

## Capacitor Array (IPC)

### BENEFITS OF USING CAPACITOR ARRAYS

AVX capacitor arrays offer designers the opportunity to lower placement costs, increase assembly line output through lower component count per board and to reduce real estate requirements.

#### Reduced Costs

Placement costs are greatly reduced by effectively placing one device instead of four or two. This results in increased throughput and translates into savings on machine time. Inventory levels are lowered and further savings are made on solder materials, etc.

#### Space Saving

Space savings can be quite dramatic when compared to the use of discrete chip capacitors. As an example, the 0508 4-element array offers a space reduction of >40% vs. 4 x 0402 discrete capacitors and of >70% vs. 4 x 0603 discrete capacitors. (This calculation is dependent on the spacing of the discrete components.)

#### Increased Throughput

Assuming that there are 220 passive components placed in a mobile phone:

A reduction in the passive count to 200 (by replacing discrete components with arrays) results in an increase in throughput of approximately 9%.

A reduction of 40 placements increases throughput by 18%.

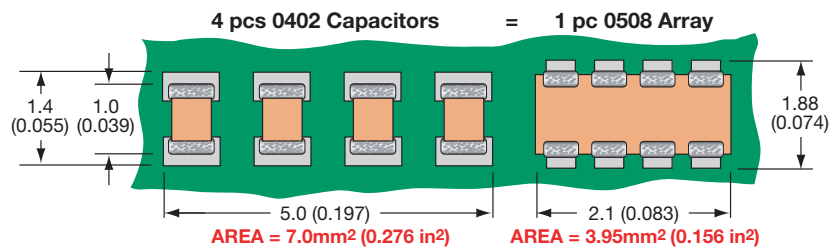
For high volume users of cap arrays using the very latest placement equipment capable of placing 10 components per second, the increase in throughput can be very significant and can have the overall effect of reducing the number of placement machines required to mount components:

If 120 million 2-element arrays or 40 million 4-element arrays were placed in a year, the requirement for placement equipment would be reduced by one machine.

During a 20Hr operational day a machine places 720K components. Over a working year of 167 days the machine can place approximately 120 million. If 2-element arrays are mounted instead of discrete components, then the number of placements is reduced by a factor of two and in the scenario where 120 million 2-element arrays are placed there is a saving of one pick and place machine.

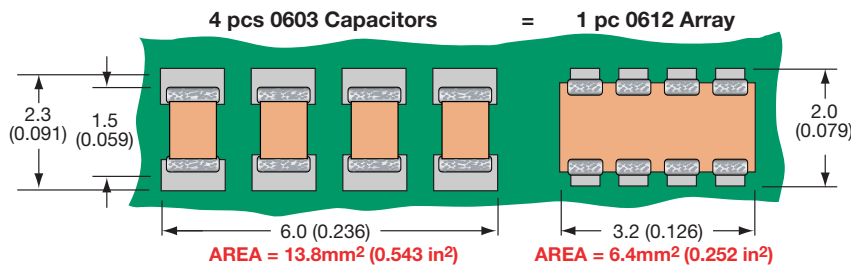
Smaller volume users can also benefit from replacing discrete components with arrays. The total number of placements is reduced thus creating spare capacity on placement machines. This in turn generates the opportunity to increase overall production output without further investment in new equipment.

#### W2A (0508) Capacitor Arrays



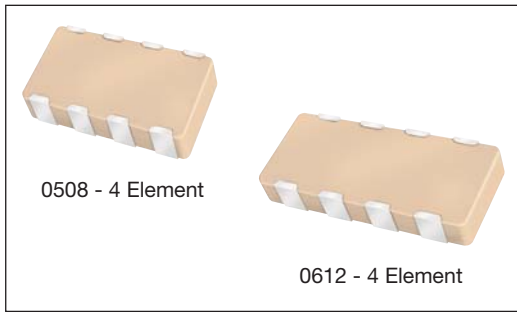
The 0508 4-element capacitor array gives a PCB space saving of over 40% vs four 0402 discretés and over 70% vs four 0603 discrete capacitors.

