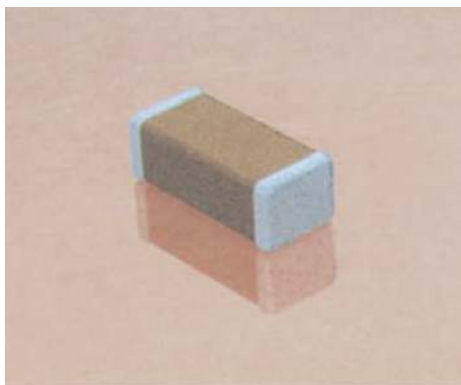


# High Voltage MLC Chips FLEXITERM®

## For 600V to 5000V Applications



High value, low leakage and small size are difficult parameters to obtain in capacitors for high voltage systems. AVX special high voltage MLC chips capacitors meet these performance characteristics and are designed for applications such as snubbers in high frequency power converters, resonators in SMPS, and high voltage coupling/DC blocking. These high voltage chip designs exhibit low ESRs at high frequencies.

To make high voltage chips, larger physical sizes than are normally encountered are necessary. These larger sizes require that special precautions be taken in applying these chips in surface mount assemblies. In response to this, and to follow from the success of the FLEXITERM® range of low voltage parts, AVX is delighted to offer a FLEXITERM® high voltage range of capacitors, FLEXITERM®.

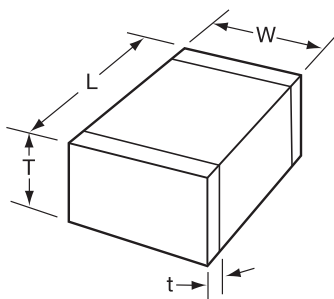
The FLEXITERM® layer is designed to enhance the mechanical flexure and temperature cycling performance of a standard ceramic capacitor, giving customers a solution where board flexure or temperature cycle damage are concerns.

### HOW TO ORDER

1808	A	C	272	K	A	Z	1	A
AVX Style	Voltage	Temperature Coefficient	Capacitance Code (2 significant digits + no. of zeros) Examples:	Capacitance Tolerance COG: J = ±5% K = ±10% M = ±20% X7R: K = ±10% M = ±20% Z = +80%, -20%	Test Level	Termination* Z = FLEXITERM® 100% Tin (RoHS Compliant)	Packaging 2 = 7" Reel 4 = 13" Reel	Special Code A = Standard
0805	600V/630V = C	COG = A	10 pF = 100					
1206	1000V = A	X7R = C	100 pF = 101					
1210	1500V = S		1,000 pF = 102					
1808	2000V = G		22,000 pF = 223					
1812	2500V = W		220,000 pF = 224					
1825	3000V = H		1 μF = 105					
1825	4000V = J							
2220	5000V = K							
2225								
***								

Notes: Capacitors with X7R dielectrics are not intended for applications across AC supply mains or AC line filtering with polarity reversal. Contact plant for recommendations. Contact factory for availability of Termination and Tolerance options for Specific Part Numbers.

\*\*\* AVX offers nonstandard chip sizes. Contact factory for details.



### DIMENSIONS

millimeters (inches)

