

## 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<sub>RMS</sub> at 100 kHz
- High voltage breakdown compared to standard design
- 100 % voltage conditioning available up to 630 V<sub>DC</sub> rating (process code "5H")  
Contact [mlcc@vishay.com](mailto: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](http://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](mailto:mlcc@vishay.com)

### ELECTRICAL SPECIFICATIONS

| COG (NP0)                                                                                                                                                                             |                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| <b>GENERAL SPECIFICATION</b>                                                                                                                                                          |                        |
| <b>Note</b><br>Electrical characteristics at +25 °C unless otherwise specified                                                                                                        |                        |
| <b>Operating Temperature:</b> -55 °C to +125 °C                                                                                                                                       |                        |
| <b>Capacitance Range:</b> 10 pF to 47 nF                                                                                                                                              |                        |
| <b>Voltage Range:</b> 50 V <sub>DC</sub> to 3000 V <sub>DC</sub>                                                                                                                      |                        |
| <b>Temperature Coefficient of Capacitance (TCC):</b><br>0 ppm/°C ± 30 ppm/°C from -55 °C to +125 °C                                                                                   |                        |
| <b>Dissipation Factor (DF):</b><br>0.1 % maximum at 1.0 V <sub>RMS</sub> and<br>1 MHz for values ≤ 1000 pF<br>0.1 % maximum at 1.0 V <sub>RMS</sub> and<br>1 kHz for values > 1000 pF |                        |
| <b>Insulating Resistance:</b><br>at +25 °C 100 000 MΩ min. or 1000 ΩF whichever is less<br>at +125 °C 10 000 MΩ min. or 100 ΩF whichever is less                                      |                        |
| <b>Aging Rate:</b> 0 % maximum per decade                                                                                                                                             |                        |
| <b>Dielectric Strength Test:</b><br>performed per method 103 of EIA 198-2-E<br>Applied test voltages                                                                                  |                        |
| ≤ 200 V <sub>DC</sub> -rated:                                                                                                                                                         | 250 % of rated voltage |
| 500 V <sub>DC</sub> -rated:                                                                                                                                                           | 200 % of rated voltage |
| 630 V <sub>DC</sub> / 1000 V <sub>DC</sub> -rated:                                                                                                                                    | 150 % of rated voltage |
| 1500 V <sub>DC</sub> to 3000 V <sub>DC</sub> -rated:                                                                                                                                  | 120 % of rated voltage |

| X7R                                                                                                                                                                 |                             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
| <b>GENERAL SPECIFICATION</b>                                                                                                                                        |                             |
| <b>Note</b><br>Electrical characteristics at +25 °C unless otherwise specified                                                                                      |                             |
| <b>Operating Temperature:</b> -55 °C to +125 °C                                                                                                                     |                             |
| <b>Capacitance Range:</b> 100 pF to 1.8 μF                                                                                                                          |                             |
| <b>Voltage Range:</b> 16 V <sub>DC</sub> to 3000 V <sub>DC</sub>                                                                                                    |                             |
| <b>Temperature Coefficient of Capacitance (TCC):</b><br>± 15 % from -55 °C to +125 °C, with 0 V <sub>DC</sub> applied                                               |                             |
| <b>Dissipation Factor (DF):</b><br>< 50 V ratings 3.5 % maximum at 1.0 V <sub>RMS</sub> and 1 kHz<br>≥ 50 V ratings 2.5 % maximum at 1.0 V <sub>RMS</sub> and 1 kHz |                             |
| <b>Insulating Resistance:</b><br>at +25 °C 100 000 MΩ min. or 1000 ΩF whichever is less<br>at +125 °C 10 000 MΩ min. or 100 ΩF whichever is less                    |                             |
| <b>Aging Rate:</b> 1 % maximum per decade                                                                                                                           |                             |
| <b>Dielectric Strength Test:</b><br>performed per method 103 of EIA 198-2-E<br>Applied test voltages                                                                |                             |
| ≤ 250 V <sub>DC</sub> -rated:                                                                                                                                       | 250 % of rated voltage      |
| 500 V <sub>DC</sub> -rated:                                                                                                                                         | min. 150 % of rated voltage |
| 630 V <sub>DC</sub> / 1000 V <sub>DC</sub> -rated:                                                                                                                  | 150 % of rated voltage      |
| 1500 V <sub>DC</sub> to 3000 V <sub>DC</sub> -rated:                                                                                                                | 120 % of rated voltage      |



