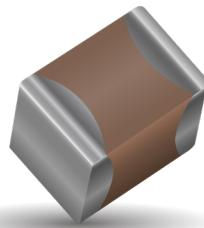


# X7S Dielectric

## General Specifications



### GENERAL DESCRIPTION

X7S formulations are called "temperature stable" ceramics and fall into EIA Class II materials. Its temperature variation of capacitances within  $\pm 22\%$  from  $-55^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$ . This capacitance change is non-linear.

Capacitance for X7S varies under the influence of electrical operating conditions such as voltage and frequency.

X7S dielectric chip usage covers the broad spectrum of industrial applications where known changes in capacitance due to applied voltages are acceptable.

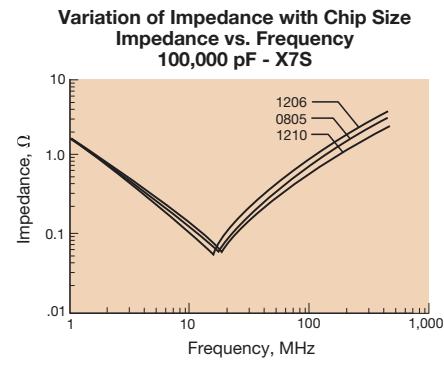
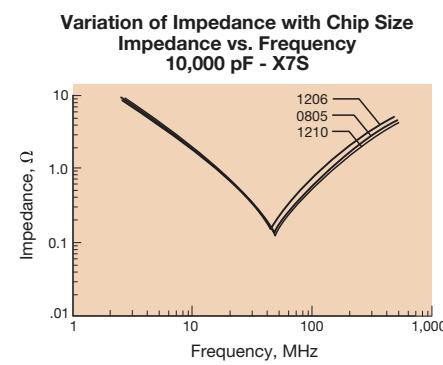
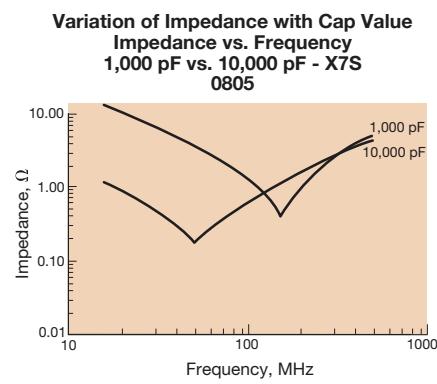
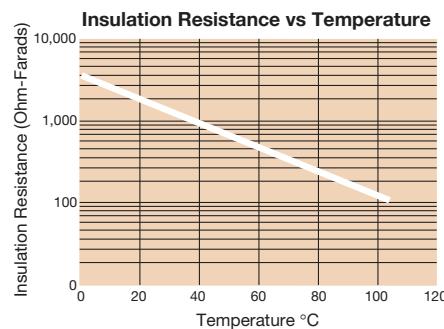
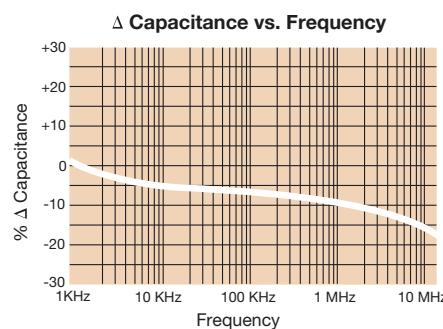
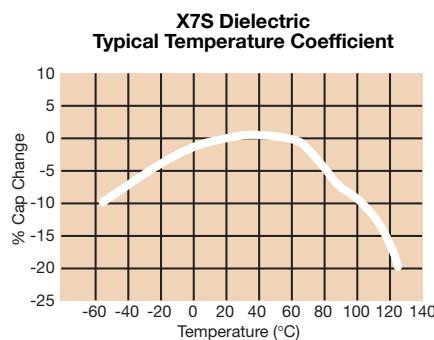
### PART NUMBER (SEE PAGE 4 FOR COMPLETE PART NUMBER EXPLANATION)

<b>1206</b>	<b>Z</b>	<b>Z</b>	<b>105</b>	<b>M</b>	<b>A</b>	<b>T</b>	<b>2</b>	<b>A</b>
Size (L" x W")	Voltage 4 = 4V 6 = 6.3V Z = 10V Y = 16V 3 = 25V 5 = 50V 1 = 100V 2 = 200V	Dielectric Z = X7S	Capacitance Code (In pF) 2 Sig. Digits + Number of Zeros	Capacitance Tolerance K = $\pm 10\%$ M = $\pm 20\%$	Failure Rate A = N/A	Terminations T = Plated Ni and Sn	Packaging 2 = 7" Reel 4 = 13" Reel	Special Code A = Std. Product

NOTE: Contact factory for availability of Tolerance Options for Specific Part Numbers.

