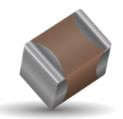
General Specifications





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.

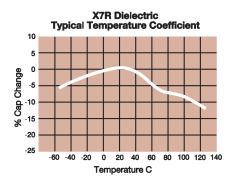
Capacitance for X7R varies under the influence of electrical operating con-ditions such as voltage and frequency.

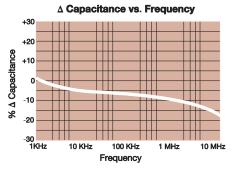
X7R dielectric chip usage covers the broad spectrum of industrial applications where known changes in capacitance due to applied voltages are acceptable.

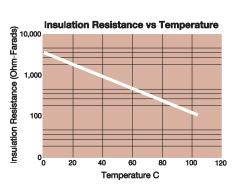
PART NUMBER (SEE PAGE 4 FOR COMPLETE PART NUMBER EXPLANATION)

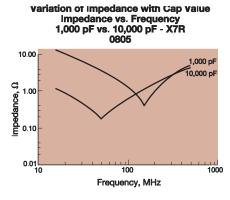
0805	5	С	103	М	Α	T	2	Α
	T	T	$\overline{}$	T	T	T	T	T
Size	Voltage	Dielectric	Capacitance	Capacitance	Failure	Terminations	Packaging	Special
(L" x W")	4V = 4	X7R = C	Code (In pF)	Tolerance	Rate	T = Plated Ni and Sn	2 = 7" Reel	Code
	6.3V = 6		2 Sig. Digits +	$J = \pm 5\%$ *	A = Not	Z= FLEXITERM®**	4 = 13" Reel	A = Std.
	10V = Z		Number of Zeros	$K = \pm 10\%$	Applicable	*Optional termination		Product
	16V = Y			$M = \pm 20\%$		optional termination	Contact	
	25V = 3					**See FLEXITERM®	Factory For	
	50V = 5			*≤1µF only,		X7R section	Multiples	
	100V = 1		(contact factory for	or			
	200V = 2			additional values				
	500V = 7				-			

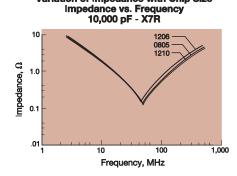
Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers. Contact factory for non-specified capacitance values.



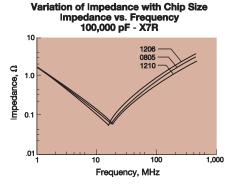








Variation of Impedance with Chip Size







Paramete	er/Test	X7R Specification Limits	Measuring Conditions								
Operating Temp		-55°C to +125°C	Temp	perature Cycle Chamber							
Capacit Dissipation		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 R	esistance	10,000MΩ or 500MΩ - μF, whichever is less		levice with rated voltage for secs @ room temp/humidity							
Dielectric S	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) Note: Charge device with 150% of rated voltage for 500V devices.								
	Appearance	No defects									
Resistance to	Capacitance Variation	≤ ±12%		Deflection: 2mm							
Flexure Stresses	Dissipation Factor	Meets Initial Values (As Above)	T€	est Time: 30 seconds							
	Insulation Resistance	≥ Initial Value x 0.3									
Soldera	bility	≥ 95% of each terminal should be covered with fresh solder		in eutectic solder at 230 ± 5°C or 5.0 ± 0.5 seconds							
	Appearance	No defects, <25% leaching of either end terminal									
	Capacitance 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							
Solder Heat	Insulation Resistance	Meets Initial Values (As Above)		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 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							
	Appearance Capacitance Variation	No visual defects ≤ ±12.5%	Pre-treatment: After m 10C for 2 hour, then	nounting, perform heat treatment 150+0/- stabilise for 24+/-2 hour at room temp, then measure.							
	Dissipation Factor	≤ Initial Value x 2.0 (See Above)		≥ rated voltage in test chamber set at							
Load Life	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/-100 at roo	remove from test chamber, perform heat c for 2 hour, then stabilise for 24+/-2 hour om temp, then measure. A AVX for datasheet of specific parts.							
	Appearance	No visual defects	Pre-treatment: After m	ounting, perform heat treatment 150+0/-							
	Capacitance 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)		per set at 85°C ± 2°C/ 85% ± 5% relative							
Humidity	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.								

