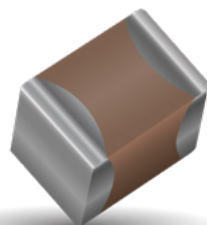


X7S Dielectric

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°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.

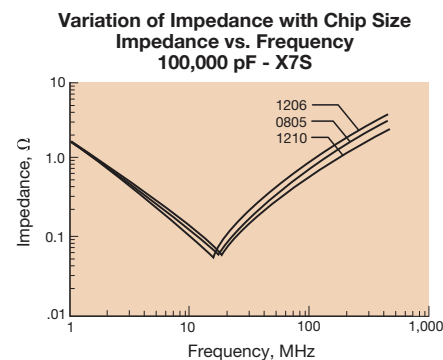
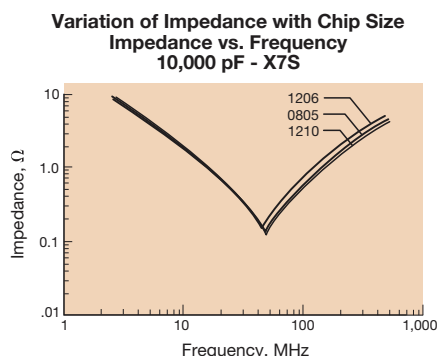
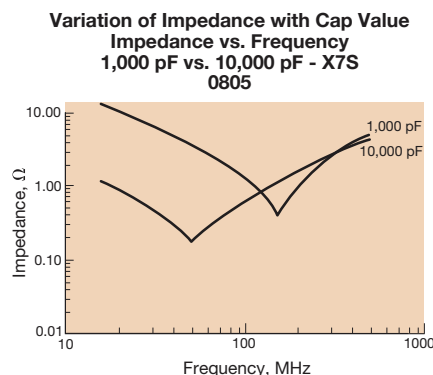
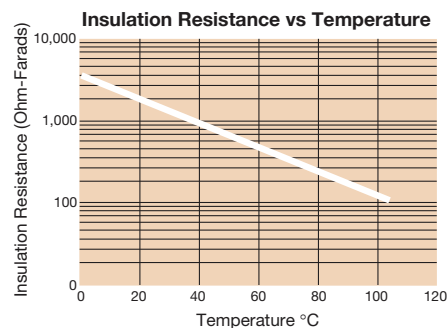
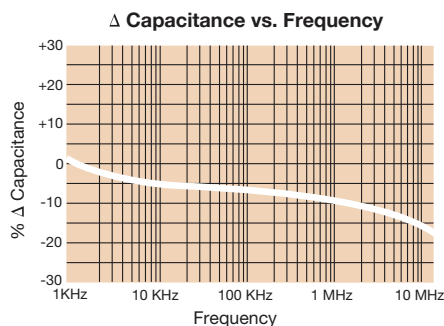
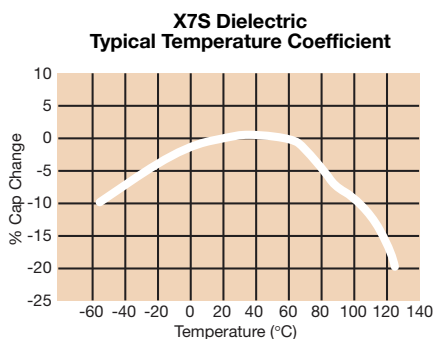
PART NUMBER (SEE PAGE 4 FOR COMPLETE PART NUMBER EXPLANATION)

1206	Z	Z	105	M	A	T	2	A
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.

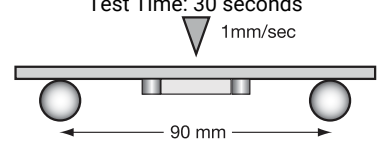


TYPICAL ELECTRICAL CHARACTERISTICS



X7S Dielectric

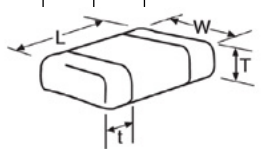
Specifications and Test Methods

Parameter/Test		X7S Specification Limits	Measuring Conditions	
Operating Temperature Range		-55°C to +125°C	Temperature Cycle Chamber	
Capacitance		Within specified tolerance	Freq.: 1.0 kHz $\pm$ 10% Voltage: 1.0Vrms $\pm$.2V For Cap > 10 μ F, 0.5Vrms @ 120Hz	
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		
Insulation Resistance		100,000M Ω or 1000M Ω - μ F, whichever is less		
Dielectric Strength		No breakdown or visual defects		
Resistance to Flexure Stresses	Appearance	No defects	Deflection: 2mm Test Time: 30 seconds 	
	Capacitance Variation	$\leq \pm 12\%$		
	Dissipation Factor	Meets Initial Values (As Above)		
	Insulation Resistance	$\geq$ Initial Value x 0.3		
Solderability		$\geq$ 95% of each terminal should be covered with fresh solder	Dip device in eutectic solder at 230 $\pm$ 5°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°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°C $\pm$ 2°	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°C $\pm$ 2°	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°C $\pm$ 2°C for 1000 hours (+48, -0) 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 x 2.0 (See Above)		
	Insulation Resistance	$\geq$ Initial Value x 0.3 (See Above)		
	Dielectric Strength	Meets Initial Values (As Above)		
Load Humidity	Appearance	No visual defects	Store in a test chamber set at 85°C $\pm$ 2°C/ 85% $\pm$ 5% relative humidity for 1000 hours (+48, -0) with rated voltage applied. Remove from chamber and stabilize at room temperature and humidity for 24 $\pm$ 2 hours before measuring.	
	Capacitance Variation	$\leq \pm 12.5\%$		
	Dissipation Factor	$\leq$ Initial Value x 2.0 (See Above)		
	Insulation Resistance	$\geq$ Initial Value x 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/Wave			Reflow Only
Packaging		All Paper		All Paper	Paper/Embossed	Paper/Embossed			Paper/Embossed
(L) Length	mm	1.00 ± 0.10		1.60 ± 0.15	2.01 ± 0.20	3.20 ± 0.20			3.20 ± 0.20
	(in.)	(0.040 ± 0.004)		(0.063 ± 0.006)	(0.079 ± 0.008)	(0.126 ± 0.008)			(0.126 ± 0.008)
W) Width	mm	0.50 ± 0.10		0.81 ± 0.15	1.25 ± 0.20	1.60 ± 0.20			2.50 ± 0.20
	(in.)	(0.020 ± 0.004)		(0.032 ± 0.006)	(0.049 ± 0.008)	(0.063 ± 0.008)			(0.098 ± 0.008)
(t) Terminal	mm	0.25 ± 0.15		0.35 ± 0.15	0.50 ± 0.25	0.50 ± 0.25			0.50 ± 0.25
	(in.)	(0.010 ± 0.006)		(0.014 ± 0.006)	(0.020 ± 0.010)	(0.020 ± 0.010)			(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						
		1.5			N				
		2.2	E		N		Q		
		3.3			N				
		4.7			N	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)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
PAPER						EMBOSSED							

*Contact Factory for Specifications