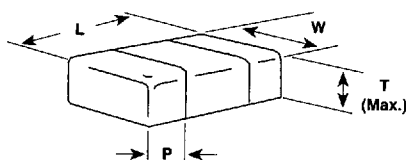
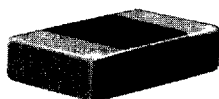


# NPO DIELECTRIC - HIGH VOLTAGE Ceramic Capacitors

## Monolithic Chips, Surge Suppression



### FEATURES

- High voltage ratings
- Stable NPO dielectric
- Ideal for snubber and surge suppression applications

| DIMENSIONS [Numbers in brackets indicate millimeters] |        |                           |                           |                    |             |             |
|---|--------|---------------------------|---------------------------|--------------------|-------------|-------------|
| E.I.A. TYPE   | STYLE  | LENGTH (L)                | WIDTH (W)                 | THICKNESS (T) Max. | TERM. (P)   |             |
|   |        |                           |                           |                    | Min.        | Max.        |
| 0603  | VJ0603 | .063 ± .005 [1.60 ± 0.12] | .031 ± .005 [0.80 ± 0.12] | .035 [0.89]        | .005 [0.12] | .015 [0.38] |
| 0805  | VJ0805 | .079 ± .008 [2.00 ± 0.20] | .049 ± .008 [1.25 ± 0.20] | .051 [1.30]        | .010 [0.25] | .028 [0.71] |
| 1206  | VJ1206 | .126 ± .008 [3.20 ± 0.20] | .063 ± .008 [1.60 ± 0.20] | .059 [1.50]        | .010 [0.25] | .028 [0.71] |
| 1210  | VJ1210 | .126 ± .008 [3.20 ± 0.20] | .098 ± .008 [2.50 ± 0.20] | .059 [1.50]        | .010 [0.25] | .028 [0.71] |
| —   | VJ1808 | .180 ± .010 [4.57 ± 0.25] | .080 ± .010 [2.03 ± 0.25] | .065 [1.65]        | .010 [0.25] | .030 [0.76] |
| 1812  | VJ1812 | .177 ± .010 [4.50 ± 0.25] | .126 ± .008 [3.20 ± 0.20] | .067 [1.70]        | .010 [0.25] | .030 [0.76] |
| 1825  | VJ1825 | .177 ± .010 [4.50 ± 0.25] | .252 ± .010 [6.40 ± 0.25] | .067 [1.70]        | .010 [0.25] | .030 [0.76] |
| —   | VJ2225 | .220 ± .010 [5.59 ± 0.25] | .250 ± .010 [6.35 ± 0.25] | .070 [1.78]        | .010 [0.25] | .030 [0.76] |

| PART NUMBERING SYSTEM |   |                            |                        |
|-----------------------|---|----------------------------|------------------------|
| <b>VJ1812</b>         | Style   |                            |                        |
| <b>A</b>              | Temperature Characteristic: A = NPO.  |                            |                        |
| <b>102</b>            | <b>Capacitance:</b><br>Expressed in picofarads (pF). The first two digits are significant figures. The last digit is the number of zeros to follow. An R denotes a decimal point in which case all figures are significant. (See Capacitance Codes on next page.) <b>Example:</b> Capacitance Code 102 = 1000 pF. |                            |                        |
| <b>K</b>              | <b>Capacitance Tolerance:</b><br>G = ± 2%.<br>J = ± 5%.<br>K = ± 10%.   |                            |                        |
| <b>X</b>              | <b>Termination Material:</b><br>X = Nickel Barrier, Tin Plated Finish.<br>F = Palladium Silver.   |                            |                        |
| <b>E</b>              | <b>Voltage:</b> C = 200V. E = 500V. G = 1000V.  |                            |                        |
| <b>A</b>              | <b>Marking Options:</b>   |                            |                        |
|                       |   | No Marking<br>Use Code "A" | Marked<br>Use Code "M" |
|                       | 0603  | ✓                          |                        |
|                       | All Other Sizes   | ✓                          | ✓                      |
| <b>T</b>              | <b>Packaging Options:</b><br>Tape and Reel Packaging per EIA-481A:<br>T = 7" Reel, Plastic Tape. C = 7" Reel, Paper Tape.<br>R = 13" Reel, Plastic Tape. P = 13" Reel, Paper Tape.<br>Bulk Packaging: B = Bulk, Plastic Vials.  |                            |                        |

### GENERAL SPECIFICATIONS

Electrical characteristics @ + 25°C unless otherwise specified.

