

## Surface Mount Multilayer Ceramic Chip Capacitors for Commercial Applications



### FEATURES

- C0G (NP0) and X7R/X5R dielectrics offered
- C0G (NP0) is an ultra-stable dielectric offering a very low Temperature Coefficient of Capacitance (TCC)
- C0G (NP0) offers low dissipation
- Excellent aging characteristics
- Ideal for decoupling and filtering (X7R)
- Ideal for surge suppression and high voltage applications
- Wide range of case sizes, voltage ratings and capacitance values
- 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

### APPLICATIONS

- Timing and tuning circuits
- Sensor and scanner applications
- Decoupling and filtering
- Surge suppression

### ELECTRICAL SPECIFICATIONS

#### C0G (NP0) DIELECTRIC

##### GENERAL SPECIFICATION

###### Note

Electrical characteristics at + 25 °C unless otherwise specified

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

**Capacitance Range:** 1 pF to 56 nF

**Voltage Range:** 25 V<sub>DC</sub> to 1000 V<sub>DC</sub>

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

##### Dissipation Factor (DF):

0.1 % maximum at 1.0 V<sub>RMS</sub> and  
1 MHz for values ≤ 1000 pF  
0.1 % maximum at 1.0 V<sub>RMS</sub> and  
1 kHz for values > 1000 pF

##### Insulating Resistance:

At + 25 °C 100 000 MΩ min. or 1000 ΩF whichever is less  
At + 125 °C 10 000 MΩ min. or 100 ΩF whichever is less

**Aging Rate:** 0 % maximum per decade

##### Dielectric Strength Test:

Performed per method 103 of EIA 198-2-E

Applied test voltages

|                                                    |                        |
|----------------------------------------------------|------------------------|
| ≤ 200 V <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 |

#### X5R, X7R DIELECTRIC

##### GENERAL SPECIFICATION

###### Note

Electrical characteristics at + 25 °C unless otherwise specified

**Operating Temperature:** - 55 °C to + 150 °C  
(X5R above + 85 °C changed characteristics)  
(X7R above + 125 °C changed characteristics)

**Capacitance Range:** 120 pF to 6.8 μF

**Voltage Range:** 10 V<sub>DC</sub> to 1000 V<sub>DC</sub>

##### Temperature Coefficient of Capacitance (TCC):

X5R: ± 15 % from - 55 °C to + 85 °C, with 0 V<sub>DC</sub> applied  
X7R: ± 15 % from - 55 °C to + 125 °C, with 0 V<sub>DC</sub> applied

##### Dissipation Factor (DF):

10 V ratings: 5 % maximum at 1.0 V<sub>RMS</sub> and 1 kHz  
16 V/25 V ratings: 3.5 % maximum at 1.0 V<sub>RMS</sub> and 1 kHz  
> 25 V ratings: 2.5 % maximum at 1.0 V<sub>RMS</sub> and 1 kHz

##### Insulating Resistance:

At + 25 °C 100 000 MΩ min. or 1000 ΩF whichever is less  
At + 125 °C 10 000 MΩ min. or 100 ΩF whichever is less

**Aging Rate:** 1 % maximum per decade

##### Dielectric Strength Test:

Performed per method 103 of EIA 198-2-E.

Applied test voltages

|                                                    |                             |
|----------------------------------------------------|-----------------------------|
| ≤ 250 V <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      |



## QUICK REFERENCE DATA

| DIELECTRIC | CASE | MAXIMUM VOLTAGE<br>(V) | CAPACITANCE |             |
|------------|------|------------------------|-------------|-------------|
|            |      |                        | MINIMUM     | MAXIMUM     |
| C0G (NP0)  | 0402 | 100                    | 1.0 pF      | 220 pF      |
|            | 0603 | 200                    | 1.0 pF      | 1.0 nF      |
|            | 0805 | 500                    | 1.0 pF      | 4.7 nF      |
|            | 1206 | 630                    | 1.0 pF      | 10 nF       |
|            | 1210 | 630                    | 56 pF       | 22 nF       |
|            | 1808 | 1000                   | 18 pF       | 10 nF       |
|            | 1812 | 1000                   | 39 pF       | 22 nF       |
|            | 1825 | 500                    | 100 pF      | 39 nF       |
|            | 2220 | 1000                   | 270 pF      | 47 nF       |
|            | 2225 | 1000                   | 270 pF      | 56 nF       |
| X5R        | 0805 | 10                     | 560 nF      | 1.0 $\mu$ F |
| X7R        | 0402 | 100                    | 120 pF      | 47 nF       |
|            | 0603 | 200                    | 330 pF      | 150 nF      |
|            | 0805 | 250                    | 330 pF      | 470 nF      |
|            | 1206 | 630                    | 330 pF      | 1.0 $\mu$ F |
|            | 1210 | 630                    | 390 pF      | 1.0 $\mu$ F |
|            | 1808 | 1000                   | 470 pF      | 270 nF      |
|            | 1812 | 1000                   | 1.0 nF      | 1.0 $\mu$ F |
|            | 1825 | 1000                   | 10 nF       | 2.7 $\mu$ F |
|            | 2220 | 500                    | 15 nF       | 2.2 $\mu$ F |
|            | 2225 | 1000                   | 33 nF       | 4.7 $\mu$ F |
|            | 3640 | 500                    | 27 nF       | 6.8 $\mu$ F |