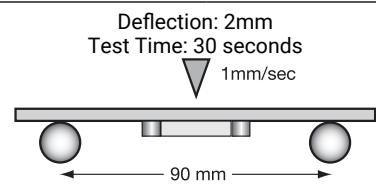


### TYPICAL ELECTRICAL CHARACTERISTICS



# X7S Dielectric

## Specifications and Test Methods

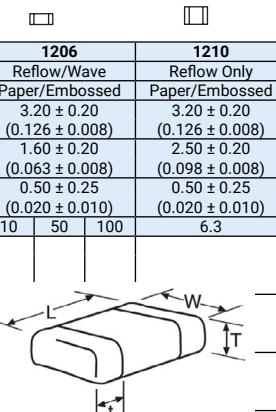
Parameter/Test	X7S Specification Limits		Measuring Conditions		
Operating Temperature Range	-55°C to +125°C		Temperature Cycle Chamber		
Capacitance	Within specified tolerance				
Dissipation Factor	$\leq 5.0\%$ for $\geq 100V$ DC rating $\leq 5.0\%$ for $\geq 25V$ DC rating $\leq 10.0\%$ for $\geq 10V$ DC rating $\leq 10.0\%$ for $\leq 10V$ DC rating Contact Factory for DF by PN		Freq.: 1.0 kHz $\pm 10\%$ Voltage: 1.0Vrms $\pm .2V$ For Cap $> 10 \mu F$ , 0.5Vrms @ 120Hz		
Insulation Resistance	100,000MΩ or 1000MΩ - $\mu F$ , whichever is less		Charge device with rated voltage for 120 $\pm 5$ secs @ room temp/humidity		
Dielectric Strength	No breakdown or visual defects		Charge device with 250% of rated voltage for 1-5 seconds, w/charge and discharge current limited to 50 mA (max)		
Resistance to Flexure Stresses	Appearance	No defects			
	Capacitance Variation	$\leq \pm 12\%$			
	Dissipation Factor	Meets Initial Values (As Above)			
	Insulation Resistance	$\geq$ Initial Value $\times 0.3$			
Solderability	$\geq 95\%$ of each terminal should be covered with fresh solder		Dip device in eutectic solder at $230 \pm 5^\circ C$ for $5.0 \pm 0.5$ seconds		
Resistance to Solder Heat	Appearance	No defects, <25% leaching of either end terminal		Dip device in eutectic solder at $260^\circ C$ for 60 seconds. Store at room temperature for $24 \pm 2$ hours before measuring electrical properties.	
	Capacitance Variation	$\leq \pm 7.5\%$			
	Dissipation Factor	Meets Initial Values (As Above)			
	Insulation Resistance	Meets Initial Values (As Above)			
	Dielectric Strength	Meets Initial Values (As Above)			
Thermal Shock	Appearance	No visual defects		Step 1: $-55^\circ C \pm 2^\circ$ $30 \pm 3$ minutes	
	Capacitance Variation	$\leq \pm 7.5\%$		Step 2: Room Temp $\leq 3$ minutes	
	Dissipation Factor	Meets Initial Values (As Above)		Step 3: $+125^\circ C \pm 2^\circ$ $30 \pm 3$ minutes	
	Insulation Resistance	Meets Initial Values (As Above)		Step 4: Room Temp $\leq 3$ minutes	
	Dielectric Strength	Meets Initial Values (As Above)		Repeat for 5 cycles and measure after $24 \pm 2$ hours at room temperature	
Load Life	Appearance	No visual defects		Charge device with 1.5 rated voltage ( $\leq 10V$ ) in test chamber set at $125^\circ C \pm 2^\circ C$ for 1000 hours (+48, -0)	
	Capacitance Variation	$\leq \pm 12.5\%$			
	Dissipation Factor	$\leq$ Initial Value $\times 2.0$ (See Above)			
	Insulation Resistance	$\geq$ Initial Value $\times 0.3$ (See Above)			
	Dielectric Strength	Meets Initial Values (As Above)			
Load Humidity	Appearance	No visual defects		Remove from test chamber and stabilize at room temperature for $24 \pm 2$ hours before measuring.	
	Capacitance Variation	$\leq \pm 12.5\%$			
	Dissipation Factor	$\leq$ Initial Value $\times 2.0$ (See Above)			
	Insulation Resistance	$\geq$ Initial Value $\times 0.3$ (See Above)			
	Dielectric Strength	Meets Initial Values (As Above)			

# X7S Dielectric

## Capacitance Range

PREFERRED SIZES ARE SHADED

SIZE	0402	0603	0805	1206	1210
Soldering	Reflow/Wave		Reflow/Wave	Reflow/Wave	Reflow Only
Packaging	All Paper		All Paper	Paper/Embossed	Paper/Embossed
(L) Length (in.)	1.00 ± 0.10 (0.040 ± 0.004)	1.60 ± 0.15 (0.063 ± 0.006)	2.01 ± 0.20 (0.079 ± 0.008)	3.20 ± 0.20 (0.126 ± 0.008)	3.20 ± 0.20 (0.126 ± 0.008)
W) Width (in.)	0.50 ± 0.10 (0.020 ± 0.004)	0.81 ± 0.15 (0.032 ± 0.006)	1.25 ± 0.20 (0.049 ± 0.008)	1.60 ± 0.20 (0.063 ± 0.008)	2.50 ± 0.20 (0.098 ± 0.008)
(t) Terminal (in.)	0.25 ± 0.15 (0.010 ± 0.006)	0.35 ± 0.15 (0.014 ± 0.006)	0.50 ± 0.25 (0.020 ± 0.010)	0.50 ± 0.25 (0.020 ± 0.010)	0.50 ± 0.25 (0.020 ± 0.010)
WVDC	4	6.3	6.3	4	10 50 100 6.3
Cap (pF)	100				
	150				
	220				
	330				
	470				
	680				
	1000				
	1500				
	2200				
	3300				
	4700				
	6800				
Cap (μF)	0.010				
	0.015				
	0.022				
	0.033	C			
	0.047	C			
	0.068	C			
	0.10	C			
	0.15				
	0.22				
	0.33		G		
	0.47		G		
	0.68		G		
	1.0	E	G		
	1.5			N	
	2.2	E		N	Q
	3.3			N	
	4.7			Q	
	10				
	22				Z
	47				
	100				
WVDC	4	6.3	6.3	4	10 50 100 6.3
SIZE	0402	0603	0805	1206	1210



Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.90 (0.075)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
PAPER					EMBOSSED								

\*Contact Factory for Specifications