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PREFERRED SIZES ARE SHADED

		0101* Reflow Only			0201			_		- 04	02						06								08	UO												
Packaging (L) Length n		Reliow Offig							Reflow/Wave					Reflow/Wave					Reflow/Wave						1206 Reflow/Wave													
(L) Length n		Paper/		Rei	flow C	Jilly			R	enow	// wav	re		_		K	enow	/ wav	e					K	ellow	/ wav	e										-	
	_	Embossed			II Pap					All P					All Paper						Paper/Embossed							Paper/Embossed										
()	mm (in.)	0.40 ± 0.02 (0.016 ± 0.0008)			50 ± 0 24 ± 0				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 ± 0.30 (0.126 ± 0.012)											
	mm	0.20 ± 0.02			30 ± 0					0.50				0.81 ± 0.15										0.20				1.60 ± 0.30										
<u> </u>	`	(0.008 ± 0.0008)		<u> </u>	1 ± 0					.020 :							.032 ±									0.00								53 ± 0				
	mm	0.10± 0.04			5 ± 0					0.25							0.35 ±					0.50 ± 0.25 (0.020 ± 0.010)											50 ± 0					
WVDC	(in.)	(0.004 ± 0.0016) 16	6.3		06 ± 0	25	50	6.3	10	.010 : 16	25	50	100	6.3	10	16	.014 ±	50		200	250	6.2	10					200	250	6.2	10	16	25	20 ± 0 50		lann	250	500
	101	В	0.3 A	A	A	A	A	0.3	С	С	C	C	C	G.3	G	G	G	G	G	J	J	0.3	10	10	23	30	100	200	230	0.3	10	10	23	G	G	N	N	N
	151	В	A	A	A	A	A	С	С	С	С	С	С	G	G	G	G	G	G	J	J	\vdash				_				G	G	G	G	G	G	N	N	N
4 /	221	В	A	A	A	A	A	c	c	С	c	c	С	G	G	G	G	G	G	J	J	Е	Е	Е	Е	Е	Е	Е	J	J	J	J	J	J	J	N	N	Р
	331	В	A	A	A	A	A	С	C	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	P
	171	В	A	A	Α	A	A	С	С	С	С	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	P
	581	В	A	A	A	A	A	c	C	c	c	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
	102	В	A	A	Α	A	A	c	C	С	c	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
	52		Α	Α	Α	Α		С	С	C	C	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
	222		Α	Α	Α	Α	İ	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
3300 3	332		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
3900 3	392		Α	Α	Α	Α																																П
4700 4	172		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
5600 5	562		Α	Α	Α	Α																																П
6800 6	582		Α	Α	Α	Α		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 1	103		Α	Α	Α	Α		С	С	С	С	С	С	G	G	G	G	G	G	J	J		J	J	٦	J	J	Р	Р	J	J	J	J	J	J	N	N	Р
· /	123																																					Ш
	153							С	С	С	С	Е		G	G	G	G	G	J	J	J		J	J	J	J	J	Р	Р	J	J	J	J	J	J	N	N	Q
	183																																					ш
	223		Α	Α	Α			С	С	С	С	E		G	G	G	G	G	J	J	J		J	J	J	J	J	Р	Р	J	J	J	J	J	J	Р	Р	Q
	273																																					ш
	333					_	_	С	С	С	С	E		G	G	G	G	J	J	_		_	J	J	J	J	Р	Р	Р	J	J	J	J	J	J	Q	Q	Q
	393								_			-		_			0										-	_	-								_	
	173							С	С	С	С	E		G	G	G	G	J	J				J	J	J	J	Р	P P	Р	J	J	J	J	J	J P	Q	Q	Q
	323							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	\vdash
	04		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	\vdash
	24		А					C	C	C	C			G	G	G	G	J	J				J	J	J	J	Г	Г		J	J	J	J	J	Г	Ų	Ų	\vdash
	54													G	G	G	J	J					N	N	N	N	Р			K	K	K	K	K	Q	Q	Q	\vdash
	224							С	С	С	С			G	G	J	J	J					N	N	N	N	P			K	K	K	K	K	Q	Q	0	Н
	334													J	J	J	J	J					P	P	P	P	P			K	K	K	K	N	Q	-	٧	Н
	174							С	С					J	J	J	J	J					P	P	P	P	P			М	М	М	М	Х	X			П
	584													J	J	J							P	P	P			М		М	М	М	М	X	X			\square
	105							С						J	J	J	J	K					P	P	P	Р		\Box		М	М	М	М	X	X			\sqcap
	225													J	J	K						İ	Р	Р	Р	P		П		М	М	М	Х	Х	Х			\Box
4.7 4	_									Ì				K									Р	Р	Р					Х	Х	Х	Х	Z				\sqcap
10 1	106																					Р	Р	Р						Х	Х	Х	Х					\Box
22 2:	226																													Х	Х							\Box
47 4	176																																					
	107																																					
WVDC		16	6.3	10	16	25	50	6.3	10	16		50	100	6.3	10	16	-		100	200	250	6.3	10	16	25	-	100	200	250	6.3	10	16	25			200	250	500
SIZE		0101*			0201			0402						0603								08	05				1206											

