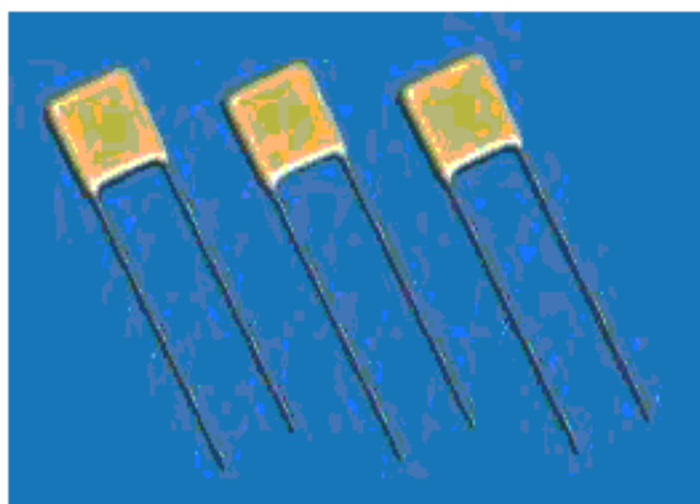


# High Voltage MLC Radials (SV Style)



## Application Information on High Voltage MLC Capacitors



High value, low leakage and small size are difficult parameters to obtain in capacitors for high voltage systems. AVX special high voltage MLC radial leaded capacitors meet these performance characteristics. The added advantage of these capacitors lies in special internal design minimizing the electric field stresses within the MLC. These special design criteria result in significant reduction of partial discharge activity within the dielectric and having, therefore, a major impact on long-term reliability of the product. The SV high voltage radial capacitors are conformally coated with high insulation resistance, high dielectric strength epoxy eliminating the possibility of arc flashover.

The SV high voltage radial MLC designs exhibit low ESRs at high frequency. The same criteria governing the high voltage design carries the added benefits of extremely low ESR in relatively low capacitance and small packages. These

capacitors are designed and are ideally suited for applications such as snubbers in high frequency power converters, resonators in SMPS, and high voltage coupling/DC blocking.

Also because these MLCs are designed for high voltage applications, as input resonator capacitors they are well safeguarded against transient requirements.

## COG Dielectric General Specifications

### Capacitance Range

10 pF to .15  $\mu$ F (1.0 Vrms, 1 KHz)

### Capacitance Tolerances

$\pm 5\%$ ;  $\pm 10\%$ ;  $\pm 20\%$

### Operating Temperature Range

-55°C to +125°C

### Temperature Characteristic

0  $\pm$  30 ppm/°C

### Voltage Ratings

1000 VDC thru 5000 VDC (+125°C)

### Dissipation Factor

0.15% max. (+25°C)  
1.0 Vrms, 1 KHz

### Insulation Resistance (+25°C, at 500V)

100K M $\Omega$  min. or 1000 M $\Omega$ - $\mu$ F min.,  
whichever is less

### Insulation Resistance (+125°C, at 500V)

10K M $\Omega$  min., or 100 M $\Omega$ - $\mu$ F min.,  
whichever is less

### Dielectric Strength

120% rated voltage, 5 seconds

### Life Test

100% rated and +125°C

## X7R Dielectric General Specifications

### Capacitance Range

100 pF to 2.2  $\mu$ F (1.0 Vrms, 1 KHz)

### Capacitance Tolerances

$\pm 10\%$ ;  $\pm 20\%$ ; +80%, -20%

### Operating Temperature Range

-55°C to +125°C

### Temperature Characteristic

$\pm 15\%$  (0 VDC)

### Voltage Ratings

1000 VDC thru 5000 VDC (+125°C)

### Dissipation Factor

2.5% max. (+25°C, 1.0 Vrms, 1 KHz)

