General Specifications
X7R formulations are called "temperature stable" ceramics and fall into EIA Class II materials. X7R is the most popular of these intermediate dielectric constant materials. Its temperature variation of capacitance is within $\pm 15 \%$ from $-55^{\circ} \mathrm{C}$ to $+125^{\circ} \mathrm{C}$. This capacitance change is non-linear.

Capacitance for X7R varies under the influence of electrical operating con-ditions such as voltage and frequency.
X7R dielectric chip usage covers the broad spectrum of industrial applications where known changes in capacitance due to applied voltages are acceptable.

PART NUMBER (SEE PAGE 4 FOR COMPLETE PART NUMBER EXPLANATION)


NOTE: Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.
Contact factory for non-specified capacitance values.


Specifications and Test Methods

|  |  | X7R Specification Limits | Measuring Conditions |  |
| :---: | :---: | :---: | :---: | :---: |
| $\frac{\text { Parameter/Test }}{\text { Operating Temperature Range }}$ |  | $-55^{\circ} \mathrm{C}$ to $+125^{\circ} \mathrm{C}$ | Temperature Cycle Chamber |  |
| Capacitance |  | Within specified tolerance | Freq.: $1.0 \mathrm{kHz} \pm 10 \%$Voltage: $1.0 \mathrm{Vrms} \pm .2 \mathrm{~V}$For Cap > $10 \mu \mathrm{~F}, 0.5 \mathrm{Vrm} @ 120 \mathrm{~Hz}$ |  |
| Dissipation Factor |  | $\leq 10 \%$ for $\geq 50 \mathrm{~V}$ DC rating $\leq 12.5 \%$ for 25 V DC rating $\leq 12.5 \%$ for 25 V and 16 V DC rating $\leq 12.5 \%$ for $\leq 10 \mathrm{~V}$ DC rating Contact Factory for DF by PN |  |  |
| Insulation Resistance |  | $100,000 \mathrm{M} \Omega$ or $1000 \mathrm{M} \Omega-\mu \mathrm{F}$, whichever is less | Charge device with rated voltage for $120 \pm 5$ secs @ room temp/humidity |  |
| Dielectric Strength |  | No breakdown or visual defects | Charge device with $250 \%$ of rated voltage for 1-5 seconds, w/charge and discharge current limited to 50 mA (max) <br> Note: Charge device with $150 \%$ of rated voltage for 500 V devices. |  |
| Resistance to Flexure Stresses | Appearance | No defects | Deflection: 2 mm Test Time: 30 seconds |  |
|  | Capacitance Variation | $\leq \pm 12 \%$ |  |  |
|  | Dissipation Factor | Meets Initial Values (As Above) |  |  |
|  | Insulation Resistance | $\geq$ Initial Value $\times 0.3$ |  |  |
| Solderability |  | $\geq 95 \%$ of each terminal should be covered with fresh solder | Dip device in eutectic solder at $230 \pm 5^{\circ} \mathrm{C}$ for $5.0 \pm 0.5$ seconds |  |
| Resistance to Solder Heat | Appearance | No defects, <25\% leaching of either end terminal | Dip device in eutectic solder at $260^{\circ} \mathrm{C}$ for 60 seconds. Store at room temperature for $24 \pm 2$ hours before measuring electrical properties. |  |
|  | Capacitance Variation | $\leq \pm 7.5 \%$ |  |  |
|  | Dissipation Factor | Meets Initial Values (As Above) |  |  |
|  | Insulation Resistance | Meets Initial Values (As Above) |  |  |
|  | Dielectric Strength | Meets Initial Values (As Above) |  |  |
| Thermal Shock | Appearance | No visual defects | Step 1: $-55^{\circ} \mathrm{C} \pm 2^{\circ}$ | $30 \pm 3$ minutes |
|  | Capacitance Variation | $\leq \pm 7.5 \%$ | Step 2: Room Temp | $\leq 3$ minutes |
|  | Dissipation Factor | Meets Initial Values (As Above) | Step 3: $+125^{\circ} \mathrm{C} \pm 2^{\circ}$ | $30 \pm 3$ minutes |
|  | Insulation Resistance | Meets Initial Values (As Above) | Step 4: Room Temp | $\leq 3$ minutes |
|  | Dielectric Strength | Meets Initial Values (As Above) | Repeat for 5 cycles and measure after $24 \pm 2$ hours at room temperature |  |
| Load Life | Appearance | No visual defects | Charge device with $\geq$ rated voltage in test chamber set at $125^{\circ} \mathrm{C} \pm 2^{\circ} \mathrm{C}$ for 1000 hours ( $+48,-0$ ). |  |
|  | Capacitance Variation | $\leq \pm 12.5 \%$ |  |  |
|  | Dissipation Factor | $\leq$ Initial Value $\times 2.0$ (See Above) | Remove from test chamber and stabilize at room temperature for $24 \pm 2$ hours before measuring. |  |
|  | Insulation Resistance | $\geq$ Initial Value $\times 0.3$ (See Above) | Contact AVX for datasheet of specific parts. |  |
|  | Dielectric Strength | Meets Initial Values (As Above) |  |  |
| Load Humidity | Appearance | No visual defects | Store in a test chamber set at $85^{\circ} \mathrm{C} \pm 2^{\circ} \mathrm{C} / 85 \% \pm 5 \%$ relative humidity for 1000 hours ( $+48,-0$ ) with rated voltage applied. |  |
|  | Capacitance Variation | $\leq \pm 12.5 \%$ |  |  |
|  | Dissipation Factor | $\leq$ Initial Value $\times 2.0$ (See Above) |  |  |
|  | Insulation Resistance | $\geq$ Initial Value $\times 0.3$ (See Above) | Remove from chamber and stabilize at room temperature and humidity for $24 \pm 2$ hours before measuring. |  |
|  | Dielectric Strength | Meets Initial Values (As Above) |  |  |

