



MULTILAYER CERAMIC CHIP CAPACITORS

VJ...W1BC X5R Dielectric



Surface-Mount MLCC Capacitors for Commodity Applications

KEY BENEFITS

- X5R ceramic offering
- 100 % tin terminations
- Available in standard case sizes: 0402, 0603, 0805, 1206, 1210

APPLICATIONS

- Telecommunications
- Consumer electronics
- Power supplies
- Industrial

Surface-Mount Multilayer Ceramic Chip Capacitors for Commodity Applications

FEATURES

- Class 2 dielectric
- Four standard sizes
- High capacitance per unit volume
- Supplied in tape and reel
- Ni-barrier with 100 % tin terminations
- Dry sheet technology process
- Base Metal Electrode system (BME)
- Compliant to RoHS directive 2002/95/EC
- Halogen-free according to IEC 61249-2-21 definition



APPLICATIONS

- Consumer electronics
- Telecommunications
- Mobile application
- Data processing



ELECTRICAL SPECIFICATION

Note
• Electrical characteristics at 25 °C, 30 % to 70 % related humidity, unless otherwise specified

Operating Temperature: - 55 °C to + 85 °C

Capacitance Range: 47 nF to 22 µF

Voltage Range: 6.3 V_{DC} to 25 V_{DC}

Temperature Coefficient of Capacitance (TCC): ± 15 % without voltage applied

Dissipation Factor (DF):

6.3 V: ≤ 10 %

10 V: ≤ 5 %

≤ 10 % for 0402 ≤ 0.33 µF; 0603 ≥ 0.33 µF; 0805 ≥ 2.2 µF;

1206 ≥ 2.2 µF, 1210 ≥ 4.7 µF

≤ 15 % for 0402 ≥ 1 µF

16 V: ≤ 3.5 %

≤ 5 % for 0402 ≤ 0.033 µF; 0603 ≥ 0.15 µF; 0805 ≥ 0.68 µF;

1206 ≥ 2.2 µF, 1210 ≥ 4.7 µF

≤ 10 % for 0603 ≥ 0.68 µF; 0805 ≥ 2.2 µF; 1206 ≥ 4.7 µF,

1210 ≥ 22 µF

25 V: ≤ 3.5 %

≤ 5 % for 0805 ≥ 1 µF, 1210 ≥ 10 µF

≤ 10 % for 0603 ≥ 0.33 µF; 1206 ≥ 4.7 µF

≤ 15 % for 0402 ≥ 0.10 µF; 0603 ≥ 0.47 µF; 0805 ≥ 2.2 µF;

1206 ≥ 6.8 µF

Test Conditions for Capacitance and DF measurement:

For C ≤ 10 µF apply 1.0 V_{RMS} ± 0.2 V_{RMS}, 1.0 kHz ± 10 %

For C > 10 µF apply 0.5 V_{RMS} ± 0.2 V_{RMS}; 120 Hz ± 20 %

Preconditioning for Capacitance Tolerance Measurement:

Perform a heat treatment at 150 °C ± 10 °C for 1 h, then leave in ambient condition for 24 h ± 2 h before measurement

Aging Rate:

6.3 V/10 V: 3 % maximum per decade

16 V/25 V: 2 % maximum per decade

Insulation Resistance (IR):

≥ 10 GΩ or R x C ≥ 500 Ω x F whichever is less

Dielectric Strength Test:

This is the maximum voltage the capacitors are tested for 1 s to 5 s period and the charge/discharge current does not exceed 50 mA

≤ 100 V_{DC}: 250 % of rated voltage

ORDERING INFORMATION

VJ0402	G	104	K	X	Q	C	W1BC
SIZE	DIELECTRIC	CAPACITANCE	TOLERANCE	TERMINATION	VOLTAGE	PACKAGING	PROCESS CODE FOR BASIC COMMODITY
0402	G = X5R	Two significant digits followed by the number of zeros: 104 = 100 000 pF	K = ± 10 % M = ± 20 %	X = Ni Barrier	S = 4 V Y = 6.3 V Q = 10 V J = 16 V X = 25 V A = 50 V	C = 7" reel/paper P = 13" reel/paper O = 10 V J = 16 V X = 25 V A = 50 V	
0603							
0805							
1206							
1210							

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For technical questions, contact mlcc@vishay.com

SELECTION CHART

DIELECTRIC STYLE	VJ0402										VJ0603										VJ0805									
	4 V	6.3 V	10 V	16 V	25 V	50 V	6.3 V	10 V	16 V	25 V	50 V	4 V	6.3 V	10 V	16 V	25 V	50 V	4 V	6.3 V	10 V	16 V	25 V	50 V							
VOLTAGE (V _{DC})	S	Y	Q	J	X	A	Y	Q	J	X	A	S	Y	Q	J	X	A	S	Y	Q	J	X	A							
CAP. CODE	CAP.																													
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																													
474	470 nF																													
564	560 nF																													
684	680 nF																													
824	820 nF																													
105	1.0 µF																													
155	1.5 µF																													
225	2.2 µF																													
335	3.3 µF																													
475	4.7 µF																													
685	6.8 µF																													
106	10 µF																													
156	15 µF																													
226	22 µF																													
336	33 µF																													
476	47 µF																													
686	68 µF																													
107	100 µF																													

Note
• Letters indicate product thickness, see packaging quantities

SELECTION CHART

DIELECTRIC STYLE	VJ1206										VJ1210									
	6.3 V	10 V	16 V	25 V	50 V	6.3 V	10 V	16 V	25 V	50 V	6.3 V	10 V	16 V	25 V	50 V					
VOLTAGE (V _{DC})	Y	Q	J	X	A	Y	Q	J	X	A	Y	Q	J	X	A					
CAP. CODE	CAP.																			
105	1.0 µF																			
155	1.5 µF																			
225	2.2 µF																			
335	3.3 µF																			
475	4.7 µF																			
685	6.8 µF																			
106	10 µF																			
156	15 µF																			
226	22 µF																			

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