#### W3A (0612) Capacitor Arrays



The 0612 4-element capacitor array gives a PCB space saving of over 50% vs four 0603 discretés and over 70% vs four 0805 discrete capacitors.

# Automotive Capacitor Array (IPC)



As the market leader in the development and manufacture of capacitor arrays AVX is pleased to offer a range of AEC-Q200 qualified arrays to compliment our product offering to the Automotive industry. Both the AVX 0612 and 0508 4-element capacitor array styles are qualified to the AEC-Q200 automotive specifications.

AEC-Q200 is the Automotive Industry qualification standard and a detailed qualification package is available on request.

All AVX automotive capacitor array production facilities are certified to ISO/TS 16949:2002.

## HOW TO ORDER

|  |  |                        |                                 |  |  |  |   |   |   |  |
|--|--|------------------------|---------------------------------|--|--|--|---|---|---|--|
| <b>W</b><br> <br>Style<br>W = RoHS<br>L = SnPb | <b>3</b><br> <br>Case Size<br>2 = 0508<br>3 = 0612 | <b>A</b><br> <br>Array | <b>4</b><br> <br>Number of Caps | <b>Y</b><br> <br>Voltage<br>Z = 10V<br>Y = 16V<br>3 = 25V<br>5 = 50V<br>1 = 100V | <b>C</b><br> <br>Dielectric<br>A = NPO<br>C = X7R<br>F = X8R | <b>104</b><br> <br>Capacitance Code (In pF)<br>Significant Digits + Number of Zeros<br>e.g. 10µF=106 | <b>K</b><br> <br>Capacitance Tolerance<br>*J = ±5%<br>*K = ±10%<br>M = ±20% | <b>4</b><br> <br>Failure Rate<br>4 = Automotive | <b>T</b><br> <br>Terminations<br>*T = Plated Ni and Sn<br>*Z = FLEXITERM®<br>B = 5% min lead<br>X = FLEXITERM® with 5% min lead | <b>2A</b><br> <br>Packaging & Quantity Code<br>2A = 7" Reel (4000)<br>4A = 13" Reel (10000)<br>2F = 7" Reel (1000) |
|--|--|------------------------|---------------------------------|--|--|--|---|---|---|--|

**\*RoHS compliant**

\*Contact factory for availability by part number for K = ±10% and J = ±5% tolerance.

