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 ±15% from -55°C to +125°C. This capacitance change is non-linear.

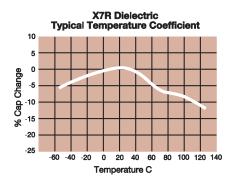
Capacitance for X7R varies under the influence of electrical operating con-ditions such as voltage and frequency.

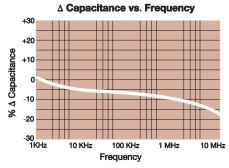
X7R dielectric chip usage covers the broad spectrum of industrial applications where known changes in capacitance due to applied voltages are acceptable.

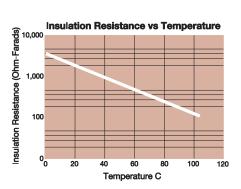
PART NUMBER (SEE PAGE 4 FOR COMPLETE PART NUMBER EXPLANATION)

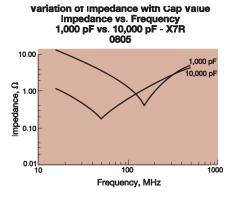
0805	<u>5</u>	<u>C</u>	103	<u>M</u>	<u>A</u>	<u>T</u>	<u>2</u>	<u>A</u>
Size (L" x W")	Voltage 4V = 4 6.3V = 6 10V = Z 16V = Y 25V = 3 50V = 5 100V = 1 200V = 2 500V = 7	Dielectric X7R = C		Capacitance Tolerance J = ± 5%* K = ±10% M = ± 20% *≤1µF only, contact factory for additional values		Terminations T = Plated Ni and Sn Z= FLEXITERM®** *Optional termination **See FLEXITERM® X7R section	Packaging 2 = 7" Reel 4 = 13" Reel Contact Factory For Multiples	Special Code A = Std. Product

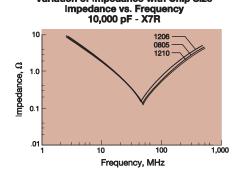
Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers. Contact factory for non-specified capacitance values.



