

# 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  $\pm 0.3\% \Delta C$  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)

**0805**

**Size**  
(L" x W")

**5**

**Voltage**  
6.3V = 6  
10V = Z  
16V = Y  
25V = 3  
50V = 5  
100V = 1  
200V = 2  
500V = 7

**A**

**Dielectric**  
C0G (NP0) = A

**101**

**Capacitance Code (In pF)**  
2 Sig. Digits + Number of Zeros

**J**

**Capacitance Tolerance**  
B =  $\pm 10 \text{ pF}$  ( $< 10 \text{ pF}$ )  
C =  $\pm 25 \text{ pF}$  ( $< 10 \text{ pF}$ )  
D =  $\pm 50 \text{ pF}$  ( $< 10 \text{ pF}$ )  
F =  $\pm 1\%$  ( $\geq 10 \text{ pF}$ )  
G =  $\pm 2\%$  ( $\geq 10 \text{ pF}$ )  
J =  $\pm 5\%$   
K =  $\pm 10\%$

**A**

**Failure Rate**  
A = Not Applicable

**T**

**Terminations**  
T = Plated Ni and Sn  
7 = Gold Plated

**2**

**Packaging**  
2 = 7" Reel  
4 = 13" Reel  
7 = Bulk Cass.  
9 = Bulk

**A**

**Special Code**  
A = Std. Product

**Contact Factory For**  
1 = Pd/Ag Term

**Contact Factory For**  
Multiples

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



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## Specifications and Test Methods

| Parameter/Test                        |                       | NP0 Specification Limits  | Measuring Conditions  |                |
|---------------------------------------|-----------------------|---|---|----------------|
| <b>Operating Temperature Range</b>    |                       | -55°C to +125°C   | Temperature Cycle Chamber   |                |
| <b>Capacitance</b>                    |                       | Within specified tolerance  | Freq.: 1.0 MHz ± 10% for cap ≤ 1000 pF<br>1.0 kHz ± 10% for cap > 1000 pF<br>Voltage: 1.0Vrms ± .2V   |                |
| <b>Q</b>                              |                       | <30 pF: Q ≥ 400+20 x Cap Value<br>≥30 pF: Q ≥ 1000                        | Charge device with rated voltage for 60 ± 5 secs @ room temp/humidity   |                |
| <b>Insulation Resistance</b>          |                       | 100,000MΩ or 1000MΩ - μF, whichever is less                               | Charge device with 300% 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. |                |
| <b>Dielectric Strength</b>            |                       | No breakdown or visual defects  | Deflection: 2mm<br>Test Time: 30 seconds<br>1mm/sec<br>  |                |
| <b>Resistance to Flexure Stresses</b> | Appearance            | No defects  |   |                |
|                                       | Capacitance Variation | ±5% or ±.5 pF, whichever is greater                                       |   |                |
|                                       | Q                     | Meets Initial Values (As Above)   |   |                |
|                                       | Insulation Resistance | ≥ Initial Value x 0.3   |   |                |
| <b>Solderability</b>                  |                       | ≥ 95% of each terminal should be covered with fresh solder                | Dip device in eutectic solder at 230 ± 5°C for 5.0 ± 0.5 seconds  |                |
