



# Surface Mount Multilayer Ceramic Chip Capacitors for High Frequency Applications



## FEATURES

- Ultra-stable dielectric offering a Temperature Coefficient of Capacitance (TCC) of 0 ppm/°C ± 30 ppm/°C over the entire temperature range
- Low Dissipation Factor (DF)
- Wet build process
- Reliable Noble Metal Electrode (NME) system
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
**GREEN**  
(5-2008)  
Available

## APPLICATIONS

- Ideal for critical timing applications
- Ideal for tuning applications

## ELECTRICAL SPECIFICATIONS

### Note

- Electrical characteristics at + 25 °C unless otherwise specified.

**Operating Temperature:** - 55 °C to + 150 °C

**Voltage Range:** 50 V<sub>DC</sub> to 200 V<sub>DC</sub>

**Capacitance Range:** 1.0 pF to 220 pF

**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

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

**Insulation Resistance (IR):**

At + 25 °C and rated voltage 100 000 MΩ minimum or, 1000 ΩF whichever is less.

At + 125 °C and rated voltage 10 000 MΩ minimum or 100 ΩF, whichever is less.

**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

| QUICK REFERENCE DATA |      |                     |             |         |
|----------------------|------|---------------------|-------------|---------|
| DIELECTRIC           | CASE | MAXIMUM VOLTAGE (V) | CAPACITANCE |         |
|                      |      |                     | MINIMUM     | MAXIMUM |
| HIGH Q<br>COG (NP0)  | 0603 | 100                 | 1.0 pF      | 100 pF  |
|                      | 0805 | 200                 | 1.0 pF      | 220 pF  |

**Note**

- Detail ratings see “Selection Chart”

| ORDERING INFORMATION |            |  |   |  |                                    |              |  |                    |
|----------------------|------------|--|---|--|------------------------------------|--------------|--|--------------------|
| VJ0805               | Q          | 101  | K   | X  | A                                  | A            | C  | ### <sup>(2)</sup> |
| CASE CODE            | DIELECTRIC | CAPACITANCE NOMINAL CODE   | CAPACITANCE TOLERANCE   | TERMINATION  | DC VOLTAGE RATING <sup>(1)</sup>   | MARKING      | PACKAGING  | PROCESS CODE       |
| 0603<br>0805         | Q = HIGH Q | Expressed in picofarads (pF). The first two digits are significant, the third is a multiplier. An “R” indicates a decimal point.<br><b>Examples:</b><br>101 = 100 pF<br>1R8 = 1.8 pF | B = ± 0.10 pF<br>C = ± 0.25 pF<br>D = ± 0.5 pF<br>F = ± 1 %<br>G = ± 2 %<br>J = ± 5 %<br>K = ± 10 %<br><b>Note</b><br>B, C, D < 10 pF<br>F, G, J, K ≥ 10 pF | X = Ni barrier<br>100 % tin plated<br>F, E = AgPd <sup>(3)</sup> | A = 50 V<br>B = 100 V<br>C = 200 V | A = Unmarked | C = 7" reel/paper tape<br>O = reel/flamed paper tape<br>I = 11 1/4"/13" reel/flamed paper tape<br>P = 11 1/4"/13" reel/paper tape<br><b>Note</b><br>“O” and “I” are used for “F” and “E” termination |                    |

**Notes**

- Size 0402 available with Vishay Basic Commodity series, see datasheet: [www.vishay.com/doc?28534](http://www.vishay.com/doc?28534)
- (1) DC voltage rating should not be exceeded in application. Other application factors may affect the MLCC performance. Consult for questions: [mlcc@vishay.com](mailto:mlcc@vishay.com)
- (2) Process code may be added with up to three digits, used to control non-standard products and /or special requirements.
- (3) Termination code “E” is for conductive epoxy assembly.