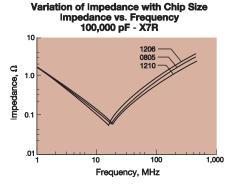








Variation of Impedance with Chip Size







Operating Temperate Capacitance		-55°C to +125°C	Temr	perature Cycle Chamber							
Capacitance	e			berature Gycle Gridffiber							
Dissipation Fac		Within specified tolerance ≤ 10% for ≥ 50V DC rating≤ 12.5% for 25V DC rating ≤ 12.5% for 25V and 16V DC rating ≤ 12.5% for ≤ 10V DC rating Contact Factory for DF by PN	Vo	Freq.: 1.0 kHz ± 10% oltage: 1.0Vrms ± .2V o > 10µF, 0.5Vrm @ 120Hz							
Insulation Resis	stance	10,000MΩ or 500MΩ - μF, whichever is less		levice with rated voltage for ecs @ room temp/humidity							
Dielectric Stre	ength	No breakdown or visual defects	charge and disch	50% of rated voltage for 1-5 seconds, w/ arge current limited to 50 mA (max) th 150% of rated voltage for 500V devices.							
Ap	ppearance	No defects									
Resistance to	apacitance Variation	≤ ±12%		Deflection: 2mm							
Stresses	Dissipation Factor	Meets Initial Values (As Above)	Τε	est Time: 30 seconds							
	Insulation Resistance	≥ Initial Value x 0.3									
Solderability	ty	≥ 95% of each terminal should be covered with fresh solder		n eutectic solder at 230 ± 5°C or 5.0 ± 0.5 seconds							
	ppearance	No defects, <25% leaching of either end terminal									
\	apacitance Variation	≤ ±7.5%									
Resistance to Solder Heat	Dissipation Factor	Meets Initial Values (As Above)		solder at 260°C for 60 seconds. Store at 24 ± 2hours before measuring electrical							
Ir	Insulation Resistance	Meets Initial Values (As Above)		properties.							
	Dielectric Strength	Meets Initial Values (As Above)									
	ppearance	No visual defects	Step 1: -55°C ± 2°	30 ± 3 minutes							
	apacitance Variation	≤ ±7.5%	Step 2: Room Temp	≤ 3 minutes							
Thermal Shock	Dissipation Factor	Meets Initial Values (As Above)	Step 3: +125°C ± 2°	30 ± 3 minutes							
	Insulation Resistance	Meets Initial Values (As Above)	Step 4: Room Temp	≤ 3 minutes							
	Dielectric Strength	Meets Initial Values (As Above)		and measure after 24 ± 2 hours at room temperature							
	ppearance	No visual defects	Pre-treatment: After m	ounting, perform heat treatment 150+0/- stabilise for 24+/-2 hour at room temp,							
\	apacitance Variation	≤ ±12.5%	100 for 2 flour, then	then measure.							
Di	Dissipation Factor	≤ Initial Value x 2.0 (See Above)		≥ rated voltage in test chamber set at							
	Insulation Resistance	≥ Initial Value x 0.3 (See Above)		2°C for 1000 hours (+48, -0).							
	Dielectric Strength	Meets Initial Values (As Above)	treatment 150+0/-10C at roo	emove from test chamber, perform heat for 2 hour, then stabilise for 24+/-2 hour om temp, then measure. AVX for datasheet of specific parts.							
Ap	ppearance	No visual defects	Pre-treatment: After m	ounting, perform heat treatment 150+0/-							
	apacitance Variation	≤ ±12.5%	10C for 2 hour, then	stabilise for 24+/-2 hour at room temp, then measure.							
Load	Dissipation Factor	≤ Initial Value x 2.0 (See Above)	Store in a test chamber set at 85°C ± 2°C/ 85% ± 5% relative								
	Insulation Resistance	≥ Initial Value x 0.3 (See Above)	humidity for 1000 hours (+48, -0) with rated voltage applied. Pre-treatment: After remove from test chamber, perform heat								
	Dielectric Strength	Meets Initial Values (As Above)	treatment: After remove from test chamber, perform heat treatment 150+0/-10C for 2 hour, then stabilise for 24+/-2 hour at room temp, then measure.								