| <b>Resistance to Solder Heat</b>      | Appearance            | No defects, <25% leaching of either end terminal                          | Dip device in eutectic solder at 260°C for 60 seconds. Store at room temperature for 24 ± 2 hours before measuring electrical properties.   |                |
|                                       | Capacitance Variation | ≤ ±2.5% or ±.25 pF, whichever is greater                                  |   |                |
|                                       | Q                     | Meets Initial Values (As Above)   |   |                |
|                                       | Insulation Resistance | Meets Initial Values (As Above)   |   |                |
| <b>Thermal Shock</b>                  | Dielectric Strength   | Meets Initial Values (As Above)   | Repeat for 5 cycles and measure after 24 hours at room temperature  |                |
|                                       | Appearance            | No visual defects   | Step 1: -55°C ± 2°  | 30 ± 3 minutes |
|                                       | Capacitance Variation | ≤ ±2.5% or ±.25 pF, whichever is greater                                  | Step 2: Room Temp   | ≤ 3 minutes    |
|                                       | Q                     | Meets Initial Values (As Above)   | Step 3: +125°C ± 2°   | 30 ± 3 minutes |
|                                       | Insulation Resistance | Meets Initial Values (As Above)   | Step 4: Room Temp   | ≤ 3 minutes    |
| <b>Load Life</b>                      | Dielectric Strength   | Meets Initial Values (As Above)   | Charge device with twice rated voltage in test chamber set at 125°C ± 2°C for 1000 hours (+48, -0).   |                |
|                                       | Appearance            | No visual defects   | Remove from test chamber and stabilize at room temperature for 24 hours before measuring.   |                |
|                                       | Capacitance Variation | ≤ ±3.0% or ± .3 pF, whichever is greater                                  |   |                |
|                                       | Q (C=Nominal Cap)     | ≥ 30 pF: Q ≥ 350<br>≥10 pF, <30 pF: Q ≥ 275 +5C/2<br><10 pF: Q ≥ 200 +10C |   |                |
|                                       | Insulation Resistance | ≥ Initial Value x 0.3 (See Above)   |   |                |
| <b>Load Humidity</b>                  | Dielectric Strength   | Meets Initial Values (As Above)   | Store in a test chamber set at 85°C ± 2°C/ 85% ± 5% relative humidity for 1000 hours (+48, -0) with rated voltage applied.  |                |
|                                       | Appearance            | No visual defects   | Remove from chamber and stabilize at room temperature for 24 ± 2 hours before measuring.  |                |
|                                       | Capacitance Variation | ≤ ±5.0% or ± .5 pF, whichever is greater                                  |   |                |
|                                       | Q                     | ≥ 30 pF: Q ≥ 350<br>≥10 pF, <30 pF: Q ≥ 275 +5C/2<br><10 pF: Q ≥ 200 +10C |   |                |
|                                       | Insulation Resistance | ≥ Initial Value x 0.3 (See Above)   |   |                |
|                                       | Dielectric Strength   | Meets Initial Values (As Above)   |   |                |

