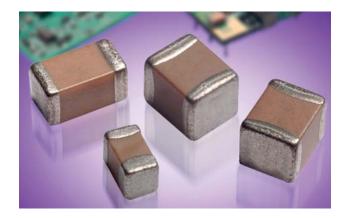
General Specifications





X7R formulations are called "temperature stable" ceramics and fall into EIA Class II materials. X7R is the most popular of these intermediate dielectric constant materials. Its temperature variation of capacitance is within $\pm 15\%$ from -55°C to +125°C. This capacitance change is non-linear.

Capacitance for X7R varies under the influence of electrical operating conditions such as voltage and frequency.

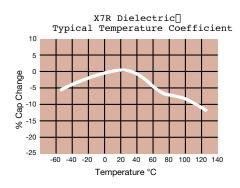
X7R dielectric chip usage covers the broad spectrum of industrial applications where known changes in capacitance due to applied voltages are acceptable.

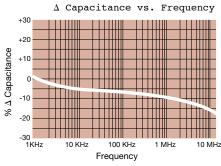


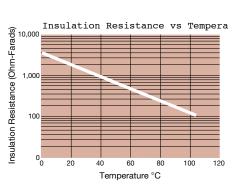
PART NUMBER (see page 2 for complete part number explanation)

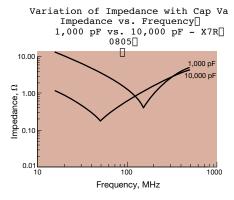
0805	<u>5</u>	<u>C</u>	103	<u>M</u>	<u>A</u>	<u>T</u>	<u>2</u>	<u>A</u>
	Voltage 4V = 4 6.3V = 6 10V = Z 16V = Y 25V = 3 50V = 5 100V = 1 200V = 2 500V = 7	Dielectric X7R = C	Capacitance Code (In pF) 2 Sig. Digits + Number of Zeros	Capacitance Tolerance J = ± 5%* K = ±10% M = ± 20% *≤1µF only, contact factory for additional values	Failure Rate A = Not Applicable	Terminations T = Plated Ni and Sn 7 = Gold Plated* Z = FLEXITERM®** *Optional termination **See FLEXITERM® X7R section	Packaging 2 = 7" Reel 4 = 13" Reel Contact Factory For Multiples	Special Code A = Std. Product

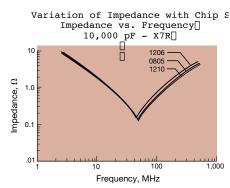
NOTE: Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers. Contact factory for non-specified capacitance values.