Letter	Α	В	С	E	G	J	K	М	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	1.78	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)	(0.070)	(0.090)	(0.100)	(0.110)			
			PAF	PER			EMBOSSED										

NOTE: Contact factory for non-specified capacitance values

^{**}Contact Factory for Specifications





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SIZE	1210						1812							1825				2220		2225					
Soldering			Re	eflow On	ıly					Reflo	w Only			R	eflow Or	nly		R	eflow Or	nly		Re	eflow On	ily	
Packaging			Pape	er/Embo	ssed					All Em	bossed			All	Emboss	sed		All	Emboss	sed		All	Emboss	ed	
(L) Length mm (in.)				3.30 ± 0.4 130± 0.0							± 0.40 ± 0.016)				.50 ± 0.4 177 ± 0.0				.70 ± 0.5 224 ± 0.0			.70 ± 0.4 !24 ± 0.0			
W) Width mm (in.)				.50 ± 0.3 198 ± 0.0				3.20 ± 0.40 (0.126 ± 0.016)							6.40 ± 0.40 (0.252 ± 0.016)				.00 ± 0.4 197 ± 0.0				.30 ± 0.4 !48 ± 0.0		
(t) Terminal mm (in.)							0.61 ± 0.36 (0.024 ± 0.014)							0.61 ± 0.3 024 ± 0.0				.64 ± 0.3 025 ± 0.0			0.64 ± 0.39 (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	500	50	100	200	
Cap 100 101																						>	~ W	,	
(pF) 150 151																					4	\leq	7	13	
220 221				K	K	K	М														(2) <u>T</u> _	
330 331				K	K	K	М			N	N	N	N								_	$\overline{}$			
470 471				K	K	K	М			N	N	N	N								Ĺ	1			
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	
1500 152	K	K	K	K	K	K	М	N	N	N	N	N	N	Х	Х	Х		Х	Х	Х	Х	Х	X	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	Ν	N	N	N	N	Ν	Х	Х	Х		Х	Х	Х	Х	Х	X	Х	
4700 472	K	K	K	K	K	K	Р	Ν	N	N	N	N	Р	Х	Х	Х		Х	Х	Х	Х	Χ	X	Х	
6800 682	K	K	K	K	K	K	Р	N	N	N	N	N	Р	Х	Х	Х		Х	Х	Х	Х	Х	X	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	X	X	
(μF) 0.015 153	K	K	K	K	K	K	Р	N	N	N	N	N	Р	Х	Х	Х		Х	Х	Х	Х	Χ	Χ	X	
0.022 223	K	K	K	K	K	Р	O	N	N	N	N	N	Р	Х	Х	Х		Х	Х	Х	Х	Χ	Χ	Х	
0.033 333	K	K	K	K	K	Р	Χ	N	N	N	N	N	Х	Х	Х	Х		Х	Х	Х	Х	Χ	Χ	Х	
0.047 473	K	K	K	K	K	Р	Χ	N	N	N	N	Р	Х	Х	Х	Х		Х	Х	Х	Х	Χ	Χ	X	
0.068 683	K	K	K	K	K	Р	Х	N	N	N	N	Р	Х	Х	Х	Х		Х	Х	Х	Х	Х	Х	X	
0.1 104	K	K	K	K	K	Р	Х	N	N	N	Р	Р	Х	Х	X	Х		Х	Х	Х	Х	Х	Х	X	
0.15 154	K	K	K	М	Р	Z	Z	N	N	N	Р	Р	Z	Х	X	Х		Х	Х	Х	Х	Х	Х	X	
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	N	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	Х	Х	Z	Z	Z				Z	Z	Z			Х	Х			Х	Z			Х	Х		
4.7 475	Z	Z	Z	Z	Z				Z	Z	Z			Х	Х			Z	Z			Х	Х		
10 106	Z	Z	Z	Z				Z	Z	Z				Z	Z	İ		Z	Z	İ		Z	Z		
22 226	Z	Z	Z														Z								
47 476	Z									İ	İ					İ			İ	İ					
100 107										İ	İ					İ			İ	İ					
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	E	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							MBOSSEI)			

