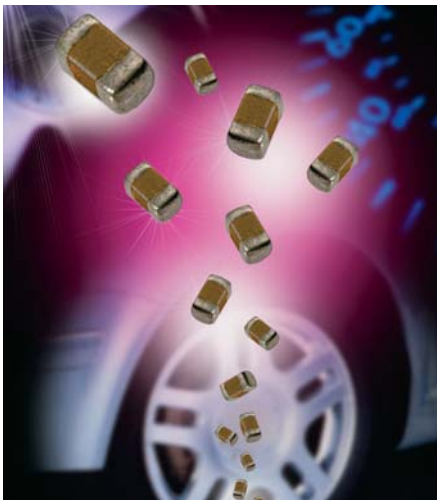
High Voltage MLC Chip Capacitors

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 cars). AVX offer high voltage ceramic capacitors qualified according to AEC-Q200 standard.

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.

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 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.

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

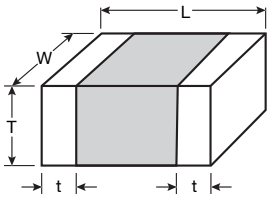
HOW TO ORDER

1210	C	C	223	K	4	T	1	A
AVX Style 1206 1210 1808 1812 2220	**Voltage** C = 630V A = 1000V S = 1500V G = 2000V W = 2500V H = 3000V	**Dielectric** C = X7R	**Capacitance Code** (2 significant digits + no. of zeros) e.g. 103 = 10nF (223 = 22nF)	**Capacitance Tolerance** J = ±5% K = ±10% M = ±20%	**Failure Rate** 4 = Automotive	**Termination** T = Plated Ni/Sn Z = FLEXITERM®	**Packaging** 2 = 7" Reel 4 = 13" Reel	**Special Code** A = Standard

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

Notes: Capacitors with X7R dielectrics are not intended 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 106)



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

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X7R CAPACITANCE RANGE
PREFERRED SIZES ARE SHADED

Case Size			1206					1210				1808						1812						2220			
Soldering			Reflow/Wave					Reflow Only				Reflow Only						Reflow Only						Reflow Only			
(L) Length		mm (in.)	3.20 ± 0.20 (0.126 ± 0.008)					3.20 ± 0.20 (0.126 ± 0.008)				4.57 ± 0.25 (0.180 ± 0.010)						4.50 ± 0.30 (0.177 ± 0.012)						5.70 ± 0.40 (0.224 ± 0.016)			
(W) Width		mm (in.)	1.60 ± 0.20 (0.063 ± 0.008)					2.50 ± 0.20 (0.098 ± 0.008)				2.03 ± 0.25 (0.080 ± 0.010)						3.20 ± 0.20 (0.126 ± 0.008)						5.00 ± 0.40 (0.197 ± 0.016)			
(T) Thickness		mm (in.)	1.52 (0.060)					1.70 (0.067)				2.03 (0.080)						2.54 (0.100)						3.30 (0.130)			
(t) Terminal		min max	0.25 (0.010) 0.75 (0.030)					0.25 (0.010) 0.75 (0.030)				0.25 (0.010) 1.02 (0.040)						0.25 (0.010) 1.02 (0.040)						0.25 (0.010) 1.02 (0.040)			
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
Cap (pF)	100	101	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■									
	120	121	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■									
	150	151	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■									
	180	181	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■									
	220	221	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■									
	270	271	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■									
	330	331	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■									
	390	391	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■									
	470	471	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
	560	561	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
	680	681	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
	820	821	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
	1000	102	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1200	122	■	■	■	■		■	■	■	■	■	■	■	■	■		■	■	■	■	■		■	■	■	■
	1500	152	■	■	■	■		■	■	■	■	■	■	■	■			■	■	■	■	■		■	■	■	■
	1800	182	■	■	■			■	■	■	■	■	■	■				■	■	■	■	■		■	■	■	■
	2200	222	■	■	■			■	■	■	■	■	■	■				■	■	■	■	■		■	■	■	■
	2700	272	■	■	■			■	■	■	■	■	■	■				■	■	■	■			■	■	■	■
	3300	332	■	■				■	■	■	■	■	■	■				■	■	■	■			■	■	■	■
	3900	392	■	■				■	■	■		■	■	■				■	■	■	■			■	■	■	■
	4700	472	■	■				■	■	■		■	■					■	■	■	■			■	■	■	■
	5600	562	■	■				■	■	■		■	■					■	■	■	■			■	■	■	■
	6800	682	■	■				■	■			■	■					■	■	■	■			■	■	■	■
	8200	822	■					■	■			■	■					■	■	■	■			■	■	■	■
Cap (µF)	0.01	103	■					■	■			■	■					■	■	■				■	■	■	■
	0.012	123						■										■	■	■				■	■	■	
	0.015	153						■										■	■	■				■	■	■	
	0.018	183						■										■	■					■	■	■	
	0.022	223						■										■	■					■	■	■	
	0.027	273						■										■						■	■		
	0.033	333																■						■	■		
	0.039	393																■						■	■		
	0.047	473																■						■	■		
	0.056	563																						■			
	0.068	683																						■			
	0.082	823																						■			
	0.100	104																						■			
	0.120	124																						■			
	0.150	154																						■			
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
Case Size			1206					1210				1808						1812						2220			

NOTE: Contact factory for non-specified capacitance values