

Vishay Vitramon

HALOGEN

FREE

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
- Surface mount, precious metal technology, wet built process
- Halogen-free according to IEC 61249-2-21



ELECTRICAL SPECIFICATIONS

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

Operating Temperature: - $55 \, ^{\circ}\text{C}$ to + $150 \, ^{\circ}\text{C}$

Capacitance Range: 100 pF to 1.8 μ F Voltage Rating: 10 Vdc to 1000 Vdc

Temperature Coefficient of Capacitance (TCC):

X7R: \pm 15 % from - 55 °C to + 125 °C, with 0 Vdc applied X5R: \pm 15 % from - 55 °C to + 85 °C, with 0 Vdc applied ⁽⁴⁾

Dissipation Factor (DF):

 \leq 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):

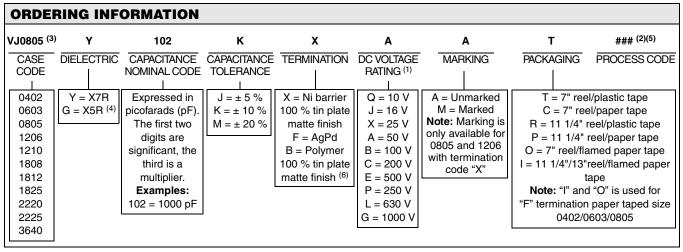
At + 25 °C and rated voltage 100 000 M Ω minimum or 1000 Ω F, whichever is less

At + 125 °C and rated voltage 10 000 M Ω minimum or 100 Ω F, 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



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
- $^{(5)}$ "A2" temporarily used to identify manufacturing plant for size \geq 1812
- (6) Selected values available, contact mlcc@vishay.com for list of released ratings

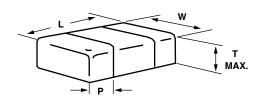
VJ X7R Dielectric

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DIMENSIONS in inches [millimeters]



EIA STYLE	PART ORDERING	LENGTH	WIDTH	MAXIMUM THICKNESS		NATION P)
EIA STILE	NUMBER	(L)	(W)	(T)	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 $[2.00 \pm 0.20]$	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]

Note:

0402/0603/3640 size, consult mlcc@vishay.com 0805/1210/1812/2220/2225 max. add length 0.0040"/0.10 mm 1206/1808 max. add length 0.0055"/0.14 mm

For technical questions, contact: mlcc@vishay.com

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[•] Polymer terminations, "B" termination part number code, length dimensions, positive tolerances (including band width) above are allowed to increase by the following amounts:



