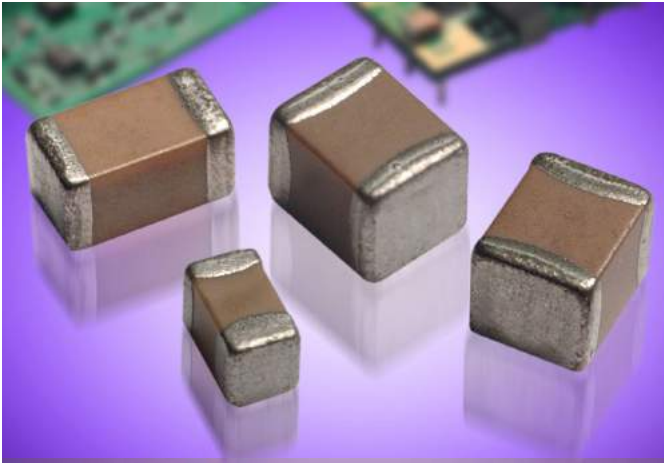


# C0G (NP0) Dielectric

## General Specifications



C0G (NP0) is the most popular formulation of the “temperature-compensating,” EIA Class I ceramic materials. Modern C0G (NP0) formulations contain neodymium, samarium and other rare earth oxides.

C0G (NP0) ceramics offer one of the most stable capacitor dielectrics available. Capacitance change with temperature is  $0 \pm 30\text{ppm}/^\circ\text{C}$  which is less than  $\pm 0.3\%$  C from  $-55^\circ\text{C}$  to  $+125^\circ\text{C}$ . Capacitance drift or hysteresis for C0G (NP0) ceramics is negligible at less than  $\pm 0.05\%$  versus up to  $\pm 2\%$  for films. Typical capacitance change with life is less than  $\pm 0.1\%$  for C0G (NP0), one-fifth that shown by most other dielectrics. C0G (NP0) formulations show no aging characteristics.

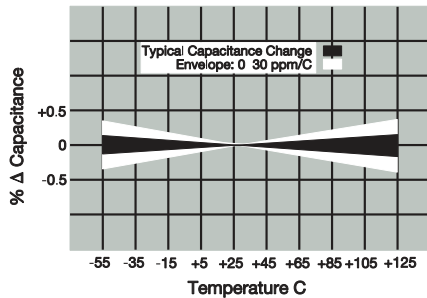


### PART NUMBER (see page 2 for complete part number explanation)

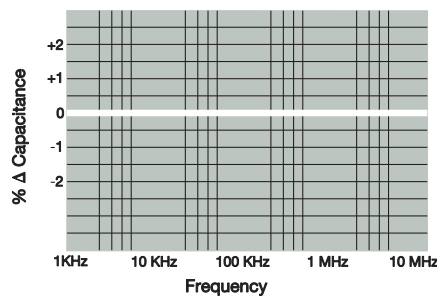
|                          |  |                                    |  |  |   |  |   |   |
|--------------------------|--|------------------------------------|--|--|---|--|---|---|
| <b>0805</b>              | <b>5</b>   | <b>A</b>                           | <b>101</b>   | <b>J</b>   | <b>A</b>                                  | <b>T</b>   | <b>2</b>  | <b>A</b>                                |
|                          |  |                                    |  |  |   |  |   |   |
| <b>Size</b><br>(L" x W") | <b>Voltage</b><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 | <b>Dielectric</b><br>C0G (NP0) = A | <b>Capacitance Code (in pF)</b><br>2 Sig. Digits + Number of Zeros | <b>Capacitance Tolerance</b><br>B = $\pm 10$ pF (<10pF)<br>C = $\pm 25$ pF (<10pF)<br>D = $\pm 50$ pF (<10pF)<br>F = $\pm 1\%$ ( $\geq 10$ pF)<br>G = $\pm 2\%$ ( $\geq 10$ pF)<br>J = $\pm 5\%$<br>K = $\pm 10\%$ | <b>Failure Rate</b><br>A = Not Applicable | <b>Terminations</b><br>T = Plated Ni and Sn  | <b>Packaging</b><br>2 = 7" Reel<br>4 = 13" Reel<br>U = 4mm TR (01005) | <b>Special Code</b><br>A = Std. Product |
|                          |  |                                    |  |  |   | <b>Contact Factory For</b><br><b>1 = Pd/Ag Term</b><br><b>7 = Gold Plated</b><br><b>NOT RoHS COMPLIANT</b> |   | <b>Contact Factory For Multiples</b>    |

