

Surface Mount Multilayer Ceramic Chip Capacitor Solutions for Boardflex Sensitive Applications



FEATURES

- Open Mode Design (OMD) reduces risk of shorts or leakage in board flex applications
- Excellent reliability and thermal shock performance
- Efficient low-power consumption, ripple current capable to 1.2 A_{RMS} at 100 kHz
- High voltage breakdown compared to standard design
- 100 % voltage conditioning available up to 630 V_{DC} rating (process code "5H")
Contact mlcc@vishay.com for higher voltages.
- Polymer termination available for intensive board flex requirements
- 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

- Demanding boardflex applications
- Input filter capacitors
- Output filter capacitors
- Snubber capacitors reduce MOSFET voltage spikes
- Filtering for switching power supplies
- For lighting and other AC applications please contact: mlcc@vishay.com

ELECTRICAL SPECIFICATIONS

| COG (NP0) | |
|---|------------------------|
| GENERAL SPECIFICATION | |
| Note Electrical characteristics at +25 °C unless otherwise specified | |
| Operating Temperature: -55 °C to +125 °C | |
| Capacitance Range: 10 pF to 47 nF | |
| Voltage Range: 50 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 Rate: 0 % maximum per decade | |
| Dielectric Strength Test: performed per method 103 of EIA 198-2-E Applied test voltages | |
| ≤ 200 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 |
| 1500 V _{DC} to 3000 V _{DC} -rated: | 120 % of rated voltage |

| X7R | |
|---|-----------------------------|
| GENERAL SPECIFICATION | |
| Note Electrical characteristics at +25 °C unless otherwise specified | |
| Operating Temperature: -55 °C to +125 °C | |
| Capacitance Range: 100 pF to 1.8 μF | |
| Voltage Range: 16 V _{DC} to 3000 V _{DC} | |
| Temperature Coefficient of Capacitance (TCC): ± 15 % from -55 °C to +125 °C, with 0 V _{DC} applied | |
| Dissipation Factor (DF): < 50 V ratings 3.5 % maximum at 1.0 V _{RMS} and 1 kHz ≥ 50 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: | 150 % of rated voltage |
| 1500 V _{DC} to 3000 V _{DC} -rated: | 120 % of rated voltage |



| QUICK REFERENCE DATA | | | | |
|----------------------|------|---------------------|-------------|---------|
| DIELECTRIC | CASE | MAXIMUM VOLTAGE (V) | CAPACITANCE | |
| | | | MINIMUM | MAXIMUM |
| COG (NP0) | 1206 | 1500 | 10 pF | 4.7 nF |
| | 1210 | 2000 | 10 pF | 8.2 nF |
| | 1808 | 3000 | 10 pF | 8.2 nF |
| | 1812 | 3000 | 10 pF | 18 nF |
| | 1825 | 1000 | 15 pF | 33 nF |
| | 2220 | 1000 | 270 pF | 39 nF |
| | 2225 | 1000 | 270 pF | 47 nF |
| X7R | 0805 | 630 | 470 pF | 220 nF |
| | 1206 | 2000 | 270 pF | 680 nF |
| | 1210 | 2000 | 390 pF | 1.0 μF |
| | 1808 | 3000 | 220 pF | 18 nF |
| | 1812 | 3000 | 100 pF | 1.2 μF |
| | 1825 | 2000 | 5.6 nF | 1.5 μF |
| | 2220 | 3000 | 1.0 nF | 1.8 μF |
| 2225 | 2000 | 5.6 nF | 1.8 μF | |

Note

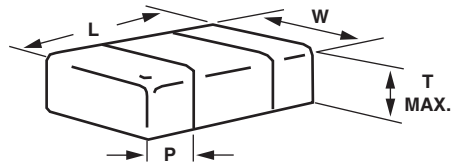
- Detail ratings see “Selection Chart”

