150°C for 1hr then set for 24±2 hrs at room temp.</li> <li>* Cap. / DF(Q) / I.R. Measurement to be made after de-aging at 150°C for 1hr then set for 24±2 hrs at room temp.</li> </ul>	<ul style="list-style-type: none"> <li>* No remarkable damage.</li> <li>* Cap change: NPO: within ±2.5% or 0.25pF whichever is larger X7R, X5R, X6S, X7S: within ±7.5% Y5V: within ±20%</li> <li>* Q/D.F., I.R. and dielectric strength: To meet initial requirements.</li> <li>* 25% max. leaching on each edge.</li> </ul>															
12.	Temperature Cycle	<ul style="list-style-type: none"> <li>* Conduct the five cycles according to the temperatures and time.</li> </ul> <table border="1" data-bbox="358 590 721 814"> <thead> <tr> <th data-bbox="358 590 407 621">STEP</th> <th data-bbox="412 590 634 621">TEMP. (°C)</th> <th data-bbox="639 590 721 621">TIME (MIN.)</th> </tr> </thead> <tbody> <tr> <td data-bbox="358 642 407 674">1</td> <td data-bbox="412 642 634 674">Min. operating temp. +0/-3</td> <td data-bbox="639 642 721 674">30±3</td> </tr> <tr> <td data-bbox="358 695 407 726">2</td> <td data-bbox="412 695 634 726">Room temp.</td> <td data-bbox="639 695 721 726">2-3</td> </tr> <tr> <td data-bbox="358 737 407 768">3</td> <td data-bbox="412 737 634 768">Max. operating temp. +3/-0</td> <td data-bbox="639 737 721 768">30±3</td> </tr> <tr> <td data-bbox="358 779 407 810">4</td> <td data-bbox="412 779 634 810">Room temp.</td> <td data-bbox="639 779 721 810">2-3</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>* Before initial measurement (Class II only): To apply de-aging at 150°C for 1hr then set for 24±2 hrs at room temp.</li> <li>* Cap. / DF(Q) / I.R. Measurement to be made after de-aging at 150°C for 1hr then set for 24±2 hrs at room temp.</li> </ul>	STEP	TEMP. (°C)	TIME (MIN.)	1	Min. operating temp. +0/-3	30±3	2	Room temp.	2-3	3	Max. operating temp. +3/-0	30±3	4	Room temp.	2-3	<ul style="list-style-type: none"> <li>* No remarkable damage.</li> <li>* Cap change: NPO: within ±2.5% or 0.25pF whichever is larger X7R, X5R, X6S, X7S: within ±7.5% Y5V: within ±20%</li> <li>* Q/D.F., I.R. and dielectric strength: To meet initial requirements.</li> </ul>
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**RELIABILITY TEST CONDITIONS & REQUIREMENTS**