PREFERRED SIZES ARE SHADED

SIZE		0101*			0201					04	02						06	03							08	05								1206				
Solderii		Reflow Only			flow (R	eflow		/e				R	eflow		e					R		//Wav	re			Reflow/Wave								
Packagi		Paper/ Embossed			II Pap						aper						All P									mbos						-		/Emb		d		
(L) Length	mm (in.)	0.40 ± 0.02 (0.016 ± 0.0008)			50 ± 0 24 ± 0					1.00 :							1.60									± 0.20				3.20 ± 0.30 (0.126 ± 0.012)								
W) Width	mm (in.)	0.20 ± 0.02 (0.008 ± 0.0008)			30 ± 0					0.50 :				0.81 ± 0.15 (0.032 ± 0.006)						1.25 ± 0.20 (0.049 ± 0.008)							1.60 ± 0.30 (0.063 ± 0.012)											
(i) = 1 1	mm	0.10± 0.04			15 ± 0				(0.020 ± 0.004) 0.25 ± 0.15						0.35 ± 0.15							0.50 ± 0.25							0.50 ± 0.25								\neg	
(t) Terminal	(in.)	(0.004 ± 0.0016)			06 ± 0				(0.	.010 :	± 0.00)6)					.014	± 0.00	16)							± 0.01				(0.020 ± 0.010)								
WVDC		16	_	10	16	25	50	6.3		16	25	_		_	10		25			200	250	6.3	10	16	25	50	100	200	250	6.3	10	16	25		_	_	250	500
Cap 100		В	Α	Α	Α	Α	Α	С	С	С	С	С	С	G	G	G	G	G	G	J	J													G	G	N	N	N
(pF) 150		В	Α	Α	Α	Α	Α	С	С	С	С	С	С	G	G	G	G	G	G	J	J									G	G	G	G	G	G	N	N	N
220		В	Α	Α	Α	Α	Α	С	С	С	С	С	С	G	G	G	G	G	G	J	J	Е	Е	Е	E	Е	Е	Е	J	J	J	J	J	J	J	N	N	Р
330		В	Α	Α	Α	Α	Α	С	С	С	С	С	С	G	G	G	G	G	G	J	J		J	J	J	J	J	J	J	J	J	J	J	J	J	N	N	Р
470		В	A	Α	Α	A	Α	С	С	С	С	С	С	G	G	G	G	G	G	J	J	_	J	J	J	J	J	J	J	J	J	J	J	J	J	N	N	Р
680		В	A	A	A	A	A	С	С	С	С	С	С	G	G	G	G	G	G	J	J	_	J	J	J	J	J	J	J	J	J	J	J	J	J	N	N	Р
1500		В	A	A	Α	A	Α	C	C	С	С	C	C	G	G	G	G	G	G	J	J	_	J	J	J	J	J	J	J	J	J	J	J	J	J	N N	N	P P
2200			A	A	A	A	<u> </u>	С	С	C	C	C	С	G	G	G	G	G	G	J	J	_	J	J	J	J	J	J	J	J	J	J	J	J	J	N	N	Р
3300			A	A	A	A	_	С	С	C	С	С	С	G	G	G	G	G	G	J	J	-	J	J	J	J	J	J	J	J	J	J	J	J	J	N	N	P
3900			A	A	A	A	\vdash	C	U	U	U	U	U	G	G	G	G	G	G	J	J		J	J	J	J	J	J	J	J	J	J	J	J	J	IN	IN	
4700			A	A	A	A		С	С	С	С	С	С	G	G	G	G	G	G	J	J		J	J	J	J	J	J	J	J	J	J	J	J	J	N	N	Р
5600			A	A	A	A		C	C	C	C	C	C	G	G	G	G	G	G	J	J		J	J	J	J	J	J	J	J	J	J	J	J	J	IN	IN	
6800			A	A	A	A		С	С	С	С	С	С	G	G	G	G	G	G	J	J		J	J	J	J	J	Р	Р	J	J	J	J	J	J	N	N	Р