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

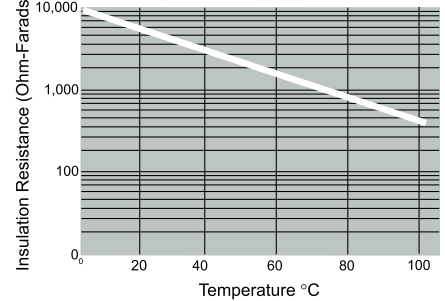
**Temperature Coefficient**



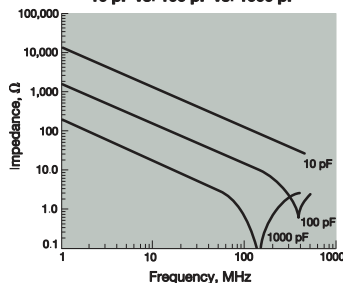
**Δ Capacitance vs. Frequency**



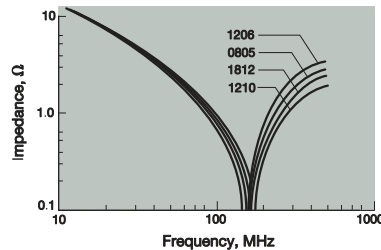
**Insulation Resistance vs Temperature**



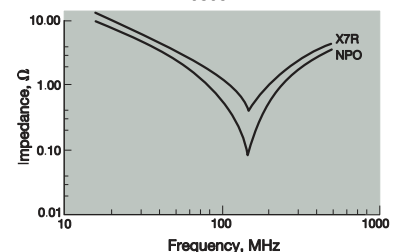
**Variation of Impedance with Cap Value Impedance vs. Frequency 0805 - C0G (NP0) 10 pF vs. 100 pF vs. 1000 pF**



**Variation of Impedance with Chip Size Impedance vs. Frequency 1000 pF - C0G (NP0)**



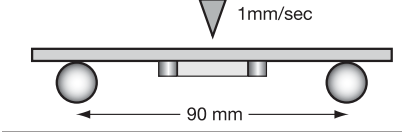
**Variation of Impedance with Ceramic Formulation Impedance vs. Frequency 1000 pF - C0G (NP0) vs X7R 0805**