## QUICK REFERENCE DATA

| DIELECTRIC | CASE | MAXIMUM VOLTAGE<br>(V) | CAPACITANCE |             |
|------------|------|------------------------|-------------|-------------|
|            |      |                        | MINIMUM     | MAXIMUM     |
| C0G (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 $\mu$ F |
|            | 1808 | 3000                   | 220 pF      | 18 nF       |
|            | 1812 | 3000                   | 100 pF      | 1.2 $\mu$ F |
|            | 1825 | 2000                   | 5.6 nF      | 1.5 $\mu$ F |
|            | 2220 | 3000                   | 1.0 nF      | 1.8 $\mu$ F |
|            | 2225 | 2000                   | 5.6 nF      | 1.8 $\mu$ F |

## Note

- Detail ratings see "Selection Chart"

## ORDERING INFORMATION

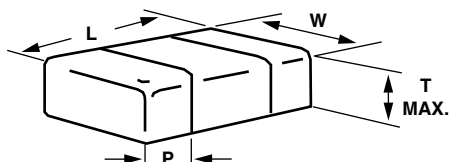
| VJ1210                                                       | Y                        | 474                                                                                                                                                                        | J                                                                                                                             | X                                                                                                               | A                                                                                                                                                         | A                                                                                                                                                                                                                                                                                                                | T         | # (2)                                                      |
|--------------------------------------------------------------|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|------------------------------------------------------------|
| CASE CODE                                                    | DIELECTRIC               | CAPACITANCE NOMINAL CODE                                                                                                                                                   | CAPACITANCE TOLERANCE                                                                                                         | TERMINATION (4)                                                                                                 | DC VOLTAGE RATING (1)                                                                                                                                     | MARKING                                                                                                                                                                                                                                                                                                          | PACKAGING | PROCESS CODE                                               |
| 0805<br>1206<br>1210<br>1808<br>1812<br>1825<br>2220<br>2225 | A = C0G (NP0)<br>Y = X7R | Expressed in picofarads (pF).<br>The first two digits are significant, the third is a multiplier. An "R" indicates a decimal point.<br><b>Examples</b><br>474 = 470 000 pF | F = ± 1 %<br>G = ± 2 %<br>J = ± 5 %<br>K = ± 10 %<br>M = ± 20 %<br><b>Note</b><br>C0G (NP0):<br>F, G, J, K<br>X7R:<br>J, K, M | X = Ni barrier<br>100 % tin plated matte finish<br>E = AgPd (3)<br>B = polymer<br>100 % tin plated matte finish | J = 16 V<br>X = 25 V<br>A = 50 V<br>B = 100 V<br>C = 200 V<br>P = 250 V<br>E = 500 V<br>L = 630 V<br>G = 1000 V<br>R = 1500 V<br>F = 2000 V<br>H = 3000 V | A = unmarked<br><br>C = 7" reel / paper tape<br>T = 7" reel / plastic tape<br>P = 11 1/4" / 13" reel / paper tape<br>R = 11 1/4" / 13" reel / plastic tape<br>O = 7" reel / flamed paper tape<br>I = 11 1/4" / 13" reel / flamed paper tape<br><b>Note</b><br>"I" and "O" are used for "E" termination size 0805 |           | 4X = OMD cap<br>5H = OMD cap<br>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](mailto: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](mailto:mlcc@vishay.com) for availability.

