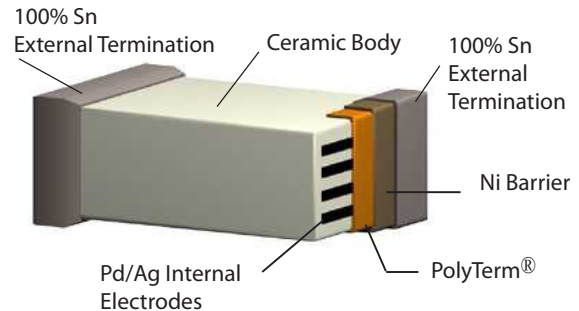


## HIGH VOLTAGE POLYTERM<sup>®</sup> CERAMIC CAPACITORS

Standard MLCCs are prone to cracking due to mishandling, depanelization, and board flexing. In response to customer requests for higher resistance to mechanical stress, and as a result of continuous efforts to improve our products, JDI has introduced PolyTerm<sup>®</sup> termination ceramic capacitors to meet those customer requirements for increased resistance to flexure cracking.

PolyTerm<sup>®</sup> is a conductive epoxy termination material loaded with silver, allowing it to absorb much more bending force than standard termination material. After termination PolyTerm<sup>®</sup> parts are nickel and tin plated using the same process as standard parts. There is no effect on solderability or capability to withstand the soldering process.

PolyTerm<sup>®</sup> capacitors are ideal for use in telecom, power supply, inverter, and modem applications.



### FEATURES

- Lead Free Terminations 100% Sn, Final Termination
- Electrodes: Pd/Ag
- Core Termination: PolyTerm<sup>®</sup>
- Middle Barrier Layer: Ni
- External Termination Layer: 100% Sn
- NP0 and X7R temperature coefficient
- Highly reliable performance
- Industry standard case sizes

### HOW TO ORDER

| 302   | R29  | N                  | 1R0  | C   | F                         | 4              | E                                   |
|---|--|--------------------|--|---|---------------------------|----------------|-------------------------------------|
| <b>VOLTAGE</b>  | <b>CASE SIZE</b>   | <b>DIELECTRIC</b>  | <b>CAPACITANCE</b>   | <b>TOLERANCE</b>  | <b>TERMINATION</b>        | <b>MARKING</b> | <b>TAPE CODE</b>                    |
| 1st two digits are significant; third digit denotes number of zeros to follow<br>eg:<br>302 = 3000 VDCW   | R15 = 0805<br>R18 = 1206<br>S41 = 1210<br>S43 = 1812<br>S47 = 2220<br>S48 = 2225<br>S49 = 1825 | N = NP0<br>W = X7R | 1st two digits are significant; third digit denotes number of zeros to follow<br>eg: 101 = 100 pF<br><br>R denotes decimal<br>eg: 1R0 = 1.0 pF | B = ± 0.1 pF<br>C = ± 0.25 pF<br>D = ± 0.5 pF<br>J = ± 5%<br>K = ± 10%<br>M = ± 20% | F = PolyTerm <sup>®</sup> | 4 = Unmarked   | E = 7" Plastic<br>T = Paper 7" reel |
| <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;">                     Safety Certified capacitor p/ns end with "****-SC" and are rated at 250 Volts AC.<br/>                     Example Part Number: 302R29N1R0CF4E                 </div> |  |                    |  |   |                           |                |                                     |