# C0G (NP0) Dielectric

## Specifications and Test Methods



| Parameter/Test                 |                       | NP0 Specification Limits  | Measuring Conditions  |                    |
|--------------------------------|-----------------------|---|---|--------------------|
| Operating Temperature Range    |                       | -55°C to +125°C   | Temperature Cycle Chamber   |                    |
| Capacitance                    |                       | Within specified tolerance  | Freq.: 1.0 MHz $\pm$ 10% for cap $\leq$ 1000 pF<br>1.0 kHz $\pm$ 10% for cap $>$ 1000 pF<br>Voltage: 1.0Vrms $\pm$ .2V  |                    |
| Q                              |                       | <30 pF: Q $\geq$ 400+20 x Cap Value<br>$\geq$ 30 pF: Q $\geq$ 1000                                  |   |                    |
| Insulation Resistance          |                       | 100,000M $\Omega$ or 1000M $\Omega$ - $\mu$ F,<br>whichever is less                                 | Charge device with rated voltage for<br>60 $\pm$ 5 secs @ room temp/humidity  |                    |
| Dielectric Strength            |                       | No breakdown or visual defects  | Charge device with 250% of rated voltage for<br>1-5 seconds, w/charge and discharge current<br>limited to 50 mA (max)<br>Note: Charge device with 150% of rated<br>voltage for 500V devices.  |                    |
| Resistance to Flexure Stresses | Appearance            | No defects  | Deflection: 2mm<br>Test Time: 30 seconds<br>   |                    |
|                                | Capacitance Variation | $\pm$ 5% or $\pm$ 5 pF, whichever is greater  |   |                    |
|                                | Q                     | Meets Initial Values (As Above)   |   |                    |
|                                | Insulation Resistance | $\geq$ Initial Value x 0.3  |   |                    |
| Solderability                  |                       | $\geq$ 95% of each terminal should be covered<br>with fresh solder                                  | Dip device in eutectic solder at 230 $\pm$ 5°C<br>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°C for 60sec-<br>onds. Store at room temperature for 24 $\pm$ 2hours<br>before measuring electrical properties.   |                    |
|                                | Capacitance Variation | $\leq$ $\pm$ 2.5% or $\pm$ 25 pF, whichever is greater  |   |                    |
|                                | Q                     | 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°C $\pm$ 2°  | 30 $\pm$ 3 minutes |
|                                | Capacitance Variation | $\leq$ $\pm$ 2.5% or $\pm$ 25 pF, whichever is greater  | Step 2: Room Temp   | $\leq$ 3 minutes   |
|                                | Q                     | Meets Initial Values (As Above)   | Step 3: +125°C $\pm$ 2°   | 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<br>24 hours at room temperature   |                    |
| Load Life                      | Appearance            | No visual defects   | Charge device with twice rated voltage in<br>test chamber set at 125°C $\pm$ 2°C<br>for 1000 hours (+48, -0).<br><br>Remove from test chamber and stabilize at<br>room temperature for 24 hours<br>before measuring.                            |                    |
|                                | Capacitance Variation | $\leq$ $\pm$ 3.0% or $\pm$ .3 pF, whichever is greater  |   |                    |
|                                | Q<br>(C=Nominal Cap)  | $\geq$ 30 pF: Q $\geq$ 350<br>$\geq$ 10 pF, <30 pF: Q $\geq$ 275 +5C/2<br><10 pF: Q $\geq$ 200 +10C |   |                    |
|                                | Insulation Resistance | $\geq$ Initial Value x 0.3 (See Above)  |   |                    |
|                                | Dielectric Strength   | Meets Initial Values (As Above)   |   |                    |
| Load Humidity                  | Appearance            | No visual defects   | Store in a test chamber set at 85°C $\pm$ 2°C/<br>85% $\pm$ 5% relative humidity for 1000 hours<br>(+48, -0) with rated voltage applied.<br><br>Remove from chamber and stabilize at room<br>temperature for 24 $\pm$ 2 hours before measuring. |                    |
|                                | Capacitance Variation | $\leq$ $\pm$ 5.0% or $\pm$ .5 pF, whichever is greater  |   |                    |
|                                | Q                     | $\geq$ 30 pF: Q $\geq$ 350<br>$\geq$ 10 pF, <30 pF: Q $\geq$ 275 +5C/2<br><10 pF: Q $\geq$ 200 +10C |   |                    |
|                                | Insulation Resistance | $\geq$ Initial Value x 0.3 (See Above)  |   |                    |
|                                | Dielectric Strength   | Meets Initial Values (As Above)   |   |                    |