## 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<br>(L)                  | WIDTH<br>(W)                   | MAXIMUM<br>THICKNESS<br>(T) | TERMINATION PAD<br>(P) |              |
|-----------|--------|--------------------------------|--------------------------------|-----------------------------|------------------------|--------------|
|           |        |                                |                                |                             | MINIMUM                | MAXIMUM      |
| 0805      | VJ0805 | 0.079 ± 0.008<br>(2.00 ± 0.20) | 0.049 ± 0.008<br>(1.25 ± 0.20) | 0.057 (1.45)                | 0.010 (0.25)           | 0.028 (0.71) |
| 1206      | VJ1206 | 0.126 ± 0.010<br>(3.20 ± 0.25) | 0.063 ± 0.010<br>(1.60 ± 0.25) | 0.067 (1.70)                | 0.010 (0.25)           | 0.028 (0.71) |
| 1210      | VJ1210 | 0.126 ± 0.010<br>(3.20 ± 0.25) | 0.098 ± 0.010<br>(2.50 ± 0.25) | 0.067 (1.70)                | 0.010 (0.25)           | 0.028 (0.71) |
| 1808      | VJ1808 | 0.180 ± 0.012<br>(4.57 ± 0.30) | 0.080 ± 0.010<br>(2.03 ± 0.25) | 0.086 (2.18)                | 0.010 (0.25)           | 0.030 (0.76) |
| 1812      | VJ1812 | 0.177 ± 0.012<br>(4.50 ± 0.30) | 0.126 ± 0.008<br>(3.20 ± 0.20) | 0.086 (2.18)                | 0.010 (0.25)           | 0.030 (0.76) |
| 1825      | VJ1825 | 0.177 ± 0.012<br>(4.50 ± 0.30) | 0.252 ± 0.010<br>(6.40 ± 0.25) | 0.086 (2.18)                | 0.010 (0.25)           | 0.030 (0.76) |
| 2220      | VJ2220 | 0.220 ± 0.010<br>(5.59 ± 0.25) | 0.200 ± 0.010<br>(5.08 ± 0.25) | 0.086 (2.18)                | 0.010 (0.25)           | 0.030 (0.76) |
| 2225      | VJ2225 | 0.220 ± 0.010<br>(5.59 ± 0.25) | 0.250 ± 0.010<br>(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                 |        | C0G (NP0)             |     |     |     |     |      |      |                       |     |     |     |     |      |      |      |                       |     |     |     |     |      |      |      |      |  |
| STYLE                      |        | VJ1206 <sup>(1)</sup> |     |     |     |     |      |      | VJ1210 <sup>(1)</sup> |     |     |     |     |      |      |      | VJ1808 <sup>(1)</sup> |     |     |     |     |      |      |      |      |  |
| CASE CODE                  |        | 1206                  |     |     |     |     |      |      | 1210                  |     |     |     |     |      |      |      | 1808                  |     |     |     |     |      |      |      |      |  |
| VOLTAGE (V <sub>DC</sub> ) |        | 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

<sup>(1)</sup> See soldering recommendations within this data book, or visit: [www.vishay.com/doc?45034](http://www.vishay.com/doc?45034)



| SELECTION CHART            |        |                       |     |     |     |     |      |      |      |      |                       |     |     |     |     |      |
|----------------------------|--------|-----------------------|-----|-----|-----|-----|------|------|------|------|-----------------------|-----|-----|-----|-----|------|
| DIELECTRIC                 |        | C0G (NP0)             |     |     |     |     |      |      |      |      |                       |     |     |     |     |      |
| STYLE                      |        | VJ1812 <sup>(1)</sup> |     |     |     |     |      |      |      |      | VJ1825 <sup>(1)</sup> |     |     |     |     |      |
| CASE CODE                  |        | 1812                  |     |     |     |     |      |      |      |      | 1825                  |     |     |     |     |      |
| VOLTAGE (V <sub>DC</sub> ) |        | 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

