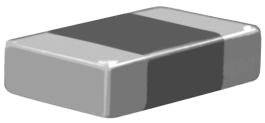
Surface Mount Multilayer Ceramic Chip Capacitors for Commercial Applications



FEATURES

- General purpose dielectric
- Excellent aging characteristics
- Ideal for decoupling and filtering
- Ideal for surge suppression and high voltage applications
- Wide range of case sizes, voltage ratings and capacitance values
- Protective surface coating of high voltage capacitors maybe required to prevent surface arcing
- Surface mount, precious metal technology, wet build process

RoHS COMPLIANT

ELECTRICAL SPECIFICATIONS

Note: Electrical characteristics at + 25 °C unless otherwise specified

Operating Temperature: - 55 °C to + 125 °C

Capacitance Range: 100 pF to 1.8 µF

Voltage Rating: 10 Vdc to 1000 Vdc

Temperature Coefficient of Capacitance (TCC):
X7R: ± 15 % from - 55 °C to + 125 °C, with 0 Vdc applied
X5R: ± 15 % from - 55 °C to + 85 °C, with 0 Vdc applied (4)

Dissipation Factor (DF):
≤ 25 V ratings: 3.5 % maximum at 1.0 V_{rms} and 1 kHz
> 25 V ratings: 2.5 % maximum at 1.0 V_{rms} and 1 kHz

Aging Rate: 1 % maximum per decade

Insulation Resistance (IR):
At + 25 °C and rated voltage 100 000 MΩ minimum or 1000 ΩF, whichever is less

At + 125 °C and rated voltage 10 000 MΩ minimum or 100 ΩF, whichever is less

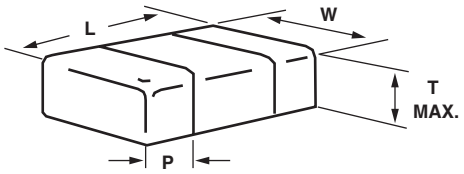
Dielectric Withstanding Voltage (DWV):
This is the maximum voltage the capacitors are tested for a 1 to 5 second period and the charge/discharge current does not exceed 50 mA
≤ 200 Vdc: DWV at 250 % of rated voltage
500 Vdc: DWV at 200 % of rated voltage
630/1000 Vdc: DWV at 150 % of rated voltage

ORDERING INFORMATION

VJ0805 (3)	Y	102	K	X	A	A	T	### (2)
CASE CODE	DIELECTRIC	CAPACITANCE NOMINAL CODE	CAPACITANCE TOLERANCE	TERMINATION	DC VOLTAGE RATING (1)	MARKING	PACKAGING	PROCESS CODE
0402 0603 0805 1206 1210 1808 1812 1825 2220 2225 3640	Y = X7R G = X5R (4)	Expressed in picofarads (pF). The first two digits are significant, the third is a multiplier. **Examples:** 102 = 1000 pF	J = ± 5 % K = ± 10 % M = ± 20 %	X = Ni barrier 100 % tin plated F = AgPd	Q = 10 V J = 16 V X = 25 V A = 50 V B = 100 V C = 200 V E = 500 V L = 630 V G = 1000 V	A = Unmarked M = Marked **Note:** Marking is only available for 0805 and 1206	T = 7" reel/plastic tape C = 7" reel/paper tape R = 11 1/4" reel/plastic tape P = 11 1/4" reel/paper tape O = 7" reel/flamed paper tape I = 11 1/4"/13"reel/flamed paper tape **Note:** "I" and "O" is used for "F" termination paper taped	

Notes:
(1) DC voltage rating should not be exceeded in application
(2) Process Code may be added with up to three digits, used to control non-standard products and/or special requirements
(3) Case size designator may be replaced by four digit drawing number used to control non-standard products and/or special requirements
(4) Selected values for X5R, see selection chart

DIMENSIONS in inches [millimeters]