**HIGH VOLTAGE POLYTERM® AVAILABILITY - NPO DIELECTRIC**

| SIZE   | 0805 |      |       | 1206 |      |       |       |       | 1210 |      |       |       |       | 1808 |      |       |       |       |       | 1812  |      |      |      |      |       | 2211  |       |       |       |    |  |
|--------|------|------|-------|------|------|-------|-------|-------|------|------|-------|-------|-------|------|------|-------|-------|-------|-------|-------|------|------|------|------|-------|-------|-------|-------|-------|----|--|
|        | 500V | 630V | 1000V | 500V | 630V | 1000V | 2000V | 3000V | 500V | 630V | 1000V | 2000V | 3000V | 500V | 630V | 1000V | 2000V | 3000V | 4000V | 5000V | X2Y3 | X1Y2 | 500V | 630V | 1000V | 2000V | 3000V | 4000V | 5000V | Y2 |  |
| 1.0 pF |      |      |       |      |      |       |       |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |    |  |
| 10 pF  |      |      |       |      |      |       |       |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |    |  |
| 12 pF  |      |      |       |      |      |       |       |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |    |  |
| 15 pF  |      |      |       |      |      |       |       |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |    |  |
| 18 pF  |      |      |       |      |      |       |       |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |    |  |
| 22 pF  |      |      |       |      |      |       |       |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |    |  |
| 27 pF  |      |      |       |      |      |       |       |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |    |  |
| 33 pF  |      |      |       |      |      |       |       |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |    |  |
| 39 pF  |      |      |       |      |      |       |       |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |    |  |
| 47 pF  |      |      |       |      |      |       |       |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |    |  |
| 56 pF  |      |      |       |      |      |       |       |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |    |  |
| 68 pF  |      |      |       |      |      |       |       |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |    |  |
| 82 pF  |      |      |       |      |      |       |       |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |    |  |
| 100 pF |      |      |       |      |      |       |       |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |    |  |
| 120 pF |      |      |       |      |      |       |       |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |    |  |
| 150 pF |      |      |       |      |      |       |       |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |    |  |
| 180 pF |      |      |       |      |      |       |       |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |    |  |
| 220 pF |      |      |       |      |      |       |       |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |    |  |
| 270 pF |      |      |       |      |      |       |       |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |    |  |
| 330 pF |      |      |       |      |      |       |       |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |    |  |
| 390 pF |      |      |       |      |      |       |       |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |    |  |
| 470 pF |      |      |       |      |      |       |       |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |    |  |
| 560 pF |      |      |       |      |      |       |       |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |    |  |
| 680 pF |      |      |       |      |      |       |       |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |    |  |
| 820 pF |      |      |       |      |      |       |       |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |    |  |
| 1.0 nF |      |      |       |      |      |       |       |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |    |  |
| 1.2 nF |      |      |       |      |      |       |       |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |    |  |
| 1.5 nF |      |      |       |      |      |       |       |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |    |  |
| 1.8 nF |      |      |       |      |      |       |       |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |    |  |
| 2.2 nF |      |      |       |      |      |       |       |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |    |  |
| 2.7 nF |      |      |       |      |      |       |       |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |    |  |
| 3.3 nF |      |      |       |      |      |       |       |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |    |  |
| 3.9 nF |      |      |       |      |      |       |       |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |    |  |
| 4.7 nF |      |      |       |      |      |       |       |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |    |  |
| 5.6 nF |      |      |       |      |      |       |       |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |    |  |
| 6.8 nF |      |      |       |      |      |       |       |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |    |  |
| 8.2 nF |      |      |       |      |      |       |       |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |    |  |
| 10 nF  |      |      |       |      |      |       |       |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |    |  |

Note: Part values marked with "." have better availability and shorter lead times.

**HIGH VOLTAGE POLYTERM® AVAILABILITY - NPO DIELECTRIC**

| SIZE   | 1825 |      |       |       |       |       |       | 2220 |      |       |       |       |       |       | 2225 |      |       |       |       |       |       |  |
|--------|------|------|-------|-------|-------|-------|-------|------|------|-------|-------|-------|-------|-------|------|------|-------|-------|-------|-------|-------|--|
|        | 500V | 630V | 1000V | 2000V | 3000V | 4000V | 5000V | 500V | 630V | 1000V | 2000V | 3000V | 4000V | 5000V | 500V | 630V | 1000V | 2000V | 3000V | 4000V | 5000V |  |
| 1.0 pF |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 10 pF  |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 15 pF  |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 18 pF  |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 22 pF  |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 27 pF  |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 33 pF  |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 47 pF  |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 56 pF  |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 68 pF  |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 82 pF  |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 100 pF |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 150 pF |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 180 pF |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 220 pF |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 270 pF |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 330 pF |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 470 pF |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 560 pF |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 680 pF |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 820 pF |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 1.0 nF |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 1.2 nF |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 1.5 nF |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 1.8 nF |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 2.2 nF |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 2.7 nF |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 3.3 nF |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 4.7 nF |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 5.6 nF |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 6.8 nF |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 8.2 nF |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 10 nF  |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 12 nF  |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 15 nF  |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 18 nF  |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 22 nF  |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 27 nF  |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 33 nF  |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 39 nF  |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |
| 47 nF  |      |      |       |       |       |       |       |      |      |       |       |       |       |       |      |      |       |       |       |       |       |  |

Note: Part values marked with '\*' have better availability and shorter lead times.

