Surface Mount Multilayer Ceramic Chip Capacitors for High Temperature Applications Up to 150 °C



FEATURES

- Specialty: high temperature applications
- High operating temperature dielectric: 150 °C
- Maintains capacitance at high temperature for frequency stability
- Wet build process
- Reliable Noble Metal Electrode (NME) system
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT
HALOGEN FREE
GREEN (5-2008) Available

APPLICATIONS

- High temperature modules

ELECTRICAL SPECIFICATIONS

Note

- Electrical characteristics at +25 °C unless otherwise specified.

Operating Temperature: -55 °C to +150 °C

Capacitance Range: 330 pF to 220 nF

Voltage Range: 25 V_{DC} to 100 V_{DC}

Temperature Coefficient of Capacitance (TCC):
± 15 % from -55 °C to +150 °C

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 Strength Test:
performed per method 103 of EIA-198-2-E
Applied test voltage:
≤ 100 V_{DC}-rated: 250 % of rated voltage

For technical questions, contact: mlcc@vishay.com

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QUICK REFERENCE DATA

DIELECTRIC	CASE	MAXIMUM VOLTAGE (V)	CAPACITANCE	
			MINIMUM	MAXIMUM
X8R	0402	100	330 pF	6.8 nF
	0603	100	470 pF	33 nF
	0805	100	470 pF	100 nF
	1206	50	1.0 nF	220 nF
	1210	50	10 nF	220 nF

Note

- Detail ratings see “Selection Chart”

ORDERING INFORMATION

VJ0805	H	102	K	X	A	A	C	### (2)
CASE CODE	DIELECTRIC	CAPACITANCE NOMINAL CODE	CAPACITANCE TOLERANCE	TERMINATION	DC VOLTAGE RATING (1)	MARKING (4)	PACKAGING	PROCESS CODE
0402 0603 0805 1206 1210	H = X8R	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, E = AgPd (3)(5)	X = 25 V A = 50 V B = 100 V	A = unmarked M = marked **Note** Marking is only available for 0805 and 1206 with termination code “X”	T = 7" reel / plastic tape C = 7" reel / paper tape R = 11 1/4" / 13" reel / plastic tape P = 11 1/4" / 13" reel / paper tape O = 7" reel / flamed paper tape I = 11 1/4" / 13" reel / flamed paper tape **Note** “I” and “O” are used for “F” termination size 0603 / 0805 and “E” termination size 0402 / 0603 / 0805	

Notes

(1) DC voltage rating should not be exceeded in application. Other application factors may affect the MLCC performance. Consult for questions: mlcc@vishay.com

(2) Process code may be added with up to three digits, used to control non-standard products and requirements

(3) Termination code “E” for conductive epoxy assembly

(4) Marking in reference to EIA198, see www.vishay.com/doc?45028

(5) Termination code “F” not available for 0402, 0603 - 100 V, 0805 - 100 V

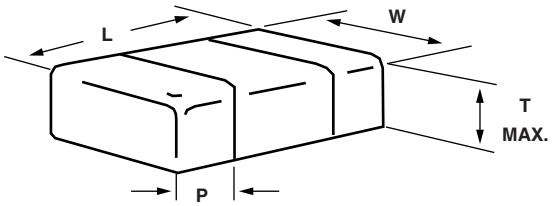
ENVIRONMENTAL STATUS

TERMINATION CODE	TERMINATION DESCRIPTION	RoHS COMPLIANT	VISHAY GREEN
X	Ni barrier 100 % tin plated matte finish	Yes	Yes
E	AgPd	Yes	Yes
F	AgPd	Yes	No

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DIMENSIONS in inches (millimeters)



CASE CODE	STYLE	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 ± 0.006 (1.60 ± 0.15)	0.031 ± 0.006 (0.80 ± 0.15)	0.036 (0.92)	0.012 (0.30)	0.022 (0.55)
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)	0.030 (0.76)
1206	VJ1206	0.126 ± 0.010 (3.20 ± 0.25)	0.063 ± 0.010 (1.60 ± 0.25)	0.067 (1.70)	0.010 (0.25)	0.030 (0.76)
1210	VJ1210	0.126 ± 0.010 (3.20 ± 0.25)	0.098 ± 0.010 (2.50 ± 0.25)	0.067 (1.70)	0.010 (0.25)	0.030 (0.76)

