

SMPS Capacitors Chip Assemblies

CH/CV - Radial, Dual-in-Line, 4 Terminal/SMT 'J' & 'L' Ranges



The CH/CV range exhibits low ESR/ESL making them well suited for high frequency applications. With its' PME technology, the range exhibits high current handling capabilities where as other technologies may not, making them the ideal choice for filtering, smoothing and decoupling circuit applications.

The CH/CV range uses a number of different lead frames types which reduces the thermo-mechanical stresses which makes them the designer's choice for high reliability applications. In combination with this the range uses a stacked capacitor design which saves on PCB space.

FEATURES

- BS9100 approved
- Voltage range 50-500 V DC
- Dielectrics 1B/COG and 2C1/X7R
- Customised ceramic capacitor packages and lead frames available.

Note: AVX does not recommend or advise the use of adhesives to secure the CH/CV components to the PCB

ELECTRICAL SPECIFICATIONS

Temperature Coefficient CECC 30 000, (4.24.1)

1B/C0G: A Temperature Coefficient - 0 ± 30 ppm/°C, -55° to +125°C
2C1/X7R: C Temperature Characteristic - $\pm 15\%$, -55° to +125°C

Capacitance Test 25°C

1B/C0G: Measured at 1 VRMS max at 1KHz (1MHz for 100 pF or less)
2C1/X7R: Measured at 1 VRMS max at 1KHz

Dissipation Factor 25°C

1B/C0G: 0.15% max at 1KHz, 1 VRMS max (1MHz for 100 pF or less)
2C1/X7R: 2.5% max at 1KHz, 1 VRMS max

Insulation Resistance 25°C

1B/C0G & 2C1/X7R: 100K megohms or 1000 megohms-μF, whichever is less

Dielectric Withstanding Voltage 25°C (Flash Test)

1B/C0G & 2C1/X7R: 250% rated voltage for 5 seconds with 50 mA max charging current. (500 Volt units @ 150% rated voltage)

Life Test (1000 hrs) CECC 30 000 (4.23)

1B/C0G & 2C1/X7R: 200% rated voltage at +125°C.
(500 Volt units @ 120% rated voltage)

Damp Heat IEC 68-2-3, 56 days.

Thermal Shock IEC 68-2-14

-55°C to +125°C, 5 cycles

Resistance to Solder Heat IEC 68-2-20

Vibration IEC 68-2-6

10Hz - 2000Hz, 0.75mm or 98m/sec², 6 hrs.

Bump IEC 68-2-29

390m/sec², 4000 bumps

MARKING

CH and CV 4x, 5x, 81-84

A5C
225K
xxxxxx

Top line A (AVX). Voltage code, dielectric code.
Middle line capacitance code, tolerance code.
Bottom line 6 digit batch code.

Other CH, CV Styles

AVX
5C
156M
xxxxxx

Top line AVX.
Second line voltage code, dielectric code.
Third line capacitance code, tolerance code.
Bottom line, 6 digit batch code.



Performance of SMPS capacitors can be simulated by downloading SpiCalci software program -
<http://www.avx.com/SpiApps/default.asp#spicalci>
Custom values, ratings and configurations are also available.



SMPS Capacitors (CV Style)

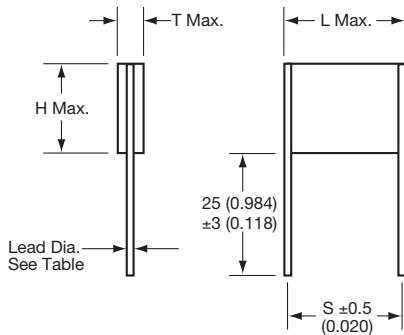


Chip Assemblies

VERTICALLY MOUNTED RADIAL PRODUCT

Part Number format (CVxxxxxxxxxxA2)

Typical Part Number CV525C106MA30A2



DIMENSIONS

millimeters (inches)