EIA STYLE	PART ORDERING NUMBER	LENGTH (L)	WIDTH (W)	MAXIMUM THICKNESS (T)	TERMINATION (P)	
					MINIMUM	MAXIMUM
0402	VJ0402	0.040 + 0.004/- 0.002 [1.00 + 0.10/- 0.05]	0.020 + 0.004/- 0.002 [0.50 + 0.10/- 0.05]	0.024 [0.60]	0.004 [0.10]	0.016 [0.41]
0603	VJ0603	0.063 ± 0.005 [1.60 ± 0.12]	0.031 ± 0.005 [0.80 ± 0.12]	0.036 [0.92]	0.012 [0.30]	0.018 [0.46]
0805	VJ0805	0.079 ± 0.008 [2.00 ± 0.20]	0.049 ± 0.008 [1.25 ± 0.20]	0.057 [1.45]	0.010 [0.25]	0.028 [0.71]
1206	VJ1206	0.126 ± 0.008 [3.20 ± 0.20]	0.063 ± 0.008 [1.60 ± 0.20]	0.067 [1.70]	0.010 [0.25]	0.028 [0.71]
1210	VJ1210	0.126 ± 0.008 [3.20 ± 0.20]	0.098 ± 0.008 [2.50 ± 0.20]	0.067 [1.70]	0.010 [0.25]	0.028 [0.71]
-	VJ1808	0.177 ± 0.010 [4.50 ± 0.25]	0.080 ± 0.010 [2.03 ± 0.25]	0.067 [1.70]	0.010 [0.25]	0.030 [0.76]
1812	VJ1812	0.177 ± 0.010 [4.50 ± 0.25]	0.126 ± 0.008 [3.20 ± 0.20]	0.086 [2.18]	0.010 [0.25]	0.030 [0.76]
1825	VJ1825	0.177 ± 0.010 [4.50 ± 0.25]	0.252 ± 0.010 [6.40 ± 0.25]	0.086 [2.18]	0.010 [0.25]	0.030 [0.76]
-	VJ2220	0.220 ± 0.008 [5.59 ± 0.20]	0.200 ± 0.010 [5.08 ± 0.25]	0.086 [2.18]	0.010 [0.25]	0.030 [0.76]
-	VJ2225	0.220 ± 0.010 [5.59 ± 0.25]	0.250 ± 0.010 [6.35 ± 0.25]	0.086 [2.18]	0.010 [0.25]	0.030 [0.76]
-	VJ3640	0.360 ± 0.015 [9.14 ± 0.38]	0.400 ± 0.015 [10.20 ± 0.38]	0.086 [2.18]	0.010 [0.25]	0.030 [0.76]

SELECTION CHART [2]