<sup>(1)</sup> See soldering recommendations within this data book, or visit: [www.vishay.com/doc?45034](http://www.vishay.com/doc?45034)



| SELECTION CHART            |        |                       |     |     |     |     |      |                       |     |     |     |     |      |
|----------------------------|--------|-----------------------|-----|-----|-----|-----|------|-----------------------|-----|-----|-----|-----|------|
| DIELECTRIC                 |        | C0G (NP0)             |     |     |     |     |      |                       |     |     |     |     |      |
| STYLE                      |        | VJ2220 <sup>(1)</sup> |     |     |     |     |      | VJ2225 <sup>(1)</sup> |     |     |     |     |      |
| CASE CODE                  |        | 2220                  |     |     |     |     |      | 2225                  |     |     |     |     |      |
| VOLTAGE (V <sub>bc</sub> ) |        | 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

<sup>(1)</sup> See soldering recommendations within this data book, or visit: [www.vishay.com/doc?45034](http://www.vishay.com/doc?45034)



| SELECTION CHART            |        |                       |    |    |     |     |     |     |  |                       |    |    |     |     |     |     |      |
|----------------------------|--------|-----------------------|----|----|-----|-----|-----|-----|--|-----------------------|----|----|-----|-----|-----|-----|------|
| DIELECTRIC                 |        | X7R                   |    |    |     |     |     |     |  |                       |    |    |     |     |     |     |      |
| STYLE                      |        | VJ0805 <sup>(1)</sup> |    |    |     |     |     |     |  | VJ1206 <sup>(1)</sup> |    |    |     |     |     |     |      |
| CASE CODE                  |        | 0805                  |    |    |     |     |     |     |  | 1206                  |    |    |     |     |     |     |      |
| VOLTAGE (V <sub>DC</sub> ) |        | 16                    | 25 | 50 | 100 | 200 | 500 | 630 |  | 16                    | 25 | 50 | 100 | 200 | 500 | 630 | 1000 |
| VOLTAGE CODE               |        | J                     | X  | A  | B   | C   | E   | L   |  | J                     | X  | A  | B   | C   | E   | L   | G    |
| 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

<sup>(1)</sup> See soldering recommendations within this data book, or visit: [www.vishay.com/doc?45034](http://www.vishay.com/doc?45034)



| SELECTION CHART            |        |                       |    |    |     |     |     |     |      |      |      |                       |      |      |      |      |
|----------------------------|--------|-----------------------|----|----|-----|-----|-----|-----|------|------|------|-----------------------|------|------|------|------|
| DIELECTRIC                 |        | X7R                   |    |    |     |     |     |     |      |      |      |                       |      |      |      |      |
| STYLE                      |        | VJ1210 <sup>(1)</sup> |    |    |     |     |     |     |      |      |      | VJ1808 <sup>(1)</sup> |      |      |      |      |
| CASE CODE                  |        | 1210                  |    |    |     |     |     |     |      |      |      | 1808                  |      |      |      |      |
| VOLTAGE (V <sub>DC</sub> ) |        | 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

<sup>(1)</sup> See soldering recommendations within this data book, or visit: [www.vishay.com/doc?45034](http://www.vishay.com/doc?45034)



| SELECTION CHART            |        |                       |     |     |     |     |     |      |      |      |      |                       |     |     |     |      |      |      |
|----------------------------|--------|-----------------------|-----|-----|-----|-----|-----|------|------|------|------|-----------------------|-----|-----|-----|------|------|------|
| DIELECTRIC                 |        | X7R                   |     |     |     |     |     |      |      |      |      |                       |     |     |     |      |      |      |
| STYLE                      |        | VJ1812 <sup>(1)</sup> |     |     |     |     |     |      |      |      |      | VJ1825 <sup>(1)</sup> |     |     |     |      |      |      |
| CASE CODE                  |        | 1812                  |     |     |     |     |     |      |      |      |      | 1825                  |     |     |     |      |      |      |
| VOLTAGE (V <sub>DC</sub> ) |        | 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

<sup>(1)</sup> See soldering recommendations within this data book, or visit: [www.vishay.com/doc?45034](http://www.vishay.com/doc?45034)



