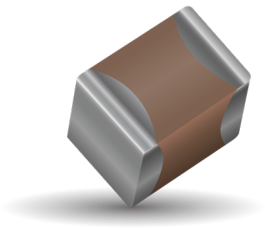
# X7R Dielectric

## 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 ±15% from -55°C to +125°C. This capacitance change is non-linear.

Capacitance for X7R varies under the influence of electrical operating con-ditions such as voltage and frequency.

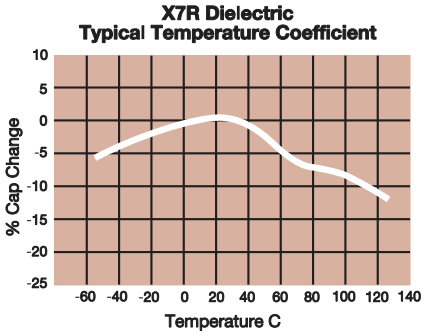
X7R dielectric chip usage covers the broad spectrum of industrial applications where known changes in capacitance due to applied voltages are acceptable.

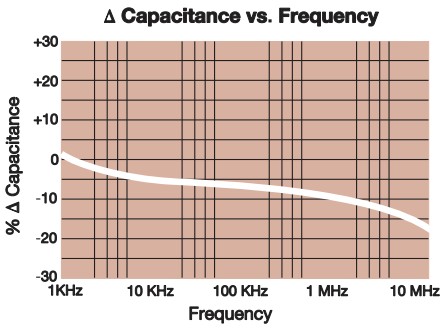
RoHS COMPLIANT

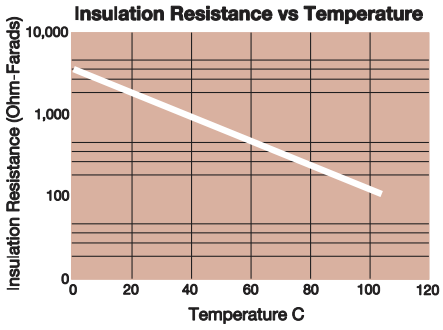
### PART NUMBER (SEE PAGE 4 FOR COMPLETE PART NUMBER EXPLANATION)

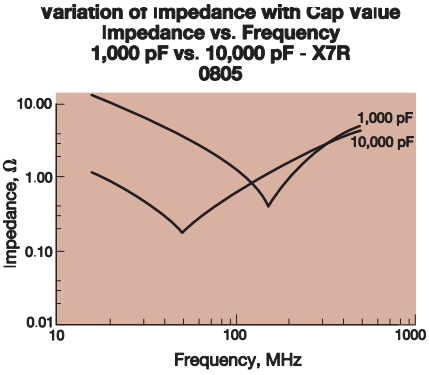
| 0805 | 5 | C | 103 | M | A | T | 2 | A |
|---|---|---|---|---|---|---|---|---|
| **Size** (L” x W”) | **Voltage** 4V = 4<br>6.3V = 6<br>10V = Z<br>16V = Y<br>25V = 3<br>50V = 5<br>100V = 1<br>200V = 2<br>500V = 7 | **Dielectric** X7R = C | **Capacitance** Code (In pF)<br>2 Sig. Digits + Number of Zeros | **Capacitance Tolerance** J = ± 5%*<br>K = ±10%<br>M = ± 20%<br>*≤1µF only, contact factory for additional values | **Failure Rate** A = Not Applicable | **Terminations** T = Plated Ni and Sn<br>Z= FLEXITERM®**<br>*Optional termination<br>**See FLEXITERM® X7R section | **Packaging** 2 = 7” Reel<br>4 = 13” Reel<br>**Contact Factory For Multiples** | **Special Code** A = Std. Product |

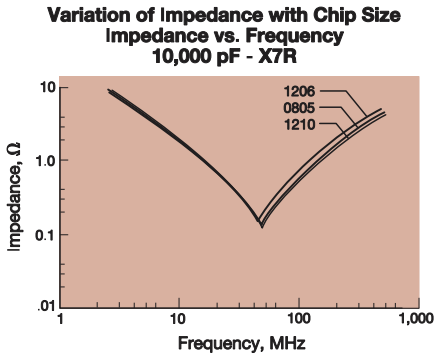
NOTE: Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.
Contact factory for non-specified capacitance values.