**HIGH VOLTAGE POLYTERM® AVAILABILITY - X7R DIELECTRIC**

| SIZE   | 0805 |      |       | 1206 |      |       | 1210  |       |      | 1808 |       |       |       |       | 1812  |      |      |      |      | 2211  |       |       |       |       |      |    |
|--------|------|------|-------|------|------|-------|-------|-------|------|------|-------|-------|-------|-------|-------|------|------|------|------|-------|-------|-------|-------|-------|------|----|
|        | 500V | 630V | 1000V | 500V | 630V | 1000V | 2000V | 3000V | 500V | 630V | 1000V | 2000V | 3000V | 4000V | 5000V | X2Y3 | X1Y2 | 500V | 630V | 1000V | 2000V | 3000V | 4000V | 5000V | X2Y3 | Y2 |
| 100 pF |      |      |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |      |    |
| 150 pF |      |      |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |      |    |
| 180 pF |      |      |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |      |    |
| 220 pF |      |      |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |      |    |
| 270 pF |      |      |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |      |    |
| 330 pF |      |      |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |      |    |
| 470 pF |      |      |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |      |    |
| 560 pF |      |      |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |      |    |
| 680 pF |      |      |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |      |    |
| 820 pF |      |      |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |      |    |
| 1.0 nF | *    | *    | *     | *    | *    | *     | *     | *     | *    | *    | *     | *     | *     | *     | *     | *    | *    |      |      |       |       |       |       |       |      |    |
| 1.2 nF |      |      |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |      |    |
| 1.5 nF |      |      |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |      |    |
| 1.8 nF |      |      |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |      |    |
| 2.2 nF |      |      |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |      |    |
| 2.7 nF |      |      |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |      |    |
| 3.3 nF |      |      |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |      |    |
| 3.9 nF |      |      |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |      |    |
| 4.7 nF |      |      |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |      |    |
| 5.6 nF |      |      |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |      |    |
| 6.8 nF |      |      |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |      |    |
| 8.2 nF |      |      |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |      |    |
| 10 nF  |      |      |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |      |    |
| 12 nF  |      |      |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |      |    |
| 15 nF  |      |      |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |      |    |
| 18 nF  |      |      |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |      |    |
| 22 nF  |      |      |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |      |    |
| 27 nF  |      |      |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |      |    |
| 33 nF  |      |      |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |      |    |
| 39 nF  |      |      |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |      |    |
| 47 nF  |      |      |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |      |    |
| 56 nF  |      |      |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |      |    |
| 68 nF  |      |      |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |      |    |
| 82 nF  |      |      |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |      |    |
| 100 nF |      |      |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |      |    |
| 120 nF |      |      |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |      |    |
| 150 nF |      |      |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |      |    |
| 180 nF |      |      |       |      |      |       |       |       |      |      |       |       |       |       |       |      |      |      |      |       |       |       |       |       |      |    |

Note: Part values marked with "\*" have better availability and shorter lead times.