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13.	Humidity (Damp Heat) Steady State	<p>* Test temp.: 40±2°C</p> <p>* Humidity: 90-95%RH</p> <p>* Test time: 500±24/-0hrs.</p> <p>* Before initial measurement (Class II only): To apply de-aging at 150°C for 1hr then set for 24±2 hrs at room temp.</p> <p>* Cap. / DF(Q) / I.R. Measurement to be made after de-aging at 150°C for 1hr then set for 24±2 hrs at room temp.</p> <p>* No remarkable damage.</p> <p>* Cap change: NPO: within ±5% or 0.5pF whichever is larger X7R, X5R, X6S, X7S: ≥10V**, within ±12.5%; ≤6.3V within ±25%; C≥1uF, within ±25%</p> <p>**10V: 0603≥4.7μF; 0402≥1μF; 0201≥0.1μF, within ±25%; Y5V: ≥10V, within ±30%; ≤6.3V, within +30/-40%</p> <p>* Q/D.F. value: NPO: More than 30pF Q≥350, 10pF≤C≤30pF, Q≤275+2.5C; Less than 10pF Q≥200+10C</p> <p><b>X7R, X5R, X6S, X7S:</b></p> <table border="1"> <thead> <tr> <th>RATED VOL.</th> <th>D.F.≤</th> <th colspan="2">EXCEPTION OF D.F.≤</th> </tr> </thead> <tbody> <tr> <td rowspan="3">≥100V</td> <td rowspan="3">≤3%</td> <td>≤6%</td> <td>1206≥0.47μF</td> </tr> <tr> <td>≤7.5%</td> <td>0805&gt;0.1μF, 0603≥0.068μF, 1206&gt;1μF; 1210≥2.2μF</td> </tr> <tr> <td>≤20%</td> <td>0805&gt;0.22μF; 1210≥3.3μF</td> </tr> <tr> <td rowspan="3">50V</td> <td rowspan="3">≤3%</td> <td>≤6%</td> <td>0201(50V); 0603≥0.047μF; 0805≥0.18μF; 1206≥0.47μF</td> </tr> <tr> <td>≤10%</td> <td>0201≥0.01uF; 1210≥4.7μF</td> </tr> <tr> <td>≤20%</td> <td>0402≥0.012μF; 0603&gt;0.1μF; 0805≥1μF; 1206≥2.2μF; 1210≥10μF</td> </tr> <tr> <td>35V</td> <td>≤5%</td> <td>≤20%</td> <td>0603≥1μF; 0805 2.2F; 1206≥2.2μF; 1210≥10μF</td> </tr> <tr> <td rowspan="4">25V</td> <td rowspan="4">≤5%</td> <td>≤10%</td> <td>0201≥0.01μF; 0805≥1μF; 1210≥10μF</td> </tr> <tr> <td>≤14%</td> <td>0603≥0.33μF</td> </tr> <tr> <td>≤15%</td> <td>0201≥0.1μF; 0402≥0.10μF &amp; (0402/X7R≥0.056μF); 0603≥0.47μF; 0805≥2.2μF; 1206≥4.7μF; 1210≥22μF</td> </tr> <tr> <td>≤20%</td> <td>0402μ0.47μF</td> </tr> <tr> <td rowspan="2">16V</td> <td rowspan="2">≤5%</td> <td>≤10%</td> <td>0603≥0.15μF; 0805≥0.68μF; 1206≥2.2μF; 1210≥4.7μF</td> </tr> <tr> <td>≤15%</td> <td>0201≥0.01μF (0201/X7R≥0.022μF); 0402≥0.033μF; 0603≥0.68μF; 0805≥2.2μF; 1206≥4.7μF; 1210≥22μF</td> </tr> <tr> <td rowspan="2">10V</td> <td rowspan="2">≤7.5%</td> <td>≤15%</td> <td>0201≥0.012μF; 0402≥0.33μF (0402/X7R≥0.22μF); 0603≥0.33μF; 0805≥2.2μF; 1206≥2.2μF; 1210≥22μF</td> </tr> <tr> <td>≤20%</td> <td>0201≥0.1μF ; 0402≥1μF; 01R5</td> </tr> <tr> <td>6.3V</td> <td>≤15%</td> <td>≤30%</td> <td>0201≥0.1μF; 0402≥1μF (0402/X6S≥0.47μF); 0603V10μF; 0805≥4.7μF; 1206≥47μF; 1210≥100μF</td> </tr> <tr> <td>4V</td> <td>≤20%</td> <td>-</td> <td>-</td> </tr> </tbody> </table> <p><b>Y5V:</b></p> <table border="1"> <thead> <tr> <th>RATED VOL.</th> <th>D.F.