Style	L (max)	H (max)	S (nom)	Lead Dia (nom)
CV41-44	10.6 (0.417)	8.7 (0.342)	8.2 (0.322)	0.7 (0.028)
CV51-54	11.9 (0.468)	10.7 (0.421)	10.2 (0.400)	0.9 (0.035)
CV61-64	16.5 (0.649)	13.6 (0.535)	15.2 (0.600)	0.9 (0.035)
CV71-74	17.8 (0.700)	21.6 (0.850)	15.2 (0.600)	0.9 (0.035)
CV76-79	22.7 (0.893)	16.6 (0.653)	21.2* (0.834)	0.9 (0.035)

*Tolerance ± 0.8

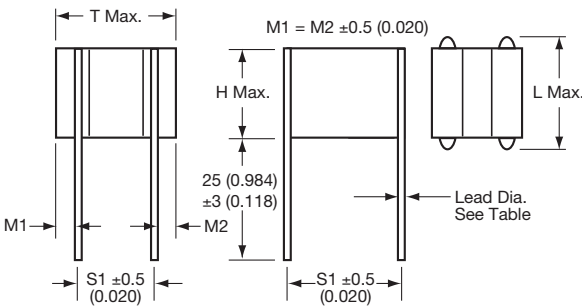
millimeters (inches)

Style	T max
CV41/51/61/71/76	3.80 (0.150)
CV42/52/62/72/77	7.40 (0.291)
CV43/53/63/73/78	11.1 (0.437)
CV44/54/64/74/79	14.8 (0.583)

VERTICALLY MOUNTED 4 TERMINAL RADIAL PRODUCT

Part Number format (CVxxxxxxxx3xx4)

Typical Part Number CV435C106MA30A4



DIMENSIONS

millimeters (inches)

Style	L (max)	H (max)	S (nom)	Lead Dia (nom)
CV43-44	10.6 (0.417)	8.7 (0.342)	8.2 (0.322)	0.7 (0.028)
CV53-54	11.9 (0.468)	10.7 (0.421)	10.2 (0.400)	0.9 (0.035)
CV63-64	16.5 (0.649)	13.6 (0.535)	15.2 (0.600)	0.9 (0.035)
CV73-74	17.8 (0.700)	21.6 (0.850)	15.2 (0.600)	0.9 (0.035)
CV78-79	22.7 (0.893)	16.6 (0.653)	21.2* (0.834)	0.9 (0.035)

*Tolerance ± 0.8 (0.031)

millimeters (inches)

Style	T max	S1
CV43/53/63/73/78	11.1 (0.437)	5.08 (0.200)
CV44/54/64/74/79	14.8 (0.583)	7.62 (0.300)

Note 1. This style is only available in 3 & 4 chip assemblies

HOW TO ORDER

CV	52	5	C	106	M	A	3	0	A	2
Style Code (see product section)	Size Code	Voltage Code	Dielectric Code	Capacitance Code	Capacitance Tolerance	Specification Code	Finish Code	Lead Dia. Code	Lead Space Code	Lead Style Code
		5 = 50V 1 = 100V 2 = 200V 7 = 500V	A = C0G C = X7R	(2 significant digits + no. of zeros) eg. 105 = 1 μ F 106 = 10 μ F 107 = 100 μ F	C0G: J = $\pm 5\%$ K = $\pm 10\%$ M = $\pm 20\%$ X7R: K = $\pm 10\%$ M = $\pm 20\%$ P = +100, -0%	A = Non-customized	3 = Uncoated 8 = Coated (classified as uninsulated)	0 = Standard	A = Standard	2 = 2 Terminal 4 = 4 Terminal See Note 1 above

Not RoHS Compliant

Note: See page 136 for How to Order BS9100 parts

SMPS Capacitors (CH Style)

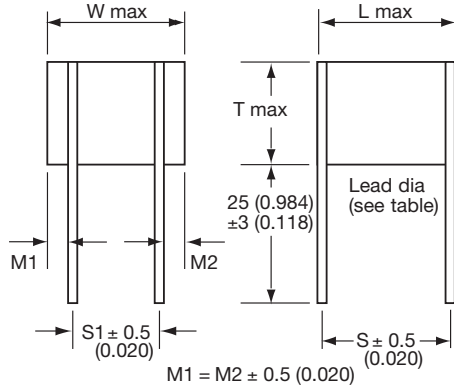


Chip Assemblies

HORIZONTALLY MOUNTED 4 TERMINAL RADIAL PRODUCT

Part Number format (CHxxxxxxxx3xx4)

