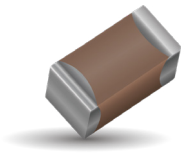
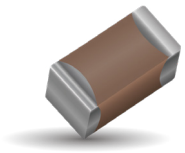
High Voltage MLC Chip Capacitors

For 600V to 3000V Automotive Applications - AEC-Q200





Modern automotive electronics could require components capable to work with high voltage (e.g. xenon lamp circuits or power converters in hybrid cards). AVX offers high voltage ceramic capacitors qualified according to AEC-Q200 standard.

High value, low leakage and small size are diffocult parameters to obtain in cpacitors for high voltage systems. AVX special hgih 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.

Due to high voltage nature, larger physical dimensions are necessary. These larger sizes require special precautions to be taken in applying of MLC chips. The temperature gradient during heating or cooling cycles should not exceed 4°C per second. The preheat temperature must be within 50°C 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.

To improve mechanical and thermal resistance, AVX recommend to use flexible terminations system - FLEXITERM®.

HOW TO ORDER

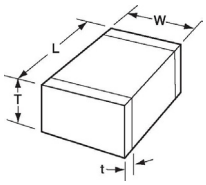
1210	C	C	223	K	4	T	2	A
Size	**Voltage**	**Dielectric**	**Capacitance Code**	**Capacitance Tolerance**	**Failure Rate**	**Terminations**	**Packaging**	**Special Code**
1206	C = 630V	X7R = C	2 Sig. Digits +	K = ±10%	4 = Automotive	T = Plated Ni and Sn	2 = 7" Reel	A = Std. Product
1210	A = 1000V		Number of Zeros	M = ±20%		Z = FLEXITERM®	4 = 13" Reel	
1808	S = 1500V		e.g. 103 = 10nF					
1812	G = 2000V		(223 = 22nF)					
2220	W = 2500V							
	H = 3000V							

*AVX offers nonstandard case size. Contact factory for details.

Notes: Capacitors with X7R dielectrics are not indeded for applications across AC supply mains or AC line filtering with polarity reversal. Please contact AVX for recommendations

CHIP DIMENSIONS DESCRIPTION

(SEE CAPACITANCE RANGE CHART ON PAGE 128)



L = Length
W = Width
T = Thickness
t = Terminal

X7R DIELECTRIC PERFORMANCE CHARACTERISTICS

Parameter/Test	Specification Limits	Measuring Conditions
Operating Temperature Range	-55°C to +125°C	Temperature Cycle Chamber
Capacitance **Dissipation Factor** **Capacitance Tolerance**	within specified tolerance 2.5% max. ±5% (J), ±10% (K), ±20% (M)	Freq.: 1kHz ±10% Voltage: 1.0Vrm s ±0.2Vrms T = +25°C, V = 0Vdc
Temperature Characteristics	X7R = ±15%	Vdc = 0V, T = (-55°C to +125°C)
Insulation Resistance	100GΩ min. or 1000MΩ • µF min. (whichever is less) 10GΩ min. or 100MΩ • µF min. (whichever is less)	T = +25°C, V = 500Vdc T = +125°C, V = 500Vdc (t ≥ 120 sec, I ≤ 50mA)
Dielectric Strength	No breakdown or visual defect	120% of rated voltage t ≤ 5 sec, I ≤ 50mA