## Note

- Detail ratings see selection chart

## ORDERING INFORMATION

| VJ0805 <sup>(3)</sup>                                                                | Y                                                  | 102                                                                                                                                                   | K                                                                                                                                                                                                                                                    | X                                                                                                                                   | A                                                                                                                           | A                                                                                                                   | T                                                                                                                                                                                                                                                                                          | ### <sup>(2)</sup> |
|--------------------------------------------------------------------------------------|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| CASE CODE                                                                            | DIELECTRIC                                         | CAPACITANCE NOMINAL CODE                                                                                                                              | CAPACITANCE TOLERANCE                                                                                                                                                                                                                                | TERMINATION                                                                                                                         | DC VOLTAGE RATING <sup>(1)</sup>                                                                                            | MARKING                                                                                                             | PACKAGING                                                                                                                                                                                                                                                                                  | PROCESS CODE       |
| 0402<br>0603<br>0805<br>1206<br>1210<br>1808<br>1812<br>1825<br>2220<br>2225<br>3640 | A = C0G (NP0)<br>Y = X7R<br>G = X5R <sup>(4)</sup> | Expressed in picofarads (pF).<br>The first two digits are significant, the third is a multiplier.<br><b>Examples</b><br>1R8 = 1.8 pF<br>102 = 1000 pF | B = $\pm 0.10$ pF<br>C = $\pm 0.25$ pF<br>D = $\pm 0.5$ pF<br>F = $\pm 1$ %<br>G = $\pm 2$ %<br>J = $\pm 5$ %<br>K = $\pm 10$ %<br>M = $\pm 20$ %<br><b>Note:</b><br>C0G (NP0):<br>B, C, D < 10 pF<br>F, G, J, K $\geq 10$ pF<br>X7R/X5R:<br>J, K, M | X = Ni barrier<br>100 % tin plated<br>matte finish<br>F, E = AgPd<br>B = Polymer<br>100 % tin plated<br>matte finish <sup>(5)</sup> | Q = 10 V<br>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 | A = Unmarked<br>M = Marked<br><b>Note:</b><br>Marking is only available for 0805 and 1206 with termination code "X" | 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 "F", "E" termination size 0402/0603/0805 |                    |

## Notes

<sup>(1)</sup> 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)

<sup>(2)</sup> Process code may be added with up to three digits, used to control non-standard products and/or special requirements

<sup>(3)</sup> Case size designator may be replaced by four digit drawing number used to control non-standard products and/or special requirements

<sup>(4)</sup> Selected values for X5R, see selection chart

<sup>(5)</sup> Selected values available, contact [mlcc@vishay.com](mailto:mlcc@vishay.com) for list of released ratings