NOTE: Contact factory for non-specified capacitance values

Mouser Electronics

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AVX:

08051X471KSJME 1206CA681MAJ1A 08051C153KAT4H 08051C222KAT4H 0201YC681K 08051C561JAT4H 08052C102JAT4H 08052C561JAT4H 12065X222MAT2A 05045C102KA79A 05045C471KA19A 05045C472MAT1A 08051X102KS19A 08051X102KSJ9A 08051X102KSJME 08051X121KSJ9A 08051X221KSJ9A 08055X103KSJ9A 08055X103KSJME\2K 08055X153KSJ9A 12061X103KSJ9A 12063C564KA76N 12065C682KHT1A 12065C683KHT1A 1206YC105MA76N 12105X104KS19A 12105X104MSJME 12105X473KSJME\1K 18051X103KSJ9A 18121X473KSJME 18125X104KSJ9A 18251X104KSJ9A 18255X474KSJ9A 05045C102KA11A 22251C105K/BULK 22251E225ZA1M6 22251E225ZA116 05041C151KAT1A 05045C101KA11A 05045C101KA79A 05045C102KAT9A 05045C102KA71A 05045C102KA76A 05045C102MAT9A 05045C103JAT1A 05045C103JA11A 05045C103JA16A 05045C103KA11A 05045C103KA19A 05045C103KA76A\100 05045C103MAT1A 05045C103MA71A 05045C103MA79A 05045C121KAT1A 05045C122JAT9A 05045C151KAT1A 05045C152JAT1A 05045C152JHT6A 05045C152KA79A 05045C152MA79A 05045C181KAT1A 05045C182KAT1A 05045C221KAT1A 05045C221KA79A 05045C222JAT1A 05045C222JA16A 05045C331KAT1A 05045C332JA16A 05045C332KAT1A 05045C332KA79A 05045C391KAT1A 05045C392JA16A\H 05045C392KAT1A 05045C471KA79A 05045C472JA16A 05045C472JA19A\H 05045C472KAT1A 05045C472KA16A 05045C561JA19A\H 05045C561KAT1A 05045C562KAT1A 05045C681KAT1A 05045C681KA11A 05045C681KA79A 05045C682JA19A\H 05045C682KAT1A 08053C104KGT1A 08053C104KGT6A 12061X103KSJME\1K 0805ZC105JAJ9A 08051X102KSJME\1K 08051X222KSJ9A 12105X104MSJME\1K 08051X332KST9A 18255X334KSJ9A 06031C103JA76N 08051X102KS1WE 08055X103KS19A 08055X472KSJ9A 18122C104KAJ9A