

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%.

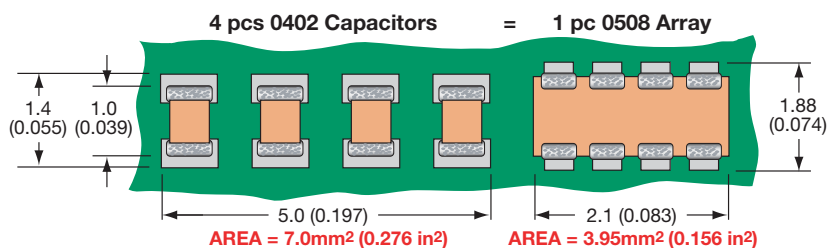
For high volume users of cap arrays using the very latest placement equipment capable of placing 10 components per second, the increase in throughput can be very significant and can have the overall effect of reducing the number of placement machines required to mount components:

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.

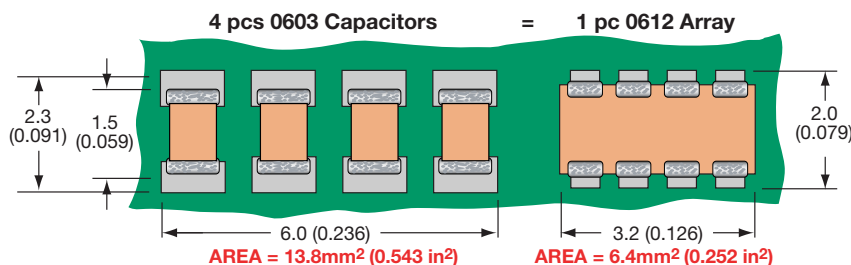
Smaller volume users can also benefit from replacing discrete components with arrays. The total number of placements is reduced thus creating spare capacity on placement machines. This in turn generates the opportunity to increase overall production output without further investment in new equipment.