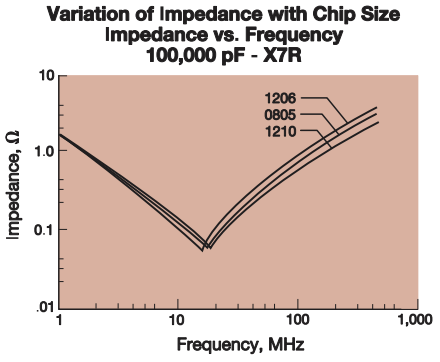


# X7R Dielectric

## Specifications and Test Methods

| Parameter/Test | | X7R Specification Limits | Measuring Conditions (Complies with JIS C5101 / IEC60384) |
|---|---|---|---|
| **Operating Temperature Range** | | -55ºC to +125ºC | Temperature Cycle Chamber |
| **Capacitance** | | Within specified tolerance | Measure after heat treatment<br>Capacitance Frequency Volt<br>C≤10µF<br>Frequency : 1kHz±10%<br>Volt : 1.0±0.2Vrms *0.5±0.2Vrms<br><br>C>10µF<br>Frequency : 120Hz±10%<br>Volt : 0.5±0.2Vrms<br>The charge and discharge current of the capacitor must not exceed 50mA. |
| **Dissipation Factor / Tanδ** | | Refer to https://spicat.kyocera-avx.com for individual part number specification | |
| **Insulation Resistance** | | Refer to https://spicat.kyocera-avx.com for individual part number specifiction | Apply the rated voltage for 1 minute, and measure it in normal temperature and humidity. The charge and discharge current of the capacitor must not exceed 50mA. |
| **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 500V devices. |
| **Bending Strength** | | No significant damage with 1mm bending | Glass epoxy PCB: Fulcrum spacing: 90mm, duration time 10 seconds. |
| **Solderability** | | Solder coverage : 95% min. | Soaking condition<br>Sn-3Ag-0.5Cu 245±5ºC 3±0.5 sec. |
| **Resistance to Solder Heat** | Appearance | No problem observed | Take the initial value after heat treatment.<br>Soak the sample in 260ºC±5ºC solder for 10±0.5 seconds and place in normal temperature and humidity, and measure after heat treatment.<br>(Pre-heating conditions)<br>Order Temperature Time<br>1 80 to 100ºC 2 minutes<br>2 150 to 200ºC 2 minutes<br>The charge and discharge current of the capacitor must not exceed 50mA for IR and withstanding voltage measurement. |
| | Capacitance Variation | ≤ ±7.5% | |
| | Dissipation Factor / Tanδ | Within specification | |
| | Insulation Resistance | Within specification | |
| | Withstanding Voltage / Dielectric Strength | Resist without problem | |
| **Thermal Shock** | Appearance | No visual defects | Take the initial value after heat treatment.<br>(Cycle)<br>Room temperature (3 min.)—><br>Lowest operation temperature (30 min.)—><br>Room temperature (3 min.)—><br>Highest operation temperature(30 min.)<br>After 5 cycles, measure after heat treatment.<br>The charge and discharge current of the capacitor must not exceed 50mA for IR and withstanding voltage measurement. |
| | Capacitance Variation | ≤ ±7.5% | |
| | Dissipation Factor | Within specification | |
| | Insulation Resistance | Within specification | |
| | Withstanding Voltage / Dielectric Strength | Resist without problem | |
| **Load Life** | Appearance | No visual defects | Take the initial value after heat treatment.<br>After applying *1.5 the rated voltage at the highest operation temperature for 1000+12/ −0 hours, and measure the sample after heat treatment in normal temperature and humidity.<br>The charge and discharge current of the capacitor must not exceed 50mA for IR measurement.<br>*Apply 1.0 times when the rated voltage is 4V or less. Applied voltages for respective products are indicated in the chart below. |
| | Capacitance Variation | ≤ ±12.5% | |
| | Dissipation Factor / Tanδ | ≤ Initial Value x 2.0 (See Above) | |
| | Insulation Resistance | Over 1000MΩ or 50MΩ · µF, whichever is less.<br>*Exceptions Listed Below | |
| **Load Humidity** | Appearance | No visual defects | Take the initial value after heat treatment.<br>After applying rated voltage for 500+12/ −0 hours in the condition of 40ºC ± 2ºC and 90 to 95%RH, and place in normal temperature and humid- ity, then measure the sample after heat treatment.<br>The charge and discharge current of the capacitor must not exceed 50mA for IR measurement. |
| | Capacitance Variation | ≤ ±12.5% | |
| | Dissipation Factor / Tanδ | Within specification | |
| | Insulation Resistance | Over 1000MΩ or 50MΩ · µF, whichever is less.<br>*Exceptions Listed Below | |
| **Appearance** | | No problem observed | Microscope |
| **Termination Strength** | | No problem observed | Apply a sideward force of 500g (5N) to a PCB-mounted sample. note : 2N for 0201 size, and 1N for 01005 size. |
| **Vibration** | Appearance | No problem observed | Take the initial value after heat treatment.<br>Vibration frequency: 10 to 55 (Hz)<br>Amplitude: 1.5mm<br>Sweeping condition: 10 —> 55 —> 10Hz/ 1 minute in X, Y and Z directions: 2 hours each, 6 hours in total, and place in normal temperature and humidity, then measure the sample after heat treatment. |
| | Capacitance | Within tolerance | |
| | Tanδ | Within tolerance | |
| **Heat Treatment** | | Expose sample in the temperature of 150+0/ −10ºC for 1 hour and leave the sample in normal temperature and humidity for 24±2 hours. | |

