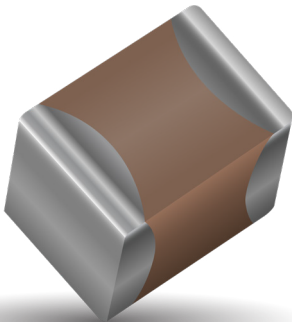# High Voltage MLC Chips

For 600V to 5000V Applications

AVX®

High value, low leakage and small size are difficult parameters to obtain in capacitors for high voltage systems. AVX special high voltage MLC chip 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.

Larger physical sizes than normally encountered chips are used to make high voltage MLC chip products. Special precautions must be taken in applying these chips in surface mount assemblies. The temperature gradient during heating or cooling cycles should not exceed 4ºC per second. The preheat temperature must be within 50ºC of the peak temperature reached by the ceramic bodies through the soldering process. Chip sizes 1210 and larger should be reflow soldered only. Capacitors may require protective surface coating to prevent external arcing.

For 1825, 2225 and 3640 sizes, AVX offers leaded version in either thru-hole or SMT configurations (for details see section on high voltage leaded MLC chips)

NEW 630V RANGE

HOW TO ORDER

| 1808 | A | A | 271 | M | A | 1 | 2 | A |

AVX Style
0805
1206
1210
1808
1812
1825
2220
2225
3640
***

Voltage
600V/630V = C
1000V = A
1500V = S
2000V = G
2500V = W
3000V = H
4000V = J
5000V = K

Temperature Coefficient
NPO (C0G) = A
X7R = C

Capacitance Code
(2 significant digits + no. of zeros)
Examples:
10 pF = 100
100 pF = 101
1,000 pF = 102
22,000 pF = 223
220,000 pF = 224
1 µF =105

Capacitance Tolerance
C0G: J = ±5%
K = ±10%
M = ±20%
X7R: K = ±10%
M = ±20%
Z = +80%, -20%

Test Level
A = Standard

Termination*
1 = Pd/Ag
T = Plated Ni and Sn (RoHS Compliant)

Packaging
1 or 2 = 7" Reel**
3 or 4 = 13" Reel

Special Code
A = Standard

*Note: Terminations with 5% minimum lead (Pb) is available, see pages 100 and 101 for LD style.
Leaded terminations are available, see pages 102-106.

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.

**The 3640 Style is not available on 7" Reels.
*** AVX offers nonstandard chip sizes. Contact factory for details.

RoHS COMPLIANT
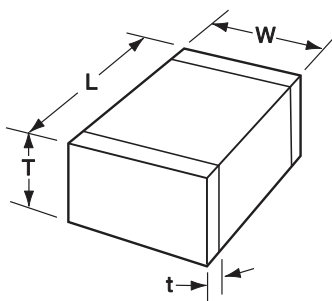
DIMENSIONS

MILLIMETERS (INCHES)

SIZE	0805	1206	1210*	1808*	1812*	1825*	2220*	2225*	3640*
(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)	5.72 ± 0.25 (0.225 ± 0.010)	9.14 ± 0.25 (0.360 ± 0.010)
(W) Width	1.25 ± 0.20 (0.049 ±0.008)	1.60 ± 0.20 (0.063 ± 0.008)	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)	6.35 ± 0.25 (0.250 ± 0.010)	10.2 ± 0.25 (0.400 ± 0.010)
(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)	2.54 (0.100)	2.54 (0.100)
(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)	0.76 (0.030) 1.52 (0.060)