<sup>(6)</sup> Termination code "E" is for conductive epoxy assembly

## DIMENSIONS in inches (millimeters)



| CASE CODE | STYLE  | LENGTH<br>(L)                                 | WIDTH<br>(W)                                  | MAXIMUM<br>THICKNESS<br>(T) | TERMINATION<br>(P) |                 |
|-----------|--------|-----------------------------------------------|-----------------------------------------------|-----------------------------|--------------------|-----------------|
|           |        |                                               |                                               |                             | MINIMUM            | MAXIMUM         |
| 0402      | VJ0402 | 0.040 + 0.004/- 0.002<br>(1.00 + 0.10/- 0.05) | 0.020 + 0.004/- 0.002<br>(0.50 + 0.10/- 0.05) | 0.024<br>(0.60)             | 0.004<br>(0.10)    | 0.016<br>(0.41) |
| 0603      | VJ0603 | 0.063 ± 0.006<br>(1.60 ± 0.15)                | 0.031 ± 0.006<br>(0.80 ± 0.15)                | 0.036<br>(0.92)             | 0.012<br>(0.30)    | 0.018<br>(0.46) |
| 0805      | VJ0805 | 0.079 ± 0.008<br>(2.00 ± 0.20)                | 0.049 ± 0.008<br>(1.25 ± 0.20)                | 0.057<br>(1.45)             | 0.010<br>(0.25)    | 0.028<br>(0.71) |
| 1206      | VJ1206 | 0.126 ± 0.008<br>(3.20 ± 0.20)                | 0.063 ± 0.008<br>(1.60 ± 0.20)                | 0.067<br>(1.70)             | 0.010<br>(0.25)    | 0.028<br>(0.71) |
| 1210      | VJ1210 | 0.126 ± 0.008<br>(3.20 ± 0.20)                | 0.098 ± 0.008<br>(2.50 ± 0.20)                | 0.067<br>(1.70)             | 0.010<br>(0.25)    | 0.028<br>(0.71) |
| 1808      | VJ1808 | 0.180 ± 0.012<br>(4.57 ± 0.30)                | 0.080 ± 0.010<br>(2.03 ± 0.25)                | 0.086<br>(2.18)             | 0.010<br>(0.25)    | 0.030<br>(0.76) |
| 1812      | VJ1812 | 0.177 ± 0.012<br>(4.50 ± 0.30)                | 0.126 ± 0.008<br>(3.20 ± 0.20)                | 0.086<br>(2.18)             | 0.010<br>(0.25)    | 0.030<br>(0.76) |
| 1825      | VJ1825 | 0.177 ± 0.012<br>(4.50 ± 0.30)                | 0.252 ± 0.010<br>(6.40 ± 0.25)                | 0.086<br>(2.18)             | 0.010<br>(0.25)    | 0.030<br>(0.76) |
| 2220      | VJ2220 | 0.220 ± 0.010<br>(5.59 ± 0.25)                | 0.200 ± 0.010<br>(5.08 ± 0.25)                | 0.086<br>(2.18)             | 0.010<br>(0.25)    | 0.030<br>(0.76) |
| 2225      | VJ2225 | 0.220 ± 0.010<br>(5.59 ± 0.25)                | 0.250 ± 0.010<br>(6.35 ± 0.25)                | 0.086<br>(2.18)             | 0.010<br>(0.25)    | 0.030<br>(0.76) |
| 3640      | VJ3640 | 0.360 ± 0.015<br>(9.14 ± 0.38)                | 0.400 ± 0.015<br>(10.20 ± 0.38)               | 0.086<br>(2.18)             | 0.010<br>(0.25)    | 0.030<br>(0.76) |