### Insulation Resistance (+25°C, at 500V)

100K M $\Omega$  min., or 1000 M $\Omega$ - $\mu$ F min.,  
whichever is less

### Insulation Resistance (+125°C, at 500V)

10K M $\Omega$  min., or 100 M $\Omega$ - $\mu$ F min.,  
whichever is less

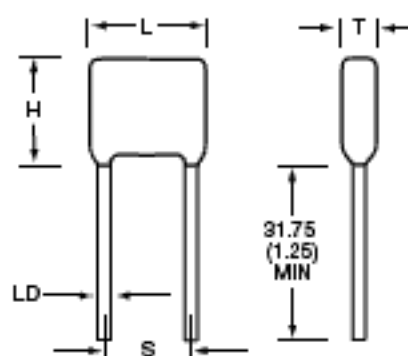
### Dielectric Strength

120% rated voltage, 5 seconds

### Life Test

100% rated and +125°C

# High Voltage MLC Radials (SV Style)



## HIGH VOLTAGE RADIAL LEAD

### HOW TO ORDER

AVX Styles: SV01 THRU SV16

| SV01      | A                                                                        | A                                             | 102                                                                                                                                                                               | K                                                                                                                                        | A                  | A                  |
|-----------|--------------------------------------------------------------------------|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------|
| AVX Style | Voltage<br>1000V = A<br>2000V = G<br>3000V = H<br>4000V = J<br>5000V = K | Temperature Coefficient<br>CoG = A<br>X7R = C | Capacitance Code<br>(2 significant digits + no. of zeros)<br>Examples:<br>10 pF = 100<br>100 pF = 101<br>1,000 pF = 102<br>22,000 pF = 223<br>220,000 pF = 224<br>1 $\mu$ F = 105 | Capacitance Tolerance<br>CoG: J = $\pm 5\%$<br>K = $\pm 10\%$<br>M = $\pm 20\%$<br>X7R: K = $\pm 10\%$<br>M = $\pm 20\%$<br>Z = +80 -20% | A = Does not apply | A = Does not apply |

Note: Capacitors with X7R Dielectrics are not intended for AC line filtering applications. Contact Plant for recommendations.

## DIMENSIONS

millimeters (inches)

| AVX Style | Length (L) max | Height (H) max | Thickness (T) max | Lead Spacing $\pm .762$ (.030) (S) | LD (Nom)     |
|-----------|----------------|----------------|-------------------|------------------------------------|--------------|
| SV01      | 6.35 (0.250)   | 5.59 (0.220)   | 5.08 (0.200)      | 4.32 (0.170)                       | 0.64 (0.025) |
| SV02      | 8.13 (0.320)   | 7.11 (0.280)   | 5.08 (0.200)      | 5.59 (0.220)                       | 0.64 (0.025) |
| SV03      | 9.40 (0.370)   | 7.62 (0.300)   | 5.08 (0.200)      | 6.99 (0.275)                       | 0.64 (0.025) |
| SV04      | 11.4 (0.450)   | 5.59 (0.220)   | 5.08 (0.200)      | 7.62 (0.300)                       | 0.64 (0.025) |
| SV05      | 11.9 (0.470)   | 10.2 (0.400)   | 5.08 (0.200)      | 9.52 (0.375)                       | 0.64 (0.025) |
| SV06      | 14.0 (0.550)   | 7.11 (0.280)   | 5.08 (0.200)      | 10.16 (0.400)                      | 0.64 (0.025) |
| SV07      | 14.5 (0.570)   | 12.7 (0.500)   | 5.08 (0.200)      | 12.1 (0.475)                       | 0.64 (0.025) |
| SV08      | 17.0 (0.670)   | 15.2 (0.600)   | 5.08 (0.200)      | 14.6 (0.575)                       | 0.64 (0.025) |
| SV09      | 19.8 (0.770)   | 18.3 (0.720)   | 5.08 (0.200)      | 17.1 (0.675)                       | 0.64 (0.025) |
| SV10      | 26.7 (1.050)   | 12.7 (0.500)   | 5.08 (0.200)      | 22.9 (0.900)                       | 0.64 (0.025) |
| SV11      | 31.8 (1.250)   | 15.2 (0.600)   | 5.08 (0.200)      | 27.9 (1.100)                       | 0.64 (0.025) |
| SV12      | 36.8 (1.450)   | 18.3 (0.720)   | 5.08 (0.200)      | 33.0 (1.300)                       | 0.64 (0.025) |
| SV13      | 7.62 (0.300)   | 9.14 (0.360)   | 5.08 (0.200)      | 5.08 (0.200)                       | 0.51 (0.020) |
| SV14      | 10.2 (0.400)   | 11.7 (0.460)   | 5.08 (0.200)      | 5.08 (0.200)                       | 0.51 (0.020) |
| SV15      | 12.7 (0.500)   | 14.2 (0.560)   | 5.08 (0.200)      | 10.2 (0.400)                       | 0.64 (0.025) |
| SV16      | 22.1 (0.870)   | 16.8 (0.660)   | 5.08 (0.200)      | 20.1 (0.790)                       | 0.81 (0.032) |
| SV17      | 23.8 (0.930)   | 19.8 (0.780)   | 6.35 (0.250)      | 20.3 (0.800)                       | 0.81 (0.032) |