STYLE		VJ0402				VJ0603					VJ0805							VJ1206							VJ1210 [1]						
EIA TYPE		0402				0603					0805							1206							1210						
VOLTAGE (Vdc)		16	25	50	100	16	25	50	100	200	10	16	25	50	100	200	500	16	25	50	100	200	500	630	16	25	50	100	200	500	630
CAP. CODE	CAP.																														
121	120 pF	••	••	••	••																										
151	150 pF	••	••	••	••																										
181	180 pF	••	••	••	••																										
221	220 pF	••	••	••	••																										
271	270 pF	••	••	••	••																										
331	330 pF	••	••	••	••			••	••	••						••															
391	390 pF	••	••	••	••	••	••	••	••	••						••															•
471	470 pF	••	••	••	••	••	••	••	••	••		••	••	••	••	••															•
561	560 pF	••	••	••	••	••	••	••	••	••		••	••	••	••	••															•
681	680 pF	••	••	••	••	••	••	••	••	••		••	••	••	••	••						•	•	•							•
821	820 pF	••	••	••	••	••	••	••	••	••		••	••	••	••	••						•	•	•							•
102	1000 pF	••	••	••	••	••	••	••	••	••		••	••	••	••	••		•	•	•	•	•	•	•					•		•
122	1200 pF	••	••	••	••	••	••	••	••	••		••	••	••	••	••		•	•	•	•	•	•	•					•		•
152	1500 pF	••	••	••	••	••	••	••	••	••		••	••	••	••	••		•	•	•	•	•	•	•					•		•
182	1800 pF	••	••	••	••	••	••	••	••	••		••	••	••	••	••		•	•	•	•	•	•	•					•		•
222	2200 pF	••	••	••	••	••	••	••	••	••		••	••	••	••	••		•	•	•	•	•	•	•					•		•
272	2700 pF	••	••	••	••	••	••	••	••	••		••	••	••	••	••		•	•	•	•	•	•	•					•		•
332	3300 pF	••	••	••	••	••	••	••	••	••		••	••	••	••	••		•	•	•	•	•	•	•					•		•
392	3900 pF	••	••	••	••	••	••	••	••	••		••	••	••	••	••		•	•	•	•	•	•	•					•		•
472	4700 pF	••	••	••	••	••	••	••	••	••		••	••	••	••	••		•	•	•	•	•	•	•					•		•
562	5600 pF	••	••	••		••	••	••	••			••	••	••	••	••		•	•	•	•	•	•						•		•
682	6800 pF	••	••	••		••	••	••	••			••	••	••	••	••		•	•	•	•	•	•						•		•
822	8200 pF	••	••	••		••	••	••	••			••	••	••	••	••		•	•	•	•	•	•						•		•
103	0.010 µF	••	••	••		••	••	••	••			••	••	••	••	••		•	•	•	•	•	•		•	•	•	•	•	•	•
123	0.012 µF	••	••			••	••	••	••			••	••	••	••	••		•	•	•	•	•	•		•	•	•	•	•	•	
153	0.015 µF	••	••			••	••	••	••			••	••	••	••	•		•	•	•	•	•	•		•	•	•	•	•	•	
183	0.018 µF	••	••			••	••	••	••			••	••	••	••	•		•	•	•	•	•	•		•	•	•	•	•	•	
223	0.022 µF	••				••	••	••	••			••	••	••	••	•		•	•	•	•	•			•	•	•	•	•	•	
273	0.027 µF	••				••	••	••	••			••	••	••	••	•		•	•	•	•	•			•	•	•	•	•	•	
333	0.033 µF	••				••	••	••	••			••	••	••	•			•	•	•	•	•			•	•	•	•	•	•	
393	0.039 µF	••				••	••	••	••			••	••	••	•			•	•	•	•	•			•	•	•	•	•	•	
473	0.047 µF	••				••	••	••				••	••	••	•			•	•	•	•	•			•	•	•	•	•		
563	0.056 µF					••	••	••				••	••	••	•			•	•	•	•	•			•	•	•	•	•		
683	0.068 µF					••	••	••				•	•	•	•			•	•	•	•	•			•	•	•	•	•		
823	0.082 µF					••	••	••				•	•	•	•			•	•	•	•	•			•	•	•	•	•		
104	0.10 µF					••	••	••				•	•	•				•	•	•	•	•			•	•	•	•	•		
124	0.12 µF					•						•	•	•				•	•	•	•				•	•	•	•	•		
154	0.15 µF					•						•	•	•				•	•	•	•				•	•	•	•	•		
184	0.18 µF											•	•					•	•	•	•				•	•	•	•			
224	0.22 µF											•	•					•	•	•	•				•	•	•	•			
274	0.27 µF											•	•					•	•	•	•				•	•	•	•			
334	0.33 µF											•	•					•	•	•					•	•	•	•			
394	0.39 µF											•						•	•	•					•	•	•	•			
474	0.47 µF											•						•	•	•					•	•	•	•			
564	0.56 µF										•							•	•						•	•	•				
684	0.68 µF										•							•	•						•	•	•				
824	0.82 µF										•							•	•						•	•	•				
105	1.0 µF										•							•	•						•	•	•				
125	1.2 µF																														
155	1.5 µF																														
185	1.8 µF																														
225	2.2 µF																														
275	2.7 µF																														
335	3.3 µF																														
395	3.9 µF																														
475	4.7 µF																														
565	5.6 µF																														
685	6.5 µF																														

Notes:

[1] See soldering recommendations within this data book, or visit www.vishay.com/doc?45034

