

## 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%.

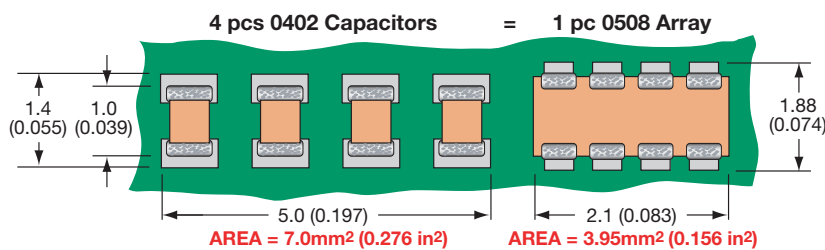
For high volume users of cap arrays using the very latest placement equipment capable of placing 10 components per second, the increase in throughput can be very significant and can have the overall effect of reducing the number of placement machines required to mount components:

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.

# Capacitor Array



## Capacitor Array (IPC)



### GENERAL DESCRIPTION

AVX is the market leader in the development and manufacture of capacitor arrays. The smallest array option available from AVX, the 0405 2-element device, has been an enormous success in the Telecommunications market. 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 (COG) 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

<b>W</b>	<b>2</b>	<b>A</b>	<b>4</b>	<b>3</b>	<b>C</b>	<b>103</b>	<b>M</b>	<b>A</b>	<b>T</b>	<b>2A</b>
<b>Style</b> W = RoHS L = SnPb	<b>Case Size</b> 1 = 0405 2 = 0508 3 = 0612 5 = 0306	<b>Array</b>	<b>Number of Caps</b>	<b>Voltage</b> 6 = 6V Z = 10V Y = 16V 3 = 25V 5 = 50V 1 = 100V	<b>Dielectric</b> A = NP0 C = X7R D = X5R	<b>Capacitance Code</b> 2 Sig Digits + Number of Zeros	<b>Capacitance Tolerance</b> J = ±5% K = ±10% M = ±20%	<b>Failure Rate</b> A = Commercial 4 = Automotive	<b>Termination Code</b> T = Plated Ni and Sn** Z = FLEXITERM®** B = 5% min lead X = FLEXITERM® with 5% min lead	<b>Packaging &amp; Quantity Code</b> 2A = 7" Reel (4000) 4A = 13" Reel (10000) 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/COG

SIZE		0405			0508				0508				0612			
# Elements		2			2				4				4			
Soldering		Reflow Only			Reflow/Wave				Reflow/Wave				Reflow/Wave			
Packaging		All Paper			All Paper				Paper/Embossed				Paper/Embossed			
Length	mm	1.00 ± 0.15			1.30 ± 0.15				1.30 ± 0.15				1.60 ± 0.150			
	(in.)	(0.039 ± 0.006)			(0.051 ± 0.006)				(0.051 ± 0.006)				(0.063 ± 0.006)			
Width	mm	1.37 ± 0.15			2.10 ± 0.15				2.10 ± 0.15				3.20 ± 0.20			
	(in.)	(0.054 ± 0.006)			(0.083 ± 0.006)				(0.083 ± 0.006)				(0.126 ± 0.008)			
Max. Thickness	mm	0.66			0.94				0.94				1.35			
	(in.)	(0.026)			(0.037)				(0.037)				(0.053)			
WVDC		16	25	50	16	25	50	100	16	25	50	100	16	25	50	100
1R0	1.0															
1R2	1.2															
1R5	1.5															
1R8	1.8															
2R2	2.2															
2R7	2.7															
3R3	3.3															
3R9	3.9															
4R7	4.7															
5R6	5.6															
6R8	6.8															
8R2	8.2															
100	10															
120	12															
150	15															
180	18															
220	22															
270	27															
330	33															
390	39															
470	47															
560	56															
680	68															
820	82															
101	100															
121	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															

# Capacitor Array

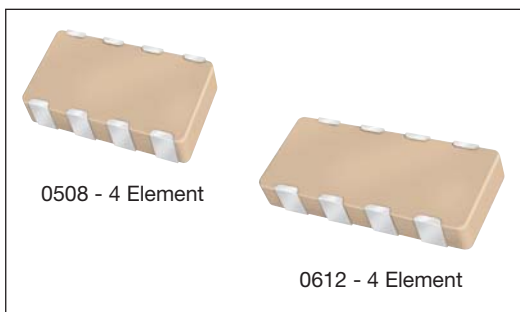


## Capacitance Range – X7R/X5R

SIZE	0306				0405					0508						0508						0612				
# Elements	4				2					2						4						4				
Soldering	Reflow Only				Reflow Only					Reflow/Wave						Reflow/Wave						Reflow/Wave				
Packaging	All Paper				All Paper					All Paper						Paper/Embossed						Paper/Embossed				
Length	mm (in.)	1.60 ± 0.15 (0.063 ± 0.006)			1.00 ± 0.15 (0.039 ± 0.006)					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.)	0.81 ± 0.15 (0.032 ± 0.006)			1.37 ± 0.15 (0.054 ± 0.006)					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.)	0.50 (0.020)			0.66 (0.026)					0.94 (0.037)							0.94 (0.037)									1.35 (0.053)
WVDC		6 10 16 25			6 10 16 25 50					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																								
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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																								

