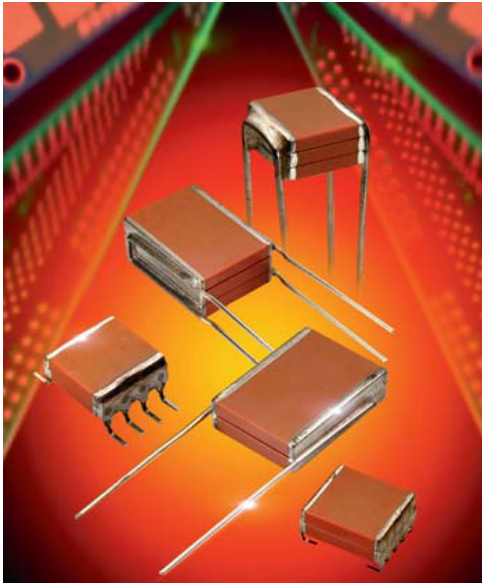


# SMPS Capacitors Chip Assemblies

## 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 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)

2C1/X7R: C Temperature Characteristic -  $\pm 15\%$ ,  $-55^{\circ}$  to  $+125^{\circ}\text{C}$

**Capacitance Test 25°C**

2C1/X7R: Measured at 1 VRMS max at 1KHz

**Dissipation Factor 25°C**

2C1/X7R: 2.5% max at 1KHz, 1 VRMS max

**Insulation Resistance 25°C**

2C1/X7R: 100K megohms or 1000 megohms- $\mu\text{F}$ , whichever is less

**Dielectric Withstanding Voltage 25°C** (Flash Test)

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)

2C1/X7R: 200% rated voltage at  $+125^{\circ}\text{C}$ .  
(500 Volt units @ 120% rated voltage)

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

**Thermal Shock** IEC 68-2-14

$-55^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$ , 5 cycles

**Resistance to Solder Heat** IEC 68-2-20

**Vibration** IEC 68-2-6

10Hz - 2000Hz, 0.75mm or 98m/sec<sup>2</sup>, 6 hrs.

**Bump** IEC 68-2-29

390m/sec<sup>2</sup>, 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/download/software/SpiCalci-AVX.zip>  
Custom values, ratings and configurations are also available.

# SMPS Capacitors (CV Style)

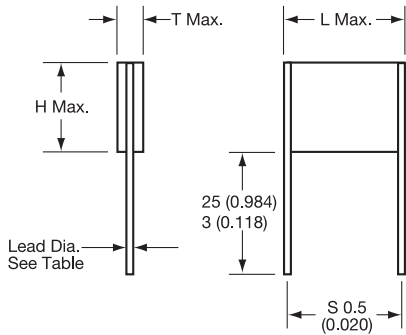
## Chip Assemblies



### 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

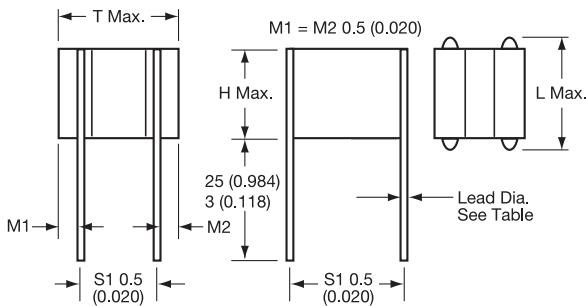
millimeters (inches)

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

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

Not RoHS Compliant

Note: See page 139 for How to Order BS9100 parts



The Important Information/Disclaimer is incorporated in these specifications by reference and should be reviewed in full before placing any order.

# SMPS Capacitors (CH Style)

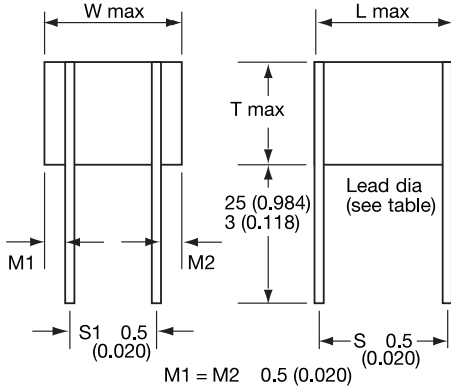
## Chip Assemblies



### HORIZONTALLY MOUNTED 4 TERMINAL RADIAL PRODUCT

Part Number format (CHxxxxxxxx3xx4)

Typical Part Number CH782C106MA30A4



#### DIMENSIONS

millimeters (inches)

Style	L (max)	H (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  $\pm 0.8$