≤</th> <th colspan="2">EXCEPTION OF D.F.≤</th> </tr> </thead> <tbody> <tr> <td rowspan="2">≥50V</td> <td rowspan="2">≤7.5%</td> <td>≤10%</td> <td>0603≥0.1μF; 0805≥0.47μF; 1206≥4.7μF</td> </tr> <tr> <td>≤20%</td> <td>1210≥6.8μF</td> </tr> <tr> <td>35V</td> <td>≤10%</td> <td>-</td> <td>-</td> </tr> <tr> <td rowspan="2">25V</td> <td rowspan="2">≤7.5%</td> <td>≤10%</td> <td>0402≥0.047μF; 0603≥0.1μF; 0805≥0.33μF; 1206≥1μF; 1210≥4.7μF</td> </tr> <tr> <td>≤15%</td> <td>0402≥0.068μF; 0603≥0.47μF; 1206≥4.7μF; 1210≥22μF</td> </tr> <tr> <td rowspan="2">16V (C&lt;1.0μF)</td> <td rowspan="2">≤10%</td> <td>≤12.5%</td> <td>0402≥0.068μF; 0603≥0.68μF</td> </tr> <tr> <td>≤20%</td> <td>0402≥0.22μF</td> </tr> <tr> <td>16V (Cμ1.0μF)</td> <td>≤12.5%</td> <td>≤20%</td> <td>0603≥2.2μF; 0805≥3.3μF; 1206≥10μF; 1210≥22μF; 1812≥47μF;</td> </tr> <tr> <td>10V</td> <td>≤20%</td> <td>≤30%</td> <td>0402≥0.47μF</td> </tr> <tr> <td>6.3V</td> <td>≤30%</td> <td>-</td> <td>-</td> </tr> </tbody> </table> <p>*I.R.: ≥10V, 1GΩ or 50Ω -F whichever is smaller.</p>	RATED VOL.	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**Note:** Additional values may be available. Please contact us for more information. Due to demand and raw material fluctuations, specific values may not be available.

### RELIABILITY TEST CONDITIONS & REQUIREMENTS

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13. Humidity (Damp Heat) Steady State (continued)	<ul style="list-style-type: none"> <li>* Test temp.: 40±2°C</li> <li>* Humidity: 90-95%RH</li> <li>* Test time: 500+24/-0hrs.</li> <li>* Before initial measurement (Class II only): To apply de-aging at 150°C for 1hr then set for 24±2 hrs at room temp.</li> <li>* Cap. / DF(Q) / I.R. Measurement to be made after de-aging at 150°C for 1hr then set for 24±2 hrs at room temp.</li> </ul>	<p>Class II (X7R, X5R, X6S, X7S, Y5V):</p> <table border="1"> <thead> <tr> <th>RATED VOL.</th> <th>INSULATION RESISTANCE</th> </tr> </thead> <tbody> <tr> <td>100V: All X7R;1210≥3.3μF</td> <td rowspan="7">1GΩ OR 100Ω-F Whichever is smaller</td> </tr> <tr> <td>50V: 0402&gt;0.01μF;0603≥1μF;0805≥1μF;1206≥4.7μF;1210≥4.7μF</td> </tr> <tr> <td>35V:0603≥1μF;0805≥2.2μF; 1206≥2.2μF;1210≥10μF</td> </tr> <tr> <td>25V:0201≥0.1uF; 0402≥0.22μF; 0603≥2.2μF;0805≥2.2μF; 1206≥10μF;1210≥10μF</td> </tr> <tr> <td>16V: 0201≥0.1uF;0402≥0.22μF;0603≥1μF;0805≥2.2μF; 1206≥10μF;1210≥47μF</td> </tr> <tr> <td>10V:0201≥47nF;0402≥0.47μF;0603≥0.47μF;0805≥2.2μF; 1206≥4.7μF;1210≥47μF</td> </tr> <tr> <td>6.3V ; 4V ; All X6S/X7S items; Size1812</td> </tr> </tbody> </table>	RATED VOL.	