BENEFITS OF USING CAPACITOR ARRAYS

KYOCERA 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%.

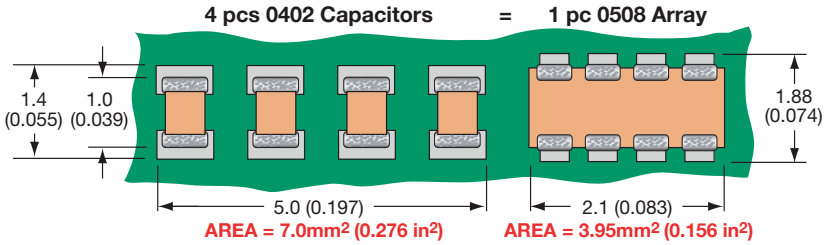
For high volume users of cap arrays using the very latest placement equipment capable of placing 10 components per second, the increase in throughput can be very significant and can have the overall effect of reducing the number of placement machines required to mount components:

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.

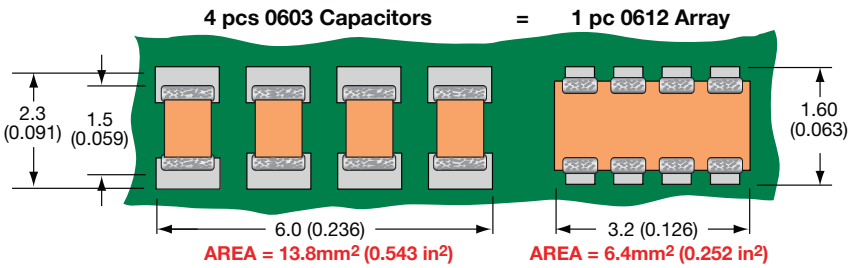
Smaller volume users can also benefit from replacing discrete components with arrays. The total number of placements is reduced thus creating spare capacity on placement machines. This in turn generates the opportunity to increase overall production output without further investment in new equipment.

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.

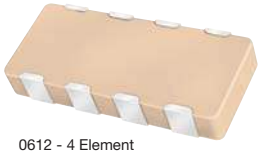
W3A (0612) Capacitor Arrays



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.

0508 - 2 Element

0508 - 4 Element



0612 - 4 Element

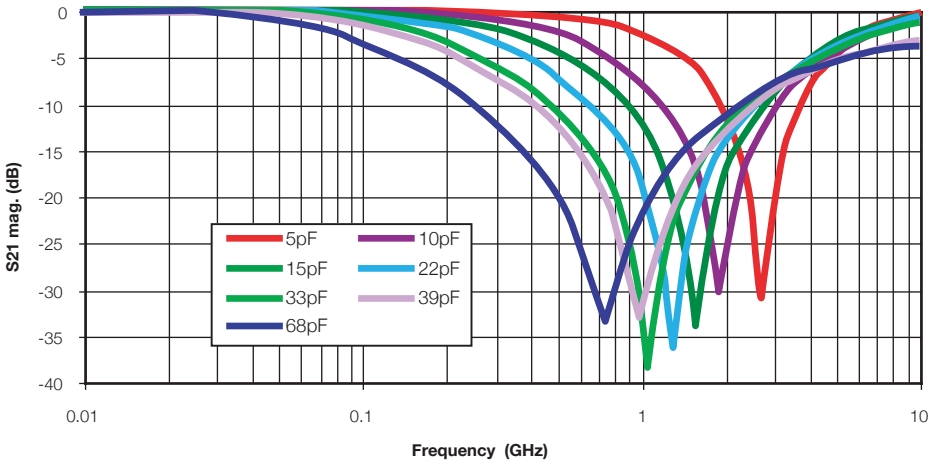
GENERAL DESCRIPTION

KYOCERA 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.

KYOCERA 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. KYOCERA 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** 2 = 0508 3 = 0612	**Array**	**Number of Caps** 2 = 2 Element 4 = 4 Element	**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 *RoHS Compliant *Not RoHS Compliant	**Packaging & Quantity Code** 2A = 7" Reel 4A = 13" Reel 2F = 7" Reel (1000)

RoHS COMPLIANT

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

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	Cap	1.0	■	■	■	■	■	■
1R2	(pF)	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						