## X7R Dielectric

Capacitance Range

## PREFERRED SIZES ARE SHADED

| SIZE |  | 0101* | 0201 |  |  |  |  | 0402 |  |  |  |  |  | 0603 |  |  |  |  |  |  |  | 0805 |  |  |  |  |  |  |  | 1206 |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Soldering |  | Reflow Only | Reflow Only |  |  |  |  | Reflow/Wave |  |  |  |  |  | Reflow/Wave |  |  |  |  |  |  |  | Reflow/Wave |  |  |  |  |  |  |  | Reflow/Wave |  |  |  |  |  |  |  |  |
| Packaging |  | Paper/ Embossed | All Paper |  |  |  |  | All Paper |  |  |  |  |  | All Paper |  |  |  |  |  |  |  | Paper/Embossed |  |  |  |  |  |  |  | Paper/Embossed |  |  |  |  |  |  |  |  |
| (L) Length | $\begin{array}{\|c\|c\|} \hline \mathrm{min}_{\text {(in.) }} \\ \hline \end{array}$ | $\begin{array}{\|c\|} \hline 0.40 \pm 0.02 \\ (0.016 \pm 0.0008) \\ \hline \end{array}$ | $\begin{gathered} 0.60 \pm 0.09 \\ (0.024 \pm 0.004) \\ \hline \end{gathered}$ |  |  |  |  | $\begin{gathered} 1.00 \pm 0.10 \\ (0.040 \pm 0.004) \\ \hline \end{gathered}$ |  |  |  |  |  | $\begin{gathered} 1.60 \pm 0.15 \\ (0.063 \pm 0.006) \\ \hline \end{gathered}$ |  |  |  |  |  |  |  | $\begin{aligned} 2.01 & \pm 0.20 \\ (0.079 & \pm 0.008) \end{aligned}$ |  |  |  |  |  |  |  | $\begin{gathered} 3.20 \pm 0.30 \\ (0.126 \pm 0.012) \end{gathered}$ |  |  |  |  |  |  |  |  |
| W) Width | $\begin{gathered} \mathrm{mm} \\ \text { (in.) } \end{gathered}$ | $\begin{array}{\|c\|} \hline 0.20 \pm 0.02 \\ (0.008 \pm 0.0008) \\ \hline \end{array}$ | $\begin{gathered} 0.30 \pm 0.09 \\ (0.011 \pm 0.004) \\ \hline \end{gathered}$ |  |  |  |  | $\begin{gathered} 0.50 \pm 0.10 \\ (0.020 \pm 0.004) \end{gathered}$ |  |  |  |  |  | $\begin{gathered} 0.81 \pm 0.15 \\ (0.032 \pm 0.006) \end{gathered}$ |  |  |  |  |  |  |  | $\begin{gathered} 1.25 \pm 0.20 \\ (0.049 \pm 0.008) \end{gathered}$ |  |  |  |  |  |  |  | $\begin{gathered} 1.60 \pm 0.30 \\ (0.063 \pm 0.012) \end{gathered}$ |  |  |  |  |  |  |  |  |
| (t) Terminal ${ }_{\text {(in }}$ | $\begin{array}{\|c\|c\|} \hline m & 0.10 \pm 0.04 \\ \mathrm{n} .) & (0.004 \pm 0.0016) \\ \hline \end{array}$ |  | $\begin{gathered} 0.15 \pm 0.05 \\ (0.006 \pm 0.002) \\ \hline \end{gathered}$ |  |  |  |  | $\begin{gathered} 0.25 \pm 0.15 \\ (0.010 \pm 0.006) \\ \hline \end{gathered}$ |  |  |  |  |  | $\begin{gathered} 0.35 \pm 0.15 \\ (0.014 \pm 0.006) \\ \hline \end{gathered}$ |  |  |  |  |  |  |  | $\begin{gathered} 0.50 \pm 0.25 \\ (0.020 \pm 0.010) \\ \hline \end{gathered}$ |  |  |  |  |  |  |  | $\begin{gathered} 0.50 \pm 0.25 \\ (0.020 \pm 0.010) \\ \hline \end{gathered}$ |  |  |  |  |  |  |  |  |
| WVDC |  | 16 | 6.3 | 10 | 10 | 25 | 50 | 6.3 | 10 | 16 | 25 | 50 | 100 | 6.3 | 10 | 16 | 25 | 501 | 100 | 200 | 250 | 6.3 | 10 | 16 | 25 | 50 | 100 | 200 | 250 | 6.3 | 10 | 16 | 25 | 50 | 100 | 200 | 250 | 500 |
| Cap 100 | 101 | B | A | A | A A | A | A | C | C | C | c | c | C | G | G | G | G | G | G | J | J |  |  |  |  |  |  |  |  |  |  |  |  | G | G | N | N | N |
| (pF) 150 | 151 | B | A | A | A A | A | A | c | c | C | C | c | C | G | G | G | G | G | G | J | J |  |  |  |  |  |  |  |  | G | G | G | G | G | G | N | N | N |
| 220 | 221 | B | A | A | A A | A | A | c | c | C | C | c | C | G | G | G | G | G | G | J | J | E | E | E | E | E | E | E | J | $J$ | $J$ | J | $J$ | J | J | N | N | P |
| 330 | 331 | B | A | A | A | A | A | c | c | c | c | c | c | G | G | G | G | G | G | J | J |  | J | J | J | J | J | J | J | J | J | J | J | J | J | N | N | P |
| 470 | 471 | B | A | A | A | A | A | C | c | C | c | C | c | G | G | G | G | G | G | $J$ | J |  | J | J | $J$ | J | J | J | $J$ | J | J | J | J | J | J | N | N | P |
| 680 | 681 | B | A | A | A | A | A | c | c | C | c | c | c | G | G | G | G | G | G | J | J |  | J | J | J | J | J | J | J | J | J | J | J | J | J | N | N | P |
| 1000 | 102 | B | A | A | A | A | A | C | c | c | c | C | c | G | G | G | G | G | G | J | J |  | $J$ | J | $J$ | J | J | J | J | J | J | J | J | J | J | N | N | P |
| 1500 | 152 |  | A | A | A A | A |  | c | c | c | c | c | c | G | G | G | G | G | G | J | J |  | J | J | J | J | J | J | J | J | J | J | J | J | J | N | N | P |