| ORDERING INFORMATION | | | | | | | | |
|--|--------------------------|---|---|---|---|--------------|--|--|
| VJ1210 | Y | 474 | J | X | A | A | T | # (2) |
| CASE CODE | DIELECTRIC | CAPACITANCE NOMINAL CODE | CAPACITANCE TOLERANCE | TERMINATION (4) | DC VOLTAGE RATING (1) | MARKING | PACKAGING | PROCESS CODE |
| 0805 1206 1210 1808 1812 1825 2220 2225 | A = COG (NP0) Y = X7R | Expressed in picofarads (pF). The first two digits are significant, the third is a multiplier. An “R” indicates a decimal point. Examples 474 = 470 000 pF | F = ± 1 % G = ± 2 % J = ± 5 % K = ± 10 % M = ± 20 % Note COG (NP0): F, G, J, K X7R: J, K, M | X = Ni barrier 100 % tin plated matte finish E = AgPd (3) B = polymer 100 % tin plated matte finish (5) | J = 16 V X = 25 V 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 | C = 7" reel / paper tape T = 7" reel / plastic tape P = 11 1/4" / 13" reel / paper tape R = 11 1/4" / 13" reel / plastic tape O = 7" reel / flamed paper tape I = 11 1/4" / 13" reel / flamed paper tape Note “I” and “O” are used for “E” termination size 0805 | 4X = OMD cap 5H = OMD cap 100 % voltage conditioning |

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 with 2 digits has to be added
- (3) Termination code “E” is for conductive epoxy assembly
- (4) Other termination options contact mlcc@vishay.com for availability
- (5) Polymer termination, code “B”, only available in plastic tape “T” / “R”

| ENVIRONMENTAL STATUS | | | |
|----------------------|--|----------------|--------------|
| TERMINATION CODE | TERMINATION DESCRIPTION | RoHS COMPLIANT | VISHAY GREEN |
| X | Ni barrier 100 % tin plated matte finish | Yes | Yes |
| E | AgPd | Yes | Yes |
| B | Polymer layer, 100 % tin plated matte finish | Yes | No |

DIMENSIONS in inches (millimeters)


| CASE CODE | STYLE | LENGTH (L) | WIDTH (W) | MAXIMUM THICKNESS (T) | TERMINATION PAD (P) | |
|-----------|--------|--------------------------------|--------------------------------|-----------------------------|------------------------|--------------|
| | | | | | MINIMUM | MAXIMUM |
| 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) | 0.028 (0.71) |
| 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) | 0.028 (0.71) |
| 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) | 0.028 (0.71) |
| 1808 | VJ1808 | 0.180 ± 0.012 (4.57 ± 0.30) | 0.080 ± 0.010 (2.03 ± 0.25) | 0.086 (2.18) | 0.010 (0.25) | 0.030 (0.76) |
| 1812 | VJ1812 | 0.177 ± 0.012 (4.50 ± 0.30) | 0.126 ± 0.008 (3.20 ± 0.20) | 0.086 (2.18) | 0.010 (0.25) | 0.030 (0.76) |
| 1825 | VJ1825 | 0.177 ± 0.012 (4.50 ± 0.30) | 0.252 ± 0.010 (6.40 ± 0.25) | 0.086 (2.18) | 0.010 (0.25) | 0.030 (0.76) |
| 2220 | VJ2220 | 0.220 ± 0.010 (5.59 ± 0.25) | 0.200 ± 0.010 (5.08 ± 0.25) | 0.086 (2.18) | 0.010 (0.25) | 0.030 (0.76) |
| 2225 | 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) |

Note

- Polymer (B-termination) have increased dimensions:
length 0.006" (0.15 mm)



| SELECTION CHART | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------------|--------|-----------------------|-----|-----|-----|-----|------|-----------------------|----|-----|-----|-----|-----|-----------------------|------|------|----|-----|-----|-----|-----|------|------|------|------|
| DIELECTRIC | | COG (NP0) | | | | | | | | | | | | | | | | | | | | | | | |
| STYLE | | VJ1206 ⁽¹⁾ | | | | | | VJ1210 ⁽¹⁾ | | | | | | VJ1808 ⁽¹⁾ | | | | | | | | | | | |
| CASE CODE | | 1206 | | | | | | 1210 | | | | | | 1808 | | | | | | | | | | | |
| VOLTAGE (V _{DC}) | | 50 | 100 | 200 | 500 | 630 | 1000 | 1500 | 50 | 100 | 200 | 500 | 630 | 1000 | 1500 | 2000 | 50 | 100 | 200 | 500 | 630 | 1000 | 1500 | 2000 | 3000 |
| VOLTAGE CODE | | A | B | C | E | L | G | R | A | B | C | E | L | G | R | F | A | B | C | E | L | G | R | F | H |
| CAP. CODE | CAP. | | | | | | | | | | | | | | | | | | | | | | | | |
| 100 | 10 pF | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| 120 | 12 pF | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| 150 | 15 pF | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| 180 | 18 pF | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| 220 | 22 pF | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| 270 | 27 pF | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| 330 | 33 pF | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| 390 | 39 pF | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| 470 | 47 pF | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| 560 | 56 pF | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| 680 | 68 pF | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| 820 | 82 pF | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| 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 | 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 | | | | | | | | | | | | | | | | | | | | | | | | |