| NPO/COG          |           |    |    |     |           |    |    |     |  |  |  |  |
|------------------|-----------|----|----|-----|-----------|----|----|-----|--|--|--|--|
| SIZE             | W2 = 0508 |    |    |     | W3 = 0612 |    |    |     |  |  |  |  |
|                  | 4         |    |    |     | 4         |    |    |     |  |  |  |  |
| No. of Elements  | 16        | 25 | 50 | 100 | 16        | 25 | 50 | 100 |  |  |  |  |
| 1R0 Cap 1.0 (pF) |           |    |    |     |           |    |    |     |  |  |  |  |
| 1R2 1.2 (pF)     |           |    |    |     |           |    |    |     |  |  |  |  |
| 1R5 1.5 (pF)     |           |    |    |     |           |    |    |     |  |  |  |  |
| 1R8 1.8 (pF)     |           |    |    |     |           |    |    |     |  |  |  |  |
| 2R2 2.2 (pF)     |           |    |    |     |           |    |    |     |  |  |  |  |
| 2R7 2.7 (pF)     |           |    |    |     |           |    |    |     |  |  |  |  |
| 3R3 3.3 (pF)     |           |    |    |     |           |    |    |     |  |  |  |  |
| 3R9 3.9 (pF)     |           |    |    |     |           |    |    |     |  |  |  |  |
| 4R7 4.7 (pF)     |           |    |    |     |           |    |    |     |  |  |  |  |
| 5R6 5.6 (pF)     |           |    |    |     |           |    |    |     |  |  |  |  |
| 6R8 6.8 (pF)     |           |    |    |     |           |    |    |     |  |  |  |  |
| 8R2 8.2 (pF)     |           |    |    |     |           |    |    |     |  |  |  |  |
| 100 10 (pF)      |           |    |    |     |           |    |    |     |  |  |  |  |
| 120 12 (pF)      |           |    |    |     |           |    |    |     |  |  |  |  |
| 150 15 (pF)      |           |    |    |     |           |    |    |     |  |  |  |  |
| 180 18 (pF)      |           |    |    |     |           |    |    |     |  |  |  |  |
| 220 22 (pF)      |           |    |    |     |           |    |    |     |  |  |  |  |
| 270 27 (pF)      |           |    |    |     |           |    |    |     |  |  |  |  |
| 330 33 (pF)      |           |    |    |     |           |    |    |     |  |  |  |  |
| 390 39 (pF)      |           |    |    |     |           |    |    |     |  |  |  |  |
| 470 47 (pF)      |           |    |    |     |           |    |    |     |  |  |  |  |
| 560 56 (pF)      |           |    |    |     |           |    |    |     |  |  |  |  |
| 680 68 (pF)      |           |    |    |     |           |    |    |     |  |  |  |  |
| 820 82 (pF)      |           |    |    |     |           |    |    |     |  |  |  |  |
| 101 100 (pF)     |           |    |    |     |           |    |    |     |  |  |  |  |
| 121 120 (pF)     |           |    |    |     |           |    |    |     |  |  |  |  |
| 151 150 (pF)     |           |    |    |     |           |    |    |     |  |  |  |  |
| 181 180 (pF)     |           |    |    |     |           |    |    |     |  |  |  |  |
| 221 220 (pF)     |           |    |    |     |           |    |    |     |  |  |  |  |
| 271 270 (pF)     |           |    |    |     |           |    |    |     |  |  |  |  |
| 331 330 (pF)     |           |    |    |     |           |    |    |     |  |  |  |  |
| 391 390 (pF)     |           |    |    |     |           |    |    |     |  |  |  |  |
| 471 470 (pF)     |           |    |    |     |           |    |    |     |  |  |  |  |
| 561 560 (pF)     |           |    |    |     |           |    |    |     |  |  |  |  |
| 681 680 (pF)     |           |    |    |     |           |    |    |     |  |  |  |  |
| 821 820 (pF)     |           |    |    |     |           |    |    |     |  |  |  |  |
| 102 1000 (pF)    |           |    |    |     |           |    |    |     |  |  |  |  |
| 122 1200 (pF)    |           |    |    |     |           |    |    |     |  |  |  |  |
| 152 1500 (pF)    |           |    |    |     |           |    |    |     |  |  |  |  |
| 182 1800 (pF)    |           |    |    |     |           |    |    |     |  |  |  |  |
| 222 2200 (pF)    |           |    |    |     |           |    |    |     |  |  |  |  |
| 272 2700 (pF)    |           |    |    |     |           |    |    |     |  |  |  |  |
| 332 3300 (pF)    |           |    |    |     |           |    |    |     |  |  |  |  |
| 392 3900 (pF)    |           |    |    |     |           |    |    |     |  |  |  |  |
| 472 4700 (pF)    |           |    |    |     |           |    |    |     |  |  |  |  |
| 562 5600 (pF)    |           |    |    |     |           |    |    |     |  |  |  |  |
| 682 6800 (pF)    |           |    |    |     |           |    |    |     |  |  |  |  |
| 822 8200 (pF)    |           |    |    |     |           |    |    |     |  |  |  |  |