Cap 0.01			A	A	A	A		С	С	C	С	С	С	G	G	G	G	G	G	J	J		J	J	J	J	J	P	P	J	J	J	J	J	J	N	N	P
(µF) 0.012	_										-	-					U		_		-			-	-	-	"		•		U	-	-	-	"		.,	
0.015								С	С	С	С	С		G	G	G	G	G	J	J	J		J	J	J	J	J	Р	Р	J	J	J	J	J	J	N	N	Q
0.018								_	-	-	_	-		_	-	_	-	_	_	-	-		_		-	-	_				_	_	-	-	-			$\overline{}$
0.022			Α	Α	Α			С	С	С	С	С		G	G	G	G	G	J	J	J		J	J	J	J	J	Р	Р	J	J	J	J	J	J	Р	Р	Q
0.027	273																																					
0.033	333							С	С	С	С	С		G	G	G	G	J	J				J	J	J	J	Р	Р	Р	J	J	J	J	J	J	Q	Q	Q
0.039	393																																					П
0.047	473							С	С	С	С	С		G	G	G	G	J	J				J	J	J	J	Р	Р	Р	J	J	J	J	J	J	Q	Q	Q
0.068	683							С	С	С	С	Е		G	G	G	G	J	J				J	J	J	J	Р	Р		J	J	J	J	J	Р	Q	Q	
0.082	823																																					
0.1	104		Α					С	С	С	С	Е		G	G	G	G	J	J				J	J	J	J	Р	Р		J	J	J	J	J	Р	Q	Q	
0.12																																						ш
0.15	154													G	G	G	J	J					N	N	N	N	Р			K	K	K	K	K	Q	Q	Q	ш
	224							С	С	С	С			G	G	J	J	J					N	N	N	N	Р			К	K	К	К	K	Q	Q	Q	Ш
0.33														J	J	J	J	J					Р	Р	Р	Р	Р			K	K	K	K	N	Q			ш
0.47								С	С					J	J	J	J	J					Р	Р	Р	Р	Р	Ш		М	М	М	М	Х	Х			ш
0.68					<u> </u>									J	J	J						<u> </u>	Р	Р	Р			Ш		М	М	М	М	Х	Х			Ш
1.0				_	├	_	_	С			_			J	J	J	J	K	_			<u> </u>	P	P	P	P	_	Ш		М	М	М	М	Х	X	_		ш
2.2				_	<u> </u>			_			_			J	J	K		<u> </u>				<u> </u>	Р	Р	P	Р		Ш		М	М	М	Х	X	Х			ш
4.7				<u> </u>	├		<u> </u>	_						K	_							_	Р	Р	Р		_	\vdash		Х	X	X	X	Z				${oxdot}$
10								_			_	_	_	<u> </u>				<u> </u>			_	Р	Р	Р				Ш		X	X	Х	Х	Х		_		ш
22				_	-			_			_		<u> </u>	<u> </u>	_			<u> </u>			<u> </u>				_			Ш		Х	Χ		_		_			Ш
47				_	-	-				_	_	_	-	_				_			-		-		_	-						_	_	-	_	_		Н
100 WVDC		16	6.2	10	16	25	EO	6.2	10	16	25	EO	100	6.0	10	16	25	EO	100	200	250	6.2	10	16	25	EO	100	200	250	6.2	10	16	25	FO	100	200	250	FOO
WVDC	•	16	0.3	10	10	25	50	0.3	10	10	25	50	100	0.3	10	10	25	50	100	200	250	0.3	10	10	25	50	100	200	250	0.3	10	10	25	50	100	200	250	300