| 2200 | 222 |  | A | A | A ${ }^{\text {A }}$ | A |  | c | c | C | C | c | C | G | G | G | G | G | G | J | J |  | J | J | $J$ | J | J | J | J | $J$ | J | J | J | $J$ | J | N | N | P |
| 3300 | 332 |  | A | A | A A | A |  | c | c | c | c | c | c | G | G | G | G | G | G | J | J |  | J | J | J | J | J | J | J | $J$ | J | J | J | J | J | N | N | P |
| 3900 | 392 |  | A | A | A A | A |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 4700 | 472 |  | A | A | A | A |  | c | c | c | c | c | C | G | G | G | G | G | G | J | J |  | J | J | J | J | J | J | J | J | J | J | J | J | J | N | N | P |
| 5600 | 562 |  | A | A | A A | A |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 6800 | 682 |  | A | A | A A | A |  | c | c | c | c | c | c | G | G | G | G | G | G | J | J |  | J | J | J | J | J | P | P | J | J | J | J | J | J | N | N | P |
| Cap 0.01 | 103 |  | A | A | A A | A |  | c | c | C | C | c | C | G | G | G | G | G | G | J | J |  | J | J | $J$ | J | J | P | P | J | J | J | J | J | J | N | N | P |
| ( $\mu \mathrm{F}$ ) 0.012 | 123 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0.015 | 153 |  |  |  |  |  |  | c | c | C | C | E |  | G | G | G | G | G | J | J | J |  | J | J | J | J | J | P | P | J | J | J | J | J | J | N | N | Q |
| 0.018 | 183 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0.022 | 223 |  | A | A | A A |  |  | c | c | C | C | E |  | G | G | G | G | G | J | J | J |  | J | J | J | J | J | P | P | J | J | J | J | J | J | P | P | Q |
| 0.027 | 273 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0.033 | 333 |  |  |  |  |  |  | C | C | C | C | E |  | G | G | G | G | J | J | J |  |  | J | J | J | J | P | P | P | J | $J$ | $J$ | J | J | J | Q | Q | Q |
| 0.039 | 393 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0.047 | 473 |  |  |  |  |  |  | c | c | C | C | E |  | G | G | G | G | J | J | J |  |  | J | J | J | J | P | P | P | J | J | J | $J$ | J | J | Q | Q | Q |
| 0.068 | 683 |  |  |  |  |  |  | c | c | C | C | E |  | G | G | G | G | J | J | J |  |  | J | J | $J$ | J | P | P |  | J | J | J | J | $J$ | P | Q | Q |  |
| 0.082 | 823 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0.1 | 104 |  | A |  |  |  |  | C | C | C | C | E |  | G | G | G | G | J | J | J |  |  | J | J | $J$ | J | P | P |  | J | J | J | J | J | P | Q | Q |  |
| 0.12 | 124 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0.15 | 154 |  |  |  |  |  |  |  |  |  |  |  |  | G | G | G | J | J |  |  |  |  | N | N | N | N | P |  |  | K | K | K | K | K | Q | Q | Q |  |
| 0.22 | 224 |  |  |  |  |  |  | c | c | c | c |  |  | G | G | J | J | J |  |  |  |  | N | N | N | N | P |  |  | K | K | K | K | K | Q | Q | Q |  |
| 0.33 | 334 |  |  |  |  |  |  |  |  |  |  |  |  | $J$ | J | J | J | J |  |  |  |  | P | P | P | P | P |  |  | K | K | K | K | N | Q |  |  |  |
| 0.47 | 474 |  |  |  |  |  |  | c | C |  |  |  |  | $J$ | J | J | J | J |  |  |  |  | P | P | P | P | P |  |  | M | M | M | M | X | X |  |  |  |
| 0.68 | 684 |  |  |  |  |  |  |  |  |  |  |  |  | $J$ | J | J |  |  |  |  |  |  | P | P | P |  |  |  |  | M | M | M | M | X | X |  |  |  |
| 1.0 | 105 |  |  |  |  |  |  | C |  |  |  |  |  | $J$ | J | J | J | J |  |  |  |  | P | P | P | P |  |  |  | M | M | M | M | X | X |  |  |  |
| 2.2 | 225 |  |  |  |  |  |  |  |  |  |  |  |  | J | J | K |  |  |  |  |  |  | P | P | P | P |  |  |  | M | M | M | x | X | X |  |  |  |
| 4.7 | 475 |  |  |  |  |  |  |  |  |  |  |  |  | K |  |  |  |  |  |  |  |  | P | P | P |  |  |  |  | X | X | X | x | Z |  |  |  |  |
| 10 | 106 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | P | P | P |  |  |  |  |  | X | x | X | x |  |  |  |  |  |
| 22 | 226 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X | X | X |  |  |  |  |  |  |
| 47 | 476 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 100 | 107 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| WVDC |  | 16 | 6.3 | 10 | 116 | 25 | 50 | 6.3 | 10 | 16 | 25 | 50 | 100 | 6.3 | 10 | 16 | 25 | 501 | 100 | 200 | 250 | 6.3 | 10 | 16 | 25 | 50 | 100 | 200 | 250 | 6.3 | 10 | 16 | 25 | 50 | 100 | 200 | 250 | 500 |
| SIZE |  | 0101* |  |  | 0201 |  |  |  |  | 04 | 02 |  |  |  |  |  |  | 603 |  |  |  |  |  |  |  | 805 |  |  |  |  |  |  |  | 120 | 206 |  |  |  |