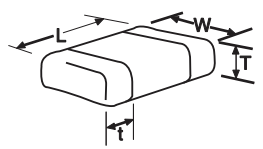
# C0G (NP0) Dielectric

## 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      | All Paper                       |                 |                 | All Paper                      |                 |                 | All Paper                      |                 |                 | All Paper                      |                 |                 |                 |                 | Paper/Embossed                 |  |  |  |  | Paper/Embossed                 |  |  |  |  |
| L) Length      | 0.40 ± 0.02<br>(0.016 ± 0.0008) |                 |                 | 0.60 ± 0.09<br>(0.024 ± 0.004) |                 |                 | 1.00 ± 0.10<br>(0.040 ± 0.004) |                 |                 | 1.60 ± 0.15<br>(0.063 ± 0.006) |                 |                 |                 |                 | 2.01 ± 0.20<br>(0.079 ± 0.008) |  |  |  |  | 3.20 ± 0.20<br>(0.126 ± 0.008) |  |  |  |  |
| W) Width       | 0.20 ± 0.02<br>(0.008 ± 0.0008) |                 |                 | 0.30 ± 0.09<br>(0.011 ± 0.004) |                 |                 | 0.50 ± 0.10<br>(0.020 ± 0.004) |                 |                 | 0.81 ± 0.15<br>(0.032 ± 0.006) |                 |                 |                 |                 | 1.25 ± 0.20<br>(0.049 ± 0.008) |  |  |  |  | 1.60 ± 0.20<br>(0.063 ± 0.008) |  |  |  |  |
| t) Terminal    | 0.10 ± 0.04<br>(0.004 ± 0.0016) |                 |                 | 0.15 ± 0.05<br>(0.006 ± 0.002) |                 |                 | 0.25 ± 0.15<br>(0.010 ± 0.006) |                 |                 | 0.35 ± 0.15<br>(0.014 ± 0.006) |                 |                 |                 |                 | 0.50 ± 0.25<br>(0.020 ± 0.010) |  |  |  |  | 0.50 ± 0.25<br>(0.020 ± 0.010) |  |  |  |  |
| WVDC           | 16                              |                 |                 | 25 50                          |                 |                 | 16 25 50                       |                 |                 | 16 25 50 100 200               |                 |                 |                 |                 | 16 25 50 100 200               |  |  |  |  | 16 25 50 100 200 500           |  |  |  |  |
| Cap (pF)       | B                               |                 |                 | A A A                          |                 |                 | C C C                          |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 1.0            | B                               |                 |                 | A A A                          |                 |                 | C C C                          |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 1.2            | B                               |                 |                 | A A A                          |                 |                 | C C C                          |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 1.5            | B                               |                 |                 | A A A                          |                 |                 | C C C                          |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 1.8            | B                               |                 |                 | A A A                          |                 |                 | C C C                          |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 2.2            | B                               |                 |                 | A A A                          |                 |                 | C C C                          |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 2.7            | B                               |                 |                 | A A A                          |                 |                 | C C C                          |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 3.3            | B                               |                 |                 | A A A                          |                 |                 | C C C                          |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 3.9            | B                               |                 |                 | A A A                          |                 |                 | C C C                          |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 4.7            | B                               |                 |                 | A A A                          |                 |                 | C C C                          |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 5.6            | B                               |                 |                 | A A A                          |                 |                 | C C C                          |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 6.8            | B                               |                 |                 | A A A                          |                 |                 | C C C                          |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 8.2            | B                               |                 |                 | A A A                          |                 |                 | C C C                          |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 10             | B                               |                 |                 | A A A                          |                 |                 | C C C                          |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 12             | B                               |                 |                 | A A A                          |                 |                 | C C C                          |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 15             | B                               |                 |                 | A A A                          |                 |                 | C C C                          |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 18             | B                               |                 |                 | A A A                          |                 |                 | C C C                          |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 22             | B                               |                 |                 | A A A                          |                 |                 | C C C                          |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 27             | B                               |                 |                 | A A A                          |                 |                 | C C C                          |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 33             | B                               |                 |                 | A A A                          |                 |                 | C C C                          |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 39             | B                               |                 |                 | A A A                          |                 |                 | C C C                          |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 47             | B                               |                 |                 | A A A                          |                 |                 | C C C                          |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 56             | B                               |                 |                 | A A A                          |                 |                 | C C C                          |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 68             | B                               |                 |                 | A A A                          |                 |                 | C C C                          |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 82             | B                               |                 |                 | A A A                          |                 |                 | C C C                          |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 100            | B                               |                 |                 | A A A                          |                 |                 | C C C                          |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 120            |                                 |                 |                 |                                |                 |                 | C C C                          |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 150            |                                 |                 |                 |                                |                 |                 | C C C                          |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 180            |                                 |                 |                 |                                |                 |                 | C C C                          |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 220            |                                 |                 |                 |                                |                 |                 | C C C                          |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 270            |                                 |                 |                 |                                |                 |                 | C C C                          |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 330            |                                 |                 |                 |                                |                 |                 | C C C                          |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 390            |                                 |                 |                 |                                |                 |                 | C C C                          |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 470            |                                 |                 |                 |                                |                 |                 | C C C                          |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 560            |                                 |                 |                 |                                |                 |                 | C C C                          |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 680            |                                 |                 |                 |                                |                 |                 | C C C                          |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 820            |                                 |                 |                 |                                |                 |                 | C C C                          |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 1000           |                                 |                 |                 |                                |                 |                 | C C C                          |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 1200           |                                 |                 |                 |                                |                 |                 |                                |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 1500           |                                 |                 |                 |                                |                 |                 |                                |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 1800           |                                 |                 |                 |                                |                 |                 |                                |                 |                 | G G G G G                      |                 |                 |                 |                 | J J J J J                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 2200           |                                 |                 |                 |                                |                 |                 |                                |                 |                 | G G G G G                      |                 |                 |                 |                 | N N N N N                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 2700           |                                 |                 |                 |                                |                 |                 |                                |                 |                 | G G G G G                      |                 |                 |                 |                 | N N N N N                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 3300           |                                 |                 |                 |                                |                 |                 |                                |                 |                 | G G G G G                      |                 |                 |                 |                 | P P P P P                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 3900           |                                 |                 |                 |                                |                 |                 |                                |                 |                 | G G G G G                      |                 |                 |                 |                 | P P P P P                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 4700           |                                 |                 |                 |                                |                 |                 |                                |                 |                 | G G G G G                      |                 |                 |                 |                 | P P P P P                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 5600           |                                 |                 |                 |                                |                 |                 |                                |                 |                 |                                |                 |                 |                 |                 | P P P P P                      |  |  |  |  | J J J J J                      |  |  |  |  |
| 6800           |                                 |                 |                 |                                |                 |                 |                                |                 |                 |                                |                 |                 |                 |                 | P P P P P                      |  |  |  |  | M M M M M                      |  |  |  |  |
| 8200           |                                 |                 |                 |                                |                 |                 |                                |                 |                 |                                |                 |                 |                 |                 | P P P P P                      |  |  |  |  | M M M M M                      |  |  |  |  |
| Cap (µF)       |                                 |                 |                 |                                |                 |                 |                                |                 |                 |                                |                 |                 |                 |                 | P P P P P                      |  |  |  |  | M M M M M                      |  |  |  |  |
| 0.010          |                                 |                 |                 |                                |                 |                 |                                |                 |                 |                                |                 |                 |                 |                 | P P P P P                      |  |  |  |  | M M M M M                      |  |  |  |  |
| 0.012          |                                 |                 |                 |                                |                 |                 |                                |                 |                 |                                |                 |                 |                 |                 | P P P P P                      |  |  |  |  | M M M M M                      |  |  |  |  |
| 0.015          |                                 |                 |                 |                                |                 |                 |                                |                 |                 |                                |                 |                 |                 |                 | P P P P P                      |  |  |  |  | M M M M M                      |  |  |  |  |
| 0.018          |                                 |                 |                 |                                |                 |                 |                                |                 |                 |                                |                 |                 |                 |                 |                                |  |  |  |  |                                |  |  |  |  |
| 0.022          |                                 |                 |                 |                                |                 |                 |                                |                 |                 |                                |                 |                 |                 |                 |                                |  |  |  |  |                                |  |  |  |  |
| 0.027          |                                 |                 |                 |                                |                 |                 |                                |                 |                 |                                |                 |                 |                 |                 |                                |  |  |  |  |                                |  |  |  |  |
| 0.033          |                                 |                 |                 |                                |                 |                 |                                |                 |                 |                                |                 |                 |                 |                 |                                |  |  |  |  |                                |  |  |  |  |
| 0.039          |                                 |                 |                 |                                |                 |                 |                                |                 |                 |                                |                 |                 |                 |                 |                                |  |  |  |  |                                |  |  |  |  |
| 0.047          |                                 |                 |                 |                                |                 |                 |                                |                 |                 |                                |                 |                 |                 |                 |                                |  |  |  |  |                                |  |  |  |  |
| 0.068          |                                 |                 |                 |                                |                 |                 |                                |                 |                 |                                |                 |                 |                 |                 |                                |  |  |  |  |                                |  |  |  |  |
| 0.082          |                                 |                 |                 |                                |                 |                 |                                |                 |                 |                                |                 |                 |                 |                 |                                |  |  |  |  |                                |  |  |  |  |
| 0.1            |                                 |                 |                 |                                |                 |                 |                                |                 |                 |                                |                 |                 |                 |                 |                                |  |  |  |  |                                |  |  |  |  |
| WVDC           | 16                              |                 |                 | 25 50                          |                 |                 | 16 25 50                       |                 |                 | 16 25 50 100 200               |                 |                 |                 |                 | 16 25 50 100 200               |  |  |  |  | 16 25 50 100 200 500           |  |  |  |  |
| 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<br>(0.013)                 | 0.22<br>(0.009) | 0.56<br>(0.022) | 0.71<br>(0.028)                | 0.90<br>(0.035) | 0.94<br>(0.037) | 1.02<br>(0.040)                | 1.27<br>(0.050) | 1.40<br>(0.055) | 1.52<br>(0.060)                | 1.78<br>(0.070) | 2.29<br>(0.090) | 2.54<br>(0.100) | 2.79<br>(0.110) |                                |  |  |  |  |                                |  |  |  |  |
| PAPER          |                                 |                 |                 |                                |                 |                 | EMBOSSSED                      |                 |                 |                                |                 |                 |                 |                 |                                |  |  |  |  |                                |  |  |  |  |