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

| DIMENSIONS in inches (millimeters) |        |                                |                                |                       |                 |                 |
|------------------------------------|--------|--------------------------------|--------------------------------|-----------------------|-----------------|-----------------|
|                                    |        |                                |                                |                       |                 |                 |
| CASE CODE                          | STYLE  | LENGTH (L)                     | WIDTH (W)                      | MAXIMUM THICKNESS (T) | TERMINATION (P) |                 |
|                                    |        |                                |                                |                       | MINIMUM         | MAXIMUM         |
| 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) | 0.022<br>(0.55) |
| 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) | 0.030<br>(0.76) |



| SELECTION CHART            |        |        |     |        |     |     |
|----------------------------|--------|--------|-----|--------|-----|-----|
| DIELECTRIC                 |        | HIGH Q |     |        |     |     |
| STYLE                      |        | VJ0603 |     | VJ0805 |     |     |
| CASE CODE                  |        | 0603   |     | 0805   |     |     |
| VOLTAGE (V <sub>DC</sub> ) |        | 50     | 100 | 50     | 100 | 200 |
| VOLTAGE CODE               |        | A      | B   | A      | B   | C   |
| 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 |        |     | ••     | ••  |     |

**Notes**

- RoHS-compliant
- Available in paper carrier tape only

| HIGH Q PACKAGING QUANTITIES (1) |           |                           |                                 |
|---------------------------------|-----------|---------------------------|---------------------------------|
| CASE CODE                       | TAPE SIZE | 7" REEL QUANTITIES        | 11 1/4" AND 13" REEL QUANTITIES |
|                                 |           | PACKAGING CODE<br>"C"/"O" | PACKAGING CODE<br>"P"/"I"       |
| 0603                            | 8 mm      | 4000                      | 10 000                          |
| 0805                            | 8 mm      | 3000                      | 10 000                          |