| Letter | A | B | C | E | G | J | K | M | N | P | Q | X | Y | z |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Max. Thickness | $\begin{gathered} 0.33 \\ (0.013) \\ \hline \end{gathered}$ | $\begin{gathered} 0.22 \\ (0.009) \\ \hline \end{gathered}$ | $\begin{gathered} 0.56 \\ (0.022) \\ \hline \end{gathered}$ | $\begin{gathered} 0.71 \\ (0.028) \\ \hline \end{gathered}$ | $\begin{gathered} 0.90 \\ (0.035) \\ \hline \end{gathered}$ | $\begin{gathered} 0.94 \\ (0.037) \\ \hline \end{gathered}$ | $\begin{gathered} \hline 1.02 \\ (0.040) \\ \hline \end{gathered}$ | $\begin{gathered} 1.27 \\ (0.050) \\ \hline \end{gathered}$ | $\begin{gathered} 1.40 \\ (0.055) \\ \hline \end{gathered}$ | $\begin{gathered} 1.52 \\ (0.060) \\ \hline \end{gathered}$ | $\begin{gathered} 1.78 \\ (0.070) \\ \hline \end{gathered}$ | $\begin{gathered} \hline 2.29 \\ (0.090) \\ \hline \end{gathered}$ | $\begin{gathered} 2.54 \\ (0.100) \\ \hline \end{gathered}$ | $\begin{gathered} 2.79 \\ (0.110) \\ \hline \end{gathered}$ |
|  | PAPER |  |  |  |  |  | EMBOSSED |  |  |  |  |  |  |  |