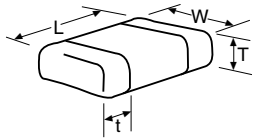
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## Capacitance Range

PREFERRED SIZES ARE SHADED

| SIZE           | 01005  |                 | 0201                           |                 | 0402                           |                 |                 | 0603                           |                 |                 |                 | 0805                           |                 |                 |     |     | 1206                           |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
|----------------|--|-----------------|--------------------------------|-----------------|--------------------------------|-----------------|-----------------|--------------------------------|-----------------|-----------------|-----------------|--------------------------------|-----------------|-----------------|-----|-----|--------------------------------|----|-----|-----|-----|-----|---|--|---|---|--|--|---|--|--|--|---|--|--|--|--|---|--|--|--|--|
|                | 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 ± 0.03<br>(0.024 ± 0.001) |                 | 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 ± 0.03<br>(0.011 ± 0.001) |                 | 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 ± 0.016)   |                 | 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) |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| WWDC           | 16   |                 | 25                             | 50              | 16                             | 25              | 50              | 16                             | 25              | 50              | 100             | 16                             | 25              | 50              | 100 | 200 | 16                             | 25 | 50  | 100 | 200 | 500 |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| Cap (pF)       | Shaded cells (Preferred Sizes) Row 1 <td colspan="2">B</td> <td>A</td> <td colspan="3">C</td> <td colspan="4">G</td> <td colspan="5">J</td> <td colspan="5">J</td> |                 |                                |                 |                                |                 |                 |                                |                 |                 |                 |                                |                 |                 |     |     |                                |    |     |     |     |     | B |  | A | C |  |  | G |  |  |  | J |  |  |  |  | J |  |  |  |  |
| 1.0            | B  |                 | A                              | C               |                                |                 | G               |                                |                 |                 | J               |                                |                 |                 |     | J   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 1.2            | B  |                 | A                              | C               |                                |                 | G               |                                |                 |                 | J               |                                |                 |                 |     | J   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 1.5            | B  |                 | A                              | A               | C                              |                 |                 | G                              |                 |                 |                 | J                              |                 |                 |     |     | J                              |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 1.8            | B  |                 | A                              | A               | C                              |                 |                 | G                              |                 |                 |                 | J                              |                 |                 |     |     | J                              |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 2.2            | B  |                 | A                              | A               | C                              |                 |                 | G                              |                 |                 |                 | J                              |                 |                 |     |     | J                              |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 2.7            | B  |                 | A                              | A               | C                              |                 |                 | G                              |                 |                 |                 | J                              |                 |                 |     |     | J                              |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 3.3            | B  |                 | A                              | A               | C                              |                 |                 | G                              |                 |                 |                 | J                              |                 |                 |     |     | J                              |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 3.9            | B  |                 | A                              | A               | C                              |                 |                 | G                              |                 |                 |                 | J                              |                 |                 |     |     | J                              |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 4.7            | B  |                 | A                              | A               | C                              |                 |                 | G                              |                 |                 |                 | J                              |                 |                 |     |     | J                              |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 5.6            | B  |                 | A                              | A               | C                              |                 |                 | G                              |                 |                 |                 | J                              |                 |                 |     |     | J                              |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 6.8            | B  |                 | A                              | A               | C                              |                 |                 | G                              |                 |                 |                 | J                              |                 |                 |     |     | J                              |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 8.2            | B  |                 | A                              | A               | C                              |                 |                 | G                              |                 |                 |                 | J                              |                 |                 |     |     | J                              |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 10             | B  |                 | A                              | A               | C                              |                 |                 | G                              |                 |                 |                 | J                              |                 |                 |     |     | J                              |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 12             | B  |                 | A                              | A               | C                              |                 |                 | G                              |                 |                 |                 | J                              |                 |                 |     |     | J                              |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 15             | B  |                 | A                              | A               | C                              |                 |                 | G                              |                 |                 |                 | J                              |                 |                 |     |     | J                              |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 18             | B  |                 | A                              | A               | C                              |                 |                 | G                              |                 |                 |                 | J                              |                 |                 |     |     | J                              |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 22             | B  |                 | A                              | A               | C                              |                 |                 | G                              |                 |                 |                 | J                              |                 |                 |     |     | J                              |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 27             | B  |                 | A                              | A               | C                              |                 |                 | G                              |                 |                 |                 | J                              |                 |                 |     |     | J                              |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 33             | A  |                 | A                              | C               |                                |                 | G               |                                |                 |                 | J               |                                |                 |                 |     | J   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 39             | A  |                 | A                              | C               |                                |                 | G               |                                |                 |                 | J               |                                |                 |                 |     | J   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 47             | A  |                 | A                              | C               |                                |                 | G               |                                |                 |                 | J               |                                |                 |                 |     | J   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 56             | A  |                 | A                              | C               |                                |                 | G               |                                |                 |                 | J               |                                |                 |                 |     | J   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 68             | A  |                 | A                              | C               |                                |                 | G               |                                |                 |                 | J               |                                |                 |                 |     | J   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 82             | A  |                 | A                              | C               |                                |                 | G               |                                |                 |                 | J               |                                |                 |                 |     | J   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 100            | A  |                 | A                              | C               |                                |                 | G               |                                |                 |                 | J               |                                |                 |                 |     | J   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 120            | A  |                 | A                              | C               |                                |                 | G               |                                |                 |                 | J               |                                |                 |                 |     | J   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 150            | A  |                 | A                              | C               |                                |                 | G               |                                |                 |                 | J               |                                |                 |                 |     | J   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 180            | A  |                 | A                              | C               |                                |                 | G               |                                |                 |                 | J               |                                |                 |                 |     | J   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 220            | A  |                 | A                              | C               |                                |                 | G               |                                |                 |                 | J               |                                |                 |                 |     | J   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 270            | A  |                 | A                              | C               |                                |                 | G               |                                |                 |                 | J               |                                |                 |                 |     | M   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 330            | A  |                 | A                              | C               |                                |                 | G               |                                |                 |                 | G               |                                |                 |                 |     | M   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 390            | A  |                 | A                              | C               |                                |                 | G               |                                |                 |                 | G               |                                |                 |                 |     | M   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 470            | A  |                 | A                              | C               |                                |                 | G               |                                |                 |                 | G               |                                |                 |                 |     | M   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 560            | A  |                 | A                              | C               |                                |                 | G               |                                |                 |                 | G               |                                |                 |                 |     | M   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 680            | A  |                 | A                              | C               |                                |                 | G               |                                |                 |                 | G               |                                |                 |                 |     | M   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 820            | A  |                 | A                              | C               |                                |                 | G               |                                |                 |                 | G               |                                |                 |                 |     | M   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 1000           | A  |                 | A                              | C               |                                |                 | G               |                                |                 |                 | G               |                                |                 |                 |     | M   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 1200           | A  |                 | A                              | C               |                                |                 | G               |                                |                 |                 | G               |                                |                 |                 |     | M   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 1500           | A  |                 | A                              | C               |                                |                 | G               |                                |                 |                 | G               |                                |                 |                 |     | M   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 1800           | A  |                 | A                              | C               |                                |                 | G               |                                |                 |                 | G               |                                |                 |                 |     | M   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 2200           | A  |                 | A                              | C               |                                |                 | G               |                                |                 |                 | G               |                                |                 |                 |     | M   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 