## 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%.

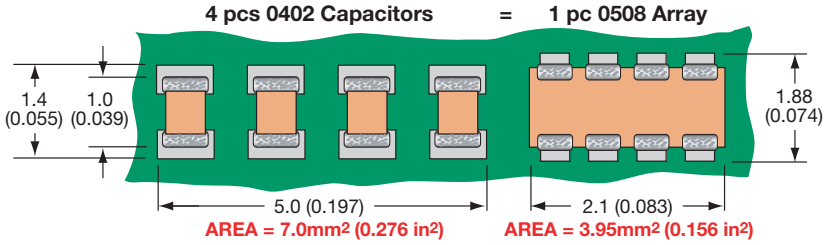
For high volume users of cap arrays using the very latest placement equipment capable of placing 10 components per second, the increase in throughput can be very significant and can have the overall effect of reducing the number of placement machines required to mount components:

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.

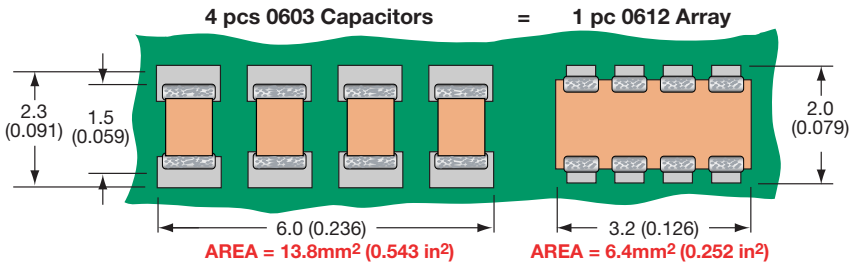
Smaller volume users can also benefit from replacing discrete components with arrays. The total number of placements is reduced thus creating spare capacity on placement machines. This in turn generates the opportunity to increase overall production output without further investment in new equipment.

**W2A (0508) Capacitor Arrays**




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

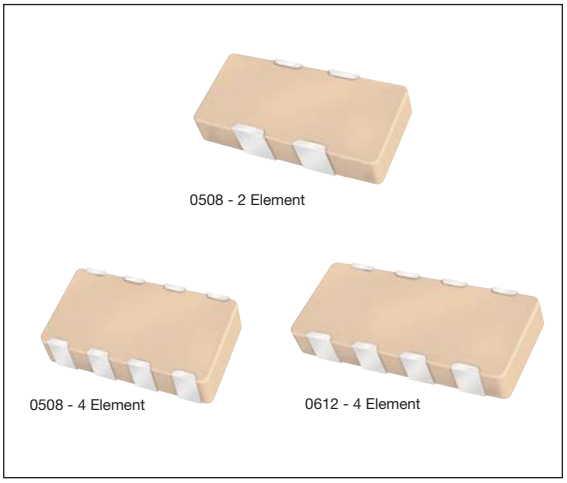
**W3A (0612) Capacitor Arrays**




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

# Capacitor Array

## Capacitor Array (IPC)



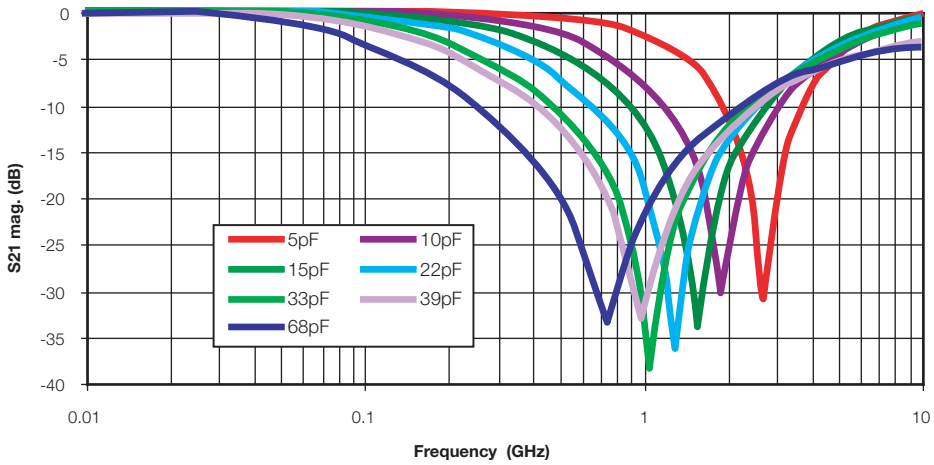

## GENERAL DESCRIPTION

AVX is the market leader in the development and manufacture of capacitor arrays. The array family of products also includes the 0612 4-element device as well as 0508 2-element and 4-element series, all of which have received widespread acceptance in the marketplace.

AVX capacitor arrays are available in X5R, X7R and NP0 (C0G) ceramic dielectrics to cover a broad range of capacitance values. Voltage ratings from 6.3 Volts up to 100 Volts are offered. AVX also now offers a range of automotive capacitor arrays qualified to AEC-Q200 (see separate table).

Key markets for capacitor arrays are Mobile and Cordless Phones, Digital Set Top Boxes, Computer Motherboards and Peripherals as well as Automotive applications, RF Modems, Networking Products, etc.