*Reflow Soldering Only

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NP0 (C0G) DIELECTRIC – PERFORMANCE CHARACTERISTICS

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

NPO (C0G) CAPACITANCE RANGE – PREFERRED SIZES ARE SHADED

Case Size	0805			1206					1210						1808								1812							
Soldering	Reflow/Wave			Reflow/Wave					Reflow Only						Reflow Only								Reflow Only							
(L) Length mm (in.)	2.10 ± 0.20 (0.085 ± 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 (0.177 + 0.012)							
W) Width mm (in.)	1.25 ± 0.2 0 (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 + 0.008)							
(T) Thickness mm (in.)	1.35 (0.053)			1.80 (0.071)					2.80 (0.110)						2.20 (0.087)								2.80 (0.100)							
(t) Terminal mm (in.)	0.50 + 0.20 (0.020 + 0.008)			0.60 + 0.20 (0.04 + 0.008)					0.75 + 0.35 (.030 0.014)						0.75 + 0.35 (.030 0.014)								0.75 + 0.35 (.030 0.014)							
Voltage (V)	600	630	1000	600	630	1000	1500	2000	600	630	1000	1500	2000	3000	600	630	1000	1500	2000	2500	3000	4000	600	630	1000	1500	2000	2500	3000	4000
Cap (pF) .5 0R5		A	C																											
1.0 1R0		A	C																											
1.2 1R2		A	C																											
1.5 1R5	A	A	C	X	X	X	X	X																						
1.8 1R8	A	A	C	X	X	X	X	X																						
2.2 2R2	A	A	C	X	X	X	X	X							C	C		C		C	C									
2.7 2R7	A	A	C	X	X	X	X	X							C	C	C	C	C	C	C									
3.3 3R3	A	A	C	X	X	X	X	X							C	C	C	C	C	C	C									
3.9 3R9	A	A	C	X	X	X	X	X							C	C	C	C	C	C	C									
4.7 4R7	A	A	C	X	X	X	X	X							C	C	C	C	C	C	C									
5.6 5R6	A	A	C	X	X	X	X	X							C	C	C	C	C	C	C									
6.8 6R8	A	A	C	X	X	X	X	X							C	C	C	C	C	C	C									
8.2 8R2	A	A	C	X	X	X	X	X							C	C	C	C	C	C	C									
10 100	A	A	C	X	X	X	X	X	C	M	M	D	M	F	C	C	C	C	C	C	C		C	C	C	C	C	C	C	E
12 120	A	A	C	X	X	X	X	X	C	M	M	D	M	F	C	C	C	C	C	C	C		C	C	C	C	C	C	C	E
15 150	A	A	C	X	X	X	X	X	C	M	M	D	M	F	C	C	C	C	C	C	C		C	C	C	C	C	C	C	E
18 180	A	A	C	X	X	X	X	X	C	M	M	D	M	F	C	C	C	C	C	C	C		C	C	C	C	C	C	C	E
22 220	A	A	C	X	X	X	X	X	C	M	M	D	M	F	C	C	C	C	C	C	C	E	C	C	C	C	C	C	C	E
27 270	A	A	C	X	X	X	X	X	C	M	M	D	M	F	C	C	C	C	C	C	C	E	C	C	C	C	F	C	C	E
33 330	A	A	C	X	X	X	D	M	C	M	M	D	M	F	C	C	C	C	C	C	F		C	C	C	C	F	C	C	E
39 390	A	A	C	X	X	X	D	M	C	M	M	D	M	F	C	C	C	C	C	C	F		C	C	C	C	F	C	C	E
47 470	A	A	C	X	X	C	D	M	C	M	M	D	M	F	C	C	C	C	C	C	C		C	C	C	C	F	C	C	E
56 560	A	A	C	X	X	C	C	C	C	M	M	C	C		C	C	C	C	C	C	C		C	C	C	C	F	C	C	F
68 680	A	A	C	X	X	C	C	C	C	M	M	C	C		C	C	C	C	C	C	C		C	C	C	C	F	C	C	F
82 820	X	X	X	X	C	C	C	C	C	M	C	C	C		C	C	C	C	C	C			C	C	C	C	F	C	C	F
100 101	X	X	X	X	C	C	C	C	C	M	C	C	C	F	C	C	C	C	C	F	F		C	C	C	C	F	C	C	F
120 121	C	C	C	X	X	C	E	E	C	M	C	C	C	F	C	C	C	C	C	F	F		C	C	C	C	F	C	C	G
150 151	C	C	C	X	C	E	E	E	C	M	C	E	E	F	C	C	C	F	F	F	F		C	C	C	C	F	C	C	G
180 181	C	C	C	X	C	E	E	E	C	M	E	E	E	F	C	C	C	F	F	F	F		C	C	C	C	F	F	F	
220 221	C	C	C	X	X	E	E	E	C	M	E	E	E	F	C	C	C	F	F	F	F		C	C	C	C	F	F	F	
270 271	C	C	C	C	M	E	E	E	C	M	E	E	E	G	C	F	C	F	F	F	F		C	C	C	C	F	F	F	
330 331	C	C	C	C	M	E	E	E	C	M	E	E	E		C	F	F	F	F	F	F		C	C	C	C	F	F	F	
390 391	C	C	C	C	M	E	E	E	C	M	E	E			C	F	F	F	F	F	F		C	C	C	C	F	F	F	
470 471	C	C		C	M	E	E	E	C	M	E	E			C	F	F	F	F	F			C	C	C	C	F	F	F	
560 561	C	C		C	C	E			C	M	E	E			C	F	F	F	F		F		C	C	C	C	F	F	F	
680 681	C	C		C	C	E			C	M	E	F			C	F	F	F	F				C	C	C	C	F	F	G	
750 751	C	C		C	E	E			C	M	E	G	E		C	F	F	F	F				C	C	C	C	F	F	G	G
820 821	C	C		C	E	E			C	M	E	G	E		C	F	F	F	E				C	C	C	C	F	F	G	G
1000 102		C		E	E	E			C	C	E	F			C	F	F	F	E	F			C	C	C	C	F	F	E	E
1200 122		C		E	E	E			C	C	E		F		C	F	F	F	E	F			C	C	C	C	F	F	E	
1500 152		C		E	E				C	C	F		G		E	F	F		F				C	C	C	C	F	F	F	
1800 182		C		E	E				C	C	G				E	F	F			F			C	C	C	C	F	G	F	
2200 222		C		E	E				E	C	G				E	F	F						C	C	C	E	G	G		
2700 272				E	E				E	C	G				E	F	F						C	C	C	E	G	G		
3300 332				E	E				E	C	G				E	F	F						C	C	C	F		G		
3900 392					E				E	C	G				E	F							C	C	C	F				
4700 472					E				E	C					E	F							C	C	C	G				
5600 562					E				E	E					E	F							C	C	C	G				
6800 682									E						F	F							C	C						
8200 822									F						F	F							E	C						
Cap (µF) 0.010 103									F						F	F							E	C						
0.012 123									G														F	F						
0.015 153																							G	G						
0.018 183																							G	G						
0.022 223																								F						
0.027 273																								G						
0.033 333																								G						
0.047 473																														
0.056 563																														
0.068 683																														
0.100 104																														
Voltage (V)	600	630	1000	600	630	1000	1500	2000	600	630	1000	1500	2000	3000	600	630	1000	1500	2000	2500	3000	4000	600	630	1000	1500	2000	2500	3000	4000
Case Size	0805			1206					1210						1808								1812							