Notes

• RoHS-compliant

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



| SELECTION CHART | | | | | | | | | | | | | | | | |
|----------------------------|--------|-----------------------|-----|-----|-----|-----|------|------|------|-----------------------|----|-----|-----|-----|-----|------|
| DIELECTRIC | | COG (NP0) | | | | | | | | | | | | | | |
| STYLE | | VJ1812 ⁽¹⁾ | | | | | | | | VJ1825 ⁽¹⁾ | | | | | | |
| CASE CODE | | 1812 | | | | | | | | 1825 | | | | | | |
| VOLTAGE (V _{DC}) | | 50 | 100 | 200 | 500 | 630 | 1000 | 1500 | 2000 | 3000 | 50 | 100 | 200 | 500 | 630 | 1000 |
| VOLTAGE CODE | | A | B | C | E | L | G | R | F | H | A | B | C | E | L | G |
| CAP. CODE | CAP. | | | | | | | | | | | | | | | |
| 100 | 10 pF | • | • | • | • | • | | | | | | | | | | |
| 120 | 12 pF | • | • | • | • | • | | | | | | | | | | |
| 150 | 15 pF | • | • | • | • | • | | | | | | | | • | • | |
| 180 | 18 pF | • | • | • | • | • | | | | | | | | • | • | |
| 220 | 22 pF | • | • | • | • | • | | | | | | | | • | • | |
| 270 | 27 pF | • | • | • | • | • | • | • | • | • | | | | • | • | |
| 330 | 33 pF | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| 390 | 39 pF | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| 470 | 47 pF | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| 560 | 56 pF | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| 680 | 68 pF | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| 820 | 82 pF | • | • | • | • | • | • | • | • | • | • | • | • | • | • | |
| 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 | 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 | | | | | | | | | | | | | | | |

Notes

• RoHS-compliant

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



| SELECTION CHART | | | | | | | | | | | | | |
|----------------------------|--------|-----------------------|-----|-----|-----|-----|------|-----------------------|-----|-----|-----|-----|------|
| DIELECTRIC | | COG (NPO) | | | | | | | | | | | |
| STYLE | | VJ2220 ⁽¹⁾ | | | | | | VJ2225 ⁽¹⁾ | | | | | |
| CASE CODE | | 2220 | | | | | | 2225 | | | | | |
| VOLTAGE (V _{DC}) | | 50 | 100 | 200 | 500 | 630 | 1000 | 50 | 100 | 200 | 500 | 630 | 1000 |
| VOLTAGE CODE | | A | B | C | E | L | G | A | B | C | E | L | G |
| CAP. CODE | CAP. | | | | | | | | | | | | |
| 100 | 10 pF | | | | | | | | | | | | |
| 120 | 12 pF | | | | | | | | | | | | |
| 150 | 15 pF | | | | | | | | | | | | |
| 180 | 18 pF | | | | | | | | | | | | |
| 220 | 22 pF | | | | | | | | | | | | |
| 270 | 27 pF | | | | | | | | | | | | |
| 330 | 33 pF | | | | | | | | | | | | |
| 390 | 39 pF | | | | | | | | | | | | |
| 470 | 47 pF | | | | | | | | | | | | |
| 560 | 56 pF | | | | | | | | | | | | |
| 680 | 68 pF | | | | | | | | | | | | |
| 820 | 82 pF | | | | | | | | | | | | |
| 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 | 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 | | | | | | | | | | | | |