HIGH VOLTAGE POLYTERM® AVAILABILITY - X7R DIELECTRIC

| SIZE   | 1825 |      |       |       |       |       |       | 2220 |      |       |       |       |       |       | 2225 |      |      |       |       |       |       |       |   |
|--------|------|------|-------|-------|-------|-------|-------|------|------|-------|-------|-------|-------|-------|------|------|------|-------|-------|-------|-------|-------|---|
|        | 500V | 630V | 1000V | 2000V | 3000V | 4000V | 5000V | 500V | 630V | 1000V | 2000V | 3000V | 4000V | 5000V | X1Y2 | 500V | 630V | 1000V | 2000V | 3000V | 4000V | 5000V |   |
| 270 pF |      |      |       | •     | •     | •     | •     |      |      |       |       | •     | •     | •     | •    |      |      |       |       | •     | •     | •     | • |
| 330 pF |      |      |       | •     | •     | •     | •     |      |      |       |       | •     | •     | •     | •    |      |      |       |       | •     | •     | •     | • |
| 470 pF |      |      |       | •     | •     | •     | •     |      |      |       |       | •     | •     | •     | •    |      |      |       |       | •     | •     | •     | • |
| 560 pF |      |      |       | •     | •     | •     | •     |      |      |       |       | •     | •     | •     | •    |      |      |       |       | •     | •     | •     | • |
| 680 pF |      |      |       | •     | •     | •     | •     |      |      |       |       | •     | •     | •     | •    |      |      |       |       | •     | •     | •     | • |
| 820 pF |      |      |       | •     | •     | •     | •     |      |      |       |       | •     | •     | •     | •    |      |      |       |       | •     | •     | •     | • |
| 1.0 nF |      | •    | •     | •     | •     | •     | •     |      | •    | •     | •     | •     | •     | •     | •    |      |      | •     | •     | •     | •     | •     | • |
| 1.2 nF |      | •    | •     | •     | •     | •     | •     |      | •    | •     | •     | •     | •     | •     | •    |      |      | •     | •     | •     | •     | •     | • |
| 1.5 nF |      | •    | •     | •     | •     | •     | •     |      | •    | •     | •     | •     | •     | •     | •    |      |      | •     | •     | •     | •     | •     | • |
| 1.8 nF |      | •    | •     | •     | •     | •     | •     |      | •    | •     | •     | •     | •     | •     | •    |      |      | •     | •     | •     | •     | •     | • |
| 2.2 nF |      | •    | •     | •     | •     | •     | •     |      | •    | •     | •     | •     | •     | •     | •    |      |      | •     | •     | •     | •     | •     | • |
| 2.7 nF |      | •    | •     | •     | •     | •     | •     |      | •    | •     | •     | •     | •     | •     | •    |      |      | •     | •     | •     | •     | •     | • |
| 3.3 nF |      | •    | •     | •     | •     | •     | •     |      | •    | •     | •     | •     | •     | •     | •    |      |      | •     | •     | •     | •     | •     | • |
| 3.9 nF |      | •    | •     | •     | •     | •     | •     |      | •    | •     | •     | •     | •     | •     | •    |      |      | •     | •     | •     | •     | •     | • |
| 4.7 nF |      | •    | •     | •     | •     | •     | •     |      | •    | •     | •     | •     | •     | •     | •    |      |      | •     | •     | •     | •     | •     | • |
| 5.6 nF |      | •    | •     | •     | •     | •     | •     |      | •    | •     | •     | •     | •     | •     | •    |      |      | •     | •     | •     | •     | •     | • |
| 6.8 nF |      | •    | •     | •     | •     | •     | •     |      | •    | •     | •     | •     | •     | •     | •    |      |      | •     | •     | •     | •     | •     | • |
| 8.2 nF |      | •    | •     | •     | •     | •     | •     |      | •    | •     | •     | •     | •     | •     | •    |      |      | •     | •     | •     | •     | •     | • |
| 10 nF  | •    | •    | •     | •     | •     | •     | •     | •    | •    | •     | •     | •     | •     | •     | •    | •    | •    | •     | •     | •     | •     | •     | • |
