

X7R Dielectric

Specifications and Test Methods

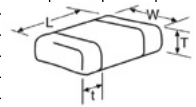


Parameter/Test		X7R Specification Limits	Measuring Conditions	
Operating Temperature Range		-55°C to +125°C	Temperature Cycle Chamber	
Capacitance		Within specified tolerance		
Dissipation Factor		$\leq 10\%$ for $\geq 50V$ DC rating $\leq 12.5\%$ for 25V DC rating $\leq 12.5\%$ for $\leq 10V$ DC rating Contact Factory for DF by PN	Freq.: 1.0 kHz $\pm 10\%$ Voltage: 1.0Vrms $\pm .2V$ For Cap > 10 μ F, 0.5Vrm @ 120Hz	
Insulation Resistance		10,000M Ω or 500M Ω - μ 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) Note: Charge device with 150% of rated voltage for 500V devices.	
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 $\pm 2^\circ$	30 \pm 3 minutes
	Capacitance Variation	$\leq \pm 7.5\%$	Step 2: Room Temp	≤ 3 minutes
	Dissipation Factor	Meets Initial Values (As Above)	Step 3: +125°C $\pm 2^\circ$	30 \pm 3 minutes
	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 \pm 2 hours at room temperature	
Load Life	Appearance	No visual defects	Pre-treatment: After mounting, perform heat treatment 150+0/-10C for 2 hour, then stabilise for 24+/-2 hour at room temp, then measure. Charge device with \geq rated voltage in test chamber set at 125°C $\pm 2^\circ$ C for 1000 hours (+48, -0). Pre-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. Contact KYOCERA AVX for datasheet of specific parts.	
	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	Pre-treatment: After mounting, perform heat treatment 150+0/-10C for 2 hour, then stabilise for 24+/-2 hour at room temp, then measure. Store in a test chamber set at 85°C $\pm 2^\circ$ C/ 85% $\pm 5\%$ relative humidity for 1000 hours (+48, -0) with rated voltage applied. Pre-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.	
	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)		

X7R Dielectric Capacitance Range

PREFERRED SIZES ARE SHADED

SIZE	1210							1812					1825			2220				2225				
	Reflow Only							Reflow Only					Reflow Only			Reflow Only				Reflow Only				
Packaging	Paper/Embossed							All Embossed					All Embossed			All Embossed				All Embossed				
(L) Length	3.30 ± 0.4 (0.130 ± 0.016)							4.50 ± 0.40 (0.177 ± 0.016)					4.50 ± 0.40 (0.177 ± 0.016)			5.70 ± 0.50 (0.224 ± 0.020)				5.70 ± 0.40 (0.224 ± 0.016)				
(W) Width	2.50 ± 0.30 (0.098 ± 0.012)							3.20 ± 0.40 (0.126 ± 0.016)					6.40 ± 0.40 (0.252 ± 0.016)			5.00 ± 0.40 (0.197 ± 0.016)				6.30 ± 0.40 (0.248 ± 0.016)				
(t) Terminal	0.50 ± 0.25 (0.020 ± 0.010)							0.61 ± 0.36 (0.024 ± 0.014)					0.61 ± 0.36 (0.024 ± 0.014)			0.64 ± 0.39 (0.025 ± 0.015)				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																						
(pF)	150	151																						
	220	221																						
	330	331																						
	470	471																						
	680	681																						
	1000	102																						
	1500	152																						
	2200	222																						
	3300	332																						
	4700	472																						
	6800	682																						
Cap	0.01	103																						
(µF)	0.015	153																						
	0.022	223																						
	0.033	333																						
	0.047	473																						
	0.068	683																						
	0.1	104																						
	0.15	154																						
	0.22	224																						
	0.33	334																						
	0.47	474																						
	0.68	684																						
	1.0	105																						
	1.5	155																						
	2.2	225																						
	3.3	335																						
	4.7	475																						
	10	106																						
	22	226																						
	47	476																						
	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	A	B	C	E	G	J	K	M	N	P	Q	X	Y	Z	7
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)	3.30 (0.130)
	PAPER						EMBOSSSED								

NOTE: Contact factory for non-specified capacitance values

Mouser Electronics

Authorized Distributor

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AVX:

[08051X471KSJME](#) [1206CA681MAJ1A](#) [08051C153KAT4H](#) [08051C222KAT4H](#) [0201YC681K](#) [08051C561JAT4H](#)
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[12065C683KHT1A](#) [1206YC105MA76N](#) [12105X104KS19A](#) [12105X104MSJME](#) [12105X473KSJME\1K](#)
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[05045C102KAT9A](#) [05045C102KA71A](#) [05045C102KA76A](#) [05045C102MAT9A](#) [05045C103JAT1A](#) [05045C103JA11A](#)
[05045C103JA16A](#) [05045C103KA11A](#) [05045C103KA19A](#) [05045C103KA76A\100](#) [05045C103MAT1A](#)
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[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](#)
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