Voltage to be applied in the High Temperature Load (Applied voltage is the multiple of the rated voltage)

# 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 | mm | 0.40 ± 0.02 | 0.60 ± 0.03 | | | | | 1.00 ± 0.10 | | | | | | 1.60 ± 0.15 | | | | | | | | 2.01 ± 0.20 | | | | | | | | 3.20 ± 0.30 | | | | | | | | |
| | (in.) | (0.016 ± 0.0008) | (0.024 ± 0.001) | | | | | (0.040 ± 0.004) | | | | | | (0.063 ± 0.006) | | | | | | | | (0.079 ± 0.008) | | | | | | | | (0.126 ± 0.012) | | | | | | | | |
| W) Width | mm | 0.20 ± 0.02 | 0.30 ± 0.03 | | | | | 0.50 ± 0.10 | | | | | | 0.81 ± 0.15 | | | | | | | | 1.25 ± 0.20 | | | | | | | | 1.60 ± 0.30 | | | | | | | | |
| | (in.) | (0.008 ± 0.0008) | (0.011 ± 0.001) | | | | | (0.020 ± 0.004) | | | | | | (0.032 ± 0.006) | | | | | | | | (0.049 ± 0.008) | | | | | | | | (0.063 ± 0.012) | | | | | | | | |
| (t) Terminal | mm | 0.10± 0.04 | 0.15 ± 0.05 | | | | | 0.25 ± 0.15 | | | | | | 0.35 ± 0.15 | | | | | | | | 0.50 ± 0.25 | | | | | | | | 0.50 ± 0.25 | | | | | | | | |
| | (in.) | (0.004 ± 0.0016) | (0.006 ± 0.002) | | | | | (0.010 ± 0.006) | | | | | | (0.014 ± 0.006) | | | | | | | | (0.020 ± 0.010) | | | | | | | | (0.020 ± 0.010) | | | | | | | | |
| WVDC | | 16 | 6.3 | 10 | 16 | 25 | 50 | 6.3 | 10 | 16 | 25 | 50 | 100 | 6.3 | 10 | 16 | 25 | 50 | 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 | 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 | 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 | 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 | | 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 | 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 | | 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 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 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 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 6800 | 682 | | 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 | | 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 |
| (µF) | 0.012 | 123 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0.015 | 153 | | | | | | | C | C | C | C | C | | 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 | | | C | C | C | C | C | | 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 | C | | G | G | G | G | 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 | C | | G | G | G | G | 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 | 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 | 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 | K | | | | | 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 | X | | | | |
| | 22 | 226 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X | X | | | | | | | |
| | 47 | 476 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 100 | 107 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| WVDC | | 16 | 6.3 | 10 | 16 | 25 | 50 | 6.3 | 10 | 16 | 25 | 50 | 100 | 6.3 | 10 | 16 | 25 | 50 | 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 | | | | | 0402 | | | | | | 0603 | | | | | | | | 0805 | | | | | | | | 1206 | | | | | | | | |