## SELECTION CHART

| DIELECTRIC                 |        | X7R                   |     |     |     |     |     |      |      |                       |     |     |     |     |      |      |      |
|----------------------------|--------|-----------------------|-----|-----|-----|-----|-----|------|------|-----------------------|-----|-----|-----|-----|------|------|------|
| STYLE                      |        | VJ2220 <sup>(1)</sup> |     |     |     |     |     |      |      | VJ2225 <sup>(1)</sup> |     |     |     |     |      |      |      |
| CASE CODE                  |        | 2220                  |     |     |     |     |     |      |      | 2225                  |     |     |     |     |      |      |      |
| VOLTAGE (V <sub>DC</sub> ) |        | 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 |                       |     |     |     |     |     |      |      |                       |     |     |     |     |      |      |      |

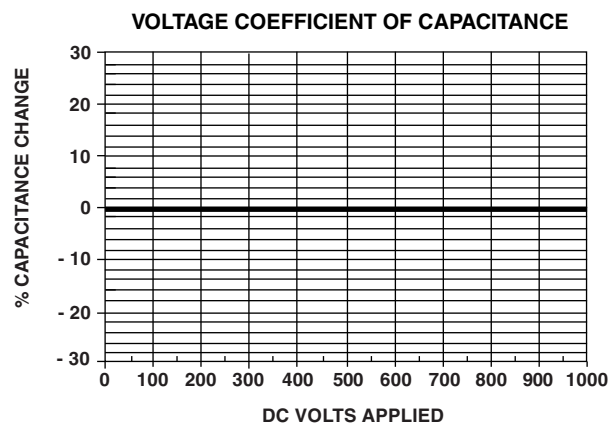
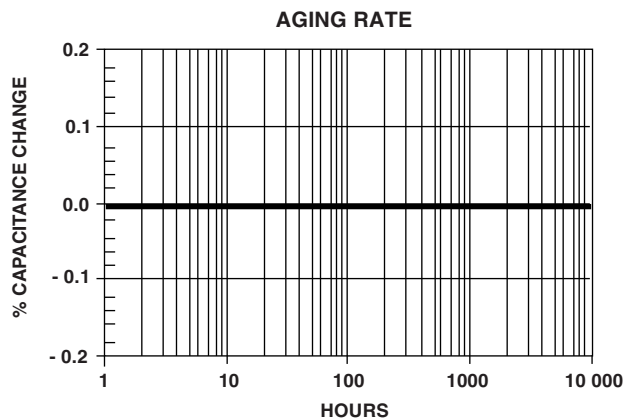
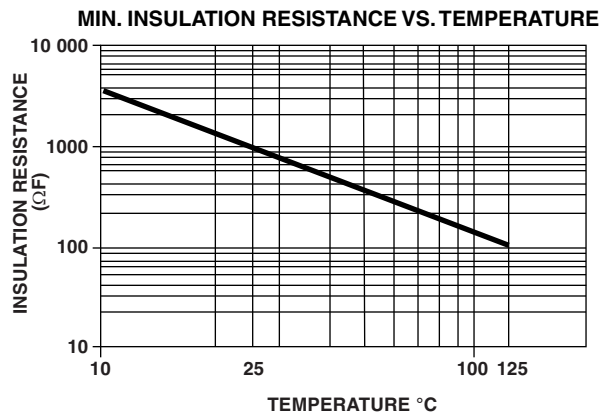
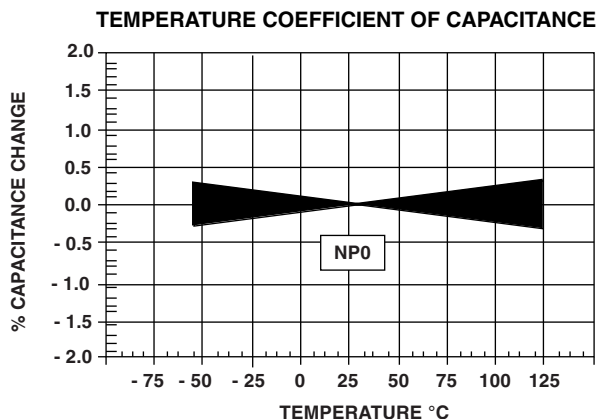
## Notes