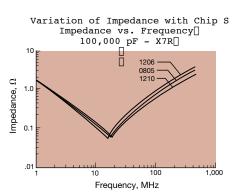














Specifications and Test Methods

	ter/Test	X7R Specification Limits	Measuring Conditions							
	perature Range	-55°C to +125°C	Temperature C							
Capac Dissipation	itance on Factor	Within specified tolerance ≤ 2.5% for ≥ 50V DC rating ≤ 3.0% for 25V DC rating ≤ 3.5% for 25V and 16V DC rating ≤ 5.0% for ≤ 10V DC rating	Freq.: 1.0 kHz ± 10% Voltage: 1.0Vrms ± .2V							
Insulation	Resistance	\leq 3.0 % for \leq 100 DC rating 100,000MΩ or 1000MΩ - μF, whichever is less	Charge device with rated voltage for 120 ± 5 secs @ room temp/humidity							
Dielectric	Strength	No breakdown or visual defects	Charge device with 300% of rated voltage for 1-5 seconds, w/charge and discharge current limited to 50 mA (max) Note: Charge device with 150% of rated voltage for 500V devices.							
	Appearance	No defects	Deflectio							
Resistance to	Capacitance Variation	≤ ±12%	Test Time: 3	30 seconds 7 1mm/sec						
Flexure Stresses	Dissipation Factor	Meets Initial Values (As Above)	V	Tillin/sec						
G G	Insulation Resistance	≥ Initial Value x 0.3	90 mm							
Solde	rability	≥ 95% of each terminal should be covered with fresh solder	Dip device in eutectic for 5.0 ± 0 .							
Resistance to Solder Heat	Appearance	No defects, <25% leaching of either end terminal								
	Capacitance Variation	≤ ±7.5%	Dip device in eutectic :	colder at 260°C for 60						
	Dissipation Factor	Meets Initial Values (As Above)	seconds. Store at room temperature for 24 ± 2 hours before measuring electrical properties.							
	Insulation Resistance	Meets Initial Values (As Above)	Tiours before measurin	g electrical properties.						
	Dielectric Strength	Meets Initial Values (As Above)								
	Appearance	No visual defects	Step 1: -55°C ± 2°	30 ± 3 minutes						
	Capacitance Variation	≤ ±7.5%	Step 2: Room Temp	≤ 3 minutes						
Thermal	Dissipation Factor	Meets Initial Values (As Above)	Step 3: +125°C ± 2°	30 ± 3 minutes						
Shock	Insulation Resistance	Meets Initial Values (As Above)	Step 4: Room Temp	≤ 3 minutes						
	Dielectric Strength	Meets Initial Values (As Above)	Repeat for 5 cycles and measure after 24 ± 2 hours at room temperature							
	Appearance	No visual defects		'						
	Capacitance Variation	≤ ±12.5%	Charge device with 1.5 test chamber set							
Load Life	Dissipation Factor	≤ Initial Value x 2.0 (See Above)	for 1000 hou							
	Insulation Resistance	≥ Initial Value x 0.3 (See Above)	Remove from test chamber and stabilize at room temperature for 24 ± 2 hours							
	Dielectric Strength	Meets Initial Values (As Above)	before measuring.							
	Appearance	No visual defects	Ctoro in a test share-	or oot at 0.500 : 000 /						
	Capacitance Variation	≤ ±12.5%	Store in a test chamber 85% ± 5% relative hui	midity for 1000 hours						
Load Humidity	Dissipation Factor	≤ Initial Value x 2.0 (See Above)	(+48, -0) with rated voltage applied.							
	Insulation Resistance	≥ Initial Value x 0.3 (See Above)	Remove from cham room temperature	and humidity for						
	Dielectric Strength	Meets Initial Values (As Above)	-24 ± 2 hours before measuring.							





PREFERRED SIZES ARE SHADED

ш 0805 SIZE 0101* 0402 0603 0201 1206 Soldering Reflow Only Reflow Only Reflow/Wave Reflow/Wave Reflow/Wave Reflow/Wave Packaging All Paper All Paper All Paper Paper/Embossed Paper/Embossed Paper/Embossed 0.40 ± 0.02 1.00 ± 0.10 (0.040 ± 0.004) 1.60 ± 0.15 (L) Length (0.126 ± 0.008) (0.016 ± 0.0008) (0.024 ± 0.001) (0.063 ± 0.006) (0.079 ± 0.008) 0.50 ± 0.10 (0.020 ± 0.004) 0.20 + 0.02(W) Width (0.008 ± 0.0008) (0.011 ± 0.001) (0.032 ± 0.006) (0.049 ± 0.008) (0.063 ± 0.008) 0.10± 0.04 (0.004 ± 0.0016) 0.15 ± 0.05 (0.006 ± 0.002) 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) (t) Terminal mm (in.) WVDC 10 16 25 50 10 16 25 50 6.3 10 16 25 50 100 200 16 25 50 16 25 50 100 200 Α 470 471 Α A 1000 102 1500 3300 4700 Α 6800 N 104 0.22 224 N N N N N N N N N P 0.68 М М 475 106 476 WVDC 50 100 200 50 100 200 500 0101 SIZE 1206

Letter	А	В	С	E	G	J	K	M	N	Р	Q	X	Υ	Z		
Max.	0.33	0.22	0.56	0.71	0.90	0.94	1.02	1.27	1.40	1.52	1.80	2.29	2.54	2.79		
Thickness	(0.013)	(0.009)	(0.022)	(0.028)	(0.035)	(0.037)	(0.040)	(0.050)	(0.055)	(0.060)	(0.071)	(0.090)	(0.100)	(0.110)		
			PAF	PER			EMBOSSED									