Notes

RoHS-compliant

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



| SELECTION CHART | | | | | | | | | | | | | | | | | | |
|----------------------------|--------|-----------------------|----|----|-----|-----|-----|-----|----|-----------------------|----|-----|-----|-----|-----|------|------|------|
| DIELECTRIC | | X7R | | | | | | | | | | | | | | | | |
| STYLE | | VJ0805 ⁽¹⁾ | | | | | | | | VJ1206 ⁽¹⁾ | | | | | | | | |
| CASE CODE | | 0805 | | | | | | | | 1206 | | | | | | | | |
| VOLTAGE (V _{DC}) | | 16 | 25 | 50 | 100 | 200 | 500 | 630 | 16 | 25 | 50 | 100 | 200 | 500 | 630 | 1000 | 1500 | 2000 |
| VOLTAGE CODE | | J | X | A | B | C | E | L | J | X | A | B | C | E | L | G | R | F |
| 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 | 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 | | | | | | | | • | • | | | | | | | | |
| 474 | 470 nF | | | | | | | | • | • | | | | | | | | |
| 564 | 560 nF | | | | | | | | • | | | | | | | | | |
| 684 | 680 nF | | | | | | | | • | | | | | | | | | |
| 824 | 820 nF | | | | | | | | | | | | | | | | | |
| 105 | 1.0 μF | | | | | | | | | | | | | | | | | |
| 125 | 1.2 μF | | | | | | | | | | | | | | | | | |
| 155 | 1.5 μF | | | | | | | | | | | | | | | | | |
| 185 | 1.8 μF | | | | | | | | | | | | | | | | | |
| 225 | 2.2 μF | | | | | | | | | | | | | | | | | |

Notes

•• RoHS-compliant

•• Paper tape • Plastic tape

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



| SELECTION CHART | | | | | | | | | | | | | | | | |
|----------------------------|--------|-----------------------|----|----|-----|-----|-----|-----|------|------|------|-----------------------|------|------|------|------|
| DIELECTRIC | | X7R | | | | | | | | | | | | | | |
| STYLE | | VJ1210 ⁽¹⁾ | | | | | | | | | | VJ1808 ⁽¹⁾ | | | | |
| CASE CODE | | 1210 | | | | | | | | | | 1808 | | | | |
| VOLTAGE (V _{DC}) | | 16 | 25 | 50 | 100 | 200 | 500 | 630 | 1000 | 1500 | 2000 | 630 | 1000 | 1500 | 2000 | 3000 |
| VOLTAGE CODE | | J | X | A | B | C | E | L | G | R | F | L | G | R | F | H |
| 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 | 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 | • | • | • | • | • | • | • | • | | | | | | | |
| 474 | 470 nF | • | • | • | • | • | • | • | • | | | | | | | |
| 564 | 560 nF | • | • | • | • | • | • | • | • | | | | | | | |
| 684 | 680 nF | • | • | • | • | • | • | • | • | | | | | | | |
| 824 | 820 nF | • | • | • | • | • | • | • | • | | | | | | | |
| 105 | 1.0 μF | • | | | | | | | | | | | | | | |
| 125 | 1.2 μF | | | | | | | | | | | | | | | |
| 155 | 1.5 μF | | | | | | | | | | | | | | | |
| 185 | 1.8 μF | | | | | | | | | | | | | | | |
| 225 | 2.2 μF | | | | | | | | | | | | | | | |

Notes

• RoHS-compliant

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



| SELECTION CHART | | | | | | | | | | | | | | | | | | |
|----------------------------|--------|-----------------------|-----|-----|-----|-----|-----|------|------|------|-----------------------|-----|-----|-----|-----|------|------|------|
| DIELECTRIC | | X7R | | | | | | | | | | | | | | | | |
| STYLE | | VJ1812 ⁽¹⁾ | | | | | | | | | VJ1825 ⁽¹⁾ | | | | | | | |
| CASE CODE | | 1812 | | | | | | | | | 1825 | | | | | | | |
| VOLTAGE (V _{DC}) | | 50 | 100 | 200 | 250 | 500 | 630 | 1000 | 1500 | 2000 | 3000 | 100 | 200 | 500 | 630 | 1000 | 1500 | 2000 |
| VOLTAGE CODE | | A | B | C | P | E | L | G | R | F | H | B | C | E | L | G | R | F |
| 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 | 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 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 203 | 20 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 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 474 | 470 nF | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 564 | 560 nF | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 684 | 680 nF | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 824 | 820 nF | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 105 | 1.0 μF | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 125 | 1.2 μF | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 155 | 1.5 μF | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 185 | 1.8 μF | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 225 | 2.2 μF | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |

Notes

• RoHS-compliant

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



| SELECTION CHART | | | | | | | | | | | | | | | | | |
|----------------------------|--------|-----------------------|-----|-----|-----|-----|-----|------|------|-----------------------|-----|-----|-----|-----|------|------|------|
| DIELECTRIC | | X7R | | | | | | | | | | | | | | | |
| STYLE | | VJ2220 ⁽¹⁾ | | | | | | | | VJ2225 ⁽¹⁾ | | | | | | | |
| CASE CODE | | 2220 | | | | | | | | 2225 | | | | | | | |
| VOLTAGE (V _{DC}) | | 50 | 100 | 200 | 250 | 500 | 630 | 1000 | 2000 | 3000 | 100 | 200 | 500 | 630 | 1000 | 1500 | 2000 |
| VOLTAGE CODE | | A | B | C | P | E | L | G | F | H | B | C | E | L | G | R | F |
| 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 | 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 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 203 | 20 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 | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 474 | 470 nF | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 564 | 560 nF | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 684 | 680 nF | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 824 | 820 nF | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 105 | 1.0 μF | • | • | | | | | | | | • | • | | | | | |
| 125 | 1.2 μF | • | • | | | | | | | | • | • | | | | | |
| 155 | 1.5 μF | • | • | | | | | | | | • | | | | | | |
| 185 | 1.8 μF | • | | | | | | | | | • | | | | | | |
| 225 | 2.2 μF | | | | | | | | | | | | | | | | |

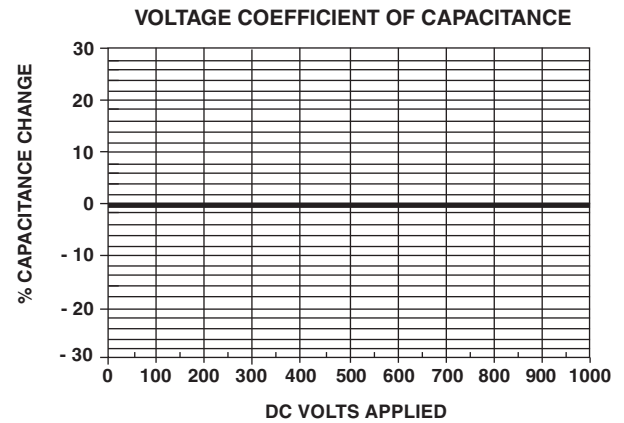
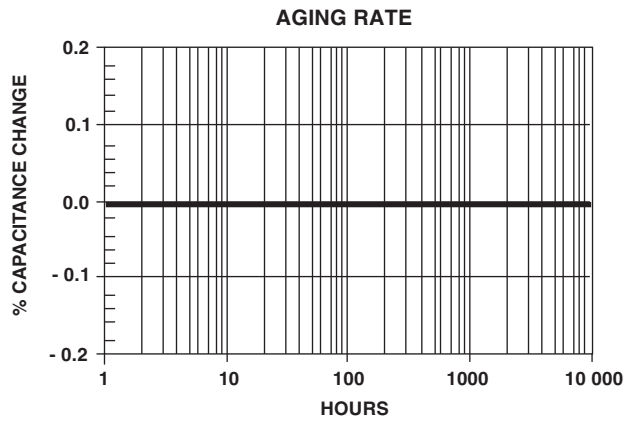
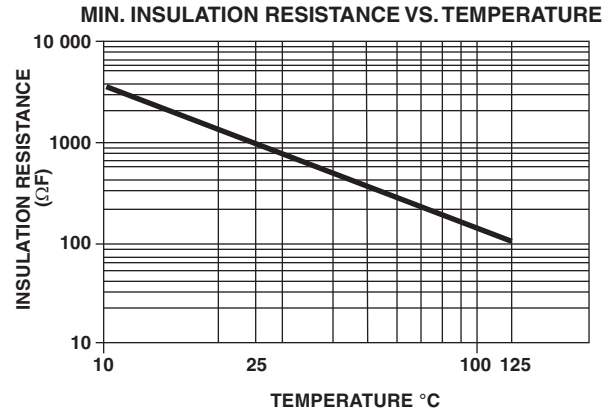
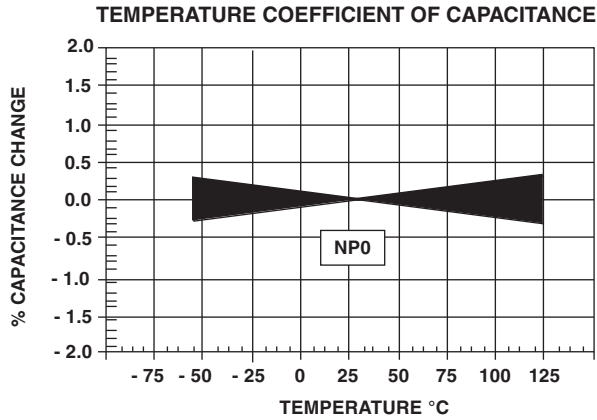
Notes