Letter	A	C	E	F	G	X	7
Max. Thickness	0.813 (0.032)	1.448 (0.057)	1.8034 (0.071)	2.2098 (0.087)	2.794 (0.110)	0.940 (0.037)	3.30 (0.130)

NOTE: Contact factory for non-specified capacitance values

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High Voltage MLC Chips

For 600V to 5000V Applications

NP0 (C0G) CAPACITANCE RANGE – PREFERRED SIZES ARE SHADED

Case dimensions

Case Size	1825	2220	2225	3640
Soldering	Reflow Only	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)	5.70 ± 0.50 (0.225 ± 0.010)	9.14 ± 0.25 (0.360 ± 0.010)
(W) Width mm (in.)	6.30 ± 0.40 (0.248 ± 0.016)	5.00 ± 0.40 (0.197 ± 0.016)	6.30 ± 0.40 (0.250 ± 0.010)	10.2 ± 0.25 (0.400 ± 0.010)
(T) Thickness mm (in.)	3.40 (0.134)	3.40 (0.134)	3.40 (0.100)	2.54 (0.100)
(t) Terminal mm max	0.75 ± 0.35 (0.030 ± 0.014)	0.85 ± 0.35 (0.033 ± 0.014)	0.85 ± 0.35 (0.033 ± 0.014)	0.76 (0.030) / 1.52 (0.060)

Capacitance Range grid

Voltage columns — 1825: 600/630/1000/1500/2000/2500/3000/4000; 2220, 2225, 3640: 600/630/1000/1500/2000/2500/3000/4000/5000