■ = NPO/COG

| X7R                |           |    |    |     |           |    |    |     |           |    |    |    |     |
|--------------------|-----------|----|----|-----|-----------|----|----|-----|-----------|----|----|----|-----|
| SIZE               | W2 = 0508 |    |    |     | W2 = 0508 |    |    |     | W3 = 0612 |    |    |    |     |
|                    | 2         |    |    |     | 4         |    |    |     | 4         |    |    |    |     |
| No. of Elements    | 16        | 25 | 50 | 100 | 16        | 25 | 50 | 100 | 10        | 16 | 25 | 50 | 100 |
| 101 Cap 100 (pF)   |           |    |    |     |           |    |    |     |           |    |    |    |     |
| 121 120 (pF)       |           |    |    |     |           |    |    |     |           |    |    |    |     |
| 151 150 (pF)       |           |    |    |     |           |    |    |     |           |    |    |    |     |
| 181 180 (pF)       |           |    |    |     |           |    |    |     |           |    |    |    |     |
| 221 220 (pF)       |           |    |    |     |           |    |    |     |           |    |    |    |     |
| 271 270 (pF)       |           |    |    |     |           |    |    |     |           |    |    |    |     |
| 331 330 (pF)       |           |    |    |     |           |    |    |     |           |    |    |    |     |
| 391 390 (pF)       |           |    |    |     |           |    |    |     |           |    |    |    |     |
| 471 470 (pF)       |           |    |    |     |           |    |    |     |           |    |    |    |     |
| 561 560 (pF)       |           |    |    |     |           |    |    |     |           |    |    |    |     |
| 681 680 (pF)       |           |    |    |     |           |    |    |     |           |    |    |    |     |
| 821 820 (pF)       |           |    |    |     |           |    |    |     |           |    |    |    |     |
| 102 1000 (pF)      |           |    |    |     |           |    |    |     |           |    |    |    |     |
| 122 1200 (pF)      |           |    |    |     |           |    |    |     |           |    |    |    |     |
| 152 1500 (pF)      |           |    |    |     |           |    |    |     |           |    |    |    |     |
| 182 1800 (pF)      |           |    |    |     |           |    |    |     |           |    |    |    |     |
| 222 2200 (pF)      |           |    |    |     |           |    |    |     |           |    |    |    |     |
| 272 2700 (pF)      |           |    |    |     |           |    |    |     |           |    |    |    |     |
| 332 3300 (pF)      |           |    |    |     |           |    |    |     |           |    |    |    |     |
| 392 3900 (pF)      |           |    |    |     |           |    |    |     |           |    |    |    |     |
| 472 4700 (pF)      |           |    |    |     |           |    |    |     |           |    |    |    |     |
| 562 5600 (pF)      |           |    |    |     |           |    |    |     |           |    |    |    |     |
| 682 6800 (pF)      |           |    |    |     |           |    |    |     |           |    |    |    |     |
| 822 8200 (pF)      |           |    |    |     |           |    |    |     |           |    |    |    |     |
| 103 Cap 0.010 (µF) |           |    |    |     |           |    |    |     |           |    |    |    |     |
| 123 0.012 (µF)     |           |    |    |     |           |    |    |     |           |    |    |    |     |
| 153 0.015 (µF)     |           |    |    |     |           |    |    |     |           |    |    |    |     |
| 183 0.018 (µF)     |           |    |    |     |           |    |    |     |           |    |    |    |     |
| 223 0.022 (µF)     |           |    |    |     |           |    |    |     |           |    |    |    |     |
| 273 0.027 (µF)     |           |    |    |     |           |    |    |     |           |    |    |    |     |
| 333 0.033 (µF)     |           |    |    |     |           |    |    |     |           |    |    |    |     |
| 393 0.039 (µF)     |           |    |    |     |           |    |    |     |           |    |    |    |     |
| 473 0.047 (µF)     |           |    |    |     |           |    |    |     |           |    |    |    |     |
| 563 0.056 (µF)     |           |    |    |     |           |    |    |     |           |    |    |    |     |
| 683 0.068 (µF)     |           |    |    |     |           |    |    |     |           |    |    |    |     |
| 823 0.082 (µF)     |           |    |    |     |           |    |    |     |           |    |    |    |     |
| 104 0.10 (µF)      |           |    |    |     |           |    |    |     |           |    |    |    |     |
| 124 0.12 (µF)      |           |    |    |     |           |    |    |     |           |    |    |    |     |
| 154 0.15 (µF)      |           |    |    |     |           |    |    |     |           |    |    |    |     |
| 224 0.22 (µF)      |           |    |    |     |           |    |    |     |           |    |    |    |     |

