

# 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



# COG (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 ± 10% for cap ≤ 1000 pF<br>1.0 kHz ± 10% for cap > 1000 pF<br>Voltage: 1.0Vrms ± .2V  |                |
| Q                              |                                   | <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  |                |
| Insulation Resistance          |                                   | 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.  |                |
| Dielectric Strength            |                                   | No breakdown or visual defects  | Deflection: 2mm<br>Test Time: 30 seconds<br>1mm/sec<br>   |                |
| Resistance to Flexure Stresses | 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   |  |                |
| Solderability                  |                                   | ≥ 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   |                |
| Resistance to Solder Heat      | 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)   |  |                |
| Thermal Shock                  | 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    |
| Load Life                      | Dielectric Strength               | Meets Initial Values (As Above)   | Remove from test chamber and stabilize at room temperature for 24 hours before measuring.  |                |
|                                | Appearance                        | No visual defects   | Charge device with twice rated voltage in test chamber set at 125°C ± 2°C for 1000 hours (+48, -0).<br><br>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)   |  |                |
| Dielectric Strength            | Meets Initial Values (As Above)   |   |  |                |
| Load Humidity                  | 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.<br><br>Remove from chamber and stabilize at room temperature for 24 ± 2 hours before measuring. |                |
|                                | Appearance                        | No visual defects   |  |                |
|                                | 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) |   |  |                |