### Note

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



## SELECTION CHART

| DIELECTRIC                 |        | C0G (NP0) |    |     |        |     |     |        |     |     |     |                       |     |     |     |     |                       |     |     |     |     |
|----------------------------|--------|-----------|----|-----|--------|-----|-----|--------|-----|-----|-----|-----------------------|-----|-----|-----|-----|-----------------------|-----|-----|-----|-----|
| STYLE                      |        | VJ0402    |    |     | VJ0603 |     |     | VJ0805 |     |     |     | VJ1206 <sup>(1)</sup> |     |     |     |     | VJ1210 <sup>(1)</sup> |     |     |     |     |
| CASE CODE                  |        | 0402      |    |     | 0603   |     |     | 0805   |     |     |     | 1206                  |     |     |     |     | 1210                  |     |     |     |     |
| VOLTAGE (V <sub>DC</sub> ) |        | 25        | 50 | 100 | 50     | 100 | 200 | 50     | 100 | 200 | 500 | 50                    | 100 | 200 | 500 | 630 | 50                    | 100 | 200 | 500 | 630 |
| VOLTAGE CODE               |        | X         | A  | B   | A      | B   | C   | A      | B   | C   | E   | A                     | B   | C   | E   | L   | A                     | B   | C   | E   | L   |
| CAP. CODE                  | CAP.   |           |    |     |        |     |     |        |     |     |     |                       |     |     |     |     |                       |     |     |     |     |
| 1R0                        | 1.0 pF | ••        | •• | ••  | ••     | ••  | ••  | ••     | ••  | ••  | ••  | ••                    | ••  | ••  | ••  | ••  |                       |     |     |     |     |
| 1R2                        | 1.2 pF | ••        | •• | ••  | ••     | ••  | ••  | ••     | ••  | ••  | ••  | ••                    | ••  | ••  | ••  | ••  |                       |     |     |     |     |
| 1R5                        | 1.5 pF | ••        | •• | ••  | ••     | ••  | ••  | ••     | ••  | ••  | ••  | ••                    | ••  | ••  | ••  | ••  |                       |     |     |     |     |
| 1R8                        | 1.8 pF | ••        | •• | ••  | ••     | ••  | ••  | ••     | ••  | ••  | ••  | ••                    | ••  | ••  | ••  | ••  |                       |     |     |     |     |
| 2R2                        | 2.2 pF | ••        | •• | ••  | ••     | ••  | ••  | ••     | ••  | ••  | ••  | ••                    | ••  | ••  | ••  | ••  |                       |     |     |     |     |
| 2R7                        | 2.7 pF | ••        | •• | ••  | ••     | ••  | ••  | ••     | ••  | ••  | ••  | ••                    | ••  | ••  | ••  | ••  |                       |     |     |     |     |
| 3R3                        | 3.3 pF | ••        | •• | ••  | ••     | ••  | ••  | ••     | ••  | ••  | ••  | ••                    | ••  | ••  | ••  | ••  |                       |     |     |     |     |
| 3R9                        | 3.9 pF | ••        | •• | ••  | ••     | ••  | ••  | ••     | ••  | ••  | ••  | ••                    | ••  | ••  | ••  | ••  |                       |     |     |     |     |
| 4R7                        | 4.7 pF | ••        | •• | ••  | ••     | ••  | ••  | ••     | ••  | ••  | ••  | ••                    | ••  | ••  | ••  | ••  |                       |     |     |     |     |
| 5R6                        | 5.6 pF | ••        | •• | ••  | ••     | ••  | ••  | ••     | ••  | ••  | ••  | ••                    | ••  | ••  | ••  | ••  |                       |     |     |     |     |
| 6R8                        | 6.8 pF | ••        | •• | ••  | ••     | ••  | ••  | ••     | ••  | ••  | ••  | ••                    | ••  | ••  | ••  | ••  |                       |     |     |     |     |
| 8R2                        | 8.2 pF | ••        | •• | ••  | ••     | ••  | ••  | ••     | ••  | ••  | ••  | ••                    | ••  | ••  | ••  | ••  |                       |     |     |     |     |
| 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  |           |    |     |        |     |     |        |     |     |     |                       |     |     |     |     |                       |     |     |     |     |

## Notes

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

•• Paper tape • Plastic tape



## SELECTION CHART

| DIELECTRIC                 |        | COG (NP0)             |     |     |     |      |                       |     |     |     |      |                       |     |     |     |
|----------------------------|--------|-----------------------|-----|-----|-----|------|-----------------------|-----|-----|-----|------|-----------------------|-----|-----|-----|
| STYLE                      |        | VJ1808 <sup>(1)</sup> |     |     |     |      | VJ1812 <sup>(1)</sup> |     |     |     |      | VJ1825 <sup>(1)</sup> |     |     |     |
| CASE CODE                  |        | 1808                  |     |     |     |      | 1812                  |     |     |     |      | 1825                  |     |     |     |
| VOLTAGE (V <sub>DC</sub> ) |        | 50                    | 100 | 200 | 500 | 1000 | 50                    | 100 | 200 | 500 | 1000 | 50                    | 100 | 200 | 500 |
| VOLTAGE CODE               |        | A                     | B   | C   | E   | G    | A                     | B   | C   | E   | G    | A                     | B   | C   | E   |
| CAP. CODE                  | CAP.   |                       |     |     |     |      |                       |     |     |     |      |                       |     |     |     |
| 1R0                        | 1.0 pF |                       |     |     |     |      |                       |     |     |     |      |                       |     |     |     |
| 1R2                        | 1.2 pF |                       |     |     |     |      |                       |     |     |     |      |                       |     |     |     |
| 1R5                        | 1.5 pF |                       |     |     |     |      |                       |     |     |     |      |                       |     |     |     |
| 1R8                        | 1.8 pF |                       |     |     |     |      |                       |     |     |     |      |                       |     |     |     |
| 2R2                        | 2.2 pF |                       |     |     |     |      |                       |     |     |     |      |                       |     |     |     |
| 2R7                        | 2.7 pF |                       |     |     |     |      |                       |     |     |     |      |                       |     |     |     |
| 3R3                        | 3.3 pF |                       |     |     |     |      |                       |     |     |     |      |                       |     |     |     |
| 3R9                        | 3.9 pF |                       |     |     |     |      |                       |     |     |     |      |                       |     |     |     |
| 4R7                        | 4.7 pF |                       |     |     |     |      |                       |     |     |     |      |                       |     |     |     |
| 5R6                        | 5.6 pF |                       |     |     |     |      |                       |     |     |     |      |                       |     |     |     |
| 6R8                        | 6.8 pF |                       |     |     |     |      |                       |     |     |     |      |                       |     |     |     |
| 8R2                        | 8.2 pF |                       |     |     |     |      |                       |     |     |     |      |                       |     |     |     |
| 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  |                       |     |     |     |      |                       |     |     |     |      |                       |     |     |     |