[2] X5R (- 55 °C to + 85 °C TCC: ± 15 %) for all 0805/10 V ratings

•• Paper tape • Plastic tape

SELECTION CHART

STYLE		VJ1808 (1)					VJ1812 (1)						VJ1825 (1)						VJ2220 (1)				VJ2225 (1)						VJ3640 (1)				
EIA TYPE		-					1812						1825						-				-						-				
VOLTAGE (Vdc)		50	100	200	500	1000	25	50	100	200	500	1000	25	50	100	200	500	1000	50	100	200	500	25	50	100	200	500	1000	25	50	100	200	500
CAP. CODE	CAP.																																
121	120 pF																																
151	150 pF																																
181	180 pF																																
221	220 pF																																
271	270 pF																																
331	330 pF																																
391	390 pF																																
471	470 pF					•																											
561	560 pF					•																											
681	680 pF					•																											
821	820 pF					•																											
102	1000 pF				•	•						•																					
122	1200 pF				•	•						•																					
152	1500 pF				•	•						•																					
182	1800 pF				•	•						•																					
222	2200 pF				•	•						•																					
272	2700 pF				•	•						•																					
332	3300 pF				•	•					•	•																					
392	3900 pF				•	•					•	•																					
472	4700 pF			•	•	•					•	•																					
562	5600 pF			•	•	•					•	•																					
682	6800 pF			•	•	•					•	•																					
822	8200 pF			•	•	•					•	•																					
103	0.010 µF	•	•	•	•	•				•	•	•																					
123	0.012 µF	•	•	•	•					•	•	•																					
153	0.015 µF	•	•	•	•					•	•	•				•	•					•											
183	0.018 µF	•	•	•	•					•	•	•				•	•					•											
223	0.022 µF	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•				•											
273	0.027 µF	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•				•											•
333	0.033 µF	•	•	•			•	•	•	•	•		•	•	•	•	•	•				•	•	•	•	•	•	•				•	•
393	0.039 µF	•	•	•			•	•	•	•	•		•	•	•	•	•	•				•	•	•	•	•	•	•				•	•
473	0.047 µF	•	•	•			•	•	•	•	•		•	•	•	•	•	•				•	•	•	•	•	•	•				•	•
563	0.056 µF	•	•	•			•	•	•	•	•		•	•	•	•	•	•				•	•	•	•	•	•	•				•	•
683	0.068 µF	•	•	•			•	•	•	•	•		•	•	•	•	•					•	•	•	•	•	•	•				•	•
823	0.082 µF	•	•	•			•	•	•	•	•		•	•	•	•	•					•	•	•	•	•	•	•				•	•
104	0.10 µF	•	•	•			•	•	•	•	•		•	•	•	•	•				•	•	•	•	•	•	•	•				•	•
124	0.12 µF	•	•				•	•	•	•			•	•	•	•	•				•	•	•	•	•	•	•					•	•
154	0.15 µF	•	•				•	•	•	•			•	•	•	•	•				•	•	•	•	•	•	•					•	•
184	0.18 µF	•	•				•	•	•	•			•	•	•	•	•				•		•	•	•	•	•		•	•	•	•	•
224	0.22 µF	•					•	•	•	•			•	•	•	•					•		•	•	•	•	•		•	•	•	•	•
274	0.27 µF	•					•	•	•	•			•	•	•	•			•	•	•		•	•	•	•	•		•	•	•	•	•
334	0.33 µF						•	•	•	•			•	•	•	•			•	•	•		•	•	•	•	•		•	•	•	•	•
394	0.39 µF						•	•	•	•			•	•	•	•			•	•	•		•	•	•	•			•	•	•	•	•
474	0.47 µF						•	•	•				•	•	•	•			•	•	•		•	•	•	•			•	•	•	•	•
564	0.56 µF						•	•	•				•	•	•	•			•	•			•	•	•	•			•	•	•	•	•
684	0.68 µF						•	•	•				•	•	•	•			•	•			•	•	•	•			•	•	•	•	•
824	0.82 µF						•	•	•				•	•	•				•	•			•	•	•	•			•	•	•	•	
105	1.0 µF						•	•					•	•	•				•	•			•	•	•	•			•	•	•	•	
125	1.2 µF												•	•	•				•	•			•	•	•	•			•	•	•	•	
155	1.5 µF												•	•	•				•				•	•	•				•	•	•	•	
185	1.8 µF												•	•					•				•	•	•				•	•	•	•	
225	2.2 µF												•										•	•					•	•	•		
275	2.7 µF												•										•	•					•	•	•		
335	3.3 µF																						•						•	•	•		
395	3.9 µF																						•						•	•	•		
475	4.7 µF																						•						•	•			
565	5.6 µF																												•				
685	6.5 µF																												•				

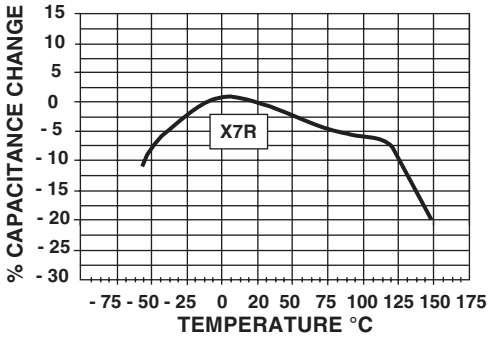
Note:

(1) See soldering recommendations within this data book, or visit www.vishay.com/doc?45034