NOTE: Contact factory for non-specified capacitance values
*EIA 01005
**Contact Factory for Specifications

Capacitance Range

## PREFERRED SIZES ARE SHADED

| SIZE |  | 1210 |  |  |  |  |  |  | 1812 |  |  |  |  |  | 1825 |  |  | 2220 |  |  |  |  | 2225 |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Soldering |  | Reflow Only |  |  |  |  |  |  | Reflow Only |  |  |  |  |  | Reflow Only |  |  | Reflow Only |  |  |  |  | Reflow Only |  |  |
| Packaging |  | Paper/Embossed |  |  |  |  |  |  | All Embossed |  |  |  |  |  | All Embossed |  |  | All Embossed |  |  |  |  | All Embossed |  |  |
| (L) Length | $\begin{gathered} \mathrm{mm} \\ \text { (in.) } \end{gathered}$ | $\begin{gathered} 3.30 \pm 0.4 \\ (0.130 \pm 0.016) \\ \hline \end{gathered}$ |  |  |  |  |  |  | $\begin{gathered} 4.50 \pm 0.40 \\ (0.177 \pm 0.016) \\ \hline \end{gathered}$ |  |  |  |  |  | $\begin{gathered} 4.50 \pm 0.40 \\ (0.177 \pm 0.016) \\ \hline \end{gathered}$ |  |  | $\begin{gathered} 5.70 \pm 0.50 \\ (0.224 \pm 0.020) \\ \hline \end{gathered}$ |  |  |  |  | $\begin{gathered} 5.70 \pm 0.40 \\ (0.224 \pm 0.016) \\ \hline \end{gathered}$ |  |  |
| W) Width | $\underset{\text { (in.) }}{\substack{m m}}$ | $\begin{gathered} 2.50 \pm 0.30 \\ (0.098 \pm 0.012) \\ \hline \end{gathered}$ |  |  |  |  |  |  | $\begin{gathered} 3.20 \pm 0.40 \\ (0.126 \pm 0.016) \\ \hline \end{gathered}$ |  |  |  |  |  | $\begin{gathered} 6.40 \pm 0.40 \\ (0.252 \pm 0.016) \\ \hline \end{gathered}$ |  |  | $\begin{gathered} 5.00 \pm 0.40 \\ (0.197 \pm 0.016) \\ \hline \end{gathered}$ |  |  |  |  | $\begin{gathered} 6.30 \pm 0.40 \\ (0.248 \pm 0.016) \\ \hline \end{gathered}$ |  |  |
| (t) Terminal | $\mathrm{mm}_{\text {(in.) }}$ | $\begin{gathered} 0.50 \pm 0.25 \\ (0.020 \pm 0.010) \\ \hline \end{gathered}$ |  |  |  |  |  |  | $\begin{gathered} 0.61 \pm 0.36 \\ (0.024 \pm 0.014) \\ \hline \end{gathered}$ |  |  |  |  |  | $\begin{gathered} 0.61 \pm 0.36 \\ (0.024 \pm 0.014) \\ \hline \end{gathered}$ |  |  | $\begin{gathered} 0.64 \pm 0.39 \\ (0.025 \pm 0.015) \\ \hline \end{gathered}$ |  |  |  |  | $\begin{gathered} 0.64 \pm 0.39 \\ (0.025 \pm 0.015) \\ \hline \end{gathered}$ |  |  |
| WVDC |  | 10 | 16 | 25 | 50 | 100 | 200 | 500 | 16 | 25 | 50 | 100 | 200 | 500 | 50 | 100 | 200 | 25 | 50 | 100 | 200 | 500 | 50 | 100200 |  |
| Cap 100 | 101 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | $\rightarrow<{ }_{W}$ |  |  |  |
| (pF) 150 | 151 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 220 | 221 |  |  |  | K | K | K | M |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 330 | 331 |  |  |  | K | K | K | M |  |  | N | N | N | N |  |  |  |  |  |  |  |  |  |  |  |
| 470 | 471 |  |  |  | K | K | K | M |  |  | N | N | N | N |  |  |  |  |  |  |  | ${ }^{\circ}+$ |  |  |  |
| 680 | 681 |  |  |  | K | K | K | M |  |  | N | N | N | N |  |  |  |  |  |  |  |  |  |  |  |
| 1000 | 102 | K | K | K | K | K | K | M | N | N | N | N | N | N | X | X | X |  | X | X | X | X | X | X | x |