PAPER and EMBOSSED available for 01005

NOTE: Contact factory for non-specified capacitance values

*EIA 01005

**Contact Factory for Specifications





PREFERRED SIZES ARE SHADED

SIZ	E				1210				1812							1825		2220					2225				
Solder	ring			Re	eflow C)nlv			Reflow Only						R	eflow O	nlv	Reflow Only					Reflow Only				
Packag					er/Emb											Embos	,	All Embossed					All Embossed				
	mm	'					All Embossed 4.50 ± 0.30						1.50 ± 0.3		5.70 ± 0.40					5.72 ± 0.25							
(L) Length	(in.)	(0.126 ± 0.008)							(0.177)	(0.177 ± 0.012)					(0.225 ± 0.016)					(0.225 ± 0.010)					
(W) Width	mm	2.50 ± 0.20					3.20 ± 0.20						6.40 ± 0.4		5.00 ± 0.40					6.35 ± 0.25							
	(in.)	(0.098 ± 0.008)							(0.126	± 0.008, ± 0.36)			252 ± 0.0 0.61 ± 0.0		(0.197 ± 0.016) 0.64 ± 0.39					(0.250 ± 0.010) 0.64 ± 0.39						
(t) Terminal	mm 0.50 ± 0.25 (in.) (0.020 ± 0.010)							(0.024)			024 ± 0.0				$0.04 \pm 0.025 \pm 0.000$			(0.025 ± 0.015)							
	WVDC	10	16	25	50	100	200	500	16	25	50	100	200	500	50	100	200	25					50	100	200		
Cap 100	101																										
(pF) 150	151																					>-	~	-W	_		
220	221	<u> </u>		_			_			_			-							*			$\overline{}$	$\supset \leq$	-		
<u>330</u>	331 471	_				-	-														(-	\sim		ا.ارا	,Τ		
680	681	-		1		+	-						_						_			.)]	_	_	_		
1000	102	\vdash				+							 						_								
1500	152	J	J	J	J	J	J	М														t					
2200	222	J	J	J	J	J	J	М												I	ı				I		
3300	332	J	J	J	J	J	J	М																			
4700	472	J	J	J	J	J	J	М																			
6800	682	J	J	J	J	J	J	М																			
Cap 0.01	103	J	J	J	J	J	J	M P		K	K	K	K	K	M	М	М		X	X	X	X	M	P	P P		
(μF) 0.015 0.022	153 223	J	J	J	J	J	J	Q		K	K	K	K	P	M M	M	M M		X	X	X	X	M M	P	P		
0.022	333	J	J	J	J	J	J	Q		K	K	K	K	Х	M	M	M		X	X	X	X	M	P	P		
0.047	473	J	J	J	J	Ĵ	J	Q		K	K	K	K	Z	M	M	M		X	X	X	X	M	P	P		
0.068	683	J	J	J	J	J	М	Q		K	K	K	K	Z	М	M	М		Х	Х	X	Х	М	Р	Р		
0.1	104	J	J	J	J	J	М	Х		K	K	K	K	Z	М	М	М		Χ	Х	Х	Х	М	Р	Р		
0.15	154	J	J	J	J	М	Z			K	K	K	Р	Z	М	М	М		Χ	Х	Х	Х	М	Р	X		
0.22	224	J	J	J	J	Р	Z			K	K	K	Р	Z	M	М	М		X	Х	Х	Х	M	Р	X		
0.33	334	J	J	J	J	Q				K	K	M	X		M	M			X	X	X	X	M	P P	X		
0.47	474 684	M M	M	M P	M X	Q			_	K M	K M	P Q	X		M M	M			X	X	Х	Х	M M	P	X		
1.0	105	N	N	P	X	7				M	M	X	7		M	P			X	X			M	P	X		
1.5	155	N	N	Z	Z	Z				Z	Z	Z			M				X	X			M	X	Z		
2.2	225	Х	Х	Z	Z	Z				Z	Z	Z							X	X			М	X	Z		
3.3	335	Х	Х	Z	Z	Z				Z	Z	Z							Χ	Z							
4.7	475	Z	Z	Z	Z					Z	Z								Χ	Z							
10	106	Z	Z	Z	Z		_		Z				_						Z	Z							
22	226	Z	Z	Z		1	-			-	-		-			-		Z			1		\vdash				
<u>47</u>	476 107	Z				-	-		_					_	_			\vdash					\vdash				
100	WVDC	10	16	25	50	100	200	500	16	25	50	100	200	500	50	100	200	25	50	100	200	500	50	100	200		
SIZE		10	10		1210	100	1 200	1 000	1812					000	1825			20	00	2220	200	000	2225		200		
3121	-				1210						10	12			1020					2220				2220			
Letter	А		В			Е		G		1	K		М		N	Р		Q		Υ	Υ		Z				
Max.	0.33	().22	0.5		0.71		0.90				.40 1.52			1.78				1	2.79							
Thickness	(0.013)		.009)	(0.0)		(0.028		0.90					(0.040		(0.050)					0.070)					(0.110)		
	(0.010)						PAPER						1 (0.0	0.055) (0.060) (0.070) (0.090) (0.100) (0.110) EMBOSSED													
		PAPER															IDU00	SEU									

NOTE: Contact factory for non-specified capacitance values