## Notes

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

- Plastic tape



| SELECTION CHART            |        |                       |     |     |     |     |      |                       |     |     |     |      |
|----------------------------|--------|-----------------------|-----|-----|-----|-----|------|-----------------------|-----|-----|-----|------|
| DIELECTRIC                 |        | C0G (NP0)             |     |     |     |     |      |                       |     |     |     |      |
| STYLE                      |        | VJ2220 <sup>(1)</sup> |     |     |     |     |      | VJ2225 <sup>(1)</sup> |     |     |     |      |
| CASE CODE                  |        | 2220                  |     |     |     |     |      | 2225                  |     |     |     |      |
| VOLTAGE (V <sub>DC</sub> ) |        | 50                    | 100 | 200 | 500 | 630 | 1000 | 50                    | 100 | 200 | 500 | 1000 |
| VOLTAGE CODE               |        | A                     | B   | C   | E   | L   | G    | A                     | B   | C   | E   | G    |
| CAP. CODE                  | CAP.   |                       |     |     |     |     |      |                       |     |     |     |      |
| 1R0                        | 1.0 pF |                       |     |     |     |     |      |                       |     |     |     |      |
| 1R2                        | 1.2 pF |                       |     |     |     |     |      |                       |     |     |     |      |
| 1R5                        | 1.5 pF |                       |     |     |     |     |      |                       |     |     |     |      |
| 1R8                        | 1.8 pF |                       |     |     |     |     |      |                       |     |     |     |      |
| 2R2                        | 2.2 pF |                       |     |     |     |     |      |                       |     |     |     |      |
| 2R7                        | 2.7 pF |                       |     |     |     |     |      |                       |     |     |     |      |
| 3R3                        | 3.3 pF |                       |     |     |     |     |      |                       |     |     |     |      |
| 3R9                        | 3.9 pF |                       |     |     |     |     |      |                       |     |     |     |      |
| 4R7                        | 4.7 pF |                       |     |     |     |     |      |                       |     |     |     |      |
| 5R6                        | 5.6 pF |                       |     |     |     |     |      |                       |     |     |     |      |
| 6R8                        | 6.8 pF |                       |     |     |     |     |      |                       |     |     |     |      |
| 8R2                        | 8.2 pF |                       |     |     |     |     |      |                       |     |     |     |      |
| 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  |                       |     |     |     |     |      | •                     |     |     |     |      |

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

- Plastic tape



| SELECTION CHART            |        |                        |    |    |     |        |    |    |     |     |        |    |    |    |     |     |
|----------------------------|--------|------------------------|----|----|-----|--------|----|----|-----|-----|--------|----|----|----|-----|-----|
| DIELECTRIC                 |        | X7R/X5R <sup>(1)</sup> |    |    |     |        |    |    |     |     |        |    |    |    |     |     |
| STYLE                      |        | VJ0402                 |    |    |     | VJ0603 |    |    |     |     | VJ0805 |    |    |    |     |     |
| CASE CODE                  |        | 0402                   |    |    |     | 0603   |    |    |     |     | 0805   |    |    |    |     |     |
| VOLTAGE (V <sub>DC</sub> ) |        | 16                     | 25 | 50 | 100 | 16     | 25 | 50 | 100 | 200 | 10     | 16 | 25 | 50 | 100 | 200 |
| VOLTAGE CODE               |        | J                      | X  | A  | B   | J      | X  | A  | B   | C   | Q      | J  | X  | A  | B   | C   |
| CAP. CODE                  | CAP.   |                        |    |    |     |        |    |    |     |     |        |    |    |    |     |     |
| 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 |                        |    |    |     |        |    |    |     |     | • X5R  |    |    |    |     |     |
| 684                        | 680 nF |                        |    |    |     |        |    |    |     |     | • X5R  |    |    |    |     |     |
| 824                        | 820 nF |                        |    |    |     |        |    |    |     |     | • X5R  |    |    |    |     |     |
| 105                        | 1.0 µF |                        |    |    |     |        |    |    |     |     | • X5R  |    |    |    |     |     |
| 125                        | 1.2 µF |                        |    |    |     |        |    |    |     |     |        |    |    |    |     |     |
| 155                        | 1.5 µF |                        |    |    |     |        |    |    |     |     |        |    |    |    |     |     |
| 185                        | 1.8 µF |                        |    |    |     |        |    |    |     |     |        |    |    |    |     |     |
| 225                        | 2.2 µF |                        |    |    |     |        |    |    |     |     |        |    |    |    |     |     |
| 275                        | 2.7 µF |                        |    |    |     |        |    |    |     |     |        |    |    |    |     |     |
| 335                        | 3.3 µF |                        |    |    |     |        |    |    |     |     |        |    |    |    |     |     |
| 395                        | 3.9 µF |                        |    |    |     |        |    |    |     |     |        |    |    |    |     |     |
| 475                        | 4.7 µF |                        |    |    |     |        |    |    |     |     |        |    |    |    |     |     |
| 565                        | 5.6 µF |                        |    |    |     |        |    |    |     |     |        |    |    |    |     |     |
| 685                        | 6.8 µF |                        |    |    |     |        |    |    |     |     |        |    |    |    |     |     |