INSULATION RESISTANCE	100V: All X7R;1210≥3.3μF	1GΩ OR 100Ω-F Whichever is smaller	50V: 0402>0.01μF;0603≥1μF;0805≥1μF;1206≥4.7μF;1210≥4.7μF	35V:0603≥1μF;0805≥2.2μF; 1206≥2.2μF;1210≥10μF	25V:0201≥0.1uF; 0402≥0.22μF; 0603≥2.2μF;0805≥2.2μF; 1206≥10μF;1210≥10μF	16V: 0201≥0.1uF;0402≥0.22μF;0603≥1μF;0805≥2.2μF; 1206≥10μF;1210≥47μF	10V:0201≥47nF;0402≥0.47μF;0603≥0.47μF;0805≥2.2μF; 1206≥4.7μF;1210≥47μF	6.3V ; 4V ; All X6S/X7S items; Size1812																																												
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14. Humidity (Damp Heat) Load	<ul style="list-style-type: none"> <li>* Test temp.: 40±2°C</li> <li>* Humidity: 90-95%RH</li> <li>* Test time: 500+24/-0 hrs.</li> <li>* To apply voltage: Rated voltage (MAX. 500V)</li> <li>* Before initial measurement (Class II only): To apply de-aging at 150°C for 1hr then set for 24±2 hrs at room temp.</li> <li>* Cap. / DF(Q) / I.R. Measurement to be made after de-aging at 150°C for 1hr then set for 24±2 hrs at room temp.</li> </ul>	<ul style="list-style-type: none"> <li>* No remarkable damage.</li> <li><b>Cap change:</b> NPO: ±7.5% or 0.75pF whichever is larger. X7R, X5R, X6S, X7S: ≥10V**,within ±12.5%; ≤6.3V within ±25%; C≥1uF,within ±25% **10V: 0603≥4.7μF;0402≥1μF;0201≥0.1μF, within ±25%; Y5V:≥10V, within ±30%;≤6.3V, within +30/-40%</li> <li><b>Q/D.F. value:</b> NPO: C≥30pF,Q≥200;C&lt;30pF, Q≥100+10/3C X7R, X5R, X6S, X7S:</li> </ul> <table border="1"> <thead> <tr> <th>RATED VOL.</th> <th>D.F.≤</th> <th colspan="2">EXCEPTION OF D.F.≤</th> </tr> </thead> <tbody> <tr> <td rowspan="3">≥100V</td> <td rowspan="3">≤3%</td> <td>≤6%</td> <td>1206≥0.47μF</td> </tr> <tr> <td>≤7.5%</td> <td>0805&gt;0.1μF, 0603≥0.068μF, 1206&gt;1μF;1210≥2.2μF</td> </tr> <tr> <td>≤20%</td> <td>0805&gt;0.22μF;1210≥3.3μF</td> </tr> <tr> <td rowspan="3">50V</td> <td rowspan="3">≤3%</td> <td>≤6%</td> <td>0201(50V);0603≥0.047μF; 0805≥0.18μF; 1206≥0.47μF</td> </tr> <tr> <td>≤10%</td> <td>0201≥0.01uF;1210≥4.7μF</td> </tr> <tr> <td>≤20%</td> <td>0402≥0.012μF; 0603&gt;0.1μF; 0805≥1μF; 1206≥2.2μF; 1210≥10μF</td> </tr> <tr> <td>35V</td> <td>≤5%</td> <td>≤20%</td> <td>0603≥1μF;08052.2F;1206≥2.2μF;1210≥10μF</td> </tr> <tr> <td rowspan="4">25V</td> <td rowspan="4">≤5%</td> <td>≤10%</td> <td>0201≥0.01μF;0805≥1μF; 1210≥10μF</td> </tr> <tr> <td>≤14%</td> <td>0603≥0.33μF</td> </tr> <tr> <td>≤15%</td> <td>0201≥0.1μF;0402≥0.10μF&amp;(0402/X7R≥0.056μF); 0603≥0.47μF; 0805≥2.2μF;1206≥4.7μF;1210≥22μF</td> </tr> <tr> <td>≤20%</td> <td>0402≥0.47μF</td> </tr> <tr> <td