| 1500 | 152 | K | K | K | K | K | K | M | N | N | N | N | N | N | X | X | x |  | X | x | x | X | X | X | X |
| 2200 | 222 | K | K | K | K | K | K | M | N | N | N | N | N | N | X | X | X |  | X | X | X | X | X | X | X |
| 3300 | 332 | K | K | K | K | K | K | P | N | N | N | N | N | N | X | X | X |  | X | X | X | X | X | X | X |
| 4700 | 472 | K | K | K | K | K | K | P | N | N | N | N | N | P | X | X | X |  | X | X | X | X | X | X | X |
| 6800 | 682 | K | K | K | K | K | K | P | N | N | N | N | N | P | X | X | X |  | X | X | X | X | X | X | X |
| Cap 0.01 | 103 | K | K | K | K | K | K | P | N | N | N | N | N | P | X | X | X |  | X | X | X | X | X | X | X |
| ( $\mu \mathrm{F}$ ) 0.015 | 153 | K | K | K | K | K | K | P | N | N | N | N | N | P | X | X | X |  | X | X | X | X | X | X | X |
| 0.022 | 223 | K | K | K | K | K | P | Q | N | N | N | N | N | P | X | X | X |  | X | X | X | X | X | X | X |
| 0.033 | 333 | K | K | K | K | K | P | X | N | N | N | N | N | X | X | X | X |  | X | X | X | X | X | X | X |
| 0.047 | 473 | K | K | K | K | K | P | X | N | N | N | N | P | X | X | X | X |  | X | X | X | X | X | X | X |
| 0.068 | 683 | K | K | K | K | K | P | X | N | N | N | N | P | X | X | X | X |  | X | X | X | X | X | X | X |
| 0.1 | 104 | K | K | K | K | K | P | X | N | N | N | P | P | X | X | X | X |  | X | X | X | X | X | X | X |
| 0.15 | 154 | K | K | K | M | P | Z | Z | N | N | N | P | P | Z | X | X | X |  | X | X | X | X | X | X | X |
| 0.22 | 224 | K | K | K | M | P | z |  | N | N | N | P | Q | z | X | X | X |  | X | X | X | X | X | X | X |
| 0.33 | 334 | K | K | K | M | Q | Z |  | N | N | N | P | X | Z | X | X | X |  | X | X | X | X | X | X | X |
| 0.47 | 474 | M | M | M | P | Q | Z |  | N | N | N | Q | X | Z | X | X | X |  | X | X | X | X | X | X | X |
| 0.68 | 684 | M | M | P | X | X | Z |  | Q | Q | Q | Q | Z |  | X | X | X |  | X | X | X |  | X | X | X |
| 1.0 | 105 | P | P | P | X | Z |  |  | Q | Q | Q | X | z |  | X | X | X |  | X | X | X |  | X | X | X |
| 1.5 | 155 | N | N | Z | Z | Z |  |  |  | Z | Z | Z |  |  | X | X | Z |  | X | X | Z |  | X | X | Z |
| 2.2 | 225 | X | X | Z | Z | Z |  |  |  | Z | Z | Z |  |  | X | X | z |  | X | X | Z |  | X | X | Z |
| 3.3 | 335 | X | X | Z | Z | z |  |  |  | Z | Z | z |  |  | X | X |  |  | X | Z |  |  | X | X |  |
| 4.7 | 475 | Z | Z | z | Z | Z |  |  |  | Z | Z | Z |  |  | X | X |  |  | Z | Z |  |  | X | X |  |
| 10 | 106 | Z | Z | z | Z |  |  |  | Z | z | Z |  |  |  | Z | Z |  |  | Z | Z |  |  | Z | Z |  |
| 22 | 226 | Z | Z | Z |  |  |  |  |  |  |  |  |  |  |  |  |  | Z |  |  |  |  |  |  |  |
| 47 | 476 | Z |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 100 | 107 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| WVDC |  | 10 | 16 | 25 | 50 | 100 | 200 | 500 | 16 | 25 | 50 | 100 | 200 | 500 | 50 | 100 | 200 | 25 | 50 | 100 | 200 | 500 | 50 | 00 | 200 |
| SIZE |  |  |  |  | 1210 |  |  |  |  |  |  |  |  |  |  | 1825 |  |  |  | 2220 |  |  |  | 225 |  |