**AVX Capacitor Array - W2A41A***K**
**S21 Magnitude**




## HOW TO ORDER

| W | 2 | A | 4 | 3 | C | 103 | M | A | T | 2A |
|---|---|---|---|---|---|---|---|---|---|---|
| **Style**<br>W = RoHS<br>L = SnPb | **Case Size**<br>2 = 0508<br>3 = 0612 | **Array** | **Number of Caps**<br>2 = 2 Element<br>4 = 4 Element | **Voltage**<br>6 = 6V<br>Z = 10V<br>Y = 16V<br>3 = 25V<br>5 = 50V<br>1 = 100V | **Dielectric**<br>A = NP0<br>C = X7R<br>D = X5R | **Capacitance Code**<br>2 Sig Digits + Number of Zeros | **Capacitance Tolerance**<br>J = ±5%<br>K = ±10%<br>M = ±20% | **Failure Rate**<br>A = Commercial<br>4 = Automotive | **Termination Code**<br>*T = Plated Ni and Sn<br>*Z = FLEXITERM®<br>*B = 5% min lead<br>*X = FLEXITERM® with 5% min lead<br>*RoHS Compliant<br>*Not RoHS Compliant | **Packaging & Quantity Code**<br>2A = 7" Reel (4000)<br>4A = 13" Reel (10000)<br>2F = 7" Reel (1000) |

RoHS COMPLIANT

NOTE: Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.

# Capacitor Array

## Capacitance Range – NP0/C0G

| SIZE | | W2 = 0508 | | | W3 = 0612 | | |
|---|---|---|---|---|---|---|---|
| # Elements | | 4 | | | 4 | | |
| Soldering | | Reflow/Wave | | | Reflow/Wave | | |
| Packaging | | Paper/Embossed | | | Paper/Embossed | | |
| Length | mm (in.) | 1.30 ± 0.15 (0.051 ± 0.006) | | | 1.60 ± 0.150 (0.063 ± 0.006) | | |
| Width | mm (in.) | 2.10 ± 0.15 (0.083 ± 0.006) | | | 3.20 ± 0.20 (0.126 ± 0.008) | | |
| Max. Thickness | mm (in.) | 0.94 (0.037) | | | 1.35 (0.053) | | |
| WVDC | | 16 | 25 | 50 | 16 | 25 | 50 |
| 1R0<br>1R2<br>1R5 | Cap (pF) 1.0<br>1.2<br>1.5 | ■ | ■ | ■ | ■ | ■ | ■ |
| 1R8<br>2R2<br>2R7 | 1.8<br>2.2<br>2.7 | ■ | ■ | ■ | ■ | ■ | ■ |
| 3R3<br>3R9<br>4R7 | 3.3<br>3.9<br>4.7 | ■ | ■ | ■ | ■ | ■ | ■ |
| 5R6<br>6R8<br>8R2 | 5.6<br>6.8<br>8.2 | ■ | ■ | ■ | ■ | ■ | ■ |
| 100<br>120<br>150 | 10<br>12<br>15 | ■ | ■ | ■ | ■ | ■ | ■ |
| 180<br>220<br>270 | 18<br>22<br>27 | ■ | ■ | ■ | ■ | ■ | ■ |
| 330<br>390<br>470 | 33<br>39<br>47 | ■ | ■ | ■ | ■ | ■ | ■ |
| 560<br>680<br>820 | 56<br>68<br>82 | ■ | ■ | ■ | ■ | ■ | ■ |
| 101<br>121<br>151 | 100<br>120<br>150 | ■ | ■ | ■ | ■ | ■ | ■ |
| 181<br>221<br>271 | 180<br>220<br>270 | ■ | ■ | ■ | ■ | ■ | ■ |
| 331<br>391<br>471 | 330<br>390<br>470 | | | | ■ | ■ | ■ |
| 561<br>681<br>821 | 560<br>680<br>820 | | | | | | |
| 102<br>122<br>152 | 1000<br>1200<br>1500 | | | | | | |
| 182<br>222<br>272 | 1800<br>2200<br>2700 | | | | | | |
| 332<br>392<br>472 | 3300<br>3900<br>4700 | | | | | | |
| 562<br>682<br>822 | 5600<br>6800<br>8200 | | | | | | |