#### Capacitance Range:

1 pF to .039 μF.

#### Capacitance Tolerance:

G = ± 2%.

J = ± 5%.

K = ± 10%.

#### Operating Temperature Range:

- 55°C to + 125°C.

#### Temperature Characteristic:

0 ± 30PPM/°C.

#### Voltage Ratings:

200, 500, 1000 Vdc @ + 125°C.

#### Dissipation Factor:

0.1% (max.) @ 1.0 Vrms and 1 kHz for values > 1000 pF and @ 1.0 Vrms and 1MHz for values ≤ 1000 pF.

#### Insulation Resistance @ + 25°C and Rated Vdc:

100,000 Megohms (min.) or 1000 ohm-farads (min.), whichever is less.

#### Insulation Resistance @ + 125°C and Rated Vdc:

10,000 Megohms (min.) or 100 ohm-farads (min.), whichever is less.

#### Dielectric Withstanding Voltage:

(200V) 250%, (500V) 200%, (1000V) 150% of rated voltage for 5 ± 1 seconds, 50 milliamps (max.).

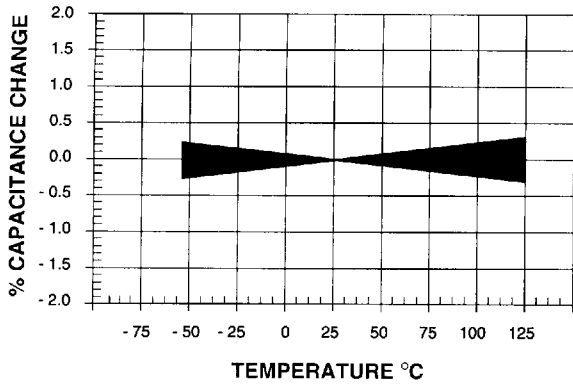
**NPO DIELECTRIC - HIGH VOLTAGE**

| STYLE            | VJ0603      | VJ0805 | VJ1206 | VJ1210 | VJ1808 | VJ1812 | VJ1825* | VJ2225* |     |     |      |     |     |      |     |     |     |     |
|------------------|-------------|--------|--------|--------|--------|--------|---------|---------|-----|-----|------|-----|-----|------|-----|-----|-----|-----|
| E.I.A. TYPE      | 0603        | 0805   | 1206   | 1210   | —      | 1812   | 1825    | —       |     |     |      |     |     |      |     |     |     |     |
| Voltage (Vdc)    | 200         | —      | 200    | 500    | 200    | 500    | 200     | 500     | 200 | 500 | 1000 | 200 | 500 | 1000 | 200 | 500 | 200 | 500 |
| Capacitance Code | Capacitance |        |        |        |        |        |         |         |     |     |      |     |     |      |     |     |     |     |
| 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              | 1000 pF     |        |        |        |        |        |         |         |     |     |      |     |     |      |     |     |     |     |
| 122              | 1200 pF     |        |        |        |        |        |         |         |     |     |      |     |     |      |     |     |     |     |
| 152              | 1500 pF     |        |        |        |        |        |         |         |     |     |      |     |     |      |     |     |     |     |
| 182              | 1800 pF     |        |        |        |        |        |         |         |     |     |      |     |     |      |     |     |     |     |
| 222              | 2200 pF     |        |        |        |        |        |         |         |     |     |      |     |     |      |     |     |     |     |
| 272              | 2700 pF     |        |        |        |        |        |         |         |     |     |      |     |     |      |     |     |     |     |
| 332              | 3300 pF     |        |        |        |        |        |         |         |     |     |      |     |     |      |     |     |     |     |
| 392              | 3900 pF     |        |        |        |        |        |         |         |     |     |      |     |     |      |     |     |     |     |
| 472              | 4700 pF     |        |        |        |        |        |         |         |     |     |      |     |     |      |     |     |     |     |
| 562              | 5600 pF     |        |        |        |        |        |         |         |     |     |      |     |     |      |     |     |     |     |
| 682              | 6800 pF     |        |        |        |        |        |         |         |     |     |      |     |     |      |     |     |     |     |
| 822              | 8200 pF     |        |        |        |        |        |         |         |     |     |      |     |     |      |     |     |     |     |
| 103              | .010 μF     |        |        |        |        |        |         |         |     |     |      |     |     |      |     |     |     |     |
| 123              | .012 μF     |        |        |        |        |        |         |         |     |     |      |     |     |      |     |     |     |     |
| 153              | .015 μF     |        |        |        |        |        |         |         |     |     |      |     |     |      |     |     |     |     |
| 183              | .018 μF     |        |        |        |        |        |         |         |     |     |      |     |     |      |     |     |     |     |
| 223              | .022 μF     |        |        |        |        |        |         |         |     |     |      |     |     |      |     |     |     |     |
| 273              | .027 μF     |        |        |        |        |        |         |         |     |     |      |     |     |      |     |     |     |     |
| 333              | .033 μF     |        |        |        |        |        |         |         |     |     |      |     |     |      |     |     |     |     |
| 393              | .039 μF     |        |        |        |        |        |         |         |     |     |      |     |     |      |     |     |     |     |
| 473              | .047 μF     |        |        |        |        |        |         |         |     |     |      |     |     |      |     |     |     |     |
| 563              | .056 μF     |        |        |        |        |        |         |         |     |     |      |     |     |      |     |     |     |     |