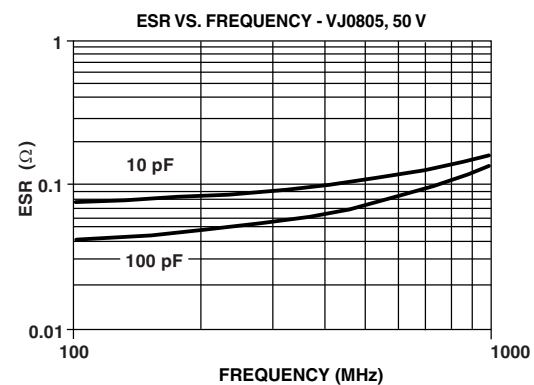
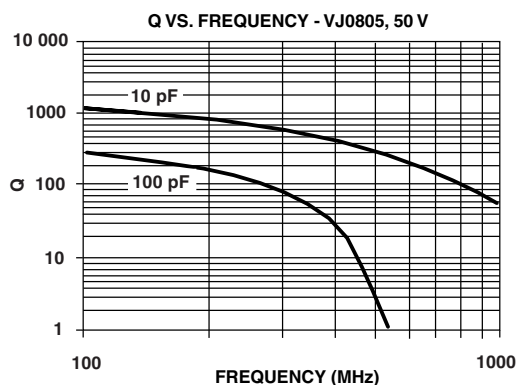
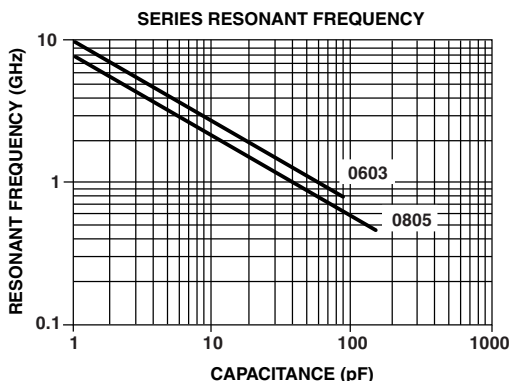
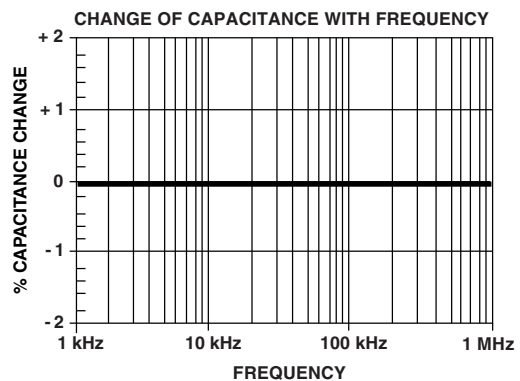
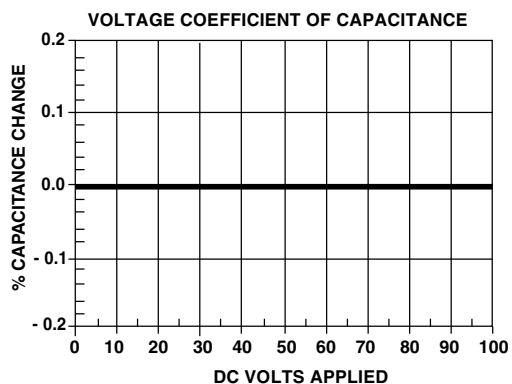
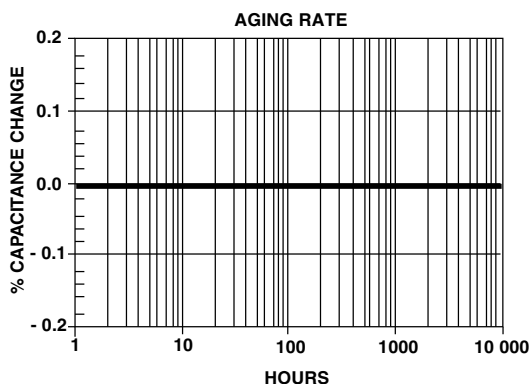
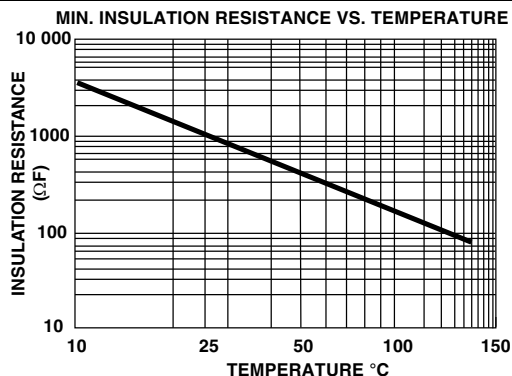
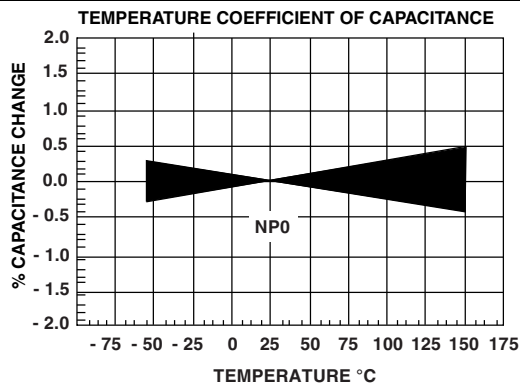
**Note**

(1) Reference: EIA standard RS481 - "Taping of Surface Mount Components for Automatic Placement"

| STORAGE AND HANDLING CONDITIONS   |
|---|
| <p>(1) Store the components at 5 °C to + 40 °C ambient temperature and ≤ 70 % related humidity conditions.</p> <p>(2) The product is recommended to be used within a time-frame of 2 years after shipment.<br/>Check solderability in case extended shelf life beyond the expiry date is needed.</p> <p>Precautions:</p> <ol style="list-style-type: none"> <li>a. Do not store products in an environment containing corrosive elements, especially where chloride gas, sulfide gas, acid, alkali, salt or the like are present. This may cause corrosion or oxidization of the terminations, which can easily lead to poor soldering.</li> <li>b. Store products on the shelf and avoid exposure to moisture or dust.</li> <li>c. Do not expose products to excessive shock, vibration, direct sunlight and so on.</li> </ol> |



HIGH Q DIELECTRIC - TYPICAL PARAMETERS





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