Cap	Code	| 1825 → 600	630	1000	1500	2000	2500	3000	4000	| 2220 → 600	630	1000	1500	2000	2500	3000	4000	5000	| 2225 → 600	630	1000	1500	2000	2500	3000	4000	5000	| 3640 → 600	630	1000	1500	2000	2500	3000	4000	5000
1.5	1R5																																			
1.8	1R8																																			
2.2	2R2																																			
2.7	2R7																																			
3.3	3R3																																			
3.9	3R9																																			
4.7	4R7																																			
5.6	5R6																																			
6.8	6R8																																			
8.2	8R2																																			
10	100	E	E	G	E	F	E	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	F	F									
12	120	E	E	G	E	F	E	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	F	F									
15	150	E	E	G	E	F	E	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	F	F									
18	180	E	E	G	E	F	E	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	F	F									
22	220	E	E	G	E	F	E	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	F	F									
27	270	E	E	G	E	F	E	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	F	F									
33	330	E	E	G	E	F	E	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	F	F									
39	390	E	E	G	E	F	E	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	F	F									
47	470	E	E	G	E	F	E	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	F	G									G
56	560	E	E	G	E	F	E	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	F	G									G
68	680	E	E	G	E	F	E	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	F	G									G
82	820	E	E	G	E	F	E	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	F	G									G
100	101	E	E	G	E	F	E	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	G	G				G	G	G	G	G	G
120	121	E	E	G	E	F	E	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	G	G				G	G	G	G	G	G
150	151	E	E	G	E	F	E	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	G	G				G	G	G	G	G	G
180	181	E	E	G	E	F	E	F	F	E	E	E	E	E	E	E	F	F	E	E	E	E	E	E	E	G	G				G	G	G	G	G	G
220	221	E	E	G	E	F	E	F	F	E	E	E	E	E	E	E	F	F	E	E	E	E	E	E	E	G	G				G	G	G	G	G	G
270	271	E	E	G	E	F	E	F	E	E	E	E	E	E	E	E			E	E	E	E	E	E	E	G	G				G	G	G	G	G	G
330	331	E	E	G	E	F	E	F	F	E	E	E	E	E	E	E			E	E	E	E	E	E	E	G					G	G	G	G	G	G
390	391	E	E	G	E	F	E	F		E	E	E	E	E	E	E			E	E	E	E	E	E	E	G					G	G	G	G	G	G
470	471	E	E	G	E	F	E	F		E	E	E	E	E	E	E			E	E	E	E	E	E	E	G					G	G	G	G	G	G
560	561	E	E	G	E	F	E	F		E	E	E	E	E	E	E			E	E	E	E	E	E	E	G					G	G	G	G	G	G
680	681	E	E	G	E	F	F	G		E	E	E	E	E	F	F			E	E	E	E	E	E	E						G	G	G	G	G	
750	751	E	E	G	E	F	F	G		E	E	E	E	E	F	F			E	E	E	E	E	E	E					G	G	G	G	G	G	G
820	821	E	E	G	E	F	F	G		E	E	E	E	E	F	F			E	E	E	E	E	F	E					G	G	G	G	G	G	G
1000	102	E	E	G	E	F	F	G		E	E	E	E	E	F	F			E	E	E	E	E	F	F				G	G	G	G	G	G	G	G
1200	122	E	E	G	E	F	G	G		E	E	E	E	E	G	G			E	E	E	E	E	F	F				G	G	G	G	G	G	G	
1500	152	E	E	G	F	G	G	G		E	E	E	F	F	G	G			E	E	E	E	E	F	F				G	G	G	G	G	G		
1800	182	E	E	G	F	G	G	G		E	E	E	F	F	G	G			E	E	E	E	E	G	G				G	G	G	G	G			
2200	222	E	E	G	G	G		G		E	E	E	G	G					E	E	E	E							G	G	G	G	G			
2700	272	E	E	G	G	G		G		E	E	E	G	G					E	E	E	F	F						G	G	G	G				
3300	332	E	E	G	G	G				E	E	E	G	G					E	E	E	F	F						G	G	G	G	G	G		
3900	392	E	E	G	G	G				E	E	E	G	G					E	E	E	G	G						G	G	G	G				
4700	472	E	E	G	G	G				E	E	E	G	G					F	F	F	G	G						G	G	G	G	G			
5600	562	F	F	G	G	G				F	F	F	G	G					F	F	F	G	G						G	G	G	G	G			
6800	682	F	F	G		G				F	F	F							F	F	F	G	G						G	G	G	G	G			
8200	822	G	G	G		G				G	G	G							G	G	G								G	G	G	G				
0.010 (µF)	103	F	E	G						7	7	7							G	G	G								G	G	G	G				
0.012	123		E	G															G	G									G	G	G					
0.015	153		E																G	G									G	G	G					
0.018	183		E																G	G									G	G	G					
0.022	223		E																G	G									G	G	G					
0.027	273		F																																	
0.033	333		F																G	G									G	G						
0.039	393		G																																	
0.047	473		G																G	G									G	G						
0.056	563		G																G	G																
0.068	683		G																G	G																
0.100	104																																			

