

Surface Mount Ceramic Capacitor Solutions for Boardflex Sensitive Applications



ELECTRICAL SPECIFICATIONS

NOTE: Electrical characteristics at + 25 °C unless otherwise stated

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

Capacitance Range: 100 pF to 1.8 µF

Voltage Rating: 50 Vdc to 3000 Vdc

Temperature Coefficient of Capacitance (TCC):

X7R: ± 15 % from - 55 °C to + 125 °C, with 0 Vdc applied

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

FEATURES

- OMD-Cap (Open Mode Design) reduce the risk of shorts or low IR because of board flex cracks
- Efficient low-power consumption, ripple current capable to 1.2 Arms at 100 kHz
- Available with 100 % voltage condition, process code "5H"
- High voltage breakdown compared to standard design
- Excellent reliability and thermal shock performance



RoHS
COMPLIANT

APPLICATIONS

- Ideal for Power Supplies

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

≤ 250 Vdc: DWV at 250 % of rated voltage

500 Vdc: DWV at 200 % of rated voltage

630 Vdc: DWV at 150 % of rated voltage

1000 Vdc: DWV at 150 % of rated voltage

1500 Vdc: DWV at 120 % of rated voltage

2000 Vdc: DWV at 120 % of rated voltage

3000 Vdc: DWV at 120 % of rated voltage

DIMENSIONS in inches [millimeters]

PART ORDERING NUMBER	LENGTH	WIDTH	MAXIMUM THICKNESS (T)	TERMINATION PAD	
				MINIMUM	MAXIMUM
VJ1206	0.126 ± 0.008 [3.20 ± 0.20]	0.063 ± 0.008 [1.60 ± 0.20]	0.067 [1.68]	0.010 [0.25]	0.028 [0.71]
VJ1210	0.126 ± 0.008 [3.20 ± 0.20]	0.098 ± 0.008 [2.50 ± 0.20]	0.067 [1.68]	0.010 [0.25]	0.028 [0.71]
VJ1808	0.180 ± 0.010 [4.57 ± 0.25]	0.080 ± 0.010 [2.03 ± 0.25]	0.067 [1.68]	0.010 [0.25]	0.030 [0.76]
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]
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]	0.197 ± 0.008 [5.00 ± 0.20]	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]

ORDERING INFORMATION

VJ1210	Y	474	K	X	A	A	T	## 2)
CASE SIZE	DIELECTRIC	CAPACITANCE CODE	CAPACITANCE TOLERANCE	TERMINATION	DC VOLTAGE RATING 1)	MARKING	PACKAGING	PROCESS CODE
1206 1210 1808 1812 1825 2220 2225	Y = X7R	Expressed in picofarads (pF). The first two digits are significant, the third is a multiplier. Example: 474 = 470 000 pF	J = ± 5 % K = ± 10 % M = ± 20 %	X = Ni barrier 100 % tin plated F = AgPd	A = 50 V B = 100 V C = 200 V P = 250 V E = 500 V L = 630 V G = 1000 V R = 1500 V F = 2000 V H = 3000 V	A = Unmarked	T = 7" Reels R = 11 1/4" Reels B = Bulk W = Waffle tray	4X = OMD Cap 5H = OMD Cap 100 % voltage conditioning

Note

1. DC voltage rating should not be exceeded in application
2. Process code with 2 digits has to be added



Surface Mount Ceramic Capacitor Solutions
for Boardflex Sensitive Applications

VJ OMD - X7R

Vishay Vitramon

OMD - X7R CAPACITANCE RANGE																					
EIA CODE		1206								1210 ¹⁾								1808 ¹⁾			
VOLTAGE (Vdc)		50	100	200	500	630	1000	1500	2000	50	100	200	500	630	1000	1500	2000	630	1000	1500	2000
CAP. CODE	CAP.																				
101	100 pF	•	•	•	•	•															
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																				