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SELECTION CHART

DIELECTRIC		X8R												
STYLE		VJ0402			VJ0603			VJ0805			VJ1206 (1)		VJ1210 (1)	
CASE CODE		0402			0603			0805			1206		1210	
VOLTAGE (V_{DC})		25	50	100	25	50	100	25	50	100	25	50	25	50
VOLTAGE CODE		X	A	B	X	A	B	X	A	B	X	A	X	A
CAP. CODE	CAP.													
331	330 pF	••	••	••										
391	390 pF	••	••	••										
471	470 pF	••	••	••		••	••	••	••	••				
561	560 pF	••	••	••		••	••	••	••	••				
681	680 pF	••	••	••	••	••	••	••	••	••				
821	820 pF	••	••	••	••	••	••	••	••	••				
102	1.0 nF	••	••	••	••	••	••	••	••	••	•	•		
122	1.2 nF	••	••	••	••	••	••	••	••	••	•	•		
152	1.5 nF	••	••		••	••	••	••	••	••	•	•		
182	1.8 nF	••	••		••	••	••	••	••	••	•	•		
222	2.2 nF	••	••		••	••	••	••	••	••	•	•		
272	2.7 nF	••			••	••	••	••	••	••	•	•		
332	3.3 nF	••			••	••	••	••	••	••	•	•		
392	3.9 nF	••			••	••	••	••	••	••	•	•		
472	4.7 nF	••			••	••	••	••	••	••	•	•		
562	5.6 nF	••			••	••		••	••	••	•	•		
682	6.8 nF	••			••	••		••	••	••	•	•		
822	8.2 nF				••	••		••	••	••	•	•		
103	10 nF				••	••		••	••	••	•	•	•	•
123	12 nF				••	••		••	••	••	•	•	•	•
153	15 nF				••	••		••	••	••	•	•	•	•
183	18 nF				••	••		••	••	••	•	•	•	•
223	22 nF				••			••	••	•	•	•	•	•
273	27 nF				••			••	•	•	•	•	•	•
333	33 nF				••			••	•		•	•	•	•
393	39 nF							••	•		•	•	•	•
473	47 nF							•	•		•	•	•	•
563	56 nF							•	•		•	•	•	•
683	68 nF							•			•	•	•	•
823	82 nF							•			•	•	•	•
104	100 nF							•			•	•	•	•
124	120 nF										•	•	•	•
154	150 nF										•		•	•
184	180 nF										•		•	
224	220 nF										•		•	
274	270 nF													
334	330 nF													
394	390 nF													

Notes

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

• Plastic tape, •• Paper tape

RoHS-compliant

X8R PACKAGING QUANTITIES (1)

CASE CODE	TAPE SIZE	7" REEL QUANTITIES		11 1/4" AND 13" REEL QUANTITIES	
		PACKAGING CODE		PACKAGING CODE	
		"C" / "O"	"T"	"P" / "I"	"R"
0402	8 mm	5000	n/a	10 000	n/a
0603	8 mm	4000	n/a	10 000	n/a
0805 (2)	8 mm	3000	3000	10 000	10 000
1206 (2)	8 mm	n/a	2500 / 3000	10 000	9000 / 10 000
1210 (2)	8 mm	n/a	2000 / 2500 / 3000	10 000	9000 / 10 000

Notes

(1) Reference: EIA standard RS481 - "Taping of Surface Mount Components for Automatic Placement"

(2) Packaging "C" / "P" / "O" / "I" and "T" / "R" or lower quantities can depend from product thickness

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STORAGE AND HANDLING CONDITIONS

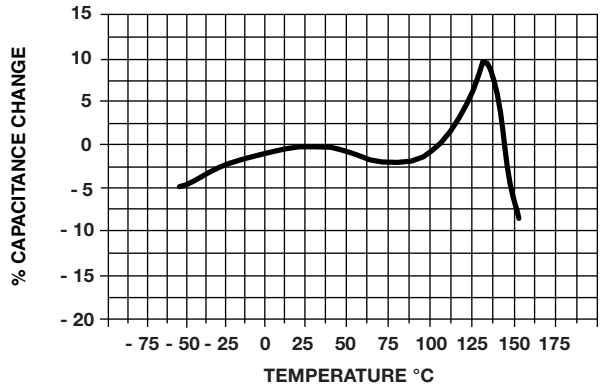
(1) Store the components at 5 °C to 40 °C ambient temperature and ≤ 70 % relative humidity conditions.
(2) The product is recommended to be used within a time-frame of 2 years after shipment.
Check solderability in case extended shelf life beyond the expiry date is needed.

