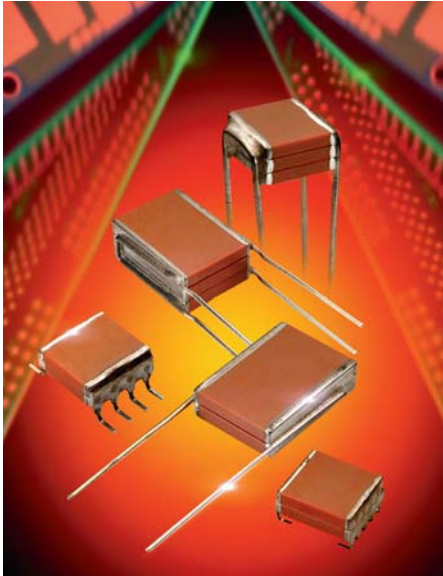


# SMPS Capacitors Chip Assemblies

## 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 -  $0 \pm 30$  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- $\mu$ F, 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/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	Top line A (AVX). Voltage code, dielectric code.
225K	Middle line capacitance code, tolerance code.
xxxxxx	Bottom line 6 digit batch code.

#### Other CH, CV Styles

AVX	Top line AVX.
5C	Second line voltage code, dielectric code.
156M	Third line capacitance code, tolerance code.
xxxxxx	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.



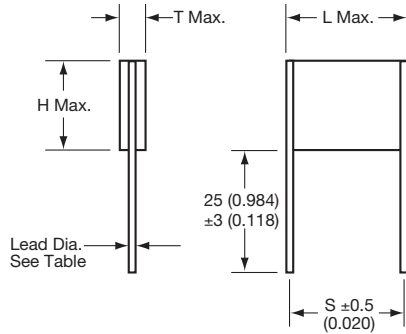
# SMPS Capacitors (CV Style)

## 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

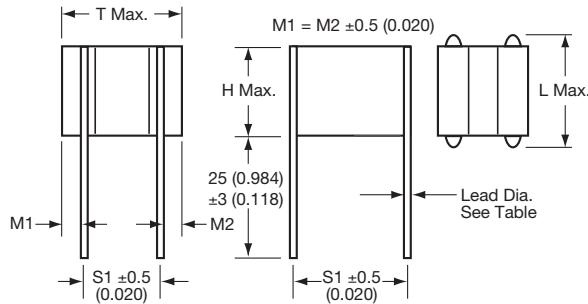
millimeters (inches)

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

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
CV	52	5	C	106	M	A	3	0	A	2
(see product section)		5 = 50V 1 = 100V 2 = 200V 7 = 500V	A = C0G C = X7R	(2 significant digits + no. of zeros) eg. 105 = 1 μF 106 = 10 μF 107 = 100 μF	C0G: 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	2 = 2 Terminal 4 = 4 Terminal See Note 1 above

**Not RoHS Compliant**

Note: See page 142 for How to Order BS9100 parts

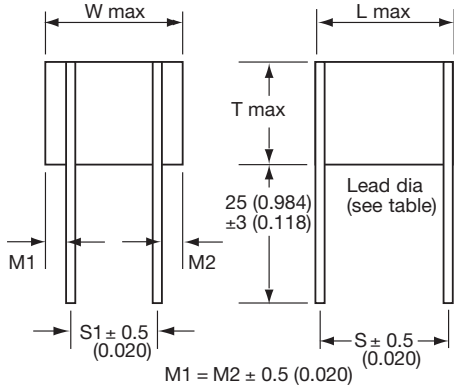
# SMPS Capacitors (CH Style)

## 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

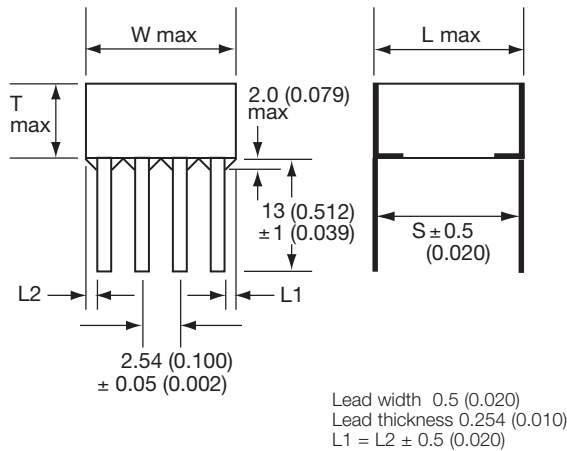
NOTE: This style is only available in 2, 3 & 4 chip assemblies only millimeters (inches)

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

**Not RoHS Compliant**

Note: See page 142 for How to Order BS9100 parts

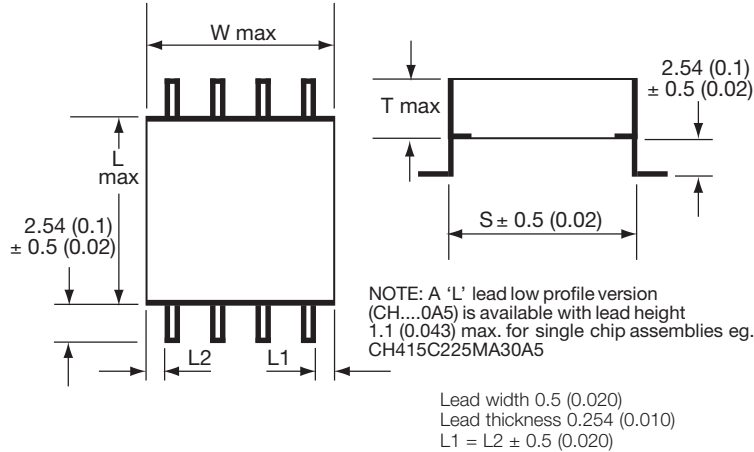
# SMPS Capacitors (CH Style)

## 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)

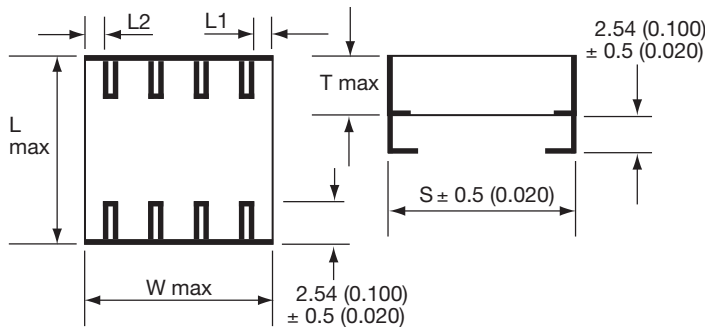
millimeters (inches)

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

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
CH	52	5	C	106	M	A	3	0	A	7
(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 142 for How to Order BS9100 parts

**Not RoHS Compliant**