• RoHS-compliant

<sup>(1)</sup> See soldering recommendations within this data book, or visit: [www.vishay.com/doc?45034](http://www.vishay.com/doc?45034)



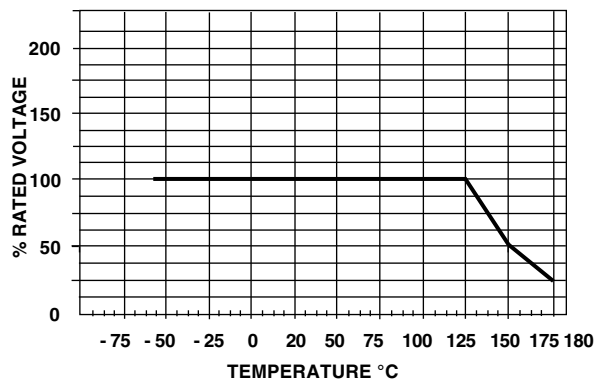
## C0G (NP0) CAPACITORS - TYPICAL PARAMETERS



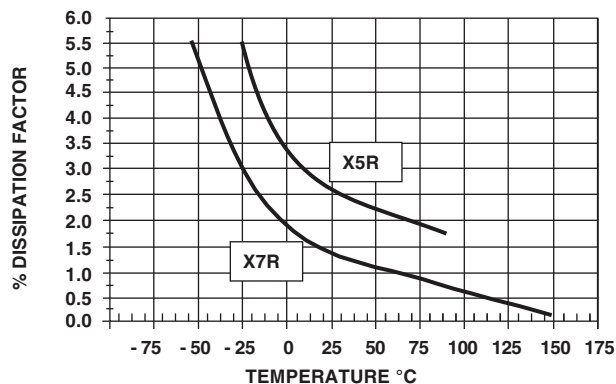


## X7R DIELECTRIC - TYPICAL PARAMETERS

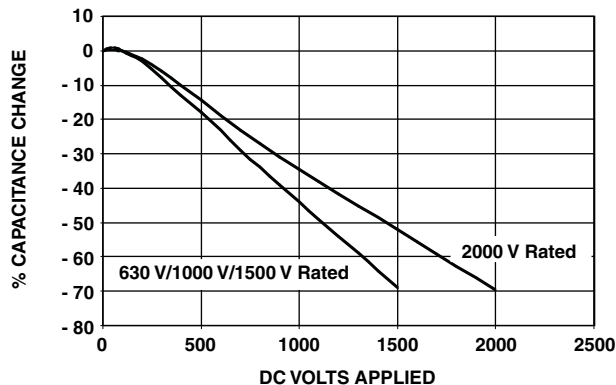
RATED VOLTAGE VS. TEMPERATURE