## CAPACITANCE VALUE

| C0G   |                    |                    |                    |                    |                    |
|-------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Style | 1000V<br>min./max. | 2000V<br>min./max. | 3000V<br>min./max. | 4000V<br>min./max. | 5000V<br>min./max. |
| SV01  | 100 pF / 1000 pF   | 10 pF / 180 pF     | 10 pF / 82 pF      | —                  | —                  |
| SV02  | 100 pF / 3300 pF   | 10 pF / 680 pF     | 10 pF / 270 pF     | 10 pF / 150 pF     | 10 pF / 100 pF     |
| SV03  | 100 pF / 5600 pF   | 100 pF / 1200 pF   | 10 pF / 470 pF     | 10 pF / 270 pF     | 10 pF / 180 pF     |
| SV04  | 100 pF / 2200 pF   | 10 pF / 470 pF     | 10 pF / 180 pF     | 10 pF / 100 pF     | 10 pF / 68 pF      |
| SV05  | 1000 pF / 0.015 µF | 100 pF / 3300 pF   | 100 pF / 1200 pF   | 10 pF / 680 pF     | 10 pF / 470 pF     |
| SV06  | 100 pF / 6800 pF   | 100 pF / 1500 pF   | 10 pF / 560 pF     | 10 pF / 330 pF     | 10 pF / 220 pF     |
| SV07  | 1000 pF / 0.027 µF | 100 pF / 5600 pF   | 100 pF / 2200 pF   | 100 pF / 1200 pF   | 10 pF / 820 pF     |
| SV08  | 1000 pF / 0.039 µF | 1000 pF / 0.01 µF  | 100 pF / 3900 pF   | 100 pF / 2200 pF   | 100 pF / 1500 pF   |
| SV09  | 1000 pF / 0.068 µF | 1000 pF / 0.015 µF | 100 pF / 6800 pF   | 100 pF / 3900 pF   | 100 pF / 2700 pF   |
| SV10  | 1000 pF / 0.056 µF | 1000 pF / 0.012 µF | 100 pF / 5600 pF   | 100 pF / 3300 pF   | 100 pF / 2200 pF   |
| SV11  | 1000 pF / 0.082 µF | 1000 pF / 0.022 µF | 100 pF / 8200 pF   | 100 pF / 4700 pF   | 100 pF / 3300 pF   |
| SV12  | .01 µF / 0.15 µF   | 1000 pF / 0.033 µF | 1000 pF / 0.015 µF | 100 pF / 8200 pF   | 100 pF / 5600 pF   |
| SV13  | 100 pF / 8200 pF   | 100 pF / 1800 pF   | 100 pF / 820 pF    | 10 pF / 390 pF     | 10 pF / 270 pF     |
| SV14  | 1000 pF / 0.015 µF | 100 pF / 4700 pF   | 100 pF / 1500 pF   | 10 pF / 820 pF     | 10 pF / 560 pF     |
| SV15  | 1000 pF / 0.033 µF | 100 pF / 0.01 µF   | 100 pF / 2700 pF   | 100 pF / 1800 pF   | 100 pF / 1200 pF   |
| SV16  | 1000 pF / 0.068 µF | 1000 pF / 0.018 µF | 100 pF / 6800 pF   | 100 pF / 3900 pF   | 100 pF / 2700 pF   |
| SV17  | 1000 pF / 0.10 µF  | 1000 pF / 0.039 µF | 1000 pF / 0.012 µF | 100 pF / 6800 pF   | 100 pF / 4700 pF   |
| X7R   |                    |                    |                    |                    |                    |
| SV01  | 1000 pF / 0.012 µF | 100 pF / 1500 pF   | —                  | —                  | —                  |
| SV02  | 1000 pF / 0.047 µF | 100 pF / 5600 pF   | 100 pF / 2700 pF   | —                  | —                  |