SIZE	0805	1206	1210*	1808*	1812*	1825*	2220*	2225*
(L) Length	2.10 ± 0.20 (0.083 ± 0.008)	3.30 ± 0.30 (0.130 ± 0.012)	3.30 ± 0.40 (0.130 ± 0.016)	4.60 ± 0.50 (0.181 ± 0.020)	4.60 ± 0.50 (0.181 ± 0.020)	4.60 ± 0.50 (0.181 ± 0.020)	5.70 ± 0.50 (0.224 ± 0.020)	5.70 ± 0.50 (0.224 ± 0.020)
(W) Width	1.25 ± 0.20 (0.049 ± 0.008)	1.60 <sup>+0.30</sup> <sub>-0.10</sub> (0.063 <sup>+0.012</sup> <sub>-0.004</sub> )	2.50 ± 0.30 (0.098 ± 0.012)	2.00 ± 0.20 (0.079 ± 0.008)	3.20 ± 0.30 (0.126 ± 0.012)	6.30 ± 0.40 (0.248 ± 0.016)	5.00 ± 0.40 (0.197 ± 0.016)	6.30 ± 0.40 (0.248 ± 0.016)
(T) Thickness Max.	1.35 (0.053)	1.80 (0.071)	2.80 (0.110)	2.20 (0.087)	2.80 (0.110)	3.40 (0.134)	3.40 (0.134)	3.40 (0.134)
(t) terminal min. max.	0.50 ± 0.20 (0.020 ± 0.008)	0.60 ± 0.20 (0.024 ± 0.008)	0.75 ± 0.35 (0.030 ± 0.014)	0.75 ± 0.35 (0.030 ± 0.014)	0.75 ± 0.35 (0.030 ± 0.014)	0.75 ± 0.35 (0.030 ± 0.014)	0.85 ± 0.35 (0.033 ± 0.014)	0.85 ± 0.35 (0.033 ± 0.014)

\*Reflow Soldering Only



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.



# High Voltage MLC Chips FLEXITERM®

For 600V to 5000V Applications

## NP0 (C0G) Dielectric Performance Characteristics

<b>Capacitance Range</b>	10 pF to 0.100 µF (+25°C, 1.0 ±0.2 Vrms, 1kHz)
<b>Capacitance Tolerances</b>	±5%, ±10%, ±20%
<b>Dissipation Factor</b>	0.1% max. (+25°C, 1.0 ±0.2 Vrms, 1kHz)
<b>Operating Temperature Range</b>	-55°C to +125°C
<b>Temperature Characteristic</b>	0 ±30 ppm/°C (0 VDC)
<b>Voltage Ratings</b>	600, 630, 1000, 1500, 2000, 2500, 3000, 4000 & 5000 VDC (+125°C)
<b>Insulation Resistance</b> (+25°C, at 500 VDC)	100K MΩ min. or 1000 MΩ - µF min., whichever is less
<b>Insulation Resistance</b> (+125°C, at 500 VDC)	10K MΩ min. or 100 MΩ - µF min., whichever is less
<b>Dielectric Strength</b>	Minimum 120% rated voltage for 5 seconds at 50 mA max. current