• RoHS-compliant

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



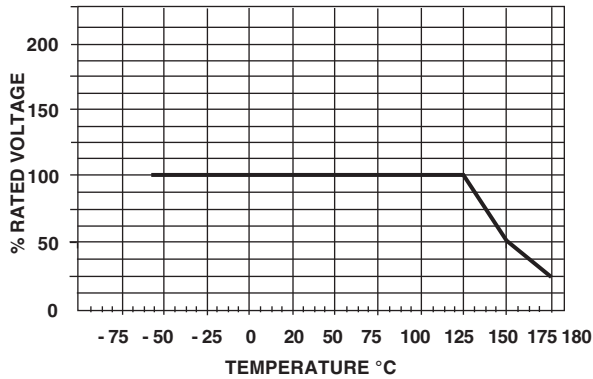
COG (NP0) CAPACITORS - TYPICAL PARAMETERS



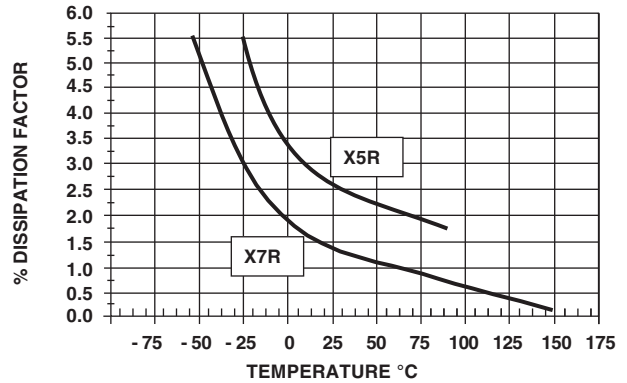


X7R DIELECTRIC - TYPICAL PARAMETERS

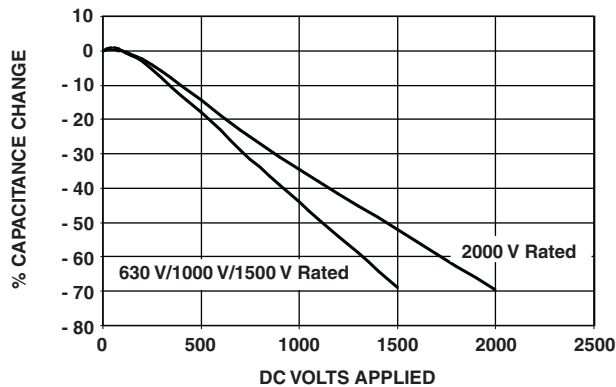
RATED VOLTAGE VS. TEMPERATURE



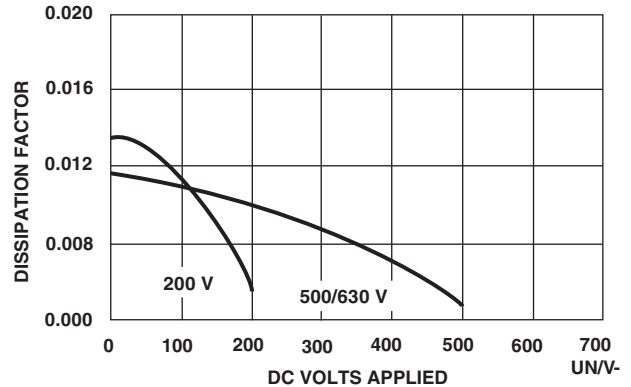
DISSIPATION FACTOR VS. TEMPERATURE



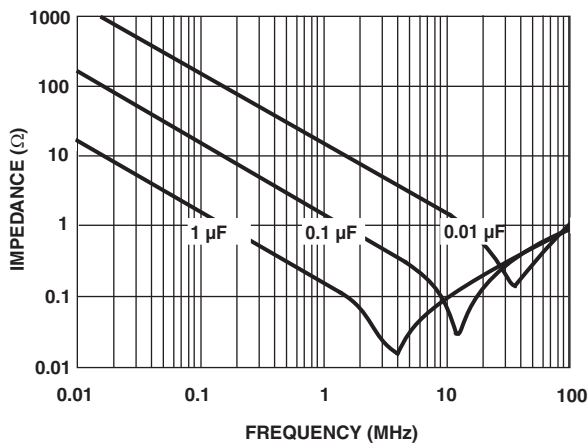
VOLTAGE COEFFICIENT OF CAPACITANCE



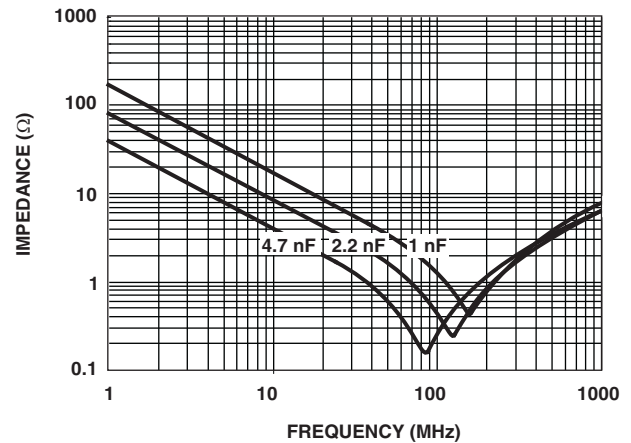
DISSIPATION FACTOR VS. VOLTAGE



IMPEDANCE VS. FREQUENCY 500 V/630 V



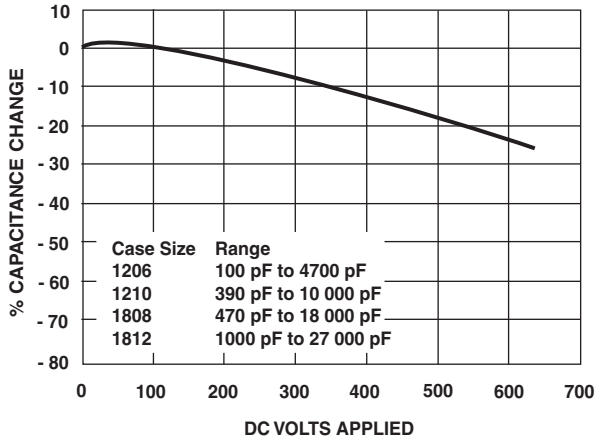
IMPEDANCE VS. FREQUENCY 2000 V



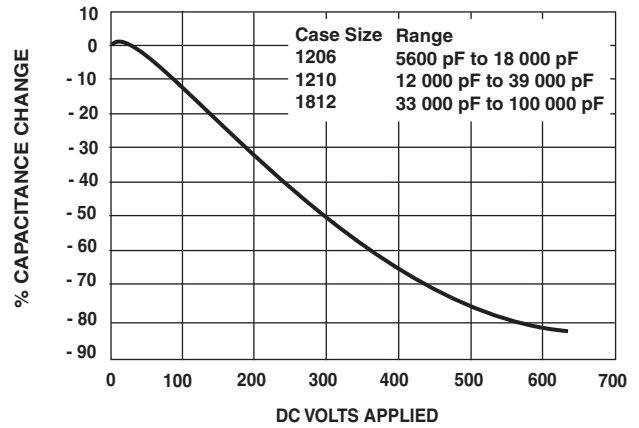


X7R DIELECTRIC - TYPICAL PARAMETERS

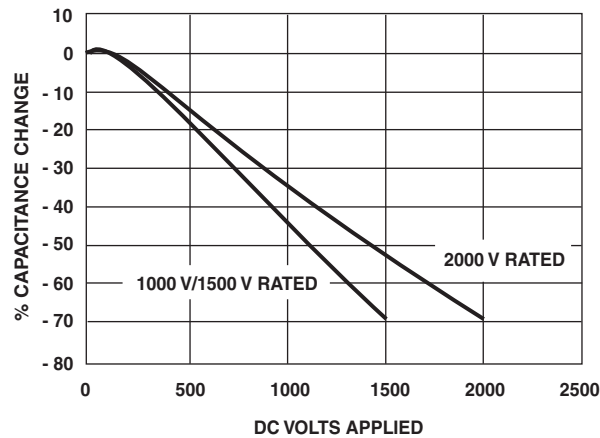
**VOLTAGE COEFFICIENT OF CAPACITANCE
LOWER CAPACITANCE**



**VOLTAGE COEFFICIENT OF CAPACITANCE
HIGHER CAPACITANCE**



VOLTAGE COEFFICIENT OF CAPACITANCE



BOARDFLEX SENSITIVE APPLICATIONS - SOLUTION

A predominant failure mode in multilayer ceramic chip capacitors is cracking caused by board flexure. Cracks can then create a path for current to pass from one electrode through the dielectric to an opposing electrode or from the terminations at one end of the MLCC through the dielectric to an opposing electrode. This may subsequently result in capacitance loss, leakage - low Insulation Resistance (IR) - and / or more seriously, high current shorts. A short circuit condition in the surface