| SV03  | 1000 pF / 0.082 µF | 1000 pF / 0.01 µF  | 100 pF / 4700 pF   | 100 pF / 1800 pF   | —                  |
| SV04  | 1000 pF / 0.033 µF | 100 pF / 3900 pF   | 100 pF / 1800 pF   | 100 pF / 820 pF    | —                  |
| SV05  | .01 µF / 0.22 µF   | 1000 pF / 0.027 µF | 1000 pF / 0.012 µF | 100 pF / 4700 pF   | —                  |
| SV06  | .01 µF / 0.10 µF   | 1000 pF / 0.012 µF | 100 pF / 6800 pF   | 100 pF / 2700 pF   | 100 pF / 1200 pF   |
| SV07  | .01 µF / 0.39 µF   | 1000 pF / 0.047 µF | 1000 pF / 0.027 µF | 1000 pF / 0.01 µF  | 100 pF / 6800 pF   |
| SV08  | .01 µF / 0.68 µF   | 1000 pF / 0.082 µF | 1000 pF / 0.047 µF | 1000 pF / 0.018 µF | 1000 pF / 0.012 µF |
| SV09  | .10 µF / 1.00 µF   | .01 µF / 0.12 µF   | 1000 pF / 0.068 µF | 1000 pF / 0.027 µF | 1000 pF / 0.018 µF |
| SV10  | .01 µF / 0.82 µF   | .01 µF / 0.10 µF   | 1000 pF / 0.056 µF | 1000 pF / 0.022 µF | 1000 pF / 0.018 µF |
| SV11  | .10 µF / 1.2 µF    | .01 µF / 0.18 µF   | .01 µF / 0.10 µF   | 1000 pF / 0.039 µF | 1000 pF / 0.027 µF |
| SV12  | .10 µF / 2.20 µF   | .01 µF / 0.27 µF   | .01 µF / 0.15 µF   | 1000 pF / 0.056 µF | 1000 pF / 0.033 µF |
| SV13  | .01 µF / 0.10 µF   | 1000 pF / 0.012 µF | 100 pF / 6800 pF   | 100 pF / 2700 pF   | —                  |
| SV14  | .01 µF / 0.18 µF   | 1000 pF / 0.022 µF | 1000 pF / 0.015 µF | 100 pF / 5600 pF   | —                  |
| SV15  | .01 µF / 0.27 µF   | 1000 pF / 0.033 µF | 1000 pF / 0.022 µF | 1000 pF / 8200 pF  | 100 pF / 4700 pF   |
| SV16  | .01 µF / 1.0 µF    | .01 µF / 0.12 µF   | 1000 pF / 0.068 µF | 1000 pF / 0.027 µF | 1000 pF / 0.018 µF |
| SV17  | .01 µF / 1.2 µF    | .01 µF / 0.15 µF   | 1000 pF / 0.082 µF | 1000 pF / 0.039 µF | 1000 pF / 0.027 µF |

Note: Contact factory for other voltage ratings or values.

## AVX IS QUALIFIED TO THE FOLLOWING DSCC DRAWINGS

| Specification # | Description   | Capacitance Range |
|-----------------|---------------|-------------------|
| 87046           | C0G-1000 VDC  | 10 pF - 0.025 µF  |
| 87043           | X7R-1000 VDC  | 100 pF - 0.47 µF  |
| 87040           | X7R-2000 VDC  | 100 pF - 0.22 µF  |
| 87114           | C0G-3000 VDC  | 10 pF - 8200 pF   |
| 87047           | X7R-3000 VDC  | 100 pF - 0.1 µF   |
| 87076           | C0G-4000 VDC  | 10 pF - 6800 pF   |
| 89044           | X7R-4000 VDC  | 100 pF - 0.056 µF |
| 87077           | C0G-5000 VDC  | 10 pF - 5600 pF   |
| 87070           | X7R-5000 VDC  | 100 pF - 0.033 µF |
| 87081           | X7R-10000 VDC | 470 pF - 0.01 µF  |

These specifications require group A and B testing per  
MIL-PRF-49467