■ = X7R

**Not RoHS Compliant**

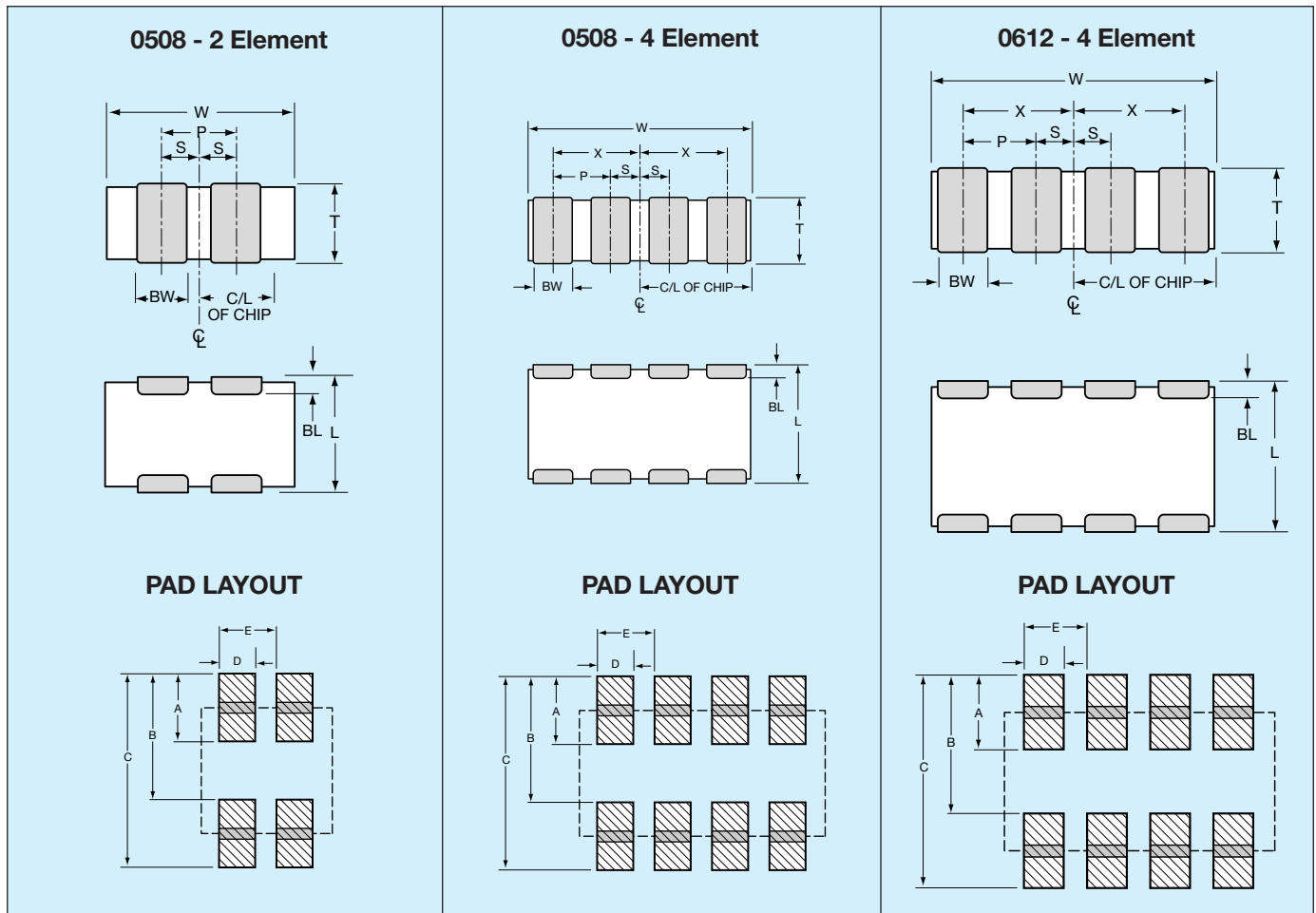


For RoHS compliant products, please select correct termination style.