**Notes**

<sup>(1)</sup> X5R (- 55 °C to + 85 °C TCC: ± 15 %) for all 0805/10 V ratings. All other values X7R.

•• Paper tape • Plastic tape



| SELECTION CHART            |        |                       |    |    |     |     |     |     |     |                       |    |    |     |     |     |     |     |
|----------------------------|--------|-----------------------|----|----|-----|-----|-----|-----|-----|-----------------------|----|----|-----|-----|-----|-----|-----|
| DIELECTRIC                 |        | X7R                   |    |    |     |     |     |     |     |                       |    |    |     |     |     |     |     |
| STYLE                      |        | VJ1206 <sup>(1)</sup> |    |    |     |     |     |     |     | VJ1210 <sup>(1)</sup> |    |    |     |     |     |     |     |
| CASE CODE                  |        | 1206 <sup>(1)</sup>   |    |    |     |     |     |     |     | 1210 <sup>(1)</sup>   |    |    |     |     |     |     |     |
| VOLTAGE (V <sub>DC</sub> ) |        | 16                    | 25 | 50 | 100 | 200 | 250 | 500 | 630 | 16                    | 25 | 50 | 100 | 200 | 250 | 500 | 630 |
| VOLTAGE CODE               |        | J                     | X  | A  | B   | C   | P   | E   | L   | J                     | X  | A  | B   | C   | P   | E   | L   |
| CAP. CODE                  | CAP.   |                       |    |    |     |     |     |     |     |                       |    |    |     |     |     |     |     |
| 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 |                       |    |    |     |     |     |     |     |                       |    |    |     |     |     |     |     |
| 275                        | 2.7 µF |                       |    |    |     |     |     |     |     |                       |    |    |     |     |     |     |     |
| 335                        | 3.3 µF |                       |    |    |     |     |     |     |     |                       |    |    |     |     |     |     |     |
| 395                        | 3.9 µF |                       |    |    |     |     |     |     |     |                       |    |    |     |     |     |     |     |
| 475                        | 4.7 µF |                       |    |    |     |     |     |     |     |                       |    |    |     |     |     |     |     |
| 565                        | 5.6 µF |                       |    |    |     |     |     |     |     |                       |    |    |     |     |     |     |     |
| 685                        | 6.8 µF |                       |    |    |     |     |     |     |     |                       |    |    |     |     |     |     |     |