Thickness codes

Letter	A	C	E	F	G	X	7
Max. Thickness	0.813 (0.032)	1.448 (0.057)	1.8034 (0.071)	2.2098 (0.087)	2.794 (0.110)	0.940 (0.037)	3.30 (0.130)

NOTE: Contact factory for non-specified capacitance values

120919

High Voltage MLC Chips

For 600V to 5000V Applications

X7R Dielectric

Performance Characteristics

Capacitance Range	10 pF to 0.82 µF (25°C, 1.0 ±0.2 Vrms at 1kHz)
Capacitance Tolerances	±10%; ±20%; +80%, -20%
Dissipation Factor	2.5% max. (+25°C, 1.0 ±0.2 Vrms, 1kHz)
Operating Temperature Range	-55°C to +125°C
Temperature Characteristic	±15% (0 VDC)
Voltage Ratings	600, 630, 1000, 1500, 2000, 2500, 3000, 4000 & 5000 VDC (+125°C)
Insulation Resistance (+25°C, at 500 VDC)	100K MΩ min. or 1000 MΩ - µF min., whichever is less
Insulation Resistance (+125°C, at 500 VDC)	10K MΩ min. or 100 MΩ - µF min., whichever is less
Dielectric Strength	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							
Soldering		Reflow/Wave			Reflow/Wave					Reflow Only					Reflow Only								Reflow Only							
(L) Length mm (in.)		2.10 0.20 (0.085 ± 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 (0.177 ± 0.012)							
W) Width mm (in.)		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 ± 0.008)							
(T) Thickness mm (in.)		1.35 (0.053)			1.80 (0.071)					2.80 (0.110)					2.20 (0.087)								2.80 (0.100)							
(t) Terminal mm 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) 100	101	X	X	C	C	C	E	E	E	E	E	E	E	E																
120	121	X	X	C	C	C	E	E	E	E	E	E	E	E																
150	151	X	X	C	C	C	E	E	E	E	E	E	E	E																
180	181	X	X	C	C	C	E	E	E	E	E	E	E	E																
220	221	X	X	C	C	C	E	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	E			
330	331	X	X	C	C	C	E	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	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	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	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	E	E	F	F	E	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	E	E	F	F	E	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	E	E	F	F	E	E	E	E	E	E	F	F
1000	102	X	X	X	C	C	E	E	E	E	E	E	E	E		E	E	E	E	E	F	F	E	E	E	E	E	E	F	F
1200	122	X	X	X	C	C	E	E	E	E	E	E	E	E		E	E	E	E	E	F	F	E	E	E	E	E	E	F	F
1500	152	X	X	X	C	C	E	E	E	E	E	E	E	E		E	E	E	E	E	F	F	E	E	E	E	E	E	G	G
1800	182	X	X	X	C	C	E	E	E	E	E	E	E	E		E	E	E	E	E	F	F	E	E	E	E	E	E	G	G
2200	222	X	X	X	C	C	E	E	E	E	E	E	E	F	E		E	E	E	F	F	F		E	E	E	E	E	E	G	G
2700	272	C	C		C	C	E	E		E	E	E	E			E	E	E	F	F				E	E	E	E	E		G	G
3300	332	C	C		C	C	E			E	E	E	F			E	E	E	F	F				E	E	E	F	F		G	G
3900	392	C	C		C	C	E			E	E	E	F			E	E	E	F					E	E	E	F	F		G	G
4700	472	C	C		C	C	E			E	E	E	F			E	E	E	F					E	E	E	F	F		G	G
5600	562	C	C		C	C	E			E	E	E	F			E	E	E	F					E	E	E	G	G	G		
6800	682	C	C		C	C	E			E	E	E				E	E	E	F					E	E	E	G	G			
8200	822	C	C		C	C	E			E	E	E				E	E	E						E	E	E	G	G			
Cap (µF) 0.010	103	C	C		C	C	E			E	E	E				E	E	E						E	E	F	G	G			
0.015	153	C	C		E	E	E			E	E	E				F	F	F						E	E	F	G				
0.018	183	C	C		E	E				E	E	E				F	F	F						E	E	G					
0.022	223	C	C		E	E				E	E	F				F	F							E	E	G					
0.027	273				E	E				E	E					F	F							E	E	G					
0.033	333				E	E				E	E					F	F							E	E	G					
0.039	393				E					E	E					F	F							E	E	G					
0.047	473				E					E	E					F	F							E	E	G					
0.056	563				F					F	F					F	F							F	F						
0.068	683				F					F	F					F	F							F	F						
0.082	823				F					F	F													F	F						
0.100	104				F					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
Case Size		0805			1206					1210					1808								1812							