## NP0 (C0G) CAPACITANCE RANGE PREFERRED SIZES ARE SHADED

Case Size	0805			1206				1210					1808							1812									
	Reflow/Wave			Reflow/Wave				Reflow Only					Reflow Only							Reflow Only									
(L) Length mm	2.10 ± 0.20 (0.083 ± 0.008)			3.30 ± 0.30 (0.130 ± 0.012)				3.30 ± 0.40 (0.130 ± 0.016)					4.60 ± 0.50 (0.181 ± 0.020)							4.60 ± 0.50 (0.181 ± 0.020)									
(W) Width mm	1.25 ± 0.20 (0.049 ± 0.008)			1.60 +0.30/-0.10 (0.063 +0.012/-0.004)				2.50 ± 0.30 (0.098 ± 0.012)					2.00 ± 0.20 (0.079 ± 0.008)							3.20 ± 0.30 (0.126 ± 0.012)									
(T) Thickness mm	1.35 (0.053)			1.80 (0.071)				2.80 (0.110)					2.20 (0.087)							2.80 (0.110)									
(t) Terminal min max	0.50 ± 0.20 (0.020 ± 0.008)			0.60 ± 0.20 (0.024 ± 0.008)				0.75 ± 0.35 (0.030 ± 0.014)					0.75 ± 0.35 (0.030 ± 0.014)							0.75 ± 0.35 (0.030 ± 0.014)									
Voltage (V)	600	630	1000	600	630	1000	1500	2000	600	630	1000	1500	2000	600	630	1000	1500	2000	2500	3000	4000	600	630	1000	1500	2000	2500	3000	4000
Cap (pF) 1.5 1R5	A	A		X	X	X	X	X																					
1.8 1R8	A	A		X	X	X	X	X																					
2.2 2R2	A	A		X	X	X	X	X																					
2.7 2R7	A	A		X	X	X	X	X																					
3.3 3R3	A	A		X	X	X	X	X																					
3.9 3R9	A	A		X	X	X	X	X																					
4.7 4R7	A	A		X	X	X	X	X																					
5.6 5R6	A	A		X	X	X	X	X																					
6.8 6R8	A	A		X	X	X	X	X																					
8.2 8R2	A	A		X	X	X	X	X																					
10 100	A	A	A	X	X	X	X	X	C	C	D	D	D	C	C	C	C	C	C	C	C	C	C	C	C	C	C	E	
12 120	A	A	A	X	X	X	X	X	C	C	D	D	D	C	C	C	C	C	C	C	C	C	C	C	C	C	C	E	
15 150	A	A	A	X	X	X	X	X	C	C	D	D	D	C	C	C	C	C	C	C	C	C	C	C	C	C	C	E	
18 180	A	A	A	X	X	X	X	X	C	C	D	D	D	C	C	C	C	C	C	C	C	C	C	C	C	C	C	E	
22 220	A	A	A	X	X	X	X	X	C	C	D	D	D	C	C	C	C	C	C	C	C	C	C	C	C	C	C	E	
27 270	A	A	A	X	X	X	X	X	C	C	D	D	D	C	C	C	C	C	C	C	C	C	C	C	C	C	C	E	
33 330	A	A	A	X	X	X	X	D	D	C	D	D	D	C	C	C	C	C	C	C	C	C	C	C	C	C	C	E	
39 390	A	A	A	X	X	X	X	D	D	C	D	D	D	C	C	C	C	C	C	C	C	C	C	C	C	C	C	E	
47 470	A	A	A	X	X	M	D	D	C	C	D	D	D	C	C	C	C	C	C	C	C	C	C	C	C	C	C	E	
56 560	A	A	A	X	X	M	C	C	C	C	D	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	F	
68 680	A	A	A	X	X	M	C	C	C	C	D	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	F	
82 820	X	X	X	X	X	C	C	C	C	C	D	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	F	
100 101	X	X	X	X	X	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	F	F						F	
120 121	C	C	C	X	X	C	E	E	C	C	C	C	C	C	C	C	C	C	C	F	F	F						G	
150 151	C	C	C	X	X	C	E	E	C	C	C	E	E	C	C	C	F	F	F	F	F							G	
180 181	C	C	C	X	X	E	E	E	C	C	E	E	E	C	C	C	F	F	F	F	F							G	
220 221	C	C	C	X	X	E	E	E	C	C	E	E	E	C	C	C	F	F	F	F	F							G	
270 271	C	C	C	X	X	E	E	E	C	C	E	E	E	C	C	C	F	F	F	F	F							G	
330 331	C	C	C	X	X	E	E	E	C	C	E	E	E	C	C	C	F	F	F	F	F							G	
390 391	C	C	C	X	X	E	E	E	C	C	E	E	E	C	C	C	F	F	F	F	F							G	
470 471	C	C	C	X	X	E	E	E	C	C	E	E	E	C	C	C	F	F	F	F	F							G	
560 561	C	C	C	X	X	E	E	E	C	C	E	E	E	C	C	C	F	F	F	F	F							G	
680 681	C	C	C	X	X	E	E	E	C	C	E	F	F	C	C	F	F	F	F	F	F							G	
750 751	C	C	C	X	X	E	E	E	C	C	E	F	G	C	C	F	F	F	F	F	F							G	
820 821	C	C	C	X	X	E	E	E	C	C	E	G	G	C	C	F	E	E	E	E	E							G	
1000 102				E	E	E	E		C	C	E			C	C	F	E	E	E	E	E							G	
1200 122				E	E	E	E		C	C	E			E	E	F	E	E	E	E	E							G	
1500 152				E	E	E	E		C	C	E			E	E	F												G	
1800 182				E	E	E	E		C	C	E	G		E	E	F												G	
2200 222				E	E	E	E		E	E	E			E	E													G	
2700 272				E	E	E	E		E	E	E			E	E													G	
3300 332				E	E	E	E		E	E	E			E	E													G	
3900 392				E	E	E	E		E	E	E			E	E													G	
4700 472				E	E	E	E		E	E	E			E	E													G	
5600 562				E	E	E	E		E	E	E			E	E													G	
6800 682				E	E	E	E		E	E	E			F	F													G	
8200 822				E	E	E	E		E	E	E																	G	
Cap (µF) 0.010 103																													G
0.012 123																													G
0.015 153																													G
0.018 183																													G
0.022 223																													G
0.033 333																													G
0.047 473																													G
0.056 563																													G
0.068 683																													G
0.100 104																													G
Voltage (V)	600	630	1000	600	630	1000	1500	2000	600	630	1000	1500	2000	600	630	1000	1500	2000	2500	3000	4000	600	630	1000	1500	2000	2500	3000	4000
Case Size	0805			1206				1210					1808							1812									