■ = Supported Values

# Capacitor Array

## Capacitance Range – X7R

| SIZE | | | W2 = 0508 | | | | | | W2 = 0508 | | | | | | W3 = 0612 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # Elements | | | 2 | | | | | | 4 | | | | | | 4 | | | | | |
| Soldering | | | Reflow/Wave | | | | | | Reflow/Wave | | | | | | Reflow/Wave | | | | | |
| Packaging | | | All Paper | | | | | | Paper/Embossed | | | | | | Paper/Embossed | | | | | |
| Length | | mm (in.) | 1.30 ± 0.15 (0.051 ± 0.006) | | | | | | 1.30 ± 0.15 (0.051 ± 0.006) | | | | | | 1.60 ± 0.150 (0.063 ± 0.006) | | | | | |
| Width | | mm (in.) | 2.10 ± 0.15 (0.083 ± 0.006) | | | | | | 2.10 ± 0.15 (0.083 ± 0.006) | | | | | | 3.20 ± 0.20 (0.126 ± 0.008) | | | | | |
| Max. Thickness | | mm (in.) | 0.94 (0.037) | | | | | | 0.94 (0.037) | | | | | | 1.35 (0.053) | | | | | |
| WVDC | | | 6 | 10 | 16 | 25 | 50 | 100 | 6 | 10 | 16 | 25 | 50 | 100 | 6 | 10 | 16 | 25 | 50 | 100 |
| 101 | Cap | 100 | | | | | | | | | | | | | | | | | | |
| 121 | (pF) | 120 | | | | | | | | | | | | | | | | | | |
| 151 | | 150 | | | | | | | | | | | | | | | | | | |
| 181 | | 180 | | | | | | | | | | | | | | | | | | |
| 221 | | 220 | | | | | | | | | | | | | | | | | | |
| 271 | | 270 | | | | | | | | | | | | | | | | | | |
| 331 | | 330 | | | | | | | | | | | | | | | | | | |
| 391 | | 390 | | | | | | | | | | | | | | | | | | |
| 471 | | 470 | | | | | | | | | | | | | | | | | | |
| 561 | | 560 | | | | | | | | | | | | | | | | | | |
| 681 | | 680 | | | | | | | | | | | | | | | | | | |
| 821 | | 820 | | | | | | | | | | | | | | | | | | |
| 102 | | 1000 | | | | | | | | | | | | | | | | | | |
| 122 | | 1200 | | | | | | | | | | | | | | | | | | |
| 152 | | 1500 | | | | | | | | | | | | | | | | | | |
| 182 | | 1800 | | | | | | | | | | | | | | | | | | |
| 222 | | 2200 | | | | | | | | | | | | | | | | | | |
| 272 | | 2700 | | | | | | | | | | | | | | | | | | |
| 332 | | 3300 | | | | | | | | | | | | | | | | | | |
| 392 | | 3900 | | | | | | | | | | | | | | | | | | |
| 472 | | 4700 | | | | | | | | | | | | | | | | | | |
| 562 | | 5600 | | | | | | | | | | | | | | | | | | |
| 682 | | 6800 | | | | | | | | | | | | | | | | | | |
| 822 | | 8200 | | | | | | | | | | | | | | | | | | |
| 103 | Cap | 0.010 | | | | | | | | | | | | | | | | | | |
| 123 | (µF) | 0.012 | | | | | | | | | | | | | | | | | | |
| 153 | | 0.015 | | | | | | | | | | | | | | | | | | |
| 183 | | 0.018 | | | | | | | | | | | | | | | | | | |
| 223 | | 0.022 | | | | | | | | | | | | | | | | | | |
| 273 | | 0.027 | | | | | | | | | | | | | | | | | | |
| 333 | | 0.033 | | | | | | | | | | | | | | | | | | |
| 393 | | 0.039 | | | | | | | | | | | | | | | | | | |
| 473 | | 0.047 | | | | | | | | | | | | | | | | | | |
| 563 | | 0.056 | | | | | | | | | | | | | | | | | | |
| 683 | | 0.068 | | | | | | | | | | | | | | | | | | |
| 823 | | 0.082 | | | | | | | | | | | | | | | | | | |
| 104 | | 0.10 | | | | | | | | | | | | | | | | | | |
| 124 | | 0.12 | | | | | | | | | | | | | | | | | | |
| 154 | | 0.15 | | | | | | | | | | | | | | | | | | |
| 184 | | 0.18 | | | | | | | | | | | | | | | | | | |
| 224 | | 0.22 | | | | | | | | | | | | | | | | | | |
| 274 | | 0.27 | | | | | | | | | | | | | | | | | | |
| 334 | | 0.33 | | | | | | | | | | | | | | | | | | |
| 474 | | 0.47 | | | | | | | | | | | | | | | | | | |
| 564 | | 0.56 | | | | | | | | | | | | | | | | | | |
| 684 | | 0.68 | | | | | | | | | | | | | | | | | | |
| 824 | | 0.82 | | | | | | | | | | | | | | | | | | |
| 105 | | 1.0 | | | | | | | | | | | | | | | | | | |
| 125 | | 1.2 | | | | | | | | | | | | | | | | | | |
| 155 | | 1.5 | | | | | | | | | | | | | | | | | | |
| 185 | | 1.8 | | | | | | | | | | | | | | | | | | |
| 225 | | 2.2 | | | | | | | | | | | | | | | | | | |
| 335 | | 3.3 | | | | | | | | | | | | | | | | | | |
| 475 | | 4.7 | | | | | | | | | | | | | | | | | | |
| 106 | | 10 | | | | | | | | | | | | | | | | | | |
| 226 | | 22 | | | | | | | | | | | | | | | | | | |
| 476 | | 47 | | | | | | | | | | | | | | | | | | |
| 107 | | 100 | | | | | | | | | | | | | | | | | | |