mounted capacitors can cause further failures of downstream components. Vishay's Open Mode Design Capacitors (VJ OMD - Cap. series) reduce the risk of these destructive conditions through MLCC designs that prevent board flexure cracks reaching the opposing electrode.

VJ OMD - Cap. MLCCs reduce the risk of early field failures associated with board flex cracks. However, it is important to note that even in the open mode designs the presence of flexure related cracks can cause capacitance loss leading to localized stresses on the parts. eventually, depending on the application environment, including such factors and high voltage pulse frequency and thermal cycling this may lead to internal breakdown of the component.

POLYMER TERMINATION

Polymer termination provides additional protection against board flexure damage by absorbing greater mechanical and thermal stresses. Components can be packaged, transported, stored and handled the same standard terminated product. Wave and reflow soldering of MLCC does not require modification to equipment and / or process. Polymer termination greatly reduces the risk of mechanical cracking however it does not completely eliminate.

STANDARD TERMINATION

Exposed Electrodes = Electrical Short


OMD CAP PLUS POLYMER TERMINATION

No Exposed Electrodes = No Electrical Short



| STANDARD PACKAGING QUANTITIES (1)(2)(3) | | | | | |
|---|-----------|-------------------------------------|---------------------------------|-------------------------------------|---------------------------------|