# High Voltage MLC Chips FLEXITERM®

For 600V to 5000V Applications

## X7R Dielectric Performance Characteristics

<b>Capacitance Range</b>	10 pF to 0.82 μF (25°C, 1.0 ±0.2 Vrms at 1kHz)
<b>Capacitance Tolerances</b>	±10%; ±20%; +80%, -20%
<b>Dissipation Factor</b>	2.5% max. (+25°C, 1.0 ±0.2 Vrms, 1kHz)
<b>Operating Temperature Range</b>	-55°C to +125°C
<b>Temperature Characteristic</b>	±15% (0 VDC)
<b>Voltage Ratings</b>	600, 630, 1000, 1500, 2000, 2500, 3000, 4000 & 5000 VDC (+125°C)
<b>Insulation Resistance (+25°C, at 500 VDC)</b>	100K MΩ min. or 1000 MΩ - μF min., whichever is less
<b>Insulation Resistance (+125°C, at 500 VDC)</b>	10K MΩ min. or 100 MΩ - μF min., whichever is less
<b>Dielectric Strength</b>	Minimum 120% rated voltage for 5 seconds at 50 mA max. current

## X7R CAPACITANCE RANGE PREFERRED SIZES ARE SHADED

Case Size	0805			1206				1210				1808				1812													
	Reflow/Wave			Reflow/Wave				Reflow Only				Reflow Only				Reflow Only													
(L) Length	2.10 ± 0.20 (0.083 ± 0.008)			3.30 ± 0.30 (0.130 ± 0.012)				3.30 ± 0.40 (0.130 ± 0.016)				4.60 ± 0.50 (0.181 ± 0.020)				4.60 ± 0.50 (0.181 ± 0.020)													
(W) Width	1.25 ± 0.20 (0.049 ± 0.008)			1.60 +0.30/-0.10 (0.063 +0.012/-0.004)				2.50 ± 0.30 (0.098 ± 0.012)				2.00 ± 0.20 (0.079 ± 0.008)				3.20 ± 0.30 (0.126 ± 0.012)													
(T) Thickness	1.35 (0.053)			1.80 (0.071)				2.80 (0.110)				2.20 (0.087)				2.80 (0.110)													
(t) Terminal	0.50 ± 0.20 (0.020 ± 0.008)			0.60 ± 0.20 (0.024 ± 0.008)				0.75 ± 0.35 (0.030 ± 0.014)				0.75 ± 0.35 (0.030 ± 0.014)				0.75 ± 0.35 (0.030 ± 0.014)													
Voltage (V)	600	630	1000	600	630	1000	1500	2000	600	630	1000	1500	2000	600	630	1000	1500	2000	2500	3000	4000	600	630	1000	1500	2000	2500	3000	4000
Cap (pF) 100	101	X	X	C	C	C	E	E	E	E	E	E	E																
120	121	X	X	C	C	C	E	E	E	E	E	E	E																
150	151	X	X	C	C	C	E	E	E	E	E	E	E																
180	181	X	X	C	C	C	E	E	E	E	E	E	E																
220	221	X	X	C	C	C	E	E	E	E	E	E	E																
270	271	X	X	C	C	C	E	E	E	E	E	E	E									E	E	E	E	E			
330	331	X	X	C	C	C	E	E	E	E	E	E	E	E	E	E	E	E	E	F		E	E	E	E	E			
390	391	X	X	C	C	C	E	E	E	E	E	E	E	E	E	E	E	E	F			E	E	E	E	E			