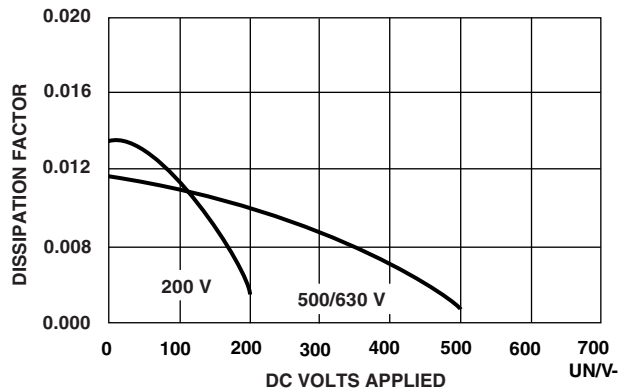
DISSIPATION FACTOR VS. TEMPERATURE



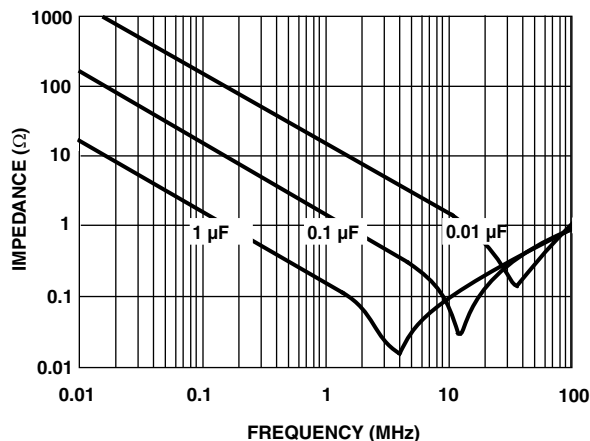
VOLTAGE COEFFICIENT OF CAPACITANCE



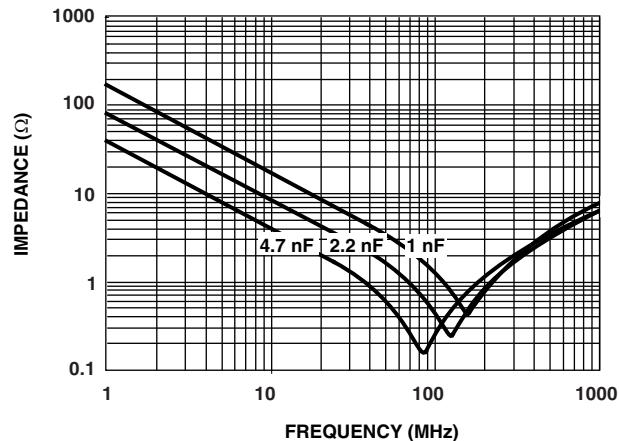
DISSIPATION FACTOR VS. VOLTAGE



IMPEDANCE VS. FREQUENCY 500 V/630 V

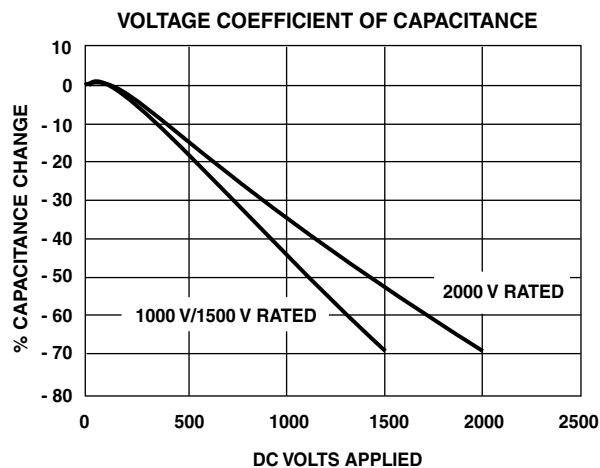
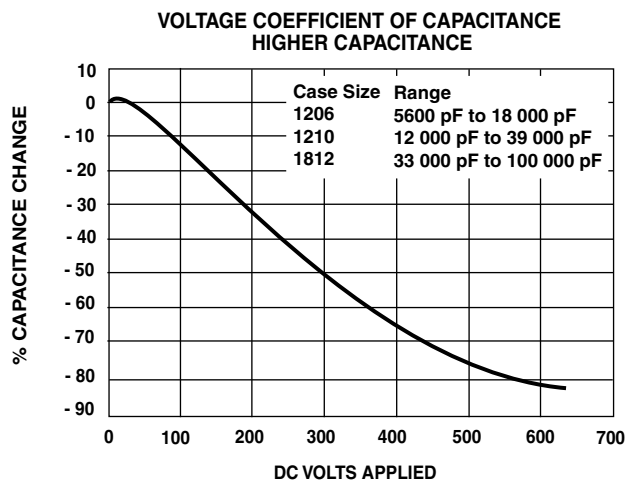
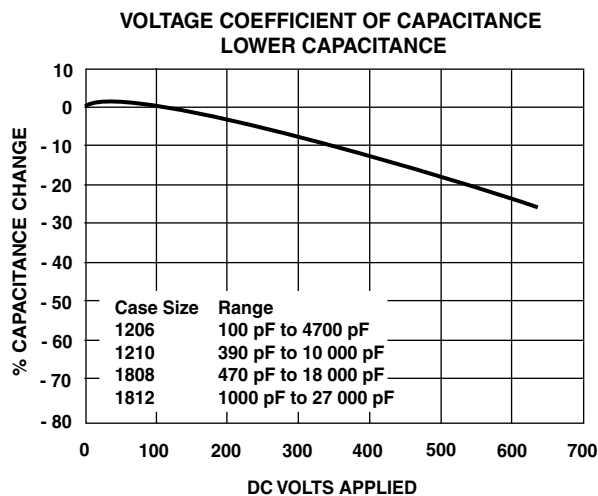