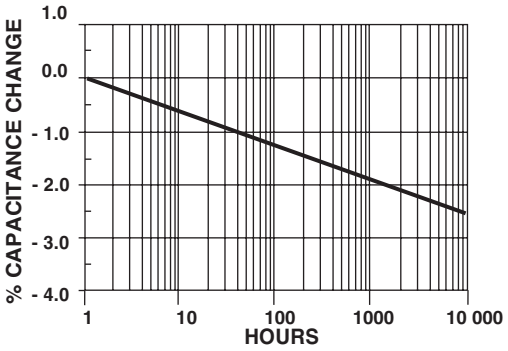
• Plastic tape

X7R DIELECTRIC - TYPICAL PARAMETERS

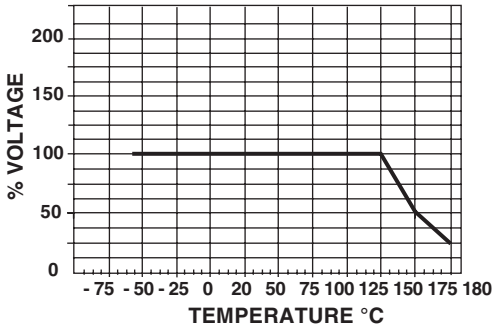
TYPICAL PARAMETER X7R
TEMPERATURE COEFFICIENT OF CAPACITANCE



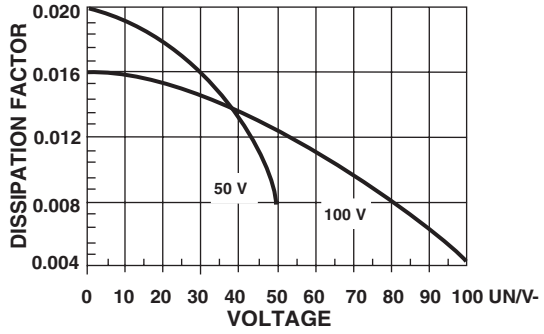
TYPICAL PARAMETER X7R
AGING RATE - X7R



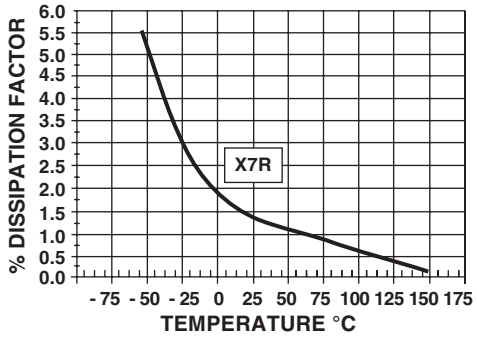
TYPICAL PARAMETER X7R
VOLTAGE VS. TEMPERATURE



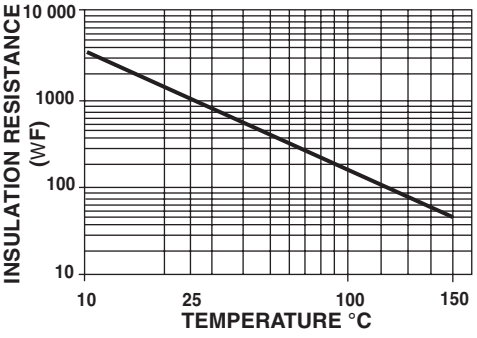
TYPICAL PARAMETER X7R
DISSIPATION FACTOR VS. VOLTAGE



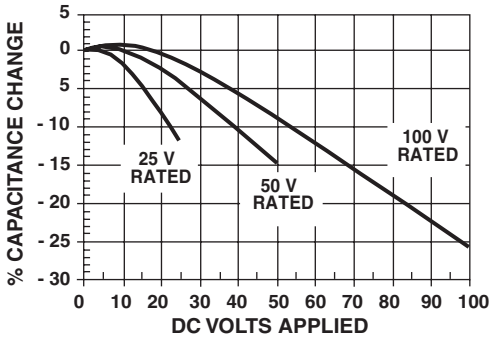
TYPICAL PARAMETER X7R
DISSIPATION FACTOR VS. TEMPERATURE



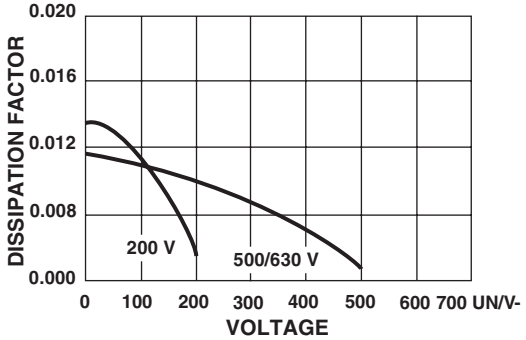
TYPICAL PARAMETER X7R MINIMUM INSULATION RESISTANCE VS. TEMPERATURE



TYPICAL PARAMETER X7R
VOLTAGE COEFFICIENT OF CAPACITANCE - X7R



TYPICAL PARAMETER X7R
DISSIPATION FACTOR VS. VOLTAGE



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