■ = Supported Values

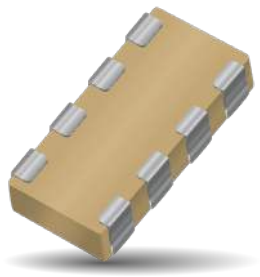
Capacitor Array

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 (pF)	100																		
121		120																		
151		150																		
181		180																		
221		220							■	■	■	■	■	■	■	■	■	■	■	■
271		270							■	■	■	■	■	■	■	■	■	■	■	■
331		330							■	■	■	■	■	■	■	■	■	■	■	■
391		390							■	■	■	■	■	■	■	■	■	■	■	■
471		470							■	■	■	■	■	■	■	■	■	■	■	■
561		560							■	■	■	■	■	■	■	■	■	■	■	■
681		680							■	■	■	■	■	■	■	■	■	■	■	■
751		750							■	■	■	■	■	■	■	■	■	■	■	■
821		820							■	■	■	■	■	■	■	■	■	■	■	■
102		1000	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
122		1200	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
152		1500	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
182		1800	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
222		2000	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
272		2700	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
332		3300	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
392		3900	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
472		4700	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
562		5600	■	■	■	■	■	■	■	■	■	■	■		■	■	■	■	■	■
682		6800	■	■	■	■	■	■	■	■	■	■	■		■	■	■	■	■	■
822		8200	■	■	■	■	■	■	■	■	■	■	■		■	■	■	■	■	■
103	Cap (µF)	0.010	■	■	■	■	■	■	■	■	■	■	■		■	■	■	■	■	■
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		0.100	■	■	■	■	■		■	■	■				■	■	■	■		
154		0.150	■	■											■					
224		0.220	■	■											■					
274		0.270													■					
334		0.330																		
394		0.390																		
474		0.470																		
564		0.560																		
684		0.680																		
824		0.820																		
105		1.000																		

Capacitor Array

Automotive Capacitor Array (IPC)



As the market leader in the development and manufacture of capacitor arrays KYOCERA AVX is pleased to offer a range of AEC-Q200 qualified arrays to compliment our product offering to the Automotive industry. Both the KYOCERA 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 KYOCERA 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** 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 4A = 13" Reel 2F = 7" Reel (1000)

*RoHS Compliant

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

NP0/C0G

SIZE		W3 = 0612		
No. of Elements		Reflow/Wave		
WVDC		16	25	50
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			

■ = NPO/COG

X7R

SIZE		W2 = 0508				W2 = 0508				W3 = 0612				
No. of Elements		2				4				4				
WVDC		16	25	50	100	16	25	50	100	10	16	25	50	100
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	■	■	■	■	■	■	■		■	■	■	■	■
103	Cap 0.010	■	■	■	■	■	■	■		■	■	■	■	■
123	(µF) 0.012	■	■	■		■	■	■		■	■	■	■	■
153	0.015	■	■	■		■	■	■		■	■	■	■	■
153	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													

■ = X7R

*Not RoHS Compliant

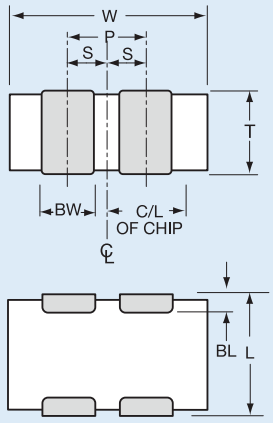
LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

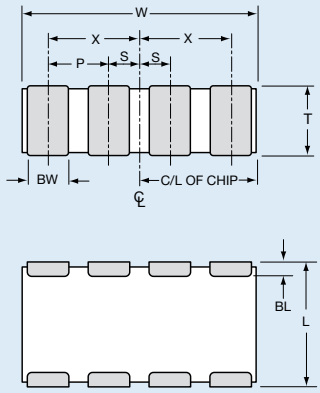
PART & PAD LAYOUT DIMENSIONS

millimeters (inches)

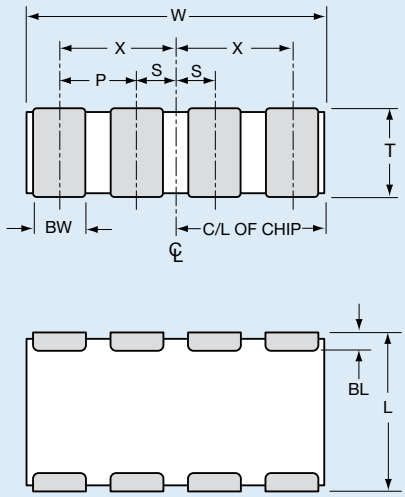
0508 - 2 Element



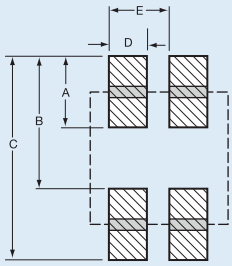
0508 - 4 Element



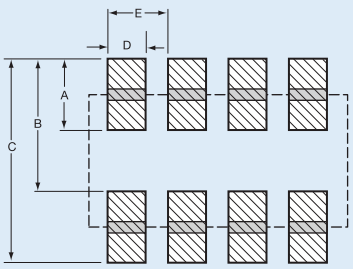
0612 - 4 Element



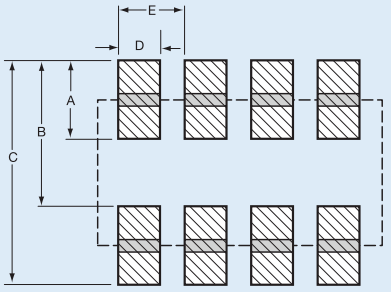
PAD LAYOUT



PAD LAYOUT



PAD LAYOUT



PART DIMENSIONS

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)	$0.18^{+0.25}_{-0.08}$ ($0.007^{+0.010}_{-0.003}$)	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

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)