rowspan="2">16V</td> <td rowspan="2">≤5%</td> <td>≤10%</td> <td>0603≥0.15μF;0805≥0.68μF;1206≥2.2μF;1210≥4.7μF</td> </tr> <tr> <td>≤15%</td> <td>0201≥0.01μF(0201/X7R≥0.022μF);0402≥0.033μF; 0603≥0.68μF;0805≥2.2μF;1206≥4.7μF; 1210≥22μF</td> </tr> <tr> <td rowspan="2">10V</td> <td rowspan="2">≤7.5%</td> <td>≤15%</td> <td>0201≥0.012μF; 0402≥0.33μF(0402/X7R≥0.22μF); 0603≥0.33μF;0805≥2.2μF;1206≥2.2μF; 1210≥22μF</td> </tr> <tr> <td>≤20%</td> <td>0201≥0.1μF ;0402≥1μF; 01R5</td> </tr> <tr> <td>6.3V</td> <td>≤15%</td> <td>≤30%</td> <td>0201≥0.1μF;0402≥1μF(0402/X6S≥0.47μF);0603≥10μF; 0805≥4.7μF;1206≥47μF;1210≥100μF</td> </tr> <tr> <td>4V</td> <td>≤20%</td> <td>-</td> <td>-</td> </tr> </tbody> </table>	RATED VOL.	D.F.≤	EXCEPTION OF D.F.≤		≥100V	≤3%	≤6%	1206≥0.47μF	≤7.5%	0805>0.1μF, 0603≥0.068μF, 1206>1μF;1210≥2.2μF	≤20%	0805>0.22μF;1210≥3.3μF	50V	≤3%	≤6%	0201(50V);0603≥0.047μF; 0805≥0.18μF; 1206≥0.47μF	≤10%	0201≥0.01uF;1210≥4.7μF	≤20%	0402≥0.012μF; 0603>0.1μF; 0805≥1μF; 1206≥2.2μF; 1210≥10μF	35V	≤5%	≤20%	0603≥1μF;08052.2F;1206≥2.2μF;1210≥10μF	25V	≤5%	≤10%	0201≥0.01μF;0805≥1μF; 1210≥10μF	≤14%	0603≥0.33μF	≤15%	0201≥0.1μF;0402≥0.10μF&(0402/X7R≥0.056μF); 0603≥0.47μF; 0805≥2.2μF;1206≥4.7μF;1210≥22μF	≤20%	0402≥0.47μF	16V	≤5%	≤10%	0603≥0.15μF;0805≥0.68μF;1206≥2.2μF;1210≥4.7μF	≤15%	0201≥0.01μF(0201/X7R≥0.022μF);0402≥0.033μF; 0603≥0.68μF;0805≥2.2μF;1206≥4.7μF; 1210≥22μF	10V	≤7.5%	≤15%	0201≥0.012μF; 0402≥0.33μF(0402/X7R≥0.22μF); 0603≥0.33μF;0805≥2.2μF;1206≥2.2μF; 1210≥22μF	≤20%	0201≥0.1μF ;0402≥1μF; 01R5	6.3V	≤15%	≤30%	0201≥0.1μF;0402≥1μF(0402/X6S≥0.47μF);0603≥10μF; 0805≥4.7μF;1206≥47μF;1210≥100μF	4V	≤20%	-	-
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**RELIABILITY TEST CONDITIONS & REQUIREMENTS**

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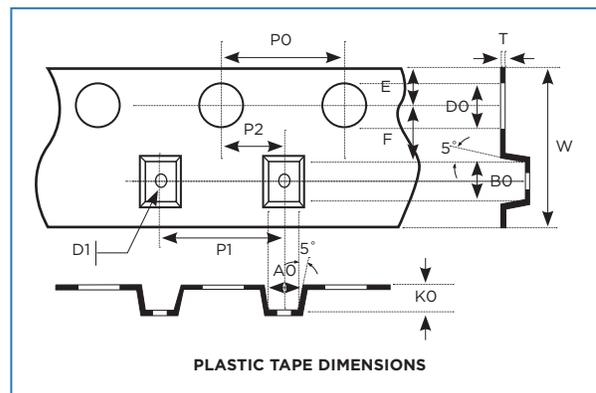
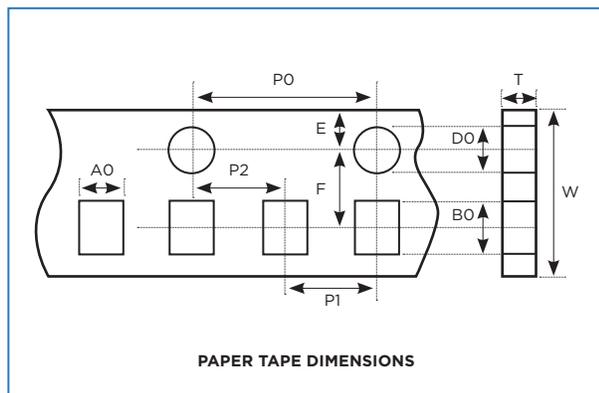
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## RELIABILITY TEST CONDITIONS & REQUIREMENTS

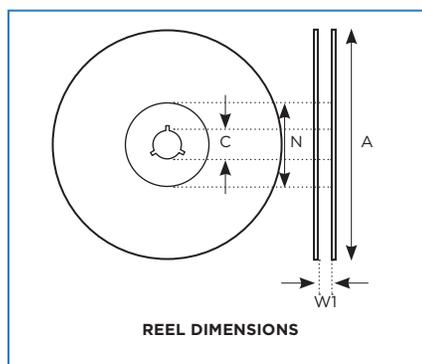
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15	HIGH TEMPERATURE Load-Endurance (Life Testing)	(3) 150% of rated voltage for below range.	<ul style="list-style-type: none"> <li>No remarkable damage.