# COG (NP0) Dielectric

## Capacitance Range



PREFERRED SIZES ARE SHADED

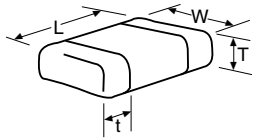
| SIZE         |       | 01005            |   |   | 0201            |   |   | 0402            |   |   | 0603            |   |   |   | 0805             |   |   |   |   | 1206                 |   |   |   |   |
|--------------|-------|------------------|---|---|-----------------|---|---|-----------------|---|---|-----------------|---|---|---|------------------|---|---|---|---|----------------------|---|---|---|---|
| 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   | mm    | 0.40 ± 0.02      |   |   | 0.60 ± 0.03     |   |   | 1.00 ± 0.10     |   |   | 1.60 ± 0.15     |   |   |   | 2.01 ± 0.20      |   |   |   |   | 3.20 ± 0.20          |   |   |   |   |
|              | (in.) | (0.016 ± 0.0008) |   |   | (0.024 ± 0.001) |   |   | (0.040 ± 0.004) |   |   | (0.063 ± 0.006) |   |   |   | (0.079 ± 0.008)  |   |   |   |   | (0.126 ± 0.008)      |   |   |   |   |
| (W) Width    | mm    | 0.20 ± 0.02      |   |   | 0.30 ± 0.03     |   |   | 0.50 ± 0.10     |   |   | 0.81 ± 0.15     |   |   |   | 1.25 ± 0.20      |   |   |   |   | 1.60 ± 0.20          |   |   |   |   |
|              | (in.) | (0.008 ± 0.0008) |   |   | (0.011 ± 0.001) |   |   | (0.020 ± 0.004) |   |   | (0.032 ± 0.006) |   |   |   | (0.049 ± 0.008)  |   |   |   |   | (0.063 ± 0.008)      |   |   |   |   |
| (t) Terminal | mm    | 0.10 ± 0.04      |   |   | 0.15 ± 0.05     |   |   | 0.25 ± 0.15     |   |   | 0.35 ± 0.15     |   |   |   | 0.50 ± 0.25      |   |   |   |   | 0.50 ± 0.25          |   |   |   |   |
|              | (in.) | (0.004 ± 0.016)  |   |   | (0.006 ± 0.002) |   |   | (0.010 ± 0.006) |   |   | (0.014 ± 0.006) |   |   |   | (0.020 ± 0.010)  |   |   |   |   | (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)     | 0.5   |                  | A |   | C               | C | C | G               | G | G | G               | J | J | J | J                | J | J | J | J | J                    | J | J | J | J |
|              | 1.0   | B                | A |   | C               | C | C | G               | G | G | G               | J | J | J | J                | J | J | J | J | J                    | J | J | J | J |
|              | 1.2   | B                | A |   | C               | C | C | G               | G | G | G               | J | J | J | J                | J | J | J | J | J                    | J | J | J | J |
|              | 1.5   | B                | A | A | C               | C | C | G               | G | G | G               | J | J | J | J                | J | J | J | J | J                    | J | J | J | J |
|              | 1.8   | B                | A | A | C               | C | C | G               | G | G | G               | J | J | J | J                | J | J | J | J | J                    | J | J | J | J |
| Cap (µF)     | 2.2   | B                | A | A | C               | C | C | G               | G | G | G               | J | J | J | J                | J | J | J | J | J                    | J | J | J | J |
|              | 2.7   | B                | A | A | C               | C | C | G               | G | G | G               | J | J | J | J                | J | J | J | J | J                    | J | J | J | J |
|              | 3.3   | B                | A | A | C               | C | C | G               | G | G | G               | J | J | J | J                | J | J | J | J | J                    | J | J | J | J |
|              | 3.9   | B                | A | A | C               | C | C | G               | G | G | G               | J | J | J | J                | J | J | J | J | J                    | J | J | J | J |
|              | 4.7   | B                | A | A | C               | C | C | G               | G | G | G               | J | J | J | J                | J | J | J | J | J                    | J | J | J | J |
|              | 5.6   | B                | A | A | C               | C | C | G               | G | G | G               | J | J | J | J                | J | J | J | J | J                    | J | J | J | J |
|              | 6.8   | B                | A | A | C               | C | C | G               | G | G | G               | J | J | J | J                | J | J | J | J | J                    | J | J | J | J |
|              | 8.2   | B                | A | A | C               | C | C | G               | G | G | G               | J | J | J | J                | J | J | J | J | J                    | J | J | J | J |
|              | 10    | B                | A | A | C               | C | C | G               | G | G | G               | J | J | J | J                | J | J | J | J | J                    | J | J | J | J |
|              | 12    | B                | A | A | C               | C | C | G               | G | G | G               | J | J | J | J                | J | J | J | J | J                    | J | J | J | J |
|              | 15    | B                | A | A | C               | C | C | G               | G | G | G               | J | J | J | J                | J | J | J | J | J                    | J | J | J | J |
|              | 18    | B                | A | A | C               | C | C | G               | G | G | G               | J | J | J | J                | J | J | J | J | J                    | J | J | J | J |
|              | 22    | B                | A | A | C               | C | C | G               | G | G | G               | J | J | J | J                | J | J | J | J | J                    | J | J | J | J |
|              | 27    |                  | A | A | C               | C | C | G               | G | G | G               | J | J | J | J                | J | J | J | J | J                    | J | J | J | J |
|              | 33    |                  | A | A | C               | C | C | G               | G | G | G               | J | J | J | J                | J | J | J | J | J                    | J | J | J | J |
|              | 39    |                  | A | A | C               | C | C | G               | G | G | G               | J | J | J | J                | J | J | J | J | J                    | J | J | J | J |
|              | 47    |                  | A | A | C               | C | C | G               | G | G | G               | J | J | J | J                | J | J | J | J | J                    | J | J | J | J |
|              | 56    |                  | A | A | C               | C | C | G               | G | G | G               | J | J | J | J                | J | J | J | J | J                    | J | J | J | J |
|              | 68    |                  | A | A | C               | C | C | G               | G | G | G               | J | J | J | J                | J | J | J | J | J                    | J | J | J | J |
|              | 82    |                  | A | A | C               | C | C | G               | G | G | G               | J | J | J | J                | J | J | J | J | J                    | J | J | J | J |
|              | 100   |                  | A | A | C               | C | C | G               | G | G | G               | J | J | J | J                | J | J | J | J | J                    | J | J | J | J |
|              | 120   |                  |   |   | C               | C | C | G               | G | G | G               | J | J | J | J                | J | J | J | J | J                    | J | J | J | J |
|              | 150   |                  |   |   | C               | C | C | G               | G | G | G               | J | J | J | J                | J | J | J | J | J                    | J | J | J | J |
|              | 180   |                  |   |   | C               | C | C | G               | G | G | G               | J | J | J | J                | J | J | J | J | J                    | J | J | J | J |
|              | 220   |                  |   |   | C               | C | C | G               | G | G | G               | J | J | J | J                | J | J | J | J | J                    | J | J | J | J |
|              | 270   |                  |   |   | C               | C | C | G               | G | G | G               | J | J | J | J                | J | M | J | J | J                    | J | J | J | J |
|              | 330   |                  |   |   | C               | C | C | G               | G | G | G               | J | J | J | J                | M | J | J | J | J                    | J | J | J | J |
|              | 390   |                  |   |   | C               | C | C | G               | G | G | G               | J | J | J | J                | M | J | J | J | J                    | J | J | J | J |
|              | 470   |                  |   |   | C               | C | C | G               | G | G | G               | J | J | J | J                | M | J | J | J | J                    | J | J | J | J |
|              | 560   |                  |   |   |                 |   |   | G               | G | G | G               | J | J | J | J                | M | J | J | J | J                    | J | J | J | J |
|              | 680   |                  |   |   |                 |   |   | G               | G | G | G               | J | J | J | J                |   | J | J | J | J                    | J | J | J | J |
|              | 820   |                  |   |   |                 |   |   | G               | G | G | G               | J | J | J | J                |   | J | J | J | J                    | J | J | J | J |
|              | 1000  |                  |   |   |                 |   |   | G               | G | G | G               | J | J | J | J                |   | J | J | J | J                    | J | J | J | J |
|              | 1200  |                  |   |   |                 |   |   |                 |   |   |                 | J | J | J | J                |   | J | J | J | J                    | J | J | J | J |
|              | 1500  |                  |   |   |                 |   |   |                 |   |   |                 | J | J | J | J                |   | J | J | J | J                    | M | J | J | J |
|              | 1800  |                  |   |   |                 |   |   |                 |   |   |                 | J | J | J | J                |   | J | J | M | M                    |   |   |   |   |
|              | 2200  |                  |   |   |                 |   |   |                 |   |   |                 | J | J | J | N                |   | J | J | M | P                    |   |   |   |   |
|              | 2700  |                  |   |   |                 |   |   |                 |   |   |                 | J | J | J | N                |   | J | J | M | P                    |   |   |   |   |
|              | 3300  |                  |   |   |                 |   |   |                 |   |   |                 | J | J | J |                  |   | J | J | M | P                    |   |   |   |   |
|              | 3900  |                  |   |   |                 |   |   |                 |   |   |                 | J | J | J |                  |   | J | J | M | P                    |   |   |   |   |
|              | 4700  |                  |   |   |                 |   |   |                 |   |   |                 | J | J | J |                  |   | J | J | M | P                    |   |   |   |   |
|              | 5600  |                  |   |   |                 |   |   |                 |   |   |                 |   |   |   |                  |   | J | J | M |                      |   |   |   |   |
|              | 6800  |                  |   |   |                 |   |   |                 |   |   |                 |   |   |   |                  |   | J | J | M |                      |   |   |   |   |
|              | 8200  |                  |   |   |                 |   |   |                 |   |   |                 |   |   |   |                  |   | M | M | M |                      |   |   |   |   |
| Cap (µF)     | 0.010 |                  |   |   |                 |   |   |                 |   |   |                 |   |   |   |                  |   |   |   |   | M                    |   |   |   |   |
|              | 0.012 |                  |   |   |                 |   |   |                 |   |   |                 |   |   |   |                  |   |   |   |   | M                    |   |   |   |   |
|              | 0.015 |                  |   |   |                 |   |   |                 |   |   |                 |   |   |   |                  |   |   |   |   | M                    |   |   |   |   |
|              | 0.018 |                  |   |   |                 |   |   |                 |   |   |                 |   |   |   |                  |   |   |   |   |                      |   |   |   |   |
|              | 0.022 |                  |   |   |                 |   |   |                 |   |   |                 |   |   |   |                  |   |   |   |   |                      |   |   |   |   |
|              | 0.027 |                  |   |   |                 |   |   |                 |   |   |                 |   |   |   |                  |   |   |   |   |                      |   |   |   |   |
|              | 0.033 |                  |   |   |                 |   |   |                 |   |   |                 |   |   |   |                  |   |   |   |   |                      |   |   |   |   |
|              | 0.039 |                  |   |   |                 |   |   |                 |   |   |                 |   |   |   |                  |   |   |   |   |                      |   |   |   |   |
|              | 0.047 |                  |   |   |                 |   |   |                 |   |   |                 |   |   |   |                  |   |   |   |   |                      |   |   |   |   |
|              | 0.068 |                  |   |   |                 |   |   |                 |   |   |                 |   |   |   |                  |   |   |   |   |                      |   |   |   |   |
|              | 0.082 |                  |   |   |                 |   |   |                 |   |   |                 |   |   |   |                  |   |   |   |   |                      |   |   |   |   |
|              | 0.1   |                  |   |   |                 |   |   |                 |   |   |                 |   |   |   |                  |   |   |   |   |                      |   |   |   |   |
|              | WWDC  | 25               |   |   | 50 16           |   |   | 25 50 16        |   |   | 25 50 100 16    |   |   |   | 25 50 100 200 16 |   |   |   |   | 25 50 100 200 500    |   |   |   |   |