Precautions:

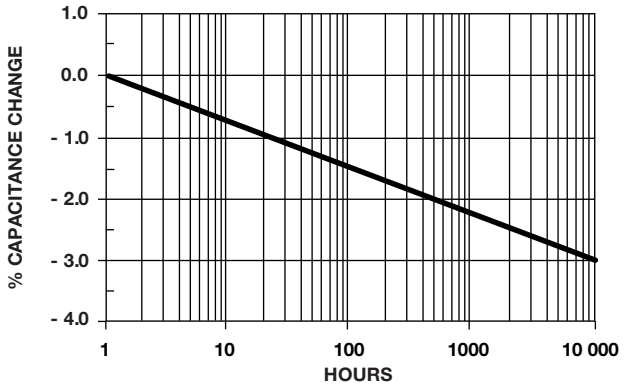
a. Do not store products in an environment containing corrosive elements, especially where chloride gas, sulfide gas, acid, alkali, salt or the like are present. This may cause corrosion or oxidization of the terminations, which can easily lead to poor soldering.
b. Store products on the shelf and avoid exposure to moisture or dust.
c. Do not expose products to excessive shock, vibration, direct sunlight and so on.

X8R DIELECTRIC - TYPICAL PARAMETERS

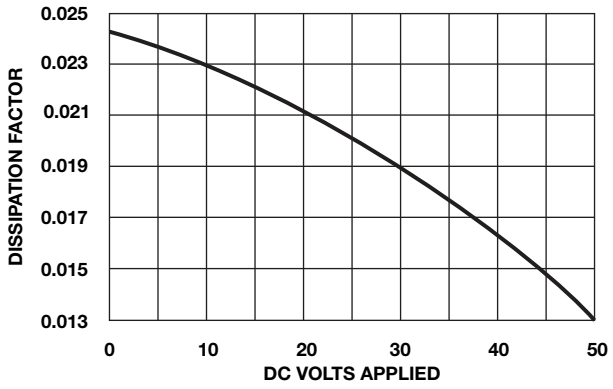
TEMPERATURE COEFFICIENT OF CAPACITANCE



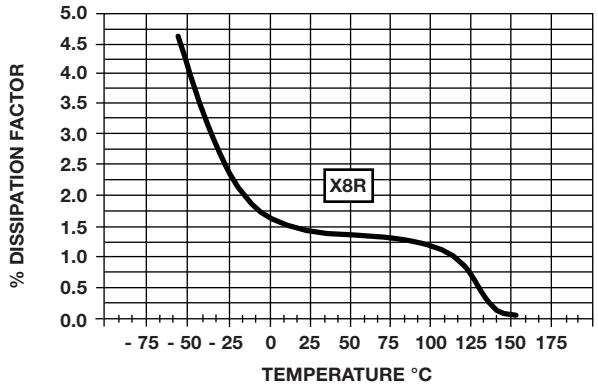
AGING RATE



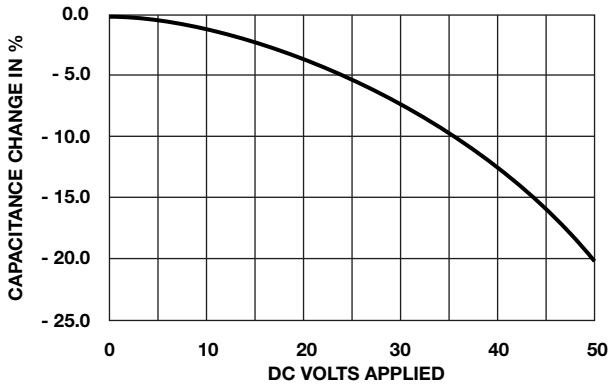
DISSIPATION FACTOR VS. VOLTAGE



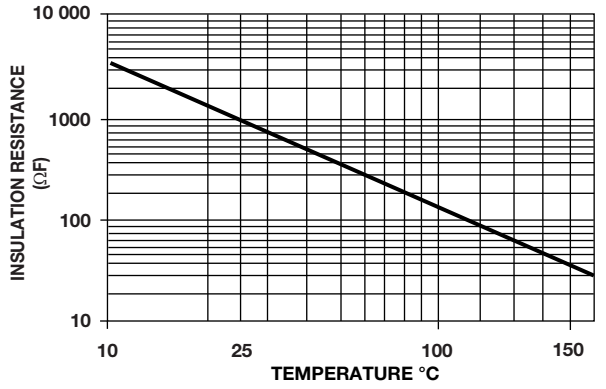
DISSIPATION FACTOR VS. TEMPERATURE



VOLTAGE COEFFICIENT OF CAPACITANCE



INSULATION RESISTANCE VS. TEMPERATURE



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