- Light brown square = Currently available X7R
- Orange square = Currently available X5R
- Diagonal lines (top-left to bottom-right) square = Under development X7R, contact factory for advance samples
- Diagonal lines (bottom-left to top-right) square = Under development X5R, contact factory for advance samples





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

**W** Style  
W = RoHS  
L = SnPb

**3** Case Size  
1 = 0405  
2 = 0508  
3 = 0612

**A** Array

**4** Number of Caps

**Y** Voltage  
Z = 10V  
Y = 16V  
3 = 25V  
5 = 50V  
1 = 100V

**C** Dielectric  
A = NP0  
C = X7R  
F = X8R

**104** Capacitance Code (In pF)  
Significant Digits + Number of Zeros  
e.g. 10 $\mu$ F=106

**K** Capacitance Tolerance  
\*J =  $\pm 5\%$   
\*K =  $\pm 10\%$   
M =  $\pm 20\%$

**4** Failure Rate  
4 = Automotive

**T** Terminations  
T = Plated Ni and Sn\*\*  
Z = FLEXITERM®\*\*\*  
B = 5% min lead  
X = FLEXITERM® with 5% min lead

**2A** Packaging & Quantity Code  
2A = 7" Reel (4000)  
4A = 13" Reel (10000)  
2F = 7" Reel (1000)

\*\*RoHS compliant

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

NP0/COG												
SIZE	0405		0508		0508				0612			
No. of Elements	2		2		4				4			
	WVDC		WVDC		WVDC				WVDC			
1R0	1.0	50	50	16	25	50	100	16	25	50	100	
1R2	1.2	50	50									
1R5	1.5											
1R8	1.8											
2R2	2.2											
2R7	2.7											
3R3	3.3											
3R9	3.9											
4R7	4.7											
5R6	5.6											
6R8	6.8											
8R2	8.2											
100	10											
120	12											
150	15											
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272	2700											
332	3300											
392	3900											
472	4700											
562	5600											
682	6800											
822	8200											

SIZE	X7R										X8R	
	0508		0508				0612					0405
No. of Elements	2		4				4				2	
	WVDC		WVDC				WVDC				WVDC	
101	100	10	16	25	50	100	16	25	50	100	10	16
121	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											
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222	2200											
272	2700											
332	3300											
392	3900											
472	4700											
562	5600											
682	6800											
822	8200											
103	0.010											
123	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											
224	0.22											

Light Blue = X7R  
 Dark Blue = X8R  
 Grey = Under development

Light Blue = NP0/COG  
 Grey = Under development



## PART & PAD LAYOUT DIMENSIONS

millimeters (inches)



## PART DIMENSIONS

### 0405 - 2 Element

L	W	T	BW	BL	P	S
1.00 ± 0.15 (0.039 ± 0.006)	1.37 ± 0.15 (0.054 ± 0.006)	0.66 MAX (0.026 MAX)	0.36 ± 0.10 (0.014 ± 0.004)	0.20 ± 0.10 (0.008 ± 0.004)	0.64 REF (0.025 REF)	0.32 ± 0.10 (0.013 ± 0.004)

### 0508 - 2 Element

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

### 0508 - 4 Element

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

### 0612 - 4 Element

L	W	T	BW	BL	P	X	S
1.60 ± 0.20 (0.063 ± 0.008)	3.20 ± 0.20 (0.126 ± 0.008)	1.35 MAX (0.053 MAX)	0.41 ± 0.10 (0.016 ± 0.004)	0.18 ± 0.08 (0.007 ± 0.003)	0.76 REF (0.030 REF)	1.14 ± 0.10 (0.045 ± 0.004)	0.38 ± 0.10 (0.015 ± 0.004)

## PAD LAYOUT DIMENSIONS

### 0405 - 2 Element

A	B	C	D	E
0.46 (0.018)	0.74 (0.029)	1.20 (0.047)	0.30 (0.012)	0.64 (0.025)

### 0508 - 2 Element

A	B	C	D	E
0.68 (0.027)	1.32 (0.052)	2.00 (0.079)	0.46 (0.018)	1.00 (0.039)

### 0508 - 4 Element

A	B	C	D	E
0.56 (0.022)	1.32 (0.052)	1.88 (0.074)	0.30 (0.012)	0.50 (0.020)

### 0612 - 4 Element

A	B	C	D	E
0.89 (0.035)	1.65 (0.065)	2.54 (0.100)	0.46 (0.018)	0.76 (0.030)