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

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

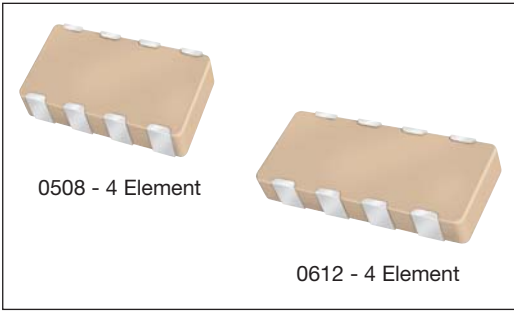


Capacitance Range – X7R/X5R

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	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	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	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	6	10	16	25	50	100
101 Cap 100	Under development X5R, contact factory for advance samples				Currently available X7R					Currently available X7R						Currently available X7R						Currently available X7R											
121 (pF) 120																																	
151 150																																	
181 180	Under development X5R, contact factory for advance samples				Currently available X7R					Currently available X7R						Currently available X7R						Currently available X7R											
221 220																																	
271 270																																	
331 330	Under development X5R, contact factory for advance samples				Currently available X7R					Currently available X7R						Currently available X7R						Currently available X7R											
391 390																																	
471 470																																	
561 560	Under development X5R, contact factory for advance samples				Currently available X7R					Currently available X7R						Currently available X7R						Currently available X7R											
681 680																																	
821 820																																	
102 1000	Under development X5R, contact factory for advance samples				Currently available X7R					Currently available X7R						Currently available X7R						Currently available X7R											
122 1200																																	
152 1500																																	
182 1800	Under development X5R, contact factory for advance samples				Currently available X7R					Currently available X7R						Currently available X7R						Currently available X7R											
222 2200																																	
272 2700																																	
332 3300	Under development X5R, contact factory for advance samples				Currently available X7R					Currently available X7R						Currently available X7R						Currently available X7R											
392 3900																																	
472 4700																																	
562 5600	Under development X5R, contact factory for advance samples				Currently available X7R					Currently available X7R						Currently available X7R						Currently available X7R											
682 6800																																	
822 8200																																	
103 Cap 0.010	Under development X5R, contact factory for advance samples				Currently available X7R					Currently available X7R						Currently available X7R						Currently available X7R											
123 (µF) 0.012																																	
153 0.015																																	
183 0.018	Under development X5R, contact factory for advance samples				Currently available X7R					Currently available X7R						Currently available X7R						Currently available X7R											
223 0.022																																	
273 0.027																																	
333 0.033	Under development X5R, contact factory for advance samples				Currently available X7R					Currently available X7R						Currently available X7R						Currently available X7R											
393 0.039																																	
473 0.047																																	
563 0.056	Under development X5R, contact factory for advance samples				Currently available X7R					Currently available X7R						Currently available X7R						Currently available X7R											
683 0.068																																	
823 0.082																																	
104 0.10	Under development X5R, contact factory for advance samples				Currently available X7R					Currently available X7R						Currently available X7R						Currently available X7R											
124 0.12																																	
154 0.15																																	
184 0.18	Under development X5R, contact factory for advance samples				Currently available X7R					Currently available X7R						Currently available X7R						Currently available X7R											
224 0.22																																	
274 0.27																																	
334 0.33	Under development X5R, contact factory for advance samples				Currently available X7R					Currently available X7R						Currently available X7R						Currently available X7R											
474 0.47																																	
564 0.56																																	
684 0.68	Under development X5R, contact factory for advance samples				Currently available X7R					Currently available X7R						Currently available X7R						Currently available X7R											
824 0.82																																	
105 1.0																																	
125 1.2	Under development X5R, contact factory for advance samples				Currently available X7R					Currently available X7R						Currently available X7R						Currently available X7R											
155 1.5																																	
185 1.8																																	
225 2.2	Under development X5R, contact factory for advance samples				Currently available X7R					Currently available X7R						Currently available X7R						Currently available X7R											
335 3.3																																	
475 4.7																																	
106 10	Under development X5R, contact factory for advance samples				Currently available X7R					Currently available X7R						Currently available X7R						Currently available X7R											
226 22																																	
476 47																																	
107 100	Under development X5R, contact factory for advance samples				Currently available X7R					Currently available X7R						Currently available X7R						Currently available X7R											

- = Currently available X7R
- = Currently available X5R
- = Under development X7R, contact factory for advance samples
- = 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	3	A	4	Y	C	104	K	4	T	2A
Style W = RoHS L = SnPb	Case Size 1 = 0405 2 = 0508 3 = 0612	Array	Number of Caps	Voltage Z = 10V Y = 16V 3 = 25V 5 = 50V 1 = 100V	Dielectric A = NP0 C = X7R F = X8R	Capacitance Code (In pF) Significant Digits + Number of Zeros e.g. 10µF=106	Capacitance Tolerance *J = ±5% *K = ±10% M = ±20%	Failure Rate 4 = Automotive	Terminations T = Plated Ni and Sn** Z = FLEXITERM®** B = 5% min lead X = FLEXITERM® with 5% min lead	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 = ±10% and J = ±5% tolerance.

NP0/COG												
SIZE	0405		0508		0508				0612			
No. of Elements	2	2	4				4					
WVDC	50	50	16	25	50	100	16	25	50	100		
1R0 Cap 1.0 (pF)												
1R2 Cap 1.2 (pF)												
1R5 Cap 1.5 (pF)												
1R8												
2R2												
2R7												
3R3												
3R9												
4R7												
5R6												
6R8												
8R2												
100												
120												
150												
180												
220												
270												
330												
390												
470												
560												
680												
820												
101												
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122												
152												
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222												
272												
332												
392												
472												
562												
682												
822												

