MULTILAYER CERAMIC CHIP CAPACITORS

VJ....31X RoHS Automotive MLCC

Surface-Mount Multilayer Ceramic Chip Capacitors for Automotive Applications

KEY BENEFITS

- AEC-Q200 qualified with PPAP available
- High operating temperature up to +150 °C
- Available in 0402 to 1812 body size
- Made with wet build process and reliable Noble Metal Electrode (NME) system
- Polymer (flexible) termination with 100 % matte tin plate finish

APPLICATIONS

- Automotive
  - Engine and steering ECU, sensors, headlight control, battery and power management
- Industrial
  - Sensors, power supplies, high-reliability control units, board-flex sensitive modules

RESOURCES

- Datasheet: VJ....31X RoHS Automotive MLCC - www.vishay.com/doc?45226
- For technical questions contact MLCC@vishay.com
- Material categorization: for definitions, please see www.vishay.com/doc?99912

AUTOMOTIVE GRADE

RoHS COMPLIANT HALOGEN FREE

One of the World's Largest Manufacturers of
Discrete Semiconductors and Passive Components

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C0G (NP0) DIELECTRIC

GENERAL SPECIFICATION

Note
Electrical characteristics at +25 °C unless otherwise specified

Operating Temperature: -55 °C to +150 °C
(above +125 °C changed characteristics, see 2.2)

Capacitance Range: 1 pF to 22 nF

Voltage Range: 25 V_{DC} to 3000 V_{DC}

Temperature Coefficient of Capacitance (TCC):
0 ppm/°C ± 30 ppm/°C from -55 °C to +125 °C

Dissipation Factor (DF):
0.1 % maximum at 1.0 V_{RMS} and
1 MHz for values ≤ 1000 pF
0.1 % maximum at 1.0 V_{RMS} and
1 kHz for values > 1000 pF

Insulating Resistance:
at +25 °C 100 000 MΩ min. or 1000 ΩF whichever is less
at +125 °C 10 000 MΩ min. or 100 ΩF whichever is less

Aging: 0 % maximum per decade

Dielectric Strength Test:
performed per method 103 of EIA 198-2-E.
Applied test voltages

≤ 250 V_{DC}-rated:	250 % of rated voltage
500 V_{DC}-rated:	200 % of rated voltage
630 V_{DC}, 1000 V_{DC}-rated:	150 % of rated voltage
3000 V_{DC}-rated:	120 % of rated voltage

X7R, X8R DIELECTRIC

GENERAL SPECIFICATION

Note
Electrical characteristics at +25 °C unless otherwise specified

Operating Temperature: -55 °C to +150 °C
(X7R above +125 °C changed characteristics, see 2.2)

Capacitance Range: 120 pF to 1.0 µF

Voltage Range: 16 V_{DC} to 1000 V_{DC}

Temperature Coefficient of Capacitance (TCC):
X7R: ± 15 % from -55 °C to +125 °C, with 0 V_{DC} applied
X8R: ± 15 % from -55 °C to +150 °C, with 0 V_{DC} applied

Dissipation Factor (DF):
16 V, 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

Insulating Resistance:
at +25 °C 100 000 MΩ min. or 1000 ΩF whichever is less
at +125 °C 10 000 MΩ min. or 100 ΩF whichever is less

Aging Rate: 1 % maximum per decade

Dielectric Strength Test:
performed per method 103 of EIA 198-2-E.
Applied test voltages

≤ 250 V_{DC}-rated:	250 % of rated voltage
500 V_{DC}-rated:	min. 150 % of rated voltage
630 V_{DC}, 1000 V_{DC}-rated:	min. 120 % of rated voltage

Revision 23-Oct-14

RANGE OVERVIEW

	CASE CODE	VOLTAGE		CAPACITANCE	
		MINIMUM	MAXIMUM	MINIMUM	MAXIMUM
C0G (NP0)	0402	25 V_{DC}	100 V_{DC}	1,0 pF	220 pF
	0603	50 V_{DC}	200 V_{DC}	1,0 pF	1 nF
	0805	50 V_{DC}	500 V_{DC}	1,0 pF	3,9 nF
	1206	50 V_{DC}	630 V_{DC}	1,0 pF	10 nF
	1210	50 V_{DC}	630 V_{DC}	100 pF	12 nF
	1812	50 V_{DC}	3000 V_{DC}	12 pF	22 nF
X7R	0402	16 V_{DC}	100 V_{DC}	120 pF	47 nF
	0603	16 V_{DC}	200 V_{DC}	330 pF	150 nF
	0805	16 V_{DC}	250 V_{DC}	330 pF	470 nF
	1206	16 V_{DC}	1000 V_{DC}	220 pF	1,0 µF
	1210	16 V_{DC}	630 V_{DC}	390 pF	1,0 µF
	1812	50 V_{DC}	630 V_{DC}	10 nF	1,0 µF
X8R	0402	25 V_{DC}	100 V_{DC}	330 pF	6,8 nF
	0603	25 V_{DC}	100 V_{DC}	470 pF	33 nF
	0805	25 V_{DC}	100 V_{DC}	470 pF	100 nF
	1206	25 V_{DC}	50 V_{DC}	1,0 nF	220 nF
	1210	25 V_{DC}	50 V_{DC}	10 nF	220 nF

Detail ratings see “Selection Charts”, datasheet : http://www.vishay.com/doc?45226