Letter	A	C	E	F	G	X	7
Max. Thickness	0.813 (0.032)	1.448 (0.057)	1.8034 (0.071)	2.2098 (0.087)	2.794 (0.110)	0.940 (0.037)	3.30 (0.130)

NOTE: Contact factory for non-specified capacitance values

High Voltage MLC Chips

For 600V to 5000V Applications

X7R CAPACITANCE RANGE

PREFERRED SIZES ARE SHADED

Case Size		1825								2220									2225									3640								
Soldering		Reflow Only								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)									5.70 ± 0.50 (0.225 ± 0.010)									9.14 ± 0.25 (0.360 ± 0.010)								
(W) Width mm (in.)		6.30 ± 0.40 (0.248 ± 0.016)								5.00 ± 0.40 (0.197 ± 0.016)									6.30 ± 0.40 (0.250 ± 0.010)									10.2 ± 0.25 (0.400 ± 0.010)								
(T) Thickness mm (in.)		3.40 (0.134)								3.40 (0.134)									3.40 (0.100)									2.54 (0.100)								
(t) Terminal mm max		0.75 ± 0.35 (0.030 ± 0.014)								0.85 ± 0.35 (0.033 ± 0.014)									0.85 ± 0.35 (0.033 ± 0.014)									0.76 (0.030) 1.52 (0.060)								
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	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	G		F	F	F	F	F	F	F			G	G	G	G	G	G	G	G	G
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		G	G	G	G	G	G	G	G	G
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		G	G	G	G	G	G	G	G	G
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		G	G	G	G	G	G	G	G	G
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		G	G	G	G	G	G	G	G	G
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		G	G	G	G	G	G	G	G	G
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		G	G	G	G	G	G	G	G	G
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		G	G	G	G	G	G	G		
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		G	G	G	G	G	G	G	G	
5600	562	F	F	F	F	F	F	F		F	F	F	F	F	F	F	G		F	F	F	F	F	F	F	F		G	G	G	G	G	G	G	G	
6800	682	F	F	F	G	G	G	G		F	F	F	F	F	G	G			F	F	F	F	F	G	G			G	G	G	G	G	G	G	G	
8200	822	F	F	F	G	G	G	G		F	F	F	G	G	G	G			F	F	F	F	F	G	G			G	G	G	G	G	G	G	G	
Cap (µF) 0.010	103	F	F	F	G	G	G	G		F	F	F	G	G	G	G			F	F	F	F	F	G	G			G	G	G	G	G	G	G	G	
0.015	153	F	F	F	G	G	G			F	F	F	G	G	G				F	F	F	G	G	G	G			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	G	G	G	G	G	G		
0.022	223	F	F	F	G	G				F	F	F	G	G					F	F	F	G	G	G				G	G	G	G	G	G			
0.027	273	F	F	F	G					F	F	F	G	G					F	F	F	G	G					G	G	G	G					
0.033	333	F	F	F	G					F	F	F	G						F	F	F	G	G					G	G	G						
0.039	393	F	F	F	G					F	F	F	G						F	F	F	G						G	G	G						
0.047	473	F	F	F	P					F	F	F	G						F	F	F	G						G	G	G						
0.056	563	F	F	F	G					F	F	F	G						F	F	F	G						G	G	G						
0.068	683	F	F	G						F	F	F	G						F	F	F	G						G	G	G						
0.082	823	F	F	G						F	F	G							F	F	G							G	G							
0.100	104	F	F	G						F	F	G							F	F	G							G	G							
0.150	154	F	F							F	F	G							F	F	G							G	G							
0.220	224	F	F							F	F	G							F	F								G	G							
0.270	274	F	F							F	F								F	F								G	G							
0.330	334	F	F							F	F								F	F								G	G							
0.390	394	F	F							F	F								F	F								G	G							
0.470	474	F	F							F	F								F	F								G	G							
0.560	564	G	G							G	G								F	F								G	G							
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	600	630	1000	1500	2000	2500	3000	4000	5000
Case Size		1825								2220									2225									3640								