PAPER and EMBOSSSED available for 01005



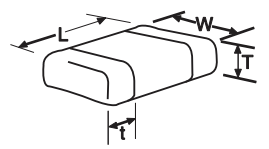
# C0G (NP0) Dielectric



## 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   | mm             | 3.20 ± 0.20     |                 |                 |                 |                 | 4.50 ± 0.30     |                 |                 |                 |                 | 4.50 ± 0.30     |                 |                 |                 |                 | 5.70 ± 0.40     |                 |                 |                 |                 | 5.72 ± 0.25     |                 |                 |                 |                 |                 |                 |                 |  |  |
|              | (in.)          | (0.126 ± 0.008) |                 |                 |                 |                 | (0.177 ± 0.012) |                 |                 |                 |                 | (0.177 ± 0.012) |                 |                 |                 |                 | (0.225 ± 0.016) |                 |                 |                 |                 | (0.225 ± 0.010) |                 |                 |                 |                 |                 |                 |                 |  |  |
| (W) Width    | mm             | 2.50 ± 0.20     |                 |                 |                 |                 | 3.20 ± 0.20     |                 |                 |                 |                 | 6.40 ± 0.40     |                 |                 |                 |                 | 5.00 ± 0.40     |                 |                 |                 |                 | 6.35 ± 0.25     |                 |                 |                 |                 |                 |                 |                 |  |  |
|              | (in.)          | (0.098 ± 0.008) |                 |                 |                 |                 | (0.126 ± 0.008) |                 |                 |                 |                 | (0.252 ± 0.016) |                 |                 |                 |                 | (0.197 ± 0.016) |                 |                 |                 |                 | (0.250 ± 0.010) |                 |                 |                 |                 |                 |                 |                 |  |  |
| (t) Terminal | mm             | 0.50 ± 0.25     |                 |                 |                 |                 | 0.61 ± 0.36     |                 |                 |                 |                 | 0.61 ± 0.36     |                 |                 |                 |                 | 0.64 ± 0.39     |                 |                 |                 |                 | 0.64 ± 0.39     |                 |                 |                 |                 |                 |                 |                 |  |  |
|              | (in.)          | (0.020 ± 0.010) |                 |                 |                 |                 | (0.024 ± 0.014) |                 |                 |                 |                 | (0.024 ± 0.014) |                 |                 |                 |                 | (0.025 ± 0.015) |                 |                 |                 |                 | (0.025 ± 0.015) |                 |                 |                 |                 |                 |                 |                 |  |  |
| WVDC         |                | 25              | 50              | 100             | 200             | 500             | 25              | 50              | 100             | 200             | 500             | 50              | 100             | 200             | 50              | 100             | 200             | 50              | 100             | 200             | 50              | 100             | 200             | 50              | 100             | 200             |                 |                 |                 |  |  |
| Cap (pF)     | 0.5            |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |  |  |
|              | 1.0            |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |  |  |
|              | 1.2            |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |  |  |
|              | 1.5            |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |  |  |
|              | 1.8            |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |  |  |
| 2.2          |                |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |  |  |
| 2.7          |                |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |  |  |
| 3.3          |                |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |  |  |
| 3.9          |                |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |  |  |
| 4.7          |                |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |  |  |
| 5.6          |                |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |  |  |
| 6.8          |                |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |  |  |
| 8.2          |                |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |  |  |
| 10           |                |                 |                 |                 |                 | J               |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |  |  |
| 12           |                |                 |                 |                 |                 | J               |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |  |  |
| 15           |                |                 |                 |                 |                 | J               |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |  |  |
| 18           |                |                 |                 |                 |                 | J               |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |  |  |
| 22           |                |                 |                 |                 |                 | J               |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |  |  |
| 27           |                |                 |                 |                 |                 | J               |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |  |  |
| 33           |                |                 |                 |                 |                 | J               |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |  |  |
| 39           |                |                 |                 |                 |                 | J               |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |  |  |
| 47           |                |                 |                 |                 |                 | J               |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |  |  |
| 56           |                |                 |                 |                 |                 | J               |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |  |  |
| 68           |                |                 |                 |                 |                 | J               |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |  |  |
| 82           |                |                 |                 |                 |                 | J               |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |  |  |
| 100          |                |                 |                 |                 |                 | J               |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |  |  |
| 120          |                |                 |                 |                 |                 | J               |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |  |  |
| 150          |                |                 |                 |                 |                 | J               |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |  |  |
| 180          |                |                 |                 |                 |                 | J               |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |  |  |
| 220          |                |                 |                 |                 |                 | J               |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |  |  |
| 270          |                |                 |                 |                 |                 | J               |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |  |  |