2700           | A  |                 | A                              | C               |                                |                 | G               |                                |                 |                 | G               |                                |                 |                 |     | M   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 3300           | A  |                 | A                              | C               |                                |                 | G               |                                |                 |                 | G               |                                |                 |                 |     | M   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 3900           | A  |                 | A                              | C               |                                |                 | G               |                                |                 |                 | G               |                                |                 |                 |     | M   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 4700           | A  |                 | A                              | C               |                                |                 | G               |                                |                 |                 | G               |                                |                 |                 |     | M   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 5600           | A  |                 | A                              | C               |                                |                 | G               |                                |                 |                 | G               |                                |                 |                 |     | M   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 6800           | A  |                 | A                              | C               |                                |                 | G               |                                |                 |                 | G               |                                |                 |                 |     | M   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 8200           | A  |                 | A                              | C               |                                |                 | G               |                                |                 |                 | G               |                                |                 |                 |     | M   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| Cap (μF)       | Row 1 <td colspan="2">M</td> <td>M</td> <td colspan="3">M</td> <td colspan="4">M</td> <td colspan="5">M</td> <td colspan="5">M</td>                                |                 |                                |                 |                                |                 |                 |                                |                 |                 |                 |                                |                 |                 |     |     |                                |    |     |     |     |     | M |  | M | M |  |  | M |  |  |  | M |  |  |  |  | M |  |  |  |  |
| 0.010          | M  |                 | M                              | M               |                                |                 | M               |                                |                 |                 | M               |                                |                 |                 |     | M   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 0.012          | M  |                 | M                              | M               |                                |                 | M               |                                |                 |                 | M               |                                |                 |                 |     | M   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 0.015          | M  |                 | M                              | M               |                                |                 | M               |                                |                 |                 | M               |                                |                 |                 |     | M   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 0.018          | M  |                 | M                              | M               |                                |                 | M               |                                |                 |                 | M               |                                |                 |                 |     | M   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 0.022          | M  |                 | M                              | M               |                                |                 | M               |                                |                 |                 | M               |                                |                 |                 |     | M   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 0.027          | M  |                 | M                              | M               |                                |                 | M               |                                |                 |                 | M               |                                |                 |                 |     | M   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 0.033          | M  |                 | M                              | M               |                                |                 | M               |                                |                 |                 | M               |                                |                 |                 |     | M   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 0.039          | M  |                 | M                              | M               |                                |                 | M               |                                |                 |                 | M               |                                |                 |                 |     | M   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 0.047          | M  |                 | M                              | M               |                                |                 | M               |                                |                 |                 | M               |                                |                 |                 |     | M   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 0.068          | M  |                 | M                              | M               |                                |                 | M               |                                |                 |                 | M               |                                |                 |                 |     | M   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 0.082          | M  |                 | M                              | M               |                                |                 | M               |                                |                 |                 | M               |                                |                 |                 |     | M   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| 0.1            | M  |                 | M                              | M               |                                |                 | M               |                                |                 |                 | M               |                                |                 |                 |     | M   |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| WWDC           | 25   |                 | 50                             | 16              | 25                             | 50              | 16              | 25                             | 50              | 100             | 16              | 25                             | 50              | 100             | 200 | 16  | 25                             | 50 | 100 | 200 | 500 |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
| SIZE           | 01005  |                 | 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) |     |     |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
|                |  |                 |                                |                 |                                |                 | <b>PAPER</b>    |                                |                 |                 |                 |                                |                 |                 |     |     |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |
|                |  |                 |                                |                 |                                |                 | <b>EMBOSSED</b> |                                |                 |                 |                 |                                |                 |                 |     |     |                                |    |     |     |     |     |   |  |   |   |  |  |   |  |  |  |   |  |  |  |  |   |  |  |  |  |