| Letter | A | B | C | E | G | J | K | M | N | P | Q | X | Y | Z |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Max. Thickness | $\begin{gathered} 0.33 \\ (0.013) \\ \hline \end{gathered}$ | $\begin{gathered} \hline 0.22 \\ (0.009) \\ \hline \end{gathered}$ | $\begin{gathered} 0.56 \\ (0.022) \\ \hline \end{gathered}$ | $\begin{gathered} 0.71 \\ (0.028) \\ \hline \end{gathered}$ | $\begin{gathered} 0.90 \\ (0.035) \\ \hline \end{gathered}$ | $\begin{gathered} 0.94 \\ (0.037) \\ \hline \end{gathered}$ | $\begin{gathered} 1.02 \\ (0.040) \\ \hline \end{gathered}$ | $\begin{gathered} 1.27 \\ (0.050) \\ \hline \end{gathered}$ | $\begin{gathered} 1.40 \\ (0.055) \\ \hline \end{gathered}$ | $\begin{gathered} 1.52 \\ (0.060) \\ \hline \end{gathered}$ | $\begin{gathered} 1.78 \\ (0.070) \\ \hline \end{gathered}$ | $\begin{gathered} \hline 2.29 \\ (0.090) \\ \hline \end{gathered}$ | $\begin{gathered} 2.54 \\ (0.100) \\ \hline \end{gathered}$ | $\begin{gathered} 2.79 \\ (0.110) \\ \hline \end{gathered}$ |
|  | PAPER |  |  |  |  |  | EMBOSSED |  |  |  |  |  |  |  |

NOTE: Contact factory for non-specified capacitance values

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