| 12 nF  | •    | •    | •     | •     | •     | •     | •     | •    | •    | •     | •     | •     | •     | •     | •    | •    | •    | •     | •     | •     | •     | •     | • |
| 15 nF  | •    | •    | •     | •     | •     | •     | •     | •    | •    | •     | •     | •     | •     | •     | •    | •    | •    | •     | •     | •     | •     | •     | • |
| 18 nF  | •    | •    | •     | •     | •     | •     | •     | •    | •    | •     | •     | •     | •     | •     | •    | •    | •    | •     | •     | •     | •     | •     | • |
| 22 nF  | •    | •    | •     | •     | •     | •     | •     | •    | •    | •     | •     | •     | •     | •     | •    | •    | •    | •     | •     | •     | •     | •     | • |
| 27 nF  | •    | •    | •     | •     | •     | •     | •     | •    | •    | •     | •     | •     | •     | •     | •    | •    | •    | •     | •     | •     | •     | •     | • |
| 33 nF  | •    | •    | •     | •     | •     | •     | •     | •    | •    | •     | •     | •     | •     | •     | •    | •    | •    | •     | •     | •     | •     | •     | • |
| 39 nF  | •    | •    | •     | •     | •     | •     | •     | •    | •    | •     | •     | •     | •     | •     | •    | •    | •    | •     | •     | •     | •     | •     | • |
| 47 nF  | •    | •    | •     | •     | •     | •     | •     | •    | •    | •     | •     | •     | •     | •     | •    | •    | •    | •     | •     | •     | •     | •     | • |
| 56 nF  | •    | •    | •     | •     | •     | •     | •     | •    | •    | •     | •     | •     | •     | •     | •    | •    | •    | •     | •     | •     | •     | •     | • |
| 68 nF  | •    | •    | •     | •     | •     | •     | •     | •    | •    | •     | •     | •     | •     | •     | •    | •    | •    | •     | •     | •     | •     | •     | • |
| 82 nF  | •    | •    | •     | •     | •     | •     | •     | •    | •    | •     | •     | •     | •     | •     | •    | •    | •    | •     | •     | •     | •     | •     | • |
| 100 nF | •    | •    | •     | •     | •     | •     | •     | •    | •    | •     | •     | •     | •     | •     | •    | •    | •    | •     | •     | •     | •     | •     | • |
| 120 nF | •    | •    | •     | •     | •     | •     | •     | •    | •    | •     | •     | •     | •     | •     | •    | •    | •    | •     | •     | •     | •     | •     | • |
| 150 nF | •    | •    | •     | •     | •     | •     | •     | •    | •    | •     | •     | •     | •     | •     | •    | •    | •    | •     | •     | •     | •     | •     | • |
| 180 nF | •    | •    | •     | •     | •     | •     | •     | •    | •    | •     | •     | •     | •     | •     | •    | •    | •    | •     | •     | •     | •     | •     | • |
| 220 nF | •    | •    | •     | •     | •     | •     | •     | •    | •    | •     | •     | •     | •     | •     | •    | •    | •    | •     | •     | •     | •     | •     | • |
| 270 nF | •    | •    | •     | •     | •     | •     | •     | •    | •    | •     | •     | •     | •     | •     | •    | •    | •    | •     | •     | •     | •     | •     | • |
| 330 nF | •    | •    | •     | •     | •     | •     | •     | •    | •    | •     | •     | •     | •     | •     | •    | •    | •    | •     | •     | •     | •     | •     | • |
| 390 nF | •    | •    | •     | •     | •     | •     | •     | •    | •    | •     | •     | •     | •     | •     | •    | •    | •    | •     | •     | •     | •     | •     | • |
| 470 nF | •    | •    | •     | •     | •     | •     | •     | •    | •    | •     | •     | •     | •     | •     | •    | •    | •    | •     | •     | •     | •     | •     | • |
| 560 nF | •    | •    | •     | •     | •     | •     | •     | •    | •    | •     | •     | •     | •     | •     | •    | •    | •    | •     | •     | •     | •     | •     | • |
| 680 nF | •    | •    | •     | •     | •     | •     | •     | •    | •    | •     | •     | •     | •     | •     | •    | •    | •    | •     | •     | •     | •     | •     | • |