## Notes

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

•• Paper tape • Plastic tape



## SELECTION CHART

| DIELECTRIC                 |        | X7R                   |     |     |     |      |                       |    |     |     |     |     |     |      |                       |    |     |     |     |     |      |
|----------------------------|--------|-----------------------|-----|-----|-----|------|-----------------------|----|-----|-----|-----|-----|-----|------|-----------------------|----|-----|-----|-----|-----|------|
| STYLE                      |        | VJ1808 <sup>(1)</sup> |     |     |     |      | VJ1812 <sup>(1)</sup> |    |     |     |     |     |     |      | VJ1825 <sup>(1)</sup> |    |     |     |     |     |      |
| CASE CODE                  |        | 1808                  |     |     |     |      | 1812                  |    |     |     |     |     |     |      | 1825                  |    |     |     |     |     |      |
| VOLTAGE (V <sub>DC</sub> ) |        | 50                    | 100 | 200 | 500 | 1000 | 25                    | 50 | 100 | 200 | 250 | 500 | 630 | 1000 | 25                    | 50 | 100 | 200 | 250 | 500 | 1000 |
| VOLTAGE CODE               |        | A                     | B   | C   | E   | G    | X                     | A  | B   | C   | P   | E   | L   | G    | X                     | A  | B   | C   | P   | E   | G    |
| CAP. CODE                  | CAP.   |                       |     |     |     |      |                       |    |     |     |     |     |     |      |                       |    |     |     |     |     |      |
| 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 |                       |     |     |     |      |                       |    |     |     |     |     |     |      | •                     |    |     |     |     |     |      |
| 275                        | 2.7 μF |                       |     |     |     |      |                       |    |     |     |     |     |     |      | •                     |    |     |     |     |     |      |
| 335                        | 3.3 μF |                       |     |     |     |      |                       |    |     |     |     |     |     |      |                       |    |     |     |     |     |      |
| 395                        | 3.9 μF |                       |     |     |     |      |                       |    |     |     |     |     |     |      |                       |    |     |     |     |     |      |
| 475                        | 4.7 μF |                       |     |     |     |      |                       |    |     |     |     |     |     |      |                       |    |     |     |     |     |      |
| 565                        | 5.6 μF |                       |     |     |     |      |                       |    |     |     |     |     |     |      |                       |    |     |     |     |     |      |
| 685                        | 6.8 μF |                       |     |     |     |      |                       |    |     |     |     |     |     |      |                       |    |     |     |     |     |      |

## Notes

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

- Plastic tape



## SELECTION CHART

| DIELECTRIC                 |        | X7R                   |     |     |     |                       |    |     |     |     |      |                       |    |     |     |     |
|----------------------------|--------|-----------------------|-----|-----|-----|-----------------------|----|-----|-----|-----|------|-----------------------|----|-----|-----|-----|
| STYLE                      |        | VJ2220 <sup>(1)</sup> |     |     |     | VJ2225 <sup>(1)</sup> |    |     |     |     |      | VJ3640 <sup>(1)</sup> |    |     |     |     |
| CASE CODE                  |        | 2220                  |     |     |     | 2225                  |    |     |     |     |      | 3640                  |    |     |     |     |
| VOLTAGE (V <sub>DC</sub> ) |        | 50                    | 100 | 200 | 500 | 25                    | 50 | 100 | 200 | 500 | 1000 | 25                    | 50 | 100 | 200 | 500 |
| VOLTAGE CODE               |        | A                     | B   | C   | E   | X                     | A  | B   | C   | E   | G    | X                     | A  | B   | C   | E   |
| CAP. CODE                  | CAP.   |                       |     |     |     |                       |    |     |     |     |      |                       |    |     |     |     |
| 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 | •                     | •   | •   | •   | •                     | •  | •   | •   | •   | •    | •                     | •  | •   | •   | •   |
| 275                        | 2.7 µF | •                     | •   | •   | •   | •                     | •  | •   | •   | •   | •    | •                     | •  | •   | •   | •   |
| 335                        | 3.3 µF | •                     | •   | •   | •   | •                     | •  | •   | •   | •   | •    | •                     | •  | •   | •   | •   |
| 395                        | 3.9 µF | •                     | •   | •   | •   | •                     | •  | •   | •   | •   | •    | •                     | •  | •   | •   | •   |
| 475                        | 4.7 µF | •                     | •   | •   | •   | •                     | •  | •   | •   | •   | •    | •                     | •  | •   | •   | •   |
| 565                        | 5.6 µF | •                     | •   | •   | •   | •                     | •  | •   | •   | •   | •    | •                     | •  | •   | •   | •   |
| 685                        | 6.8 µF | •                     | •   | •   | •   | •                     | •  | •   | •   | •   | •    | •                     | •  | •   | •   | •   |