Typical Part Number CH782C106MA30A4



DIMENSIONS

millimeters (inches)

Style	L (max)	W (max)	S (nom)	S Lead Dia (nom)	S1 (nom)
CH42-44	10.6 (0.417)	8.7 (0.342)	8.2 (0.322)	0.7 (0.028)	5.08 (0.200)
CH52-54	11.9 (0.468)	10.7 (0.421)	10.2 (0.400)	0.9 (0.035)	7.62 (0.300)
CH62-64	16.5 (0.649)	13.6 (0.535)	15.2 (0.600)	0.9 (0.035)	7.62 (0.300)
CH72-74	17.8 (0.700)	21.6 (0.850)	15.2 (0.600)	0.9 (0.035)	15.2 (0.600)
CH77-79	22.7 (0.893)	16.6 (0.653)	21.2* (0.834)	0.9 (0.035)	10.2 (0.400)
CH82-84	14.1 (0.555)	38.2 (1.503)	10.2 (0.400)	0.9 (0.035)	27.9 (1.100)
CH87-89	17.8 (0.700)	38.2 (1.503)	15.2 (0.600)	1.0 (0.039)	27.9 (1.100)
CH92-94	24.0 (0.944)	40.6 (1.598)	21.2* (0.834)	1.2 (0.047)	30.5 (1.200)

*Tolerance ± 0.8

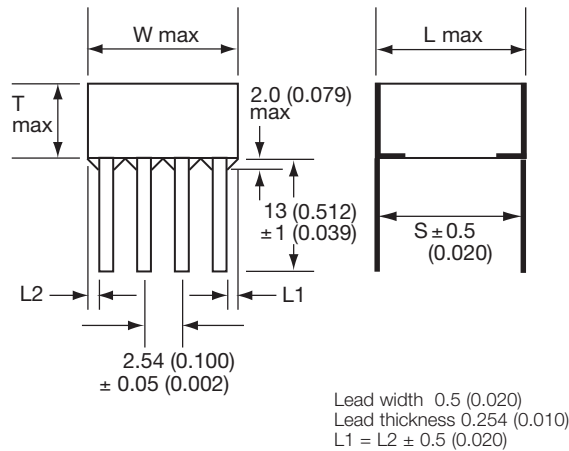
NOTE: This style is only available in 2, 3 & 4 chip assemblies only millimeters (inches)

Style	T max
CH42/52/62/72/77/87/92	7.4 (0.291)
CH43/53/63/73/78/88/93	11.1 (0.437)
CH44/54/64/74/79/89/94	14.8 (0.583)

HORIZONTALLY MOUNTED DUAL-IN-LINE PRODUCT

Part Number format (CHxxxxxxxx0A0)

Typical Part Number CH615C106MA30A0



DIMENSIONS

millimeters (inches)

Style	L (max)	W (max)	S (nom)	No. of Leads per side
CH41-44	9.2 (0.362)	8.7 (0.342)	8.2 (0.322)	3
CH51-54	10.7 (0.421)	10.7 (0.421)	10.2 (0.400)	4
CH61-64	14.9 (0.586)	13.6 (0.535)	14.0 (0.551)	5
CH71-74	16.8 (0.661)	21.6 (0.850)	15.2 (0.600)	7
CH76-79	21.6 (0.850)	16.6 (0.653)	20.3* (0.800)	6
CH81-84	12.0 (0.472)	38.2 (1.503)	10.2 (0.400)	14
CH86-89	18.9 (0.744)	38.2 (1.503)	15.2 (0.600)	14
CH91-94	24.0 (0.944)	40.6 (1.598)	20.3* (0.800)	14

*Tolerance ± 0.8 (0.031)

millimeters (inches)

Style	T max
CH41/51/61/71/76/81/86/91	3.8 (0.150)
CH42/52/62/72/77/82/87/92	7.4 (0.291)
CH43/53/63/73/78/83/88/93	11.1 (0.437)
CH44/54/64/74/79/84/89/94	14.8 (0.583)