Note: Part values marked with '•' have better availability and shorter lead times.

**BEND TEST DESCRIPTION**

The test board is designed so that the capacitance of the part can be measured while the part is being flexed (See figure 1). The capacitor is mounted at the center of the board. The testing equipment has a pressing block that is located so that it applies force at the center of the test board from below the part at a constant rate. Since the edges of the board are held in place by the support pins, this causes the board to flex. The amount of flex is measured in millimeters from the center of the board to the edge, please see "A" in Figure 2.

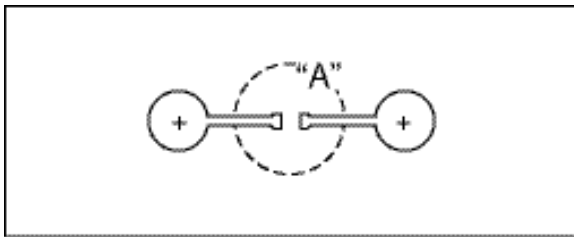


Figure 1

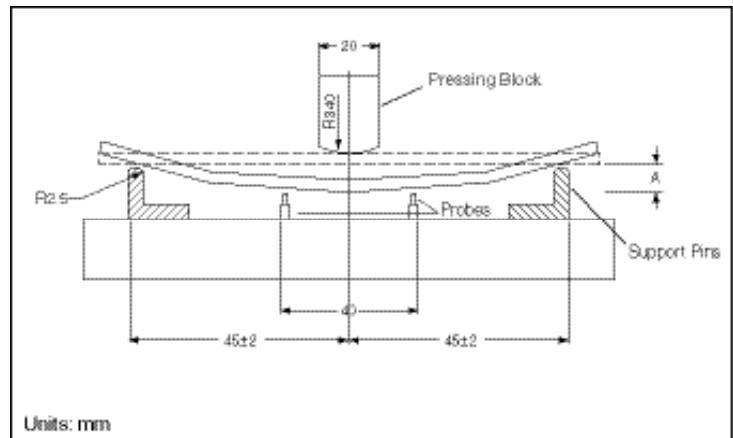
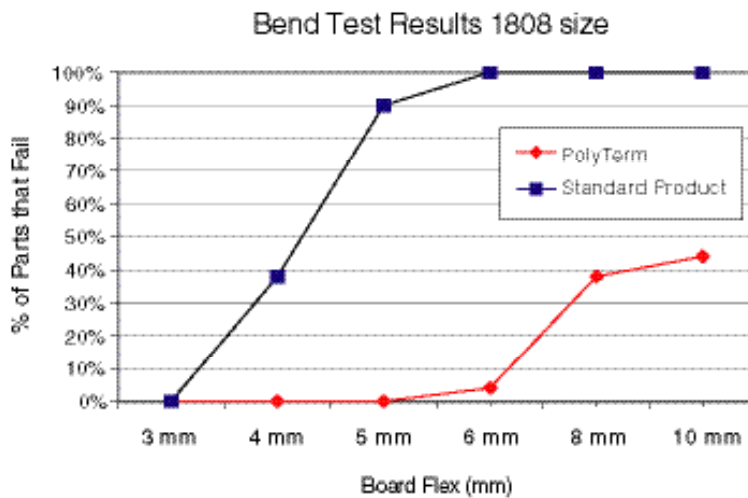


Figure 2

As the test board is flexed, the capacitance is constantly being measured by a capacitance meter which is connected to the test boards through capacitance probes. The capacitance is first measured at 0mm flex to establish the nominal value. The test board is then flexed to 1mm and held for at least on second, then the capacitance is measured, it is then flexed to 2mm, and so on up to 5mm. Any change in capacitance that exceeds 5% of the nominal value is considered a failure.



## EXAMPLE OF CUSTOMER APPLICATION

Johanson Dielectrics receives a lot of requests from our customers to help them with cracking issues. One customer had cracking at a rate of 16% on 1206 size high voltage capacitors during their process. The top picture of Figure 3 shows a clear mechanical crack with a 45 degree angle at the termination solder pad interface. Repopulating the same board with PolyTerm<sup>®</sup> capacitors showed no cracking failures. The bottom picture of Figure 3 shows how PolyTerm<sup>®</sup> Capacitors solved these problems. No cracking was exhibited on any of the PolyTerm<sup>®</sup> capacitors during the customer assembly process.

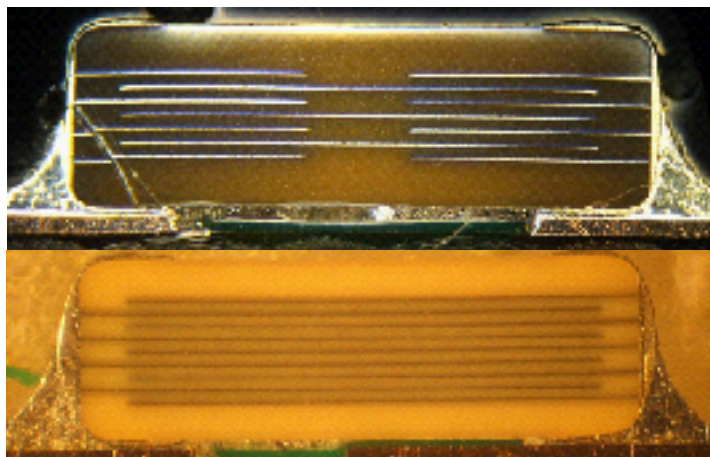


Figure 3