# COG (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 |  |  |  |
| 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               | J               | M               |                 |                 |                 |                 |                 |                 |                 |                 |    |     |                 |    |     |     |    |                 |     |  |  |  |
|                | 820   | J               | J               | J               | J               | M               |                 |                 |                 |                 |                 |                 |                 |                 |    |     |                 |    |     |     |    |                 |     |  |  |  |
|                | 1000  | J               | J               | J               | J               | M               | K               | K               | K               | K               | M               | M               | M               | M               |    |     |                 |    |     |     | M  | M               | P   |  |  |  |
|                | 1200  | J               | J               | J               | M               | M               | K               | K               | K               | K               | M               | M               | M               | M               |    |     |                 |    |     |     | M  | M               | P   |  |  |  |
|                | 1500  | J               | J               | J               | M               | M               | K               | K               | K               | K               | M               | M               | M               | M               |    |     |                 |    |     |     | M  | M               | P   |  |  |  |
|                | 1800  | J               | J               | J               | M               |                 | K               | K               | K               | K               | M               | M               | M               | M               |    |     |                 |    |     |     | M  | M               | P   |  |  |  |
|                | 2200  | J               | J               | J               | Q               |                 | K               | K               | K               | K               | P               | M               | M               | M               |    |     |                 |    |     |     | M  | M               | P   |  |  |  |
|                | 2700  | J               | J               | J               | Q               |                 | K               | K               | K               | P               | Q               | M               | M               | M               |    |     |                 |    |     |     | M  | M               | P   |  |  |  |
|                | 3300  | J               | J               | J               |                 |                 | K               | K               | K               | P               | Q               | M               | M               | M               |    |     |                 | X  |     |     | M  | M               | P   |  |  |  |
|                | 3900  | J               | J               | M               |                 |                 | K               | K               | K               | P               | Q               | M               | M               | M               |    |     |                 | X  |     |     | M  | M               | P   |  |  |  |
|                | 4700  | J               | J               | M               |                 |                 | K               | K               | K               | P               | Q               | M               | M               | M               | X  | X   |                 | X  |     |     | M  | M               | P   |  |  |  |
|                | 5600  | J               | J               |                 |                 |                 | K               | K               | M               | P               | X               | M               | M               | M               | X  | X   | X               | X  |     |     | M  | M               | P   |  |  |  |
|                | 6800  | J               | J               |                 |                 |                 | K               | K               | M               | X               |                 | M               | M               | M               | X  | X   | X               | X  |     |     | M  | M               | P   |  |  |  |
|                | 8200  | J               | J               |                 |                 |                 | K               | M               | M               |                 |                 | M               | M               | M               | X  | X   | X               | X  |     |     | M  | M               | P   |  |  |  |
| Cap (µF)       | 0.010 | J               | J               |                 |                 |                 | K               | M               | M               |                 |                 | M               | M               | M               | X  | X   | X               | X  |     |     | M  | M               | P   |  |  |  |
|                | 0.012 | J               | J               |                 |                 |                 | K               | M               |                 |                 |                 | M               | M               | M               | X  | X   | X               | X  |     |     | M  | M               | P   |  |  |  |
|                | 0.015 |                 |                 |                 |                 |                 | M               | M               |                 |                 |                 | M               | M               | M               | X  | X   | X               | X  |     |     | M  | M               | Y   |  |  |  |
|                | 0.018 |                 |                 |                 |                 |                 | M               | M               |                 |                 |                 | P               | M               |                 | X  | X   | X               |    |     |     | M  | M               | Y   |  |  |  |
|                | 0.022 |                 |                 |                 |                 |                 | M               | M               |                 |                 |                 | P               |                 |                 | X  | X   |                 |    |     |     | M  | Y               | Y   |  |  |  |
|                | 0.027 |                 |                 |                 |                 |                 | M               | M               |                 |                 |                 | P               |                 |                 | X  | X   |                 |    |     |     | P  | Y               | Y   |  |  |  |
|                | 0.033 |                 |                 |                 |                 |                 | M               | M               |                 |                 |                 | P               |                 |                 | X  | X   |                 |    |     |     | P  |                 |     |  |  |  |
|                | 0.039 |                 |                 |                 |                 |                 | M               | M               |                 |                 |                 | P               |                 |                 | Y  |     |                 |    |     |     | P  |                 |     |  |  |  |
|                | 0.047 |                 |                 |                 |                 |                 | M               | M               |                 |                 |                 | P               |                 |                 | Y  |     |                 |    |     |     | P  |                 |     |  |  |  |
|                | 0.068 |                 |                 |                 |                 |                 | M               | M               |                 |                 |                 |                 |                 |                 |    |     |                 |    |     |     | P  |                 |     |  |  |  |
|                | 0.082 |                 |                 |                 |                 |                 | M               | M               |                 |                 |                 |                 |                 |                 |    |     |                 |    |     |     | Q  |                 |     |  |  |  |
|                | 0.1   |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |    |     |                 |    |     |     | Q  |                 |     |  |  |  |
| WVDC           |       | 25              | 50              | 100             | 200             | 500             | 25              | 50              | 100             | 200             | 500             | 50              | 100             | 200             | 50 | 100 | 200             | 50 | 100 | 200 | 50 | 100             | 200 |  |  |  |
| SIZE           |       | 1210            |                 |                 |                 |                 | 1812            |                 |                 |                 |                 | 1825            |                 |                 |    |     | 2220            |    |     |     |    | 2225            |     |  |  |  |
| Letter         |       | A               | C               | E               | G               | J               | K               | M               | N               | P               | Q               | X               | Y               | Z               |    |     |                 |    |     |     |    |                 |     |  |  |  |
| Max. Thickness |       | 0.33<br>(0.013) | 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       |                 |                 |                 |                 |                 |                 |                 |    |     |                 |    |     |     |    |                 |     |  |  |  |



Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «JONHON», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «FORSTAR».



## JONHON

«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



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