HOW TO ORDER

CH	52	5	C	106	M	A	3	0	A	0
Style Code	Size Code	Voltage Code	Dielectric Code	Capacitance Code	Capacitance Tolerance	Specification Code	Finish Code	Lead Dia. Code	Lead Space Code	Lead Style Code
(see product section)		5 = 50V 1 = 100V 2 = 200V 7 = 500V	A = C0G C = X7R	(2 significant digits + no. of zeros) eg. 105 = 1 μ F 106 = 10 μ F 107 = 100 μ F	C0G: J = $\pm 5\%$ K = $\pm 10\%$ M = $\pm 20\%$ X7R: K = $\pm 10\%$ M = $\pm 20\%$ P = +100, -0%	A = Non-customized	3 = Uncoated 8 = Coated (classified as uninsulated)	0 = Standard	A = Standard	0 = Straight dual in line 4 = 4 Terminal

Not RoHS Compliant

Note: See page 136 for How to Order BS9100 parts



SMPS Capacitors (CH Style)

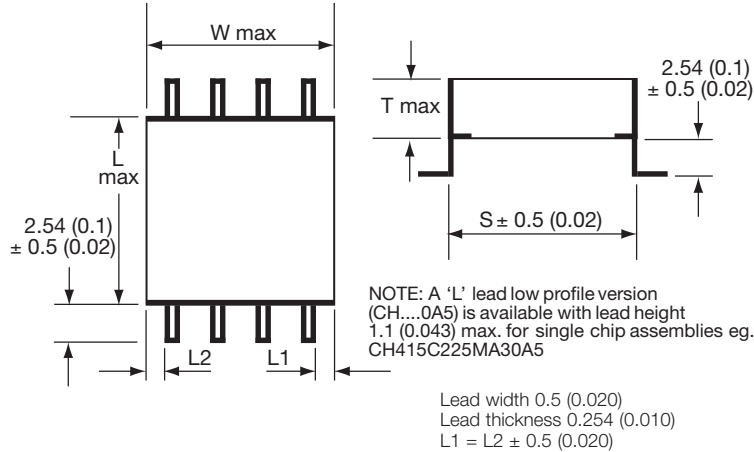


Chip Assemblies

HORIZONTALLY MOUNTED 'L' LEAD SMT PRODUCT

Part Number format (CHxxxxxxxxxx0A7)

Typical Part Number CH411C275KA30A7



DIMENSIONS

millimeters (inches)

Style	L (max)	W (max)	S (nom)	No. of Leads per side
CH41-44	9.2 (0.362)	8.7 (0.342)	8.2 (0.322)	3
CH51-54	10.7 (0.421)	10.7 (0.421)	10.2 (0.400)	4
CH61-64	14.9 (0.586)	13.6 (0.535)	14.0 (0.551)	5
CH71-74	16.8 (0.661)	21.6 (0.850)	15.2 (0.600)	7
CH76-79	21.6 (0.850)	16.6 (0.653)	20.3* (0.800)	6
CH81-84	12.0 (0.472)	38.2 (1.503)	10.2 (0.400)	14
CH86-89	18.9 (0.744)	38.2 (1.503)	15.2 (0.600)	14
CH91-94	24.0 (0.944)	40.6 (1.598)	20.3* (0.800)	14

*Tolerance ± 0.8 (0.031)

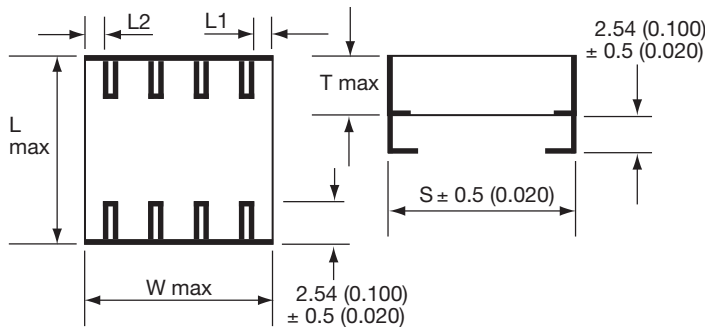
millimeters (inches)

Style	T max
CH41/51/61/71/76/81/86/91	3.8 (0.150)
CH42/52/62/72/77/82/87/92	7.4 (0.291)
CH43/53/63/73/78/83/88/93	11.1 (0.437)
CH44/54/64/74/79/84/89/94	14.8 (0.583)