| CASE CODE | TAPE SIZE | 7" REEL QUANTITIES | | 11 1/4" AND 13" REEL QUANTITIES | |
| | | PAPER TAPE PACKAGING CODE "C" / "O" | PLASTIC TAPE PACKAGING CODE "T" | PAPER TAPE PACKAGING CODE "P" / "I" | PLASTIC TAPE PACKAGING CODE "R" |
| 0805 (4)(5) | 8 mm | 3000 | 3000 | 10 000 | 10 000 |
| 1206 (4) | 8 mm | n/a | 2500 / 3000 | n/a | 9000 / 10 000 |
| 1210 (4) | 8 mm | n/a | 2000 / 2500 / 3000 | n/a | 9000 / 10 000 |
| 1808 (4) | 12 mm | n/a | 2000 | n/a | 10 000 |
| 1812 (4) | 12 mm | n/a | 1000 | n/a | 4000 |
| 1825 | 12 mm | n/a | 1000 | n/a | 4000 |
| 2220 | 12 mm | n/a | 1000 | n/a | 4000 |
| 2225 | 12 mm | n/a | 500 | n/a | 4000 |

Notes

- (1) Vishay Vitramon uses embossed plastic, and punch paper carrier tapes. Paper tape is not available for case sizes ≥ 1206 or for component thickness $> 0.035"$ (0.89 mm)
- (2) Reference: EIA standard RS 481 - "Taping of Surface Mount Components for Automatic Placement"
- (3) n/a = not available
- (4) Packaging code "C" / "O", "P" / "I" and lower quantities can depend from product thickness
- (5) Polymer termination, code "B", only available in plastic tape "T" / "R"

| STORAGE AND HANDLING CONDITIONS |
|--|
| (1) Store the components at 5 °C to 40 °C ambient temperature and $\leq 70\%$ 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 oxidation 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. |



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