</li> <li>CAP CHANGE:</li> <li>COG: <math>\pm 3.0\%</math> or <math>\pm 0.3\text{pF}</math> whichever is larger</li> <li>X7R, X5R, X6S, X7S: <math>\geq 10\text{V}^{**}</math>, within <math>\pm 12.5\%</math>; <math>\leq 6.3\text{V}</math> within <math>\pm 25\%</math>;</li> <li>**10V: 0603<math>\geq 4.7\mu\text{F}</math>; 0402<math>\geq 1.0\mu\text{F}</math>; 0201<math>\geq 0.1\mu\text{F}</math>, within <math>\pm 25\%</math></li> <li>Y5V<math>\geq 10\text{V}</math>, within <math>\pm 30\%</math>; <math>\leq 6.3\text{V}</math>, within <math>+30\%/-40\%</math></li> <li>Q/D.F. VALUE:</li> <li>COG: More than 30pF, Q<math>\geq 350</math></li> <li>10pF<math>\leq 30\text{pF}</math>, Q<math>\geq 275+2.5\text{C}</math></li> <li>Less than 10pF, Q<math>\geq 200+10\text{C}</math></li> </ul>																																																
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		0201		X5R/X6S	16V, 25V	C $\geq 0.1\mu\text{F}$																																													
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1825 2220 2225	X7R	100-250V	C $\geq 1.0\mu\text{F}$																																																
<p>* Before initial measurement (Class II only): To apply de-aging at 150 °C for 1 hr then set for 24<math>\pm</math>2 hrs at room temp</p> <p>* Cap./DF(Q)/I.R. Measurement to be made after de-aging at 150 °C for 1hr then set for 24<math>\pm</math>2hrs at room temp.</p> <p>** De-rating conditions:</p>			<p><b>Y5V:</b></p> <table border="1"> <thead> <tr> <th>RATED VOLTAGE</th> <th>D.F.</th> <th colspan="2">EXCEPTIONS OF D.F. <math>\leq</math></th> </tr> </thead> <tbody> <tr> <td rowspan="2"><math>\geq 0\text{V}</math></td> <td rowspan="2"><math>\leq 7.5\%</math></td> <td><math>\leq 10\%</math></td> <td>0603<math>\geq 0.1\mu\text{F}</math>; 0805<math>\geq 0.47\mu\text{F}</math>; 1206<math>\geq 4.7\mu\text{F}</math></td> </tr> <tr> <td><math>\leq 20\%</math></td> <td>1210<math>\geq 6.8\mu\text{F}</math></td> </tr> <tr> <td>35V</td> <td><math>\leq 10\%</math></td> <td>-</td> <td>-</td> </tr> <tr> <td rowspan="2">25V</td> <td rowspan="2"><math>\leq 7.5\%</math></td> <td><math>\leq 10\%</math></td> <td>0402<math>\geq 0.047\mu\text{F}</math>; 0603<math>\geq 0.1\mu\text{F}</math>; 0805<math>\geq 0.33\mu\text{F}</math>; 1206<math>\geq 1.0\mu\text{F}</math>; 1210<math>\geq 4.7\mu\text{F}</math></td> </tr> <tr> <td><math>\leq 15\%</math></td> <td>0402<math>\geq 0.068\mu\text{F}</math>; 0603<math>\geq 0.47\mu\text{F}</math>; 1206<math>\geq 4.7\mu\text{F}</math>; 1210<math>\geq 22\mu\text{F}</math></td> </tr> <tr> <td rowspan="2">16V (C<math>&lt; 1.0\mu\text{F}</math>)</td> <td rowspan="2"><math>\leq 10\%</math></td> <td><math>\leq 12.5\%</math></td> <td>0402<math>\geq 0.068\mu\text{F}</math>; 0603<math>\geq 0.68\mu\text{F}</math></td> </tr> <tr> <td><math>\leq 