HORIZONTALLY MOUNTED 'J' LEAD SMT PRODUCT

Part Number format (CHxxxxxxxxxx0A8)

Typical Part Number CH411C275KA30A8



NOTE: A 'J' lead low profile version (CH....0A3) is available with lead height 1.1 (0.043) max. for single chip assemblies eg. CH515C475MA30A3

Lead width 0.5 (0.020)
Lead thickness 0.254 (0.010)
L1 = L2 ± 0.5 (0.020)

DIMENSIONS

millimeters (inches)

Style	L (max)	W (max)	S (nom)	No. of Leads per side
CH41-44	9.2 (0.362)	8.7 (0.342)	8.2 (0.322)	3
CH51-54	10.7 (0.421)	10.7 (0.421)	10.2 (0.400)	4
CH61-64	14.9 (0.586)	13.6 (0.535)	14.0 (0.551)	5
CH71-74	16.8 (0.661)	21.6 (0.850)	15.2 (0.600)	7
CH76-79	21.6 (0.850)	16.6 (0.653)	20.3* (0.800)	6
CH81-84	12.0 (0.472)	38.2 (1.503)	10.2 (0.400)	14
CH86-89	18.9 (0.744)	38.2 (1.503)	15.2 (0.600)	14
CH91-94	24.0 (0.944)	40.6 (1.598)	20.3* (0.800)	14

*Tolerance ± 0.8 (0.031)

millimeters (inches)

Style	T max
CH41/51/61/71/76/81/86/91	3.8 (0.150)
CH42/52/62/72/77/82/87/92	7.4 (0.291)
CH43/53/63/73/78/83/88/93	11.1 (0.437)
CH44/54/64/74/79/84/89/94	14.8 (0.583)

HOW TO ORDER

CH	52	5	C	106	M	A	3	0	A	7
Style Code	Size Code	Voltage Code	Dielectric Code	Capacitance Code	Capacitance Tolerance	Specification Code	Finish Code	Lead Dia. Code	Lead Space Code	Lead Style Code
(see product section)		5 = 50V 1 = 100V 2 = 200V 7 = 500V	A = COG C = X7R	(2 significant digits + no. of zeros) eg. 105 = 1 µF 106 = 10 µF 107 = 100 µF	COG: J = ±5% K = ±10% M = ±20% X7R: K = ±10% M = ±20% P = +100, -0%	A = Non-customized	3 = Uncoated 8 = Coated (classified as uninsulated)	0 = Standard	A = Standard	3 = Low profile 'J' (single chip) 5 = Low profile 'L' (single chip) 7 = 'L' Dual in line 8 = 'J' Dual in line

Note: See page 136 for How to Order BS9100 parts

Not RoHS Compliant

SMPS Capacitors (CH/CV Style)