Note

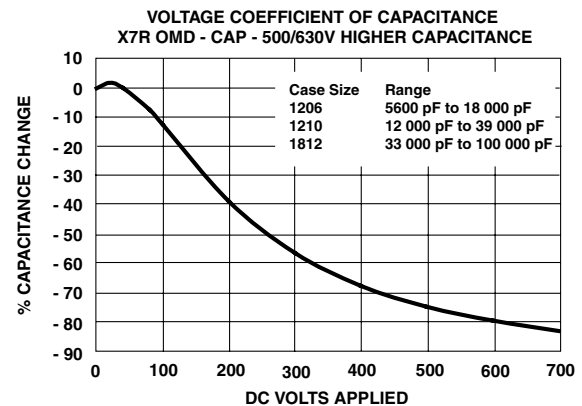
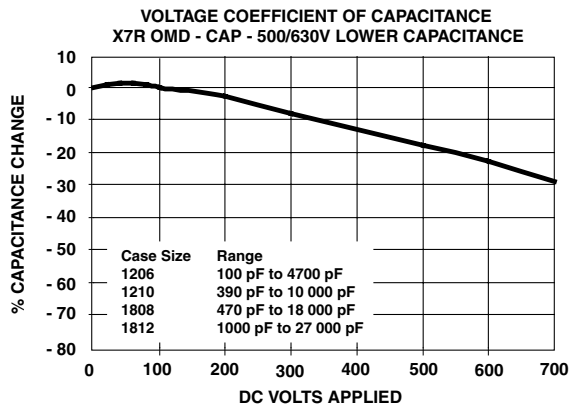
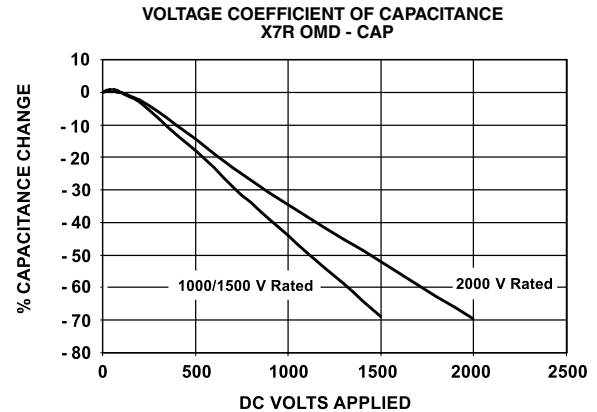
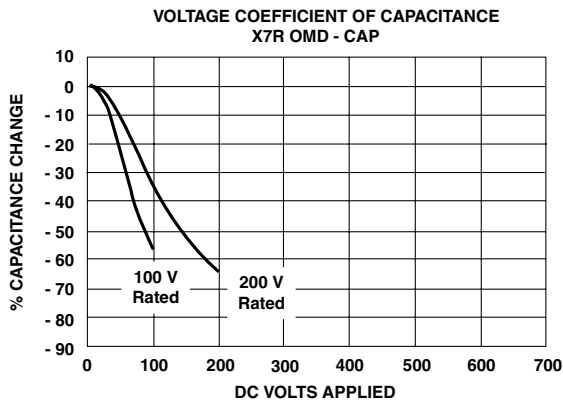
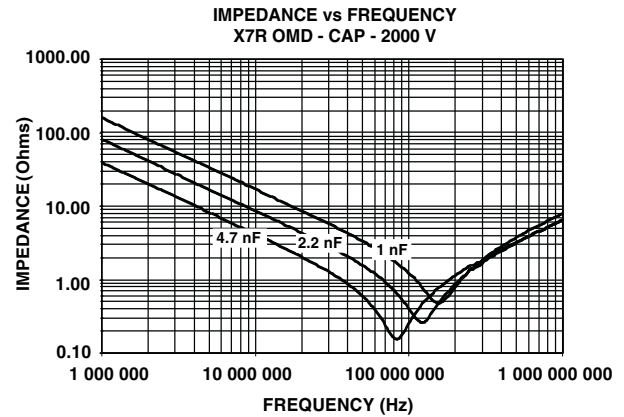
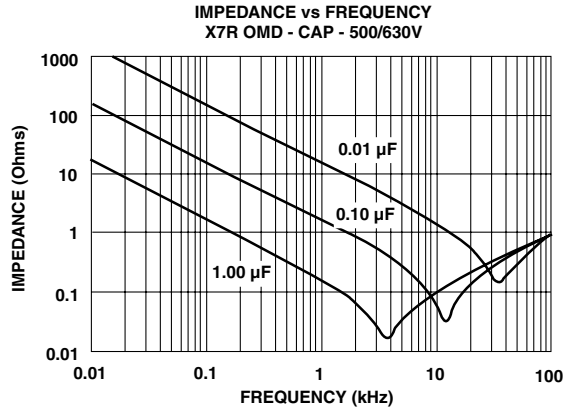
1. See soldering recommendations within this data book, or visit www.vishay.com/doc?45034