High Voltage MLC Chips FLEXITERM®

For 600V to 3000V Automotive Applications - AEC-Q200

X7R CAPACITANCE RANGE

PREFERRED SIZES ARE SHADED

Case Size		1206					1210				1808						1812						2220				
Soldering		Reflow/Wave					Reflow/Wave				Reflow Only						Reflow Only						Reflow Only				
(L) Length	mm (in.)	3.2 ± 0.2 (0.126 ± 0.008)					3.2 ± 0.2 (0.126 ± 0.008)				4.57 ± 0.25 (0.18 ± 0.01)						4.5 ± 0.3 (0.177 ± 0.012)						5.7 ± 0.5 (0.224 ± 0.02)				
W) Width	mm (in.)	1.6 ± 0.2 (0.063 ± 0.008)					2.5 ± 0.2 (0.098 ± 0.008)				2.03 ± 0.25 (0.08 ± 0.01)						3.2 ± 0.2 (0.126 ± 0.008)						5 ± 0.4 (0.197 ± 0.016)				
(t) Terminal	mm max	0.5 ± 0.25 (0.02 ± 0.01)					0.5 ± 0.25 (0.02 ± 0.01)				0.61 ± 0.36 (0.024 ± 0.014)						0.61 ± 0.36 (0.024 ± 0.014)						0.64 ± 0.39 (0.025 ± 0.015)				
Voltage (V)		630	1000	1500	2000	2500	630	1000	1500	2000	630	1000	1500	2000	2500	3000	630	1000	1500	2000	2500	3000	630	1000	1500	2000	3000
Cap (pF)	101 100	C	E	E	E	E																					
	121 120	C	E	E	E	E																					
	151 150	C	E	E	E	E																					
	181 180	C	E	E	E	E																					
	221 220	C	E	E	E	E					E	E	E	E	E	E											
	271 270	C	E	E	E	E	E	E	E	E	E	E	E	E	E	E											
	331 330	C	E	E	E	E	E	E	E	E	E	E	E	E	E	F	E										
	391 390	C	E	E	E	E	E	E	E	E	E	E	E	E	E	F	E										
	471 470	C	E	E	E	E	E	E	E	E	E	E	E	E	F	F	E	E	E	E	E	E					
	561 560	C	E	E	E	E	E	E	E	E	E	E	E	E	F	F	E	E	E	E	E	E					
	681 680	C	E	E	E	E	E	E	E	E	E	E	F	F	F	F	E	E	E	E	F	F					
	821 820	C	E	E	E	E	E	E	E	E	E	E	F	F	F	F	E	E	E	E	F	F					
	102 1000	C	E	E	E	E	E	E	E	E	E	E	F	F	F	F	E	E	E	E	F	F	F	F	F	F	G
	122 1220	C	E	E	E		E	E	E	E							F	F	F	F	G		F	F	F	F	G
	152 1500	C	E	E	E		E	E	E	E							F	F	F	F	G		F	F	F	F	G
	182 1800	C	E	E			E	E	E	E							F	F	F	F	G		F	F	F	F	G
	222 2200	C	E	E			E	E	E	E							F	F	F	F	G		F	F	F	F	G
	272 2700	C	E	E			E	E	E	E							F	F	F	F			F	F	F	F	
	332 3300	C	E				E	E	E	E							F	F	F	F			F	F	F	F	
	392 3900	C	E				E	E	E								F	F	F	F			F	F	F	F	
	472 4700	C	E				E	E	E								F	F	G	G			F	F	F	F	
	562 5600	C	E				E	E	E								F	F	G	G			F	F	F	F	
	682 6800	E	E				E	E									F	F	G	G			F	F	F	F	
	822 8200	E					E	E									F	F	G	G			F	F	G	G	
	103 0.01	E					E	E									F	F	G				G	G	G	G	
	123 0.012						E	E									F	F	G				G	G	G	G	
	153 0.015						E	E									F	F	G				G	G	G	G	
	183 0.018						E	E									F	F					G	G	G	G	
	223 0.022						E										F	F					G	G	G	G	
	273 0.027						Q										F						G	G			
	333 0.033																F						G	G			
	393 0.039																F						G	G			
	473 0.047																X						G	G			
	563 0.056																						G	Y			
	683 0.068																						G	Y			
	823 0.082																						G	Y			
	104 0.1																						G	Y			
	124 0.12																						G				
	154 0.15																						G				
	224 0.22																										
	334 0.33																										
	474 0.47																										
	684 0.68																										
	105 1																										
	155 1.5																										
	225 2.2																										
	335 3.3																										
	475 4.7																										
	106 10																										
	226 22																										
WVDC		630	1000	1500	2000	2500	630	1000	1500	2000	630	1000	1500	2000	2500	3000	630	1000	1500	2000	2500	3000	630	1000	1500	2000	3000
Size		1206					1210				1808						1812						2220				

NOTE: Contact factory for non-specified capacitance values

Letter	A	C	E	F	G	Q	X	Y
Max Thickness	0.813 (0.032)	1.448 (0.057)	1.8034 (0.071)	2.2098 (0.087)	2.794 (0.110)	1.78 (0.07)	2.29 (0.09)	2.54 (0.1)

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D55342E07B523DR-T/R NCA1206X7R103K50TRPF NCA1206X7R104K16TRPF NIN-FB391JTRF NIN-FC2R7JTRF NMC0402NPO220J50TRPF NMC0402X5R105K6.3TRPF NMC0402X5R224K6.3TRPF NMC0402X7R103J25TRPF NMC0402X7R153K16TRPF NMC0603NPO330G50TRPF NMC0603NPO331F50TRPF NMC0603X5R475M6.3TRPF NMC0805NPO220J100TRPF NMC0805NPO270J50TRPF NMC0805NPO681F50TRPF NMC0805NPO820J50TRPF NMC1206X7R102K50TRPF NMC1210Y5V105Z50TRPLPF NMC-H0805X7R472K250TRPF NMC-L0402NPO7R0C50TRPF NMC-L0603NPO2R2B50TRPF NMC-Q0402NPO8R2D200TRPF C1206C101J1GAC C1608C0G2A221J C1608X7R1E334K C2012C0G2A472J 2220J2K00562KXT KHC201E225M76N0T00 1812J2K00332KXT CCR06CG153FSV CDR14BP471CJUR CDR31BX103AKWR CDR33BX683AKUS CGA2B2C0G1H010C CGA2B2C0G1H040C CGA2B2C0G1H050C CGA2B2C0G1H060D CGA2B2C0G1H070D CGA2B2C0G1H120J CGA2B2C0G1H151J CGA2B2C0G1H1R5C CGA2B2C0G1H2R2C CGA2B2C0G1H390J CGA2B2C0G1H391J CGA2B2C0G1H3R3C CGA2B2C0G1H680J CGA2B2C0G1H6R8D CGA2B2C0G1H820J CGA2B2X8R1H152K