IMPEDANCE VS. FREQUENCY 2000 V





## X7R DIELECTRIC - TYPICAL PARAMETERS



## 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.

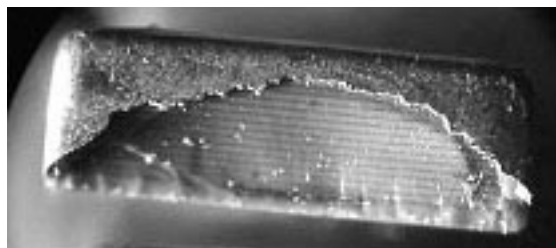
VJ OMD - Cap. MLCCs reduce the risk of early field failures associated with board flex cracks. However, it is important to note that even in the open mode designs the presence of flexure related cracks can cause capacitance loss leading to localized stresses on the parts. eventually, depending on the 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.

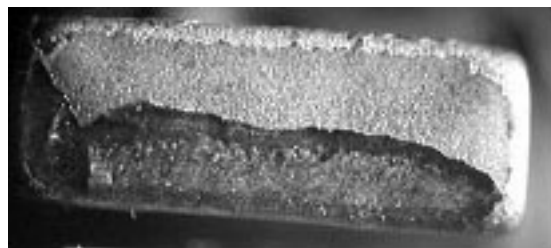
## STANDARD TERMINATION

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 <sup>(4)</sup>                     | 8 mm      | 3000                                | 3000                            | 10 000                              | 10 000                          |
| 1206 <sup>(4)</sup>                     | 8 mm      | n/a                                 | 2500 / 3000                     | n/a                                 | 9000 / 10 000                   |
| 1210 <sup>(4)</sup>                     | 8 mm      | n/a                                 | 2000 / 2500 / 3000              | n/a                                 | 9000 / 10 000                   |
| 1808 <sup>(4)</sup>                     | 12 mm     | n/a                                 | 2000                            | n/a                                 | 10 000                          |
| 1812 <sup>(4)</sup>                     | 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                                 | 1000                            | n/a                                 | 4000                            |

### Notes

- (1) Vishay Vitramon uses embossed plastic, and punch paper carrier tapes. Paper tape is not available for case sizes  $\geq 1206$  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

| STORAGE AND HANDLING CONDITIONS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>(1) Store the components at 5 °C to 40 °C ambient temperature and <math>\leq 70</math> % relative humidity conditions.</p> <p>(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.</p> <p>Precautions:</p> <ol style="list-style-type: none"> <li>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.</li> <li>b. Store products on the shelf and avoid exposure to moisture or dust.</li> <li>c. Do not expose products to excessive shock, vibration, direct sunlight and so on.</li> </ol> |



## Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.

## Material Category Policy

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.**

**Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.**

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.**

## Данный компонент на территории Российской Федерации

**Вы можете приобрести в компании MosChip.**

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

### Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: [info@moschip.ru](mailto:info@moschip.ru)

Skype отдела продаж:

moschip.ru

moschip.ru\_4

moschip.ru\_6

moschip.ru\_9