OMD - X7R CAPACITANCE RANGE																																	
EIA CODE		1812 ¹⁾										1825 ¹⁾					2220 ¹⁾								2225 ¹⁾								
VOLTAGE		50	100	200	250	500	630	1000	1500	2000	3000	100	200	500	630	1000	50	100	200	250	500	630	1000	2000	100	200	500	630	1000	1500	2000		
CAP. CODE	CAP.																																
101	100 pF	•	•	•	•	•																											
121	120 pF	•	•	•	•	•																											
151	150 pF	•	•	•	•	•																											
181	180 pF	•	•	•	•	•																											
221	220 pF	•	•	•	•	•																											
271	270 pF	•	•	•	•	•	•	•	•	•	•																						
331	330 pF	•	•	•	•	•	•	•	•	•	•																						
391	390 pF	•	•	•	•	•	•	•	•	•	•																						
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822	8200 pF	•	•	•	•	•	•	•	•	•	•																						
103	0.010 µF	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
123	0.012 µF	•	•	•	•	•	•	•				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
153	0.015 µF	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
183	0.018 µF	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
203	0.020 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																								•								

Note1. See soldering recommendations within this data book, or visit www.vishay.com/doc?45034



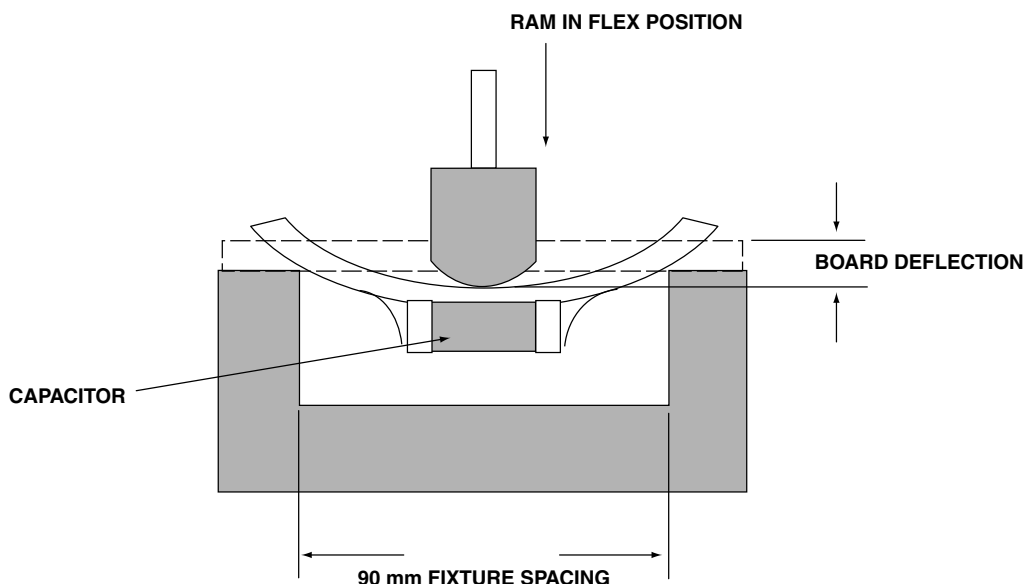
OMD - CAPACITORS - TYPICAL PARAMETERS



BOARDFLEX SENSITIVE APPLICATIONS - SOLUTION:

A predominant failure mode in multilayer ceramic capacitors is cracking caused by board flexure that results in capacitance loss, leakage and more seriously, high current shorts. A short circuit condition can cause further failures of downstream components.

Extensive board flexure testing was performed on OMD-Capacitors soldered onto glass epoxy resin boards. The boards were then subjected to 8 mm flexure (see diagram below) and the Insulation Resistance (IR) of each capacitor was measured. IR remained > 100 OhmF in all cases because these designs do not allow cracks to bridge across opposing electrodes creating conductive pathways. Commercial grade product may experience a serious loss in IR and eventually short when tested under the same conditions.



STANDARD PACKAGING QUANTITIES ^{1/2/3)}							
		7" REEL QUANTITIES		11 1/4" AND 13" REEL QUANTITIES		BULK QUANTITIES	
BODY SIZE	TAPE SIZE	PAPER TAPE PACKAGING CODE "C"	PLASTIC TAPE PACKAGING CODE "T"	PAPER TAPE PACKAGING CODE "P"	PLASTIC TAPE PACKAGING CODE "R"	VIAL PACKAGING CODE "B"	WAFFLE PACKAGING CODE "W"
1206	8 mm	N/A	2500	N/A	10 000	5000	N/A
1210	8 mm	N/A	3000	N/A	10 000	5000	N/A
1808	12 mm	N/A	3000	N/A	10 000	1000	N/A
1812	12 mm	N/A	1000	N/A	5000	1000	N/A
1825	12 mm	N/A	1000	N/A	5000	1000	1000
2220	12 mm	N/A	1000	N/A	5000	N/A	1000
2225	12 mm	N/A	1000	N/A	5000	N/A	1000

Note

1. Vishay Vitramon uses embossed plastic carrier tape
2. REFERENCE: EIA Standard RS 481 – "Taping of Surface Mount Components for Automatic Placement"
3. N/A = Not Available



Notice

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