20\%</math></td> <td>0402<math>\geq 0.22\mu\text{F}</math></td> </tr> <tr> <td>16V (C<math>\geq 1.0\mu\text{F}</math>)</td> <td><math>\leq 12.5\%</math></td> <td><math>\leq 20\%</math></td> <td>0603<math>\geq 2.2\mu\text{F}</math>; 0805<math>\geq 3.3\mu\text{F}</math>; 1206<math>\geq 10\mu\text{F}</math>; 1210<math>\geq 22\mu\text{F}</math>; 1812<math>\geq 47\mu\text{F}</math></td> </tr> <tr> <td>10V</td> <td><math>\leq 20\%</math></td> <td><math>\leq 30\%</math></td> <td>0402<math>\geq 0.47\mu\text{F}</math></td> </tr> <tr> <td>6.3V</td> <td><math>\leq 30\%</math></td> <td>-</td> <td>-</td> </tr> </tbody> </table> <p>*I.R.: <math>\geq 10\text{V}</math>, 1G<math>\Omega</math> or 50Q-F whichever is smaller. Class II (X7R, X5R, X6S, X7S, Y5V)</p> <table border="1"> <thead> <tr> <th>RATED VOLTAGE</th> <th>INSULATION RESISTANCE</th> </tr> </thead> <tbody> <tr> <td>100V: All X7R; 1210<math>\geq 3.3\mu\text{F}</math></td> <td rowspan="7">1G<math>\Omega</math> or apply <math>\geq 10\text{Q-F}</math> rule, whichever is smaller.</td> </tr> <tr> <td>50V: 0402<math>&gt; 0.01\mu\text{F}</math>; 0603<math>\geq 1.0\mu\text{F}</math>; 0805<math>\geq 1.0\mu\text{F}</math>; 1206<math>\geq 4.7\mu\text{F}</math>; 1210<math>\geq 4.7\mu\text{F}</math></td> </tr> <tr> <td>35V: 0603<math>\geq 1.0\mu\text{F}</math>; 0805<math>\geq 2.2\mu\text{F}</math>; 1206<math>\geq 2.2\mu\text{F}</math>; 1210<math>\geq 10\mu\text{F}</math></td> </tr> <tr> <td>25V: 0201<math>\geq 0.1\mu\text{F}</math>; 0402<math>\geq 0.22\mu\text{F}</math>; 0603<math>\geq 2.2\mu\text{F}</math>; 0805<math>\geq 2.2\mu\text{F}</math>; 1206<math>\geq 10\mu\text{F}</math>; 1210<math>\geq 10\mu\text{F}</math></td> </tr> <tr> <td>16V: 0201<math>\geq 0.1\mu\text{F}</math>; 0402<math>\geq 0.22\mu\text{F}</math>; 0603<math>\geq 1.0\mu\text{F}</math>; 0805<math>\geq 2.2\mu\text{F}</math>; 1206<math>\geq 10\mu\text{F}</math>; 1210<math>\geq 47\mu\text{F}</math></td> </tr> <tr> <td>10V: 0201<math>\geq 47\text{nF}</math>; 0402<math>\geq 0.47\mu\text{F}</math>; 0603<math>\geq 0.47\mu\text{F}</math>; 0805<math>\geq 2.2\mu\text{F}</math>; 1206<math>\geq 4.7\mu\text{F}</math>; 1210<math>\geq 47\mu\text{F}</math></td> </tr> <tr> <td>6.3V; 4V : All X6S/X7S items, Size<math>\geq 1812</math></td> </tr> </tbody> </table>	RATED VOLTAGE	D.F.	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Note: Additional values may be available. Please contact us for more information. Due to demand and raw material fluctuations, specific values may not be available.