| 330          |                |                 |                 |                 |                 | J               |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |  |  |
| 390          |                |                 |                 |                 |                 | M               |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |  |  |
| 470          |                |                 |                 |                 |                 | M               |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |  |  |
| 560          | J              | J               | J               | J               | M               |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |  |  |
| 680          | J              | J               | J               | K               | P               |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |  |  |
| 820          | J              | J               | J               | K               | P               |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |  |  |
| 1000         | J              | J               | P               | P               | P               | K               | K               | N               | N               | M               | M               | M               | M               |                 |                 |                 |                 |                 |                 | M               | M               | M               | P               | P               |                 |                 |                 |                 |                 |  |  |
| 1200         | P              | P               | P               | P               | P               | K               | K               | N               | N               | M               | M               | M               | M               |                 |                 |                 |                 |                 |                 | M               | M               | M               | P               | P               |                 |                 |                 |                 |                 |  |  |
| 1500         | P              | P               | P               | P               | P               | K               | K               | N               | N               | M               | M               | M               | M               |                 |                 |                 |                 |                 |                 | M               | M               | M               | P               | P               |                 |                 |                 |                 |                 |  |  |
| 1800         | P              | P               | P               | P               | P               | K               | K               | N               | N               | M               | M               | M               | M               |                 |                 |                 |                 |                 |                 | M               | M               | M               | P               | P               |                 |                 |                 |                 |                 |  |  |
| 2200         | P              | P               | P               | P               | N               | K               | K               | N               | N               | P               | X               | X               | M               |                 |                 |                 |                 |                 |                 | M               | M               | M               | P               | P               |                 |                 |                 |                 |                 |  |  |
| 2700         | P              | P               | P               | P               |                 | K               | K               | N               | P               | Q               | X               | X               | M               |                 |                 |                 |                 |                 |                 | M               | M               | M               | P               | P               |                 |                 |                 |                 |                 |  |  |
| 3300         | P              | P               | P               | P               |                 | K               | K               | N               | P               | Q               | X               | X               | X               |                 |                 |                 |                 | X               |                 | M               | M               | M               | P               | P               |                 |                 |                 |                 |                 |  |  |
| 3900         | P              | P               | P               | P               |                 | K               | K               | N               | P               | Q               | X               | X               | X               |                 |                 |                 |                 | X               |                 | M               | M               | M               | P               | P               |                 |                 |                 |                 |                 |  |  |
| 4700         | P              | P               | P               | P               |                 | K               | K               | N               | P               | Y               | X               | X               | X               |                 |                 |                 | X               | X               | M               | M               | M               | P               | P               |                 |                 |                 |                 |                 |                 |  |  |
| 5600         | P              | P               | P               |                 |                 | K               | K               | P               | P               | Y               | X               | X               | X               |                 |                 |                 | X               | X               | M               | M               | M               | P               | P               |                 |                 |                 |                 |                 |                 |  |  |
| 6800         | P              | P               | P               |                 |                 | K               | K               | Q               | Q               |                 | X               | X               | X               |                 |                 |                 | X               | X               | M               | M               | M               | P               | P               |                 |                 |                 |                 |                 |                 |  |  |
| 8200         | P              | P               | P               |                 |                 | K               | M               | Q               | Q               |                 | X               | X               | X               |                 |                 |                 | X               | X               | M               | M               | M               | P               | P               |                 |                 |                 |                 |                 |                 |  |  |
| Cap (µF)     | 0.010          | N               | N               |                 |                 | K               | M               | Q               | Q               |                 | X               | X               | X               |                 |                 |                 | X               | X               | M               | M               | M               | P               | P               |                 |                 |                 |                 |                 |                 |  |  |
|              | 0.012          | N               | N               |                 |                 | K               | M               | Q               |                 |                 | X               | X               | X               |                 |                 |                 | X               | X               | M               | M               | M               | P               | P               |                 |                 |                 |                 |                 |                 |  |  |