NP0/COG
Under development

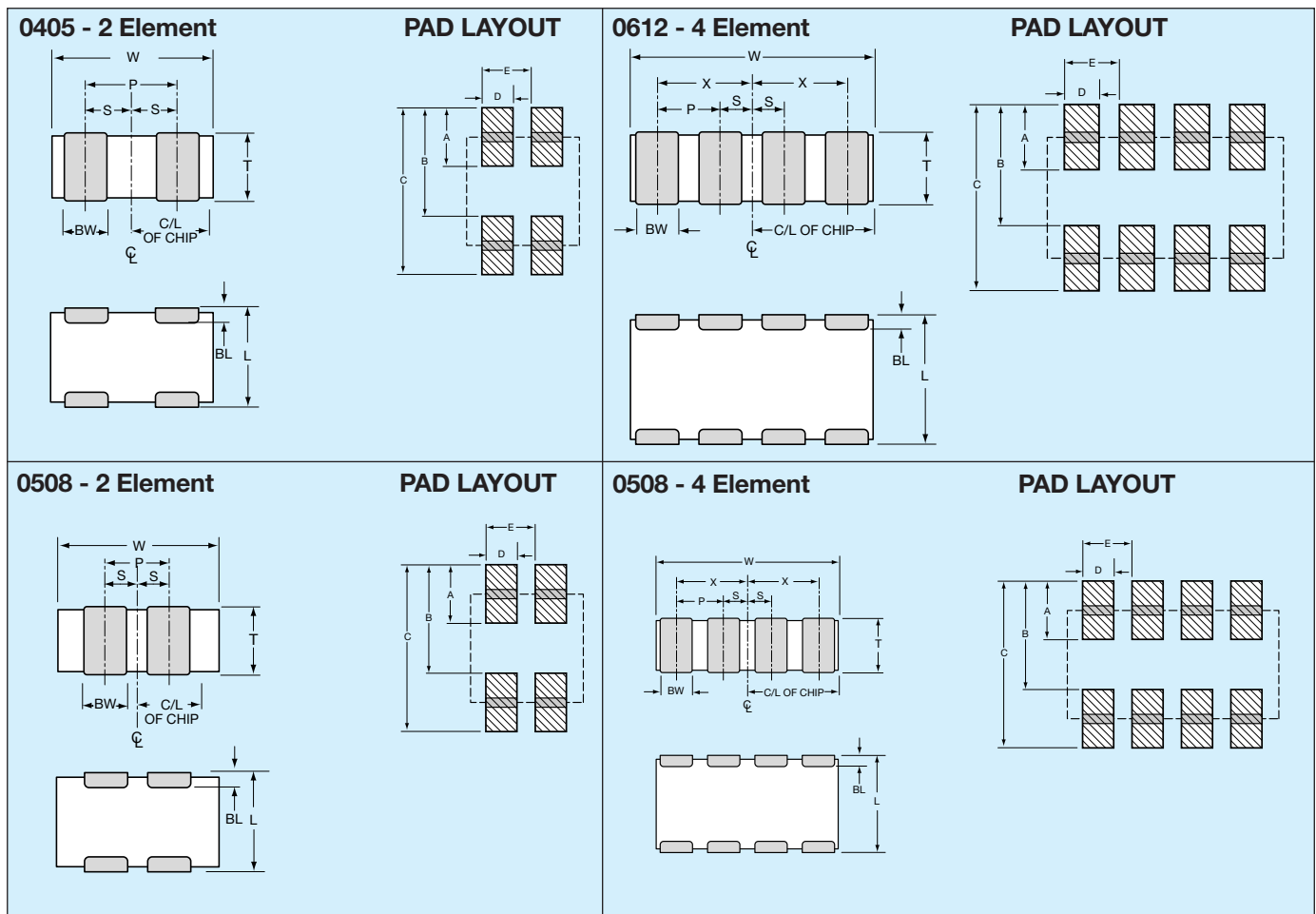
SIZE	X7R										X8R					
	0508		0508				0612					0405				
No. of Elements	2				4				4				2			
WVDC	10	16	25	50	100	16	25	50	100	10	16	25	50	100	16	
101 Cap 100 (pF)																
121 Cap 120 (pF)																
151 Cap 150 (pF)																
181																
221																
271																
331																
391																
471																
561																
681																
821																
102																
122																
152																
182																
222																
272																
332																
392																
472																
562																
682																
822																
103 Cap 0.010 (µF)																
123 Cap 0.012 (µF)																
153 Cap 0.015 (µF)																
183																
223																
273																
333																
393																
473																
563																
683																
823																
104																
124																
154																
224																

X7R
X8R
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)