### TAPE AND REEL SPECIFICATIONS



SIZE	0402	0603	0805	1206			1210		1808	1812		2220	
Thickness (mm)	0.50±0.20	0.80±0.07 0.80±0.30	1.25±0.30	1.15±0.15	1.60±0.20	1.60±0.50	0.95±0.10 1.25±0.10 1.60±0.20 2.00±0.20	2.50±0.50	1.25±0.10 1.60±0.20 2.00±0.20	1.25±0.10 1.60±0.20 2.00±0.20	2.50±0.50	1.40±0.15 1.60±0.20 2.00±0.20	2.50±0.50
A0	0.70±0.20	1.05±0.30	<1.80	1.90±0.50	<2.00	<2.30	<3.05	<3.05	<3.20	<2.50	<3.90	<5.80	<6.80
B0	1.20±0.20	1.80±0.30	<2.70	3.50±0.50	<3.70	<4.00	<3.80	<3.80	<4.00	<5.30	<5.30	<6.50	<6.50
T	≤0.80	≤1.20	0.23±0.1	≤1.20	0.23±0.1	0.23±0.1	0.23±0.1	0.23±0.1	0.23±0.1	0.25±0.1	0.25±0.1	0.30±0.1	0.30±0.1
K0	-	-	<2.50	-	<2.50	<2.50	<1.50	<2.50	<3.20	<2.50	<2.50	<2.50	<3.10
W	8.00±0.30	8.00±0.30	8.00±0.30	8.00±0.30	8.00±0.30	8.00±0.30	8.00±0.30	8.00±0.30	8.00±0.30	12.00±0.30	12.00±0.30	12.00±0.20	12.00±0.20
P0	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10
P1	2.00±0.05	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	8.00±0.10	8.00±0.10	8.00±0.10
P2	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05
D0	1.50+0.1/-0	1.50+0.1/-0	1.50+0.1/-0	1.50+0.1/-0	1.50+0.1/-0	1.50+0.1/-0	1.50+0.1/-0	1.50+0.1/-0	1.50+0.1/-0	1.50+0.1/-0	1.50+0.1/-0	1.50+0.1/-0	1.50+0.1/-0
D1	-	-	1.00±0.10	-	1.00±0.10	1.00±0.10	1.00±0.10	1.00±0.10	1.00±0.10	1.50±0.10	1.50±0.10	1.50±0.10	1.50±0.10
E	1.75±0.10	1.75±0.10	1.75±0.10	1.75±0.10	1.75±0.10	1.75±0.10	1.75±0.10	1.75±0.10	1.75±0.10	1.75±0.10	1.75±0.10	1.75±0.10	1.75±0.10
F	3.50±0.05	3.50±0.05	3.50±0.05	3.50±0.05	3.50±0.05	3.50±0.05	3.50±0.05	3.50±0.05	3.50±0.05	5.50±0.10	5.50±0.10	5.50±0.05	5.50±0.05



SIZE	0402, 0603, 0805, 1206, 1210	1808, 1812, 2220
Reel Size	7"	7"
C	13.0+0.5/-0.2	13.0+0.5/-0.2
W1	8.4+1.5/-0	12.4+2.0/-0
A	178.0±1.0	178.0±1.00
N	60.0+1.0/-0	60.0+1.0/-0