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SELECTION CHART DIELECTRIC X7R																																			
													_						•																
STYLE VJ0402			2	VJ0603					VJ0805 ⁽²⁾						VJ1206								VJ1210 ⁽¹⁾												
	TYPE		_	102				060	-			I	_	805					l		206		I -			I		1210							
	GE (Vdc)	16	25	50	100	16	25	50	100	200	10	16	25	50	100	200	16	25	50	100	200	250	500	630	16	25	50	100	200	500	630				
CAP. CODE	CAP.																																		
121	120 pF	••	••	••	••																														
151	150 pF	••	••	••	••																														
181 221	180 pF 220 pF	••	••	••	••																														
271	270 pF	••	••	••	••																										\vdash				
331	330 pF	••	••	••	••			••	••	••						••							••	••											
391	390 pF	••	••	••	••	••	••	••	••	••						••							••	••							•				
471 561	470 pF 560 pF	••	••	••	••	••	••	••	••	••		••	••	••	••	••		••	••	••	••		••	••							•				
681	680 pF	••	••	••	••	••	••	••	••	••		••	••	••	••	••		••	••	••	••		••	••							•				
821	820 pF	••	••	••	••	••	••	••	••	••		••	••	••	••	••		••	••	••	••		••	••							•				
102 122	1000 pF 1200 pF	••	••	••	••	••	••	••	••	••		••	••	••	••	••	••	••	••	••	••		••	••						•	•				
152	1500 pF	••	••	••	••	••	••	••	••	••		••	••	••	••	••	••	••	••	••	••		••	••						•	•				
182	1800 pF	••	••	••	••	••	••	••	••	••		••	••	••	••	••	••	••	••	••	••		••	••						•	•				
222 272	2200 pF 2700 pF	••	••	••	••	••	••	••	••	••	\vdash	••	••	••	••	••	••	••	••	••	••		••	••						•	•				
332	3300 pF	••	••	••	••	••	••	••	••	••		••	••	••	••	••	••	••	••	••	••		••	••					•	•	•				
392	3900 pF	••	••	••	••	••	••	••	••	••		••	••	••	••	••	••	••	••	••	••		••	••					•	•	•				
472	4700 pF	••	••	••	••	••	••	••	••	••		••	••	••	••	••	••	••	••	••	••		••	••					•	•	•				
562 682	5600 pF 6800 pF	••	••	••		••	••	••	••			••	••	••	••	••	••	••	••	••	••		••	•					•	•	•				
822	8200 pF	••	••	••		••	••	••	••			••	••	••	••	••	••	••	••	••	••		••	•					•	•	•				
103	0.010 μF	••	••	••		••	••	••	••			••	••	••	••	••	••	••	••	••	••	•	••	•	•	•	•	•	•	•	•				
123 153	0.012 μF 0.015 μF	••	••			••	••	••	••			••	••	••	••	••	••	••	••	••	••		•	•	•	•	•	•	•	•	•				
183	0.015 μF	••	••			••	••	••	••			••	••	••	••	•	••	••	••	••	••	•	•	•	•	÷	•	•	•	•	•				
223	0.022 μF	••				••	••	••	••			••	••	••	••	•	••	••	••	••	••			•	•	•	•	•	•	•	•				
273	0.027 μF	••				••	••	••	••			••	••	••	••	•	••	••	••	••	••				•	•	•	•	•	•	•				
333 393	0.033 μF 0.039 μF	••				••	••	••	••			••	••	••	•		**	*	••	••	•				÷	÷	•	•	•	•	•				
473	0.047 μF	••				••	••	••				••	••	••	•		••	••	••	••	•				•	•	•	•	•		•				
563	0.056 μF					••	••	••				••	••	••	•		••	••	••	••	•				•	•	•	•	•						
683 823	0.068 μF 0.082 μF					••	••	••				••	••	•	•		••	••	••	••	•				•	•	•	•	•						
104	0.10 μF					••	••	••				••	••	•			••	••	••	•	•	•			•	•	•	•	•						
124	0.12 μF					••						••	••	•			••	••	••	٠					•	•	•	•	•						
154 184	0.15 μF 0.18 μF		-	<u> </u>	-	••		 	-	<u> </u>	\vdash	•	••	•	<u> </u>		••	••	•	•	-		<u> </u>	<u> </u>	•	•	•	•	•		Н				
224	0.18 μF											•	•				••	••	•	•					•	•	•	•							
274	0.27 μF											•	•				••	••	•	•					•	•	•	•							
334 394	0.33 μF 0.39 μF					 					 	•	•				•	•	•						•	•	•	•							
474	0.39 μF 0.47 μF											•					•	•	•						•	•	•	•			\vdash				
564	0.56 μF										•						•	•							•	•	•								
684	0.68 μF					<u> </u>		<u> </u>			•						•	•							•	•	•								
824 105	0.82 μF 1.0 μF					\vdash					•						•	•							•	•	•				Н				
125	1.2 μF																																		
155	1.5 μF																														Щ				
185 225	1.8 μF 2.2 μF					 					 																								
275	2.2 μF 2.7 μF																														\vdash				
335	3.3 μF																																		
395	3.9 μF					<u> </u>		<u> </u>			<u> </u>																								
475 565	4.7 μF 5.6 μF		-			\vdash					\vdash																								
685	6.8 μF																																		

Notes:

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

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

[•] Paper tape • Plastic tape

VJ X7R Dielectric

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SE	LECTIO	ION CHART																																
	ECTRIC.										X7R																							
	TYLE						VJ1812 ⁽¹⁾						VJ1825 ⁽¹⁾						VJ2220 ⁽¹⁾ VJ2225 ⁽¹⁾									VJ3640 ⁽¹⁾						
	TYPE	<u> </u>					1812						1825								-		<u> </u>							<u> </u>				
	LTAGE 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																																	
221 271	220 pF 270 pF																																	
331	330 pF																																	
391	390 pF																																	
471	470 pF					•																												
561	560 pF					•																												
681	680 pF					•																												
821	820 pF				L	•	!					<u> </u>																						
102 122	1000 pF 1200 pF		<u> </u>		•	•	\vdash	-				•														<u> </u>								
152	1500 pF			<u> </u>	•	•	\vdash		-		<u> </u>	•			-		<u> </u>			-		-			-		<u> </u>							
182	1800 pF				•	•						•																						
222	2200 pF				•	•						•																						
272	2700 pF				•	•						•																						
332	3300 pF				•	•					•	•																						
392	3900 pF				•	•					•	•																						
472	4700 pF 5600 pF			•	•	•					•	•																						
562 682	6800 pF			•	•	•					•	•																						
822	8200 pF			•	•	•					•	•																						
	0.010 μF	•	•	•	•	•				•	•	•																						
123	0.012 μF	٠	•	•	•					•	•	•																						
	0.015 μF	٠	•	٠	•					•	٠	•				٠	•					٠												
183	0.018 μF	•	•	•	•		-	-	_	•	•	•	<u> </u>	_	_	•	•					•												
	0.022 μF 0.027 μF	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•				•											•	
333	0.027 μF	•	•	•	Ť		•	•	•	•	•		•	•	•	÷	•	•				•	•	•	•	•	•	•				•	•	
393	0.039 μF	•	•	•			•	•	•	•	•		•	•	•	•	•	•				•	•	•	•	•	•	•				•	•	
473	0.047 μF	٠	•	•			•	•	•	•	•		•	•	•	٠	•	•				•	•	٠	•	•	•	•				•	•	
	0.056 μF	٠	•	•			٠	•	•	•	•		•	•	•	٠	•	•				•	•	٠	•	•	•	•				•	•	
	0.068 μF	•	•	•			•	•	•	•	•		•	•	•	•	•					•	•	•	•	•	•	•				•	•	
823 104	0.082 μF 0.10 μF	•	•	•			•	•	•	•	•		-	•	•	÷	•				•	•	•	÷	•	•	•	•				•	÷	
124	0.10 μF	•	•				•	•	•	•			•	•	•	•	•				•	•	•	•	•	•	•					•	•	
154	0.15 μF	•	•				•	•	•	•			•	•	•	•	•				•	•	•	•	•	•	•					•	•	
184	0.18 μF	٠	•				•	•	•	•			•	•	•	•	•				•	•	•	•	•	•	•		٠	•	•	•	•	
224	0.22 μF	٠					٠	•	•	•			•	•	•	•					•	•	•	٠	•	•	•		•	•	•	•	•	
274	0.27 μF	•					•	•	•	•			•	•	•	•			•	•	•		•	•	•	•	•		•	•	•	•	•	
334 394	0.33 μF 0.39 μF						•	•	•	•			•	•	•	•			•	•	•		•	•	•	•	Ļ		•	•	•	•	•	
474	0.39 μr 0.47 μF						•	•	•	•			•	•	•	•			•	•	•		•	•	•	•			•	•	•	•	•	
564	0.56 μF						•	•	•				•	•	•	•			•	•	•		•	•	•	•			•	•	•	•	•	
684	0.68 μF						•	•	•				•	•	•	•			•	•	•		•	•	•	•			٠	•	•	•	•	
824	0.82 μF						٠	•	•				•	٠	•				٠	•	•		•	٠	•	٠			٠	•	٠	•		
105	1.0 μF		<u> </u>				•	•					•	•	•				•	•	•		•	•	•	•			•	•	•	•		
125 155	1.2 μF 1.5 μF												•	•	•				•	·			•	•	•	ŀ			•	•	•	•		
185	1.8 μF												•	•					•				•	•	•				•	•	•	•		
225	2.2 μF												•										•	•					•	•	•			
275	2.7 μF												•										•	•					•	•	•			
335	3.3 μF																						•						٠	•	•			
395	3.9 μF																						•						•	•	•			
475	4.7 μF		<u> </u>				_																•						•	•				
565 685	5.6 μF 6.8 μF		<u> </u>		<u> </u>		\vdash	-																		<u> </u>			•					
Note:	υ.ο μΓ		<u> </u>	l		<u> </u>		<u> </u>	I	<u> </u>	<u> </u>		<u> </u>			<u> </u>	<u> </u>	<u> </u>	<u> </u>		<u> </u>	<u> </u>	<u> </u>	l	Ŭ									

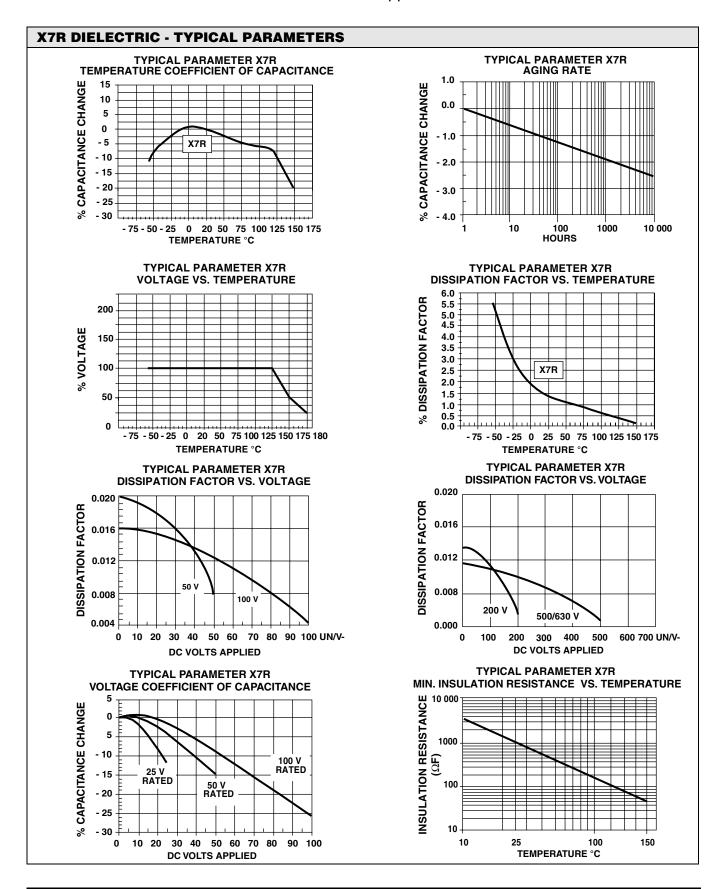
Note:

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

Plastic tape



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Vishay

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