470	471	X	X	C	C	C	E	E	E	E	E	E	E	E	E	E	E	E	F			E	E	E	E	E	E	E	
560	561	X	X	C	C	C	E	E	E	E	E	E	E	E	E	E	E	F	F			E	E	E	E	E	E	E	
680	681	X	X	C	C	C	E	E	E	E	E	E	E	E	E	E	E	F	F			E	E	E	E	E	F	F	
750	751	X	X	C	C	C	E	E	E	E	E	E	E	E	E	E	E	F	F			E	E	E	E	E	F	F	
820	821	X	X	C	C	C	E	E	E	E	E	E	E	E	E	E	E	F	F			E	E	E	E	E	F	F	
1000	102	X	X	C	C	C	E	E	E	E	E	E	E	E	E	E	E	F	F			E	E	E	E	E	F	F	
1200	122	X	X	C	C	C	E	E	E	E	E	E	E	E	E	E	E	F	F			E	E	E	E	E	F	F	
1500	152	X	X	C	C	C	E	E	E	E	E	E	E	E	E	E	E	F	F			E	E	E	E	E	G	G	
1800	182	X	X			C	C	E	E	E	E	E	E	E	E	E	E	F	F			E	E	E	E	E	G	G	
2200	222	X	X			C	C	E	E	E	E	E	E	F	F	F	F					E	E	E	E	E	G	G	
2700	272	X	X			C	C	E	E				E	E	E	F	E	E	E	F	F		E	E	E	E	E	G	G
3300	332	X	X			C	C	E					E	E	E	F	E	E	E	F	F		E	E	E	F	F	G	G
3900	392	X	X			C	C	E					E	E	E	G							E	E	E	F	F	G	G
4700	472	X	X			C	C	E					E	E	E	G							E	E	E	F	F	G	G
5600	562	X	X			C	C	E					E	E	E	G							E	E	E	G	G		
6800	682	X	X			C	C	E					E	E	E								E	E	E	G	G		
8200	822	X	X			C	C	E					E	E	E								E	E	E	G	G		
Cap (μF) 0.010	103	C	C			C	C	E					E	E	E								E	E	F	G	G		
0.015	153	C	C			E	E	E					E	E	E								E	E	F	G			
0.018	183	C	C			E	E	E					E	E	E								E	E	G				
0.022	223	C	C			E	E						E	E	E								E	E	G				
0.027	273					E	E						E	E									E	E	G				
0.033	333					E	E						E	E									E	E	G				
0.039	393												E	E									E	E	G				
0.047	473												E	E									E	E	G				
0.056	563												F	F									F	F					
0.068	683												F	F									F	F					
0.082	823												F	F									F	F					
0.100	104												F	F									F	F					
0.150	154																						G	G					
0.220	224																						G	G					
0.270	274																												
0.330	334																												
0.390	394																												
0.470	474																												
0.560	564																												
0.680	684																												
0.820	824																												
1.000	105																												
Voltage (V)	600	630	1000	600	630	1000	1500	2000	600	630	1000	1500	2000	600	630	1000	1500	2000	2500	3000	4000	600	630	1000	1500	2000	2500	3000	4000
<b>Case Size</b>	<b>0805</b>			<b>1206</b>				<b>1210</b>				<b>1808</b>				<b>1812</b>													