## PART & PAD LAYOUT DIMENSIONS

millimeters (inches)



### PART DIMENSIONS

#### 0508 - 2 Element

| L                              | W                              | T                       | BW                             | BL                             | P                       | S                              |
|--------------------------------|--------------------------------|-------------------------|--------------------------------|--------------------------------|-------------------------|--------------------------------|
| 1.30 ± 0.15<br>(0.051 ± 0.006) | 2.10 ± 0.15<br>(0.083 ± 0.006) | 0.94 MAX<br>(0.037 MAX) | 0.43 ± 0.10<br>(0.017 ± 0.004) | 0.33 ± 0.08<br>(0.013 ± 0.003) | 1.00 REF<br>(0.039 REF) | 0.50 ± 0.10<br>(0.020 ± 0.004) |

#### 0508 - 4 Element

| L                              | W                              | T                       | BW                             | BL                             | P                       | X                              | S                              |
|--------------------------------|--------------------------------|-------------------------|--------------------------------|--------------------------------|-------------------------|--------------------------------|--------------------------------|
| 1.30 ± 0.15<br>(0.051 ± 0.006) | 2.10 ± 0.15<br>(0.083 ± 0.006) | 0.94 MAX<br>(0.037 MAX) | 0.25 ± 0.06<br>(0.010 ± 0.003) | 0.20 ± 0.08<br>(0.008 ± 0.003) | 0.50 REF<br>(0.020 REF) | 0.75 ± 0.10<br>(0.030 ± 0.004) | 0.25 ± 0.10<br>(0.010 ± 0.004) |

#### 0612 - 4 Element

| L                              | W                              | T                       | BW                             | BL   | P                       | X                              | S                              |
|--------------------------------|--------------------------------|-------------------------|--------------------------------|--|-------------------------|--------------------------------|--------------------------------|
| 1.60 ± 0.20<br>(0.063 ± 0.008) | 3.20 ± 0.20<br>(0.126 ± 0.008) | 1.35 MAX<br>(0.053 MAX) | 0.41 ± 0.10<br>(0.016 ± 0.004) | 0.18 <sup>+0.25</sup> <sub>-0.08</sub><br>(0.007 <sup>+0.010</sup> <sub>-0.003</sub> ) | 0.76 REF<br>(0.030 REF) | 1.14 ± 0.10<br>(0.045 ± 0.004) | 0.38 ± 0.10<br>(0.015 ± 0.004) |

### PAD LAYOUT DIMENSIONS

#### 0508 - 2 Element

| A               | B               | C               | D               | E               |
|-----------------|-----------------|-----------------|-----------------|-----------------|
| 0.68<br>(0.027) | 1.32<br>(0.052) | 2.00<br>(0.079) | 0.46<br>(0.018) | 1.00<br>(0.039) |

#### 0508 - 4 Element

| A               | B               | C               | D               | E               |
|-----------------|-----------------|-----------------|-----------------|-----------------|
| 0.56<br>(0.022) | 1.32<br>(0.052) | 1.88<br>(0.074) | 0.30<br>(0.012) | 0.50<br>(0.020) |

#### 0612 - 4 Element

| A               | B               | C               | D               | E               |
|-----------------|-----------------|-----------------|-----------------|-----------------|
| 0.89<br>(0.035) | 1.65<br>(0.065) | 2.54<br>(0.100) | 0.46<br>(0.018) | 0.76<br>(0.030) |