Chip Assemblies

C0G DIELECTRIC ULTRA STABLE CERAMIC

	CH/CV41-44 Styles				CH/CV51-54 Styles				CH/CV61-64 Styles				CH/CV71-74 Styles				CH/CV76-79 Styles				CH81-84 Styles				CH86-89 Styles				CH91-94 Styles				
Voltage DC																																	
Cap μ F	50	100	200	500	50	100	200	500	50	100	200	500	50	100	200	500	50	100	200	500	50	100	200	500	50	100	200	500	50	100	200	500	
0.01				41																													
0.012				41																													
0.015				41																													
0.018				41																													
0.022				42				51																									
0.027				42				51																									
0.033			41	42				52				61																					
0.039			41	42				52				61																					
0.047		41	41	43				52				61																					
0.056		41	41	43				52				61																					
0.068	41	41	41	44			51	53				62			71			76				81											
0.082	41	41	42				51	53				62			71			76				81											
0.1	41	42	42			51	51	54				62			71			76				81											
0.12	42	42	42		51	51	52				61	62			72			77				81				86							
0.15	42	42	42		51	52	52			61	61	63			72			77				81				86							
0.18	42	42	43		51	52	52			61	61	63			72			77				82				86							
0.22	42	43	43		52	52	52		61	61	62	64			71	72		76	77			81	82			86					91		
0.27	43	43	44		52	52	53		61	62	62			71	71	73		76	76	78		81	81	82			87				91		
0.33	43	44			52	53	53		61	62	62			71	71	73		76	76	78		81	81	82			87				91		
0.39	44				52	53	54		62	62	62		71	71	72	74	76	76	77	79	81	81	81	83			86	87				92	
0.47					53	54			62	62	63		71	71	72		76	76	77		81	81	81	83			86	87				92	
0.56					53				62	63	63		71	72	72		76	77	77		81	81	82	84			86	86	88			92	
0.68					54				62	63	64		72	72	72		77	77	77		81	82	82			86	86	86	88			92	
0.82									63	64			72	72	73		77	77	78		82	82	82			86	86	87	89			91	93
1									63	64			72	72	73		77	77	78		82	82	82			86	87	87			91	91	93
1.2									64				72	73	74		77	78	79		82	82	83			87	87	87		91	91	92	94
1.5													73	73			78	78			82	83	83			87	87	87		91	92	92	
1.8													73	74			78	79			83	83	84			87	87	88		92	92	92	
2.2													74				79				83	84				87	88	88		92	92	92	
2.7																					84					88	88	89		92	92	93	
3.3																										88	89			92	93	93	
3.9																										89				93	93	94	
4.7																														93	94		
5.6																														94			

NB Figures in cells refer to size within ordering information

SMPS Capacitors (CH/CV Style)



Chip Assemblies

X7R DIELECTRIC STABLE CERAMIC

	CH/CV41-44 Styles				CH/CV51-54 Styles				CH/CV61-64 Styles				CH/CV71-74 Styles				CH/CV76-79 Styles				CH81-84 Styles				CH86-89 Styles				CH91-94 Styles			
Voltage DC																																
Cap μ F	50	100	200	500	50	100	200	500	50	100	200	500	50	100	200	500	50	100	200	500	50	100	200	500	50	100	200	500	50	100	200	500
0.12				41																												
0.15				41																												
0.18				41																												
0.22				41																												
0.27				42				51																								
0.33			41	42				51																								
0.39			41	42				51																								
0.47			41	42				51				61																				
0.56			41	43				52				61																				
0.68			42	43			51	52				61																				
0.82			42	44			51	52				61			71			76				81										
1		41	42	44			51	53			61	62			71			76				81										
1.2		41	42				52	53			61	62			71			76				81										
1.5		41	43				52	54			61	62			71			76				81				86						
1.8	41	41	43				52				61	62			72			77				82				86						
2.2	41	41	44			51	52				61	63		71	72			76	77			81	82				86					
2.7	41	41				51	53				62	63		71	72			76	77			81	82				87				91	
3.3	41	42				51	53				62	64		71	72			76	77			81	82				87				91	
3.9	42	42			51	51	54				62			72	73			77	78			81	83			86	87				91	
4.7	42	42			51	52				61	62			72	73			77	78			82	83			86	87				91	
5.6	42	42			51	52				61	63			72	74			77	79			82	84			86	88				92	
6.8	42	43			52	52			61	61	63			72				77				82				86	88				92	
8.2	43	43			52	52			61	61	64			71	73			76	78			82				87	89			91	92	
10	43	44			52	53			61	62	64			71	73			76	78			83				87				91	92	
12	44				53	53			62	62			71	71	74		76	76	79			81	83			87				92	93	
15					53	54			62	62			71	71			76	76			81	81	84			86	87			92	93	
18					54				62	63			71	72			76	77			81	81				86	88			92	94	
22					54				62	63			72	72			77	77			81	82			86	86	88			92		
27									63	64			72	72			77	77			82	82			86	86	89				93	
33									63	64			72	73			77	78			82	82			86	87				91	93	
39									64				72	73			77	78			82	82			87	87			91	91	94	
47													73	74			78	79			82	83			87	87			91	92		
56													73				78				83	83			87	87			92	92		
68													74				79				83	84			87	88			92	92		
82																					84				88	88			92	92		
100																									88	89			92	93		
120																									89				93	93		
150																													93	94		
180																													94			

NB Figures in cells refer to size within ordering information