Letter	Α	В	С	Е	G	J	K	М	N	Р	Q	Х	Υ	Z			
Max. Thickness	0.33 (0.013)	0.22 (0.009)	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)			
	, ,		PAI	PER			EMBOSSED										

NOTE: Contact factory for non-specified capacitance values

^{*}EIA 01005

^{**}Contact Factory for Specifications





PREFERRED SIZES ARE SHADED

4).						1210							1812							2220					
40.				Re	eflow On	ıly					Reflo	v Only			R	eflow Or	nly		R	eflow Or	nly		R	eflow On	ıly
431				Pape	er/Embo	ssed					All Em	bossed			All	l Emboss	sed		All	I Embos	sed		All	Emboss	ed
(L) Length	mm (in.)				3.30 ± 0.4 130± 0.0							± 0.40 ± 0.016)			4.50 ± 0.40 5.70 ± 0.50 (0.177 ± 0.016) (0.224 ± 0.020)								.70 ± 0.4 224 ± 0.0		
W) Width	mm (in.)				.50 ± 0.3				3.20 ± 0.40 (0.126 ± 0.016)							5.40 ± 0.4 252 ± 0.0				5.00 ± 0.4 197 ± 0.0		6.30 ± 0.40 (0.248 ± 0.016)			
(t) Terminal	mm (in.)				.50 ± 0.2 020 ± 0.0							± 0.36 ± 0.014)				0.61 ± 0.3 024 ± 0.0				0.64 ± 0.3 025 ± 0.0		0.64 ± 0.39 (0.025 ± 0.015)			
W	VDC	10	16	25	50	100	200	500	16	25	50	100	200	500	50	100	200	25	50	100	200	500	50	100	200
Cap 100	101																						-	- N	
(pF) 150	151																					ا_محا		\sim	\ ``
220	221				K	K	K	М														$I \subset I$			J_IT □
330	331				K	K	K	М			N	N	N	N								I ~	\smile		
470	471				K	K	K	М			N	N	N	Ν									a to		
680	681				K	K	K	М			N	N	N	N									`		
1000	102	K	K	K	K	K	K	М	N	N	N	N	N	N	Х	Х	Х		Х	Х	Х	Х	Х	Х	Х
	152	K	K	K	K	К	K	М	N	N	N	N	N	N	Χ	Х	Х		Х	Х	Х	Х	Х	Х	Х
2200	222	K	K	K	K	K	K	М	N	N	N	N	N	N	Х	Х	Х		Х	Х	Х	Х	Х	Х	Х
3300	332	K	K	K	K	K	K	Р	N	N	N	N	N	N	Х	Х	Х		Х	Х	Х	Х	Х	Х	Х
4700	472	K	K	K	K	K	K	Р	N	N	N	N	N	Р	Х	Х	Х		Х	Х	X	Х	Х	Х	Х
6800	682	K	K	K	K	K	K	Р	N	N	N	N	N	Р	Х	Х	Х		Х	Х	Х	Х	Х	Х	Х
Cap 0.01	103	K	K	K	K	K	K	Р	N	N	N	N	N	Р	Х	Х	Х		Х	Х	Х	Х	Х	Х	Х
(μF) 0.015	153	K	K	K	K	K	K	Р	N	N	N	N	N	Р	Х	Х	Х		Х	Х	Х	Х	Х	Х	Х
0.022	223	K	K	K	K	K	Р	Q	N	N	N	N	N	Р	Х	Х	Х		Х	Х	Х	Х	Х	Х	Х
0.033	333	K	Κ	K	K	K	Р	Х	N	N	N	N	N	Х	Х	Х	Х		Х	Х	Х	Х	Х	Х	Х
0.047	473	K	Κ	K	K	K	Р	Х	N	N	N	N	P	Χ	Х	Х	Х		Х	Х	Х	Х	Х	Х	Х
0.068	683	K	K	K	K	K	Р	Х	N	N	N	N	Р	Х	Х	X	Х		Х	Х	Х	Х	Х	Х	Х
0.1	104	K	K	K	K	K	Р	Х	N	N	N	Р	Р	Х	Х	X	Х		Х	X	X	Х	Х	Х	Х
0.15	154	K	K	K	М	Р	Z	Z	N	N	N	Р	Р	Z	Х	X	Х		Х	Х	X	Х	Х	Х	Х
0.22	224	K	K	K	М	Р	Z		N	N	N	Р	Q	Z	Х	Х	Х		Х	Х	Х	Х	Х	Х	Х
0.33	334	K	K	K	М	Q	Z		N	N	N	Р	Х	Z	Х	Х	Х		Х	Х	Х	Х	Х	Х	Х
0.47	474	М	М	М	Р	Q	Z		N	N	N	Q	Х	Z	Х	Х	Х		Х	Х	Х	Х	Х	Х	Х
0.68	684	М	М	Р	Х	Х	Z		Q	Q	Q	Q	Z		Х	Х	Х		Х	Х	Х	Z	Х	Х	Х
1.0	105	Р	Р	Р	Х	Z			Q	Q	Q	Х	Z		Х	Х	Х		Х	Х	Х	7	Х	Х	Х
1.5	155	N	Ζ	Z	Z	Z				Z	Z	Z			Х	Х	Z		Х	Х	Z		Х	Х	Z
2.2	225	Х	Х	Z	Z	Z				Z	Z	Z			Х	Х	Z		Х	Х	Z		Х	Х	Z
3.3	335	Χ	Х	Z	Z	Z				Z	Z	Z			Х	Х			Х	Z			Х	Х	
4.7	475	Z	Z	Z	Z	Z				Z	Z	Z			Χ	Х			Z	Z			Х	Х	
10	106	Z	Z	Z	Z				Z	Z	Z				Z	Z			Z	7			Z	Z	
22	226	Z	Z	Z														Z		7					
47	476	Z																							
100	107																								
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					1210				1812							1825				2220	2225				

Letter	Α	В	С	Е	G	J	K	М	N	Р	Q	Х	Υ	Z	7			
Max.	0.33	0.22	0.56	0.71	0.90	0.94	1.02	1.27	1.40	1.52	1.78	2.29	2.54	2.79	3.30			
Thickness	(0.013)	(0.009)	(0.022)	(0.028)	(0.035)	(0.037)	(0.040)	(0.050)	(0.055)	(0.060)	(0.070)	(0.090)	(0.100)	(0.110)	(0.130)			
			PAI	PER			EMBOSSED											

NOTE: Contact factory for non-specified capacitance values