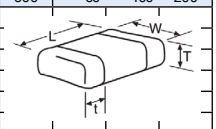
| Letter | A | B | C | E | G | J | K | M | N | P | Q | X | Y | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Max. Thickness | 0.33 (0.013) | 0.22 (0.009) | 0.56 (0.022) | 0.71 (0.028) | 0.90 (0.035) | 0.94 (0.037) | 1.02 (0.040) | 1.27 (0.050) | 1.40 (0.055) | 1.52 (0.060) | 1.78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

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

# X7R Dielectric

## Capacitance Range

### PREFERRED SIZES ARE SHADED

| SIZE | | | 1210 | | | | | | | 1812 | | | | | | 1825 | | | 2220 | | | | | 2225 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Reflow Only | | | | | | | Reflow Only | | | | | | Reflow Only | | | Reflow Only | | | | | Reflow Only | | |
| | | | Paper/Embossed | | | | | | | All Embossed | | | | | | All Embossed | | | All Embossed | | | | | All Embossed | | |
| (L) Length | | mm (in.) | 3.30 ± 0.4 (0.130± 0.016) | | | | | | | 4.50 ± 0.40 (0.177 ± 0.016) | | | | | | 4.50 ± 0.40 (0.177 ± 0.016) | | | 5.70 ± 0.50 (0.224 ± 0.020) | | | | | 5.70 ± 0.40 (0.224 ± 0.016) | | |
| W) Width | | mm (in.) | 2.50 ± 0.30 (0.098 ± 0.012) | | | | | | | 3.20 ± 0.40 (0.126 ± 0.016) | | | | | | 6.40 ± 0.40 (0.252 ± 0.016) | | | 5.00 ± 0.40 (0.197 ± 0.016) | | | | | 6.30 ± 0.40 (0.248 ± 0.016) | | |
| (t) Terminal | | mm (in.) | 0.50 ± 0.25 (0.020 ± 0.010) | | | | | | | 0.61 ± 0.36 (0.024 ± 0.014) | | | | | | 0.61 ± 0.36 (0.024 ± 0.014) | | | 0.64 ± 0.39 (0.025 ± 0.015) | | | | | 0.64 ± 0.39 (0.025 ± 0.015) | | |
| | | WVDC | 10 | 16 | 25 | 50 | 100 | 200 | 500 | 16 | 25 | 50 | 100 | 200 | 500 | 50 | 100 | 200 | 25 | 50 | 100 | 200 | 500 | 50 | 100 | 200 |
| Cap | 100 | 101 | | | | | | | | | | | | | | | | | | | | | |  | | |
| (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 | | | | | | | | | | | |
| | 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 |
| (µF) | 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 | Z | X | X | X |
| | 1.0 | 105 | P | P | P | X | Z | | | Q | Q | Q | X | Z | | X | X | X | | X | X | X | 7 | 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 | 7 | | | Z | Z | |
| | 22 | 226 | Z | Z | Z | | | | | | | | | | | | | | Z | | 7 | | | | | |
| | 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 | 100 | 200 |
| SIZE | | | 1210 | | | | | | | 1812 | | | | | | 1825 | | | 2220 | | | | | 2225 | | |

| Letter | A | B | C | E | G | J | K | M | N | P | Q | X | Y | Z | 7 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Max. Thickness | 0.33 (0.013) | 0.22 (0.009) | 0.56 (0.022) | 0.71 (0.028) | 0.90 (0.035) | 0.94 (0.037) | 1.02 (0.040) | 1.27 (0.050) | 1.40 (0.055) | 1.52 (0.060) | 1.78 (0.070) | 2.29 (0.090) | 2.54 (0.100) | 2.79 (0.110) | 3.30 (0.130) |
| | PAPER | | | | | | EMBOSSED | | | | | | | | |

NOTE: Contact factory for non-specified capacitance values