## Notes

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

- Plastic tape



COG (NP0) DIELECTRIC - TYPICAL PARAMETERS



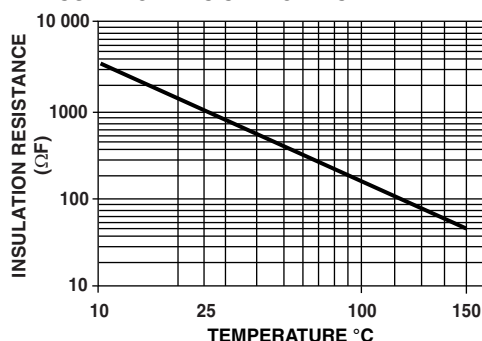


## X7R/X5R DIELECTRIC - TYPICAL PARAMETERS

TEMPERATURE COEFFICIENT OF CAPACITANCE



INSULATION RESISTANCE VS. TEMPERATURE



DISSIPATION FACTOR VS. TEMPERATURE



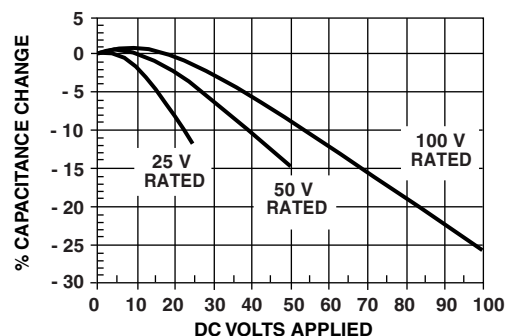
AGING RATE



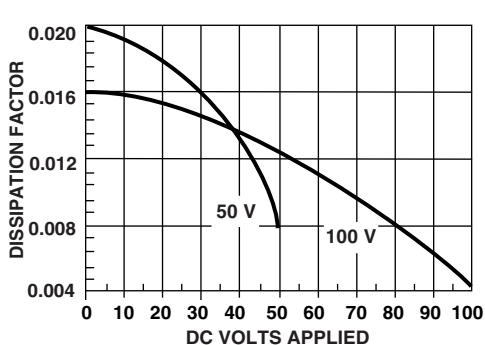
RATED VOLTAGE VS. TEMPERATURE



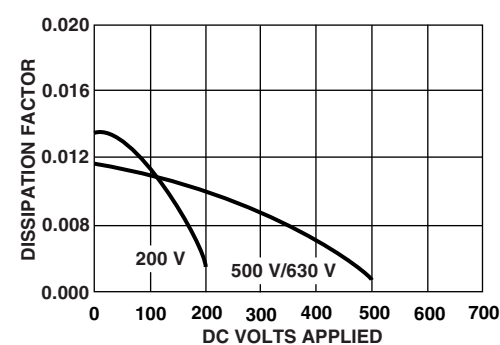
VOLTAGE COEFFICIENT OF CAPACITANCE



DISSIPATION FACTOR VS. VOLTAGE



DISSIPATION FACTOR VS. VOLTAGE





| STANDARD PACKAGING QUANTITIES (1)(2)(3) |           |                                         |                                       |                                         |                                       |
|-----------------------------------------|-----------|-----------------------------------------|---------------------------------------|-----------------------------------------|---------------------------------------|
| CASE CODE                               | TAPE SIZE | 7" REEL QUANTITIES                      |                                       | 11 1/4" AND 13" REEL QUANTITIES         |                                       |
|                                         |           | PAPER TAPE<br>PACKAGING CODE<br>"C"/"O" | PLASTIC TAPE<br>PACKAGING CODE<br>"T" | PAPER TAPE<br>PACKAGING CODE<br>"P"/"I" | PLASTIC TAPE<br>PACKAGING CODE<br>"R" |
| 0402                                    | 8 mm      | 5000                                    | n/a                                   | 10 000                                  | n/a                                   |
| 0603 (4)                                | 8 mm      | 4000                                    | 4000                                  | 10 000                                  | 10 000                                |
| 0805 (4)                                | 8 mm      | 3000                                    | 3000                                  | 10 000                                  | 10 000                                |
| 1206 (4)                                | 8 mm      | 3000                                    | 3000/2500                             | 10 000                                  | 10 000/9000                           |
| 1210 (4)                                | 8 mm      | n/a                                     | 3000/2500/2000                        | n/a                                     | 10 000/9000                           |
| 1808                                    | 12 mm     | n/a                                     | 2000                                  | n/a                                     | 10 000                                |
| 1812                                    | 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                                  |
| 3640                                    | 16 mm     | n/a                                     | 500                                   | n/a                                     | n/a                                   |

**Notes**

(1) Vishay Vitramon uses embossed plastic carrier tape

(2) REFERENCE: EIA standard RS 481 - "Taping of Surface Mount Components for Automatic Placement"

(3) N/A = Not available

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

**STORAGE AND HANDLING CONDITIONS**

(1) Store the components at 5 °C to + 40 °C ambient temperature and ≤ 70 % related humidity conditions.

(2) The product is recommended to be used within a time-frame of 2 years after shipment.

Check solderability in case extended shelf life beyond the expiry date is needed.

**Precautions:**

- 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.
- Store products on the shelf and avoid exposure to moisture or dust.
- Do not expose products to excessive shock, vibration, direct sunlight and so on.



## RoHS COMPLIANCE UPDATE

---

**The RoHS compliance of the parts in this datasheet is currently under review. For more information, please contact your local Vishay sales representative.**



## 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