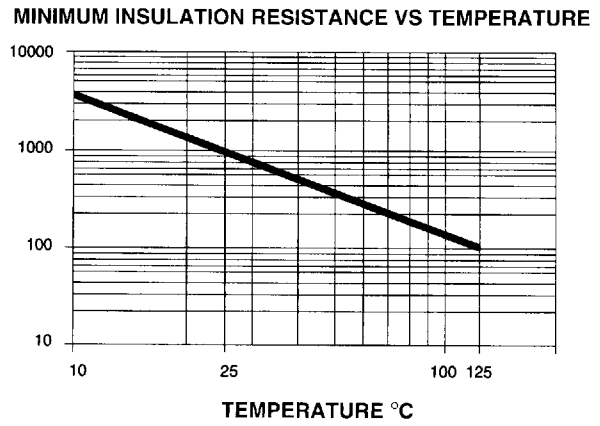
\* IR and Vapor Phase soldering only recommended.

**NPO DIELECTRIC - HIGH VOLTAGE - TYPICAL PARAMETERS**

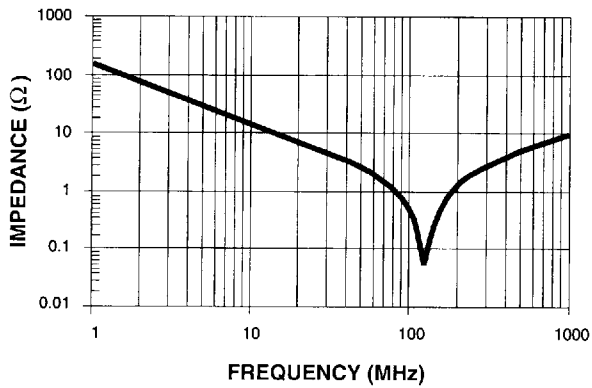
**TEMPERATURE COEFFICIENT OF CAPACITANCE**



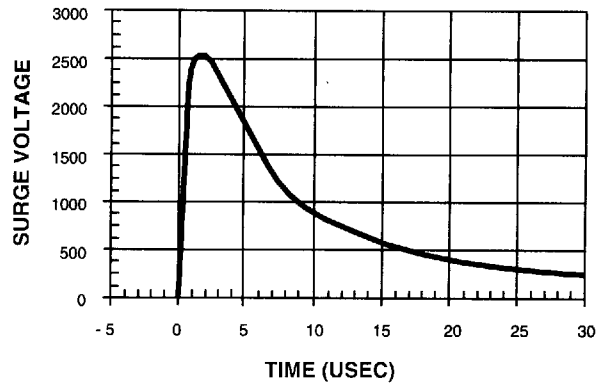
**MINIMUM INSULATION RESISTANCE VS TEMPERATURE**



**IMPEDANCE VS FREQUENCY  
1000V RATED - NPO**



**SURGE WAVEFORM  
2500V, 2/10USEC, 500 AMPS**



**VOLTAGE COEFFICIENT OF CAPACITANCE  
1000V RATED**