|              | 0.015          |                 |                 |                 |                 | P               | P               | Q               |                 |                 | X               | X               | X               |                 |                 |                 | X               | X               | M               | M               | M               | Y               | Y               |                 |                 |                 |                 |                 |                 |  |  |
|              | 0.018          |                 |                 |                 |                 | P               | P               | Q               |                 |                 | X               | X               | X               |                 |                 |                 | X               | X               | M               | M               | M               | Y               | Y               |                 |                 |                 |                 |                 |                 |  |  |
|              | 0.022          |                 |                 |                 |                 | P               | P               | Q               |                 |                 | X               | X               | X               |                 |                 |                 | X               | X               | M               | M               | M               | Y               | Y               |                 |                 |                 |                 |                 |                 |  |  |
| 0.027        |                |                 |                 |                 | Q               | Q               | X               |                 |                 | X               | X               | Y               |                 |                 |                 | X               | X               | P               | Y               | Y               | Y               | Y               | Y               |                 |                 |                 |                 |                 |                 |  |  |
| 0.033        |                |                 |                 |                 | Q               | Q               | X               |                 |                 | X               | X               |                 |                 |                 |                 | X               | X               |                 | X               | Y               | Y               | Y               | Y               |                 |                 |                 |                 |                 |                 |  |  |
| 0.039        |                |                 |                 |                 | X               | X               | X               |                 |                 | X               |                 |                 |                 |                 |                 | Y               |                 |                 | X               | Y               | Y               | Y               | Y               |                 |                 |                 |                 |                 |                 |  |  |
| 0.047        |                |                 |                 |                 | X               | X               | X               |                 |                 | X               |                 |                 |                 |                 | Y               |                 |                 | X               | Z               | Z               | Z               | Z               | Z               |                 |                 |                 |                 |                 |                 |  |  |
| 0.068        |                |                 |                 |                 | Z               | Z               | Y               |                 |                 |                 |                 |                 |                 |                 | Z               |                 |                 | X               | Z               | Z               | Z               | Z               | Z               |                 |                 |                 |                 |                 |                 |  |  |
| 0.082        |                |                 |                 |                 | Z               | Z               | Y               |                 |                 |                 |                 |                 |                 |                 | Z               |                 |                 | X               | Z               | Z               | Z               | Z               | Z               |                 |                 |                 |                 |                 |                 |  |  |
| 0.1          |                |                 |                 |                 | Z               | Z               | Z               |                 |                 |                 |                 |                 |                 |                 | Z               |                 |                 | X               | Z               | Z               | Z               | Z               | Z               |                 |                 |                 |                 |                 |                 |  |  |
| WVDC         |                | 25              | 50              | 100             | 200             | 500             | 25              | 50              | 100             | 200             | 500             | 50              | 100             | 200             | 50              | 100             | 200             | 50              | 100             | 200             | 50              | 100             | 200             | 50              | 100             | 200             |                 |                 |                 |  |  |
| SIZE         |                | 1210            |                 |                 |                 |                 | 1812            |                 |                 |                 |                 | 1825            |                 |                 |                 |                 | 2220            |                 |                 |                 |                 | 2225            |                 |                 |                 |                 |                 |                 |                 |  |  |
| Letter       | Max. Thickness | A               | B               | C               | E               | G               | J               | K               | M               | N               | P               | Q               | X               | Y               | Z               | A               | B               | C               | E               | G               | J               | K               | M               | N               | P               | Q               | X               | Y               | Z               |  |  |
|              |                | 0.33<br>(0.013) | 0.22<br>(0.009) | 0.56<br>(0.022) | 0.71<br>(0.028) | 0.90<br>(0.035) | 0.94<br>(0.037) | 1.02<br>(0.040) | 1.27<br>(0.050) | 1.40<br>(0.055) | 1.52<br>(0.060) | 1.78<br>(0.070) | 2.29<br>(0.090) | 2.54<br>(0.100) | 2.79<br>(0.110) | 0.33<br>(0.013) | 0.22<br>(0.009) | 0.56<br>(0.022) | 0.71<br>(0.028) | 0.90<br>(0.035) | 0.94<br>(0.037) | 1.02<br>(0.040) | 1.27<br>(0.050) | 1.40<br>(0.055) | 1.52<br>(0.060) | 1.78<br>(0.070) | 2.29<br>(0.090) | 2.54<br>(0.100) | 2.79<br>(0.110) |  |  |
| PAPER        |                |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 | EMBOSSED        |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |  |  |



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[LRF1206LF-01R025FTR1K](#) [1812J1K00222JCT](#) [1812J2K00102KXT](#) [1812J2K00222KXT](#) [1812J2K00472KXT](#) [1A84158H01#B](#) [2-1622820-7-CUT-](#)  
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[CGA2B2C0G1H050C](#) [CGA2B2C0G1H060D](#) [CGA2B2C0G1H070D](#) [CGA2B2C0G1H151J](#) [CGA2B2C0G1H1R5C](#) [CGA2B2C0G1H2R2C](#)  
[CGA2B2C0G1H3R3C](#) [CGA2B2C0G1H680J](#) [CGA2B2C0G1H6R8D](#) [CGA2B2X8R1H221K](#)