NOTE: This style is only available in 2, 3 & 4 chip assemblies only

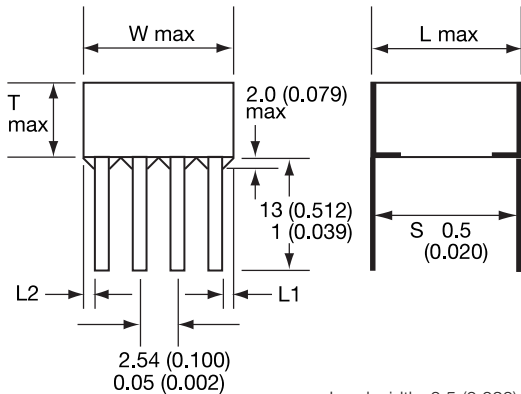
millimeters (inches)

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



Lead width 0.5 (0.020)  
Lead thickness 0.254 (0.010)  
L1 = L2  $\pm 0.5$  (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  $\pm 0.8$  (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

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

**Not RoHS Compliant**

Note: See page 139 for How to Order BS9100 parts

# SMPS Capacitors (CH Style)

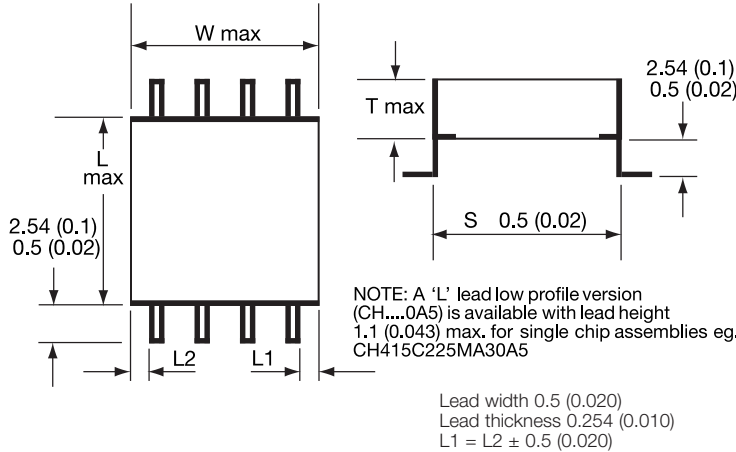


## Chip Assemblies

### HORIZONTALLY MOUNTED 'L' LEAD SMT PRODUCT

Part Number format (CHxxxxxxxxx0A7)

Typical Part Number CH411C275KA30A7



#### DIMENSIONS

millimeters (inches)

Style	L (max)	H (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)

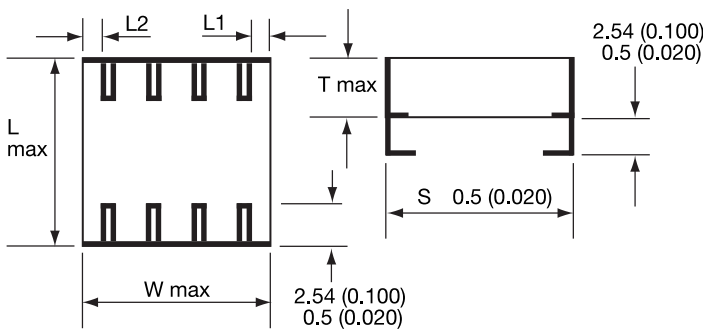
millimeters (inches)

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 (CHxxxxxxxxx0A8)

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)	H (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
<b>Style Code</b> (see product section)	<b>Size Code</b>	<b>Voltage Code</b> 5 = 50V 1 = 100V 2 = 200V 7 = 500V	<b>Dielectric Code</b> C = X7R	<b>Capacitance Code</b> (2 significant digits + no. of zeros) eg. 105 = 1 uF 106 = 10 uF 107 = 100 uF	<b>Capacitance Tolerance</b> X7R: K = ±10% M = ±20% P = +100, -0%	<b>Specification Code</b> A = Non-customized	<b>Finish Code</b> 3 = Uncoated 8 = Coated (classified as uninsulated)	<b>Lead Dia. Code</b> 0 = Standard	<b>Lead Space Code</b> A = Standard	<b>Lead Style Code</b> 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 139 for How to Order BS9100 parts

**Not RoHS Compliant**



The Important Information/Disclaimer is incorporated in these specifications by reference and should be reviewed in full before placing any order.

# SMPS Capacitors (CH/CV Style)



## Chip Assemblies

### X7R DIELECTRIC STABLE CERAMIC

Cap $\mu$ F	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											
	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	50	100	200	500				
Voltage DC																																								
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