# High Voltage MLC Chips FLEXITERM®

For 600V to 5000V Applications

## X7R CAPACITANCE RANGE PREFERRED SIZES ARE SHADED

Case Size	1825								2220								2225									
Soldering	Reflow Only								Reflow Only								Reflow Only									
(L) Length mm (in.)	4.60 ± 0.50 (0.181 ± 0.020)								5.70 ± 0.50 (0.224 ± 0.020)								5.72 ± 0.25 (0.225 ± 0.010)									
(W) Width mm (in.)	6.30 ± 0.40 (0.248 ± 0.016)								5.00 ± 0.40 (0.197 ± 0.016)								6.35 ± 0.25 (0.250 ± 0.010)									
(T) Thickness mm (in.)	3.40 (0.134)								3.40 (0.134)								2.54 (0.100)									
(t) Terminal min max	0.75 ± 0.35 (0.030 ± 0.014)								0.85 ± 0.35 (0.033 ± 0.014)								0.85 ± 0.35									
Voltage (V)	600	630	1000	1500	2000	2500	3000	4000	600	630	1000	1500	2000	2500	3000	4000	5000	600	630	1000	1500	2000	2500	3000	4000	5000
Cap (pF) 100 101																										
120 121																										
150 151																										
180 181																										
220 221																										
270 271																										
330 331																										
390 391																										
470 471																										
560 561																										
680 681																										
750 751																										
820 821																										
1000 102	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	G		F	F	F	F	F	F	F	F	F
1200 122	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	G		F	F	F	F	F	F	F	F	F
1500 152	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	G		F	F	F	F	F	F	F	F	F
1800 182	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	G		F	F	F	F	F	F	F	F	F
2200 222	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	G		F	F	F	F	F	F	F	F	F
2700 272	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	G		F	F	F	F	F	F	F	F	F
3300 332	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	G		F	F	F	F	F	F	F	F	F
3900 392	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	G		F	F	F	F	F	F	F	F	F
4700 472	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	G		F	F	F	F	F	F	F	F	F
5600 562	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	G		F	F	F	F	F	F	F	F	F
6800 682	F	F	F	G	G	G	G	G	F	F	F	F	F	F	F	G		F	F	F	F	F	F	F	G	G
8200 822	F	F	F	G	G	G	G	G	F	F	F	G	G	G	G	G		F	F	F	F	F	G	G	G	G
Cap (µF) 0.010 103	F	F	F	G	G	G	G	G	F	F	F	G	G	G	G	G		F	F	F	F	F	G	G	G	G
0.015 153	F	F	F	G	G	G	G		F	F	F	G	G	G	G		F	F	F	G	G	G	G	G	G	G
0.018 183	F	F	F	G	G				F	F	F	G	G	G			F	F	F	G	G	G	G			
0.022 223	F	F	F	G	G				F	F	F	G	G				F	F	F	G	G	G	G			
0.027 273	F	F	F	G					F	F	F	G	G				F	F	F	G	G					
0.033 333	F	F	F	G					F	F	F	G					F	F	F	G	G					
0.039 393	F	F	F	G					F	F	F	G					F	F	F	G						
0.047 473	F	F	F	P					F	F	F	G					F	F	F	G						
0.056 563	F	F	F	G					F	F	F	G					F	F	F	G						
0.068 683	F	F	G						F	F	G						F	F	F	G						
0.082 823	F	F	G						F	F	G						F	F	G							
0.100 104	F	F	G						F	F	G						F	F	G							
0.150 154	F	F							F	F	G						F	F	G							
0.220 224	F	F							F	F	G						F	F								
0.270 274	F	F							F	F							F	F								
0.330 334	F	F							F	F							F	F								
0.390 394	F	F							F	F							F	F								
0.470 474	F	F							F	F							F	F								
0.560 564	G	G							G	G							F	F								
0.680 684									G	G							G	G								
0.820 824																	G	G								
1.000 105																										
Voltage (V)	600	630	1000	1500	2000	2500	3000	4000	600	630	1000	1500	2000	2500	3000	4000	5000	600	630	1000	1500	2000	2500	3000	4000	5000

Letter	A	C	E	F	G	P	X
Max. Thickness	0.813 (0.032)	1.448 (0.057)	1.8034 (0.071)	2.2098 (0.087)	2.794 (0.110)	3.048 (0.120)	0.940 (0.037)

NOTE: Contact factory for non-specified capacitance values