Letter	A	C	E	F	G	X	7
Max. Thickness	0.813 (0.032)	1.448 (0.057)	1.8034 (0.071)	2.2098 (0.087)	2.794 (0.110)	0.940 (0.037)	3.30 (0.130)

NOTE: Contact factory for non-specified capacitance values

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

AVX:

1206AA101JAT1A   1206AA101KAM1A   1206AA220KAT1A   1206AA221JAT1A   1206AA330JAT1A
1206AA470KAT1A   1206AA471JAT1A   1206AC102KAT1A   1206AC222KAT1A   1206AC272KAT1A   1206AC392KAT1A
1206AC471KAT1A   1206AC472KA11A   1206AC472KAT1A   1206AC472MAT1A   1206CA101JAT3A
1206CC102KAT1A   1206CC102MAT1A   1206CC103KAT1A   1206CC153KAT1A   1206CC153MAT1A
1206CC271KAT1A   1206CC471KAT1A   1206CC472KBT1A   1206CC822KAT1A   1206GA220JAT1A
1206GA330KAT1A   1206GC101KAT1A   1206GC101MAT1A   1206GC102KAT1A   1206GC221KAT1A
1206GC471KA11A   1206GC471KAT1A   1206GC471MAT1A   1206JA102KAT2A   1206SA101JAT1A   1206SA390JAT1A
1206SC102KAT1A   1206SC122KA11A   1206SC122KAT1A   1206SC471KAT1A   1210AA331KAT1A
1210AC103KAT1A   1210AC222MAT1A   1210AC272KAT1A   1210AC472KAT1A   1210AC822KAT1A
1210CC102KAT1A   1210CC103KAT1A   1210CC153KAT1A   1210CC223KAT1A   1210CC273KAT1A
1210GC101KAT1A   1210GC102KAT1A   1210GC102MAT1A   1210GC471KAT1A   1210GC821KAT1A
1210SC222MAT1A   1210SC272KAT1A   1210SC272MAT1A   1808AA101KAT1A   1808AA102KAT1A
1808AA330KAT1A   1808AA331KAT1A   1808AA331KAT2A   1808AA560JAT1A   1808AA680KAT1A   1808AC102KAT1A
1808AC103KAT1A   1808AC103KBT1A   1808AC103MAT1A   1808AC152KAT1A   1808AC153KA11A
1808AC153KAT1A   1808AC153KAT3A   1808AC153MAT1A   1808AC153MAT3A   1808AC202MAT1A
1808AC222KAT1A   1808AC471KBT1A   1808AC472KAT1A   1808AC682KAT1A   1808CC103KA11A
1808CC103KAT1A   1808CC393KAT1A   1808CC393MA11A   1808CC393MAT1A   1808CC472KAT1A
1808GA101JAT1A   1808GA221JAT1A   1808GA221JAT3A   1808GA221KAT1A   1808GA331KAT1A   1808GC101KAT1A
1808GC102KAT1A   1808GC102MAT1A   1808GC152KA11A   1808GC152KAT1A   1808GC152KAT3A
1808GC152MAT1A