| 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) |

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# 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<br>(in.) | 3.20 ± 0.20<br>(0.126 ± 0.008) |                 |                 |                 |                 | 4.50 ± 0.30<br>(0.177 ± 0.012) |                 |                 |                 |                 | 4.50 ± 0.30<br>(0.177 ± 0.012) |                 |                 |    |     | 5.70 ± 0.40<br>(0.225 ± 0.016) |    |     |     |    | 5.72 ± 0.25<br>(0.225 ± 0.010) |     |  |  |  |
| (W) Width      | mm<br>(in.) | 2.50 ± 0.20<br>(0.098 ± 0.008) |                 |                 |                 |                 | 3.20 ± 0.20<br>(0.126 ± 0.008) |                 |                 |                 |                 | 6.40 ± 0.40<br>(0.252 ± 0.016) |                 |                 |    |     | 5.00 ± 0.40<br>(0.197 ± 0.016) |    |     |     |    | 6.35 ± 0.25<br>(0.250 ± 0.010) |     |  |  |  |
| (t) Terminal   | mm<br>(in.) | 0.50 ± 0.25<br>(0.020 ± 0.010) |                 |                 |                 |                 | 0.61 ± 0.36<br>(0.024 ± 0.014) |                 |                 |                 |                 | 0.61 ± 0.36<br>(0.024 ± 0.014) |                 |                 |    |     | 0.64 ± 0.39<br>(0.025 ± 0.015) |    |     |     |    | 0.64 ± 0.39<br>(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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