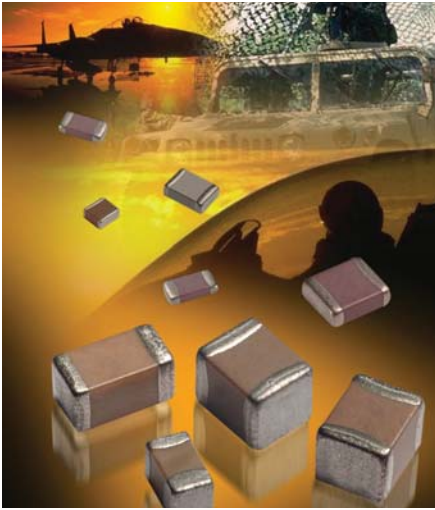


# APS COTS+ for High Reliability Applications

## Surface Mount NPO, X7R and X8R/L MLCCs



AVX's APS COTS+ series of multilayer ceramic capacitors offers the customer a high reliability solution with an ultralow failure rate,  $\leq 1$ ppb, in a variety of case sizes and voltages. The APS range encompasses a wide range of dielectric types to meet the customer's requirements from low temperature/voltage capacitance change dielectric, NPO, to high performing capacitance voltage X7R to high temperature reliability dielectrics, X8R/L.

APS capacitors have a wider capacitance range than MIL spec parts that satisfies the need for higher CV demands and board space saving requirements. Each production lot is extensively tested and removes the requirement for customer specific drawings. The testing regime uses many of the MIL-STD test methods as per MIL-PRF-55681 and has a field failure rate of less than 1 ppb. The APS testing series uses AVX's unique in-house maverick testing detection system that eliminates infant mortality failures.

Applications suitable for APS include Industrial, Telecommunications, Aviation, and Military. The APS is available with a range of different termination finishes, Flexiterm®, Nickel / Tin and Tin with Pb<sup>1</sup>. Flexiterm® technology delivers improved thermo-mechanical stress resistance.

### AVX'S APS RELIABILITY TEST SUMMARY

- 100 % Visual Inspection
- DPA
- IR, DF, Cap, DWV
- Maverick Lot Review
- Thermal Shock
- 85/85 Testing
- Life Testing 125°C 2xRV
- C of C with every Order
- Quarterly Data Package

Dielectric	Temperature/Percentage Cap Change
<b>NPO</b>	-30ppm +30ppm from -55°C to + 125°C
<b>X7R</b>	-15% +15% from -55°C to + 125°C
<b>X8R</b>	-15% +15% from -55°C to + 150°C
<b>X8L</b>	-15% +40% from -55°C to + 150°C

### FEATURES

- The APS range has been extensively reliability tested as standard resulting in an ultralow failure rate,  $\leq 1$ ppb.
- The APS range is available with Flexiterm® that deliver's high thermo-mechanical stress resistance.
- High CV range enabling board space saving requirements.

### HOW TO ORDER

AP03	5	A	104	K	Q	T	2	A
Size	Voltage	Dielectric	Capacitance Code (In pF)	Capacitance Tolerance	Failure Rate	Terminations	Packaging	Special Code
AP03=0603	16V = Y	NPO = A	2 Significant Digits + Number of Zeros e.g. 10µF = 106	J = ±5% K = ±10% M = ±20%	Q = APS	T = Plated Ni and Sn** Z = FLEXITERM®*** B = 10% min lead X = FLEXITERM® with 10% min lead	2 = 7" Reel 4 = 13" Reel	A = Std. Product
AP05=0805	25V = 3	X7R = C						
AP06=1206	50V = 5	X8R = F						
AP10=1210	100V = 1	X8L = L						
AP12=1812	200V = 2							
AP20=2220	500V = 7							

Z,X for X7R only  
\*\*RoHS compliant

NOTE: Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.

# APS COTS+ NP0 Series

## Capacitance Range

		AP03 = 0603			AP05 = 0805			AP06 = 1206					AP10 = 1210			
		25V	50V	100V	25V	50V	100V	25V	50V	100V	200V	500V	25V	50V	100V	200V
100	10pF	G	G	G	J	J	J	J	J	J	J	J				
120	12	G	G	G	J	J	J	J	J	J	J	J				
150	15	G	G	G	J	J	J	J	J	J	J	J				
180	18	G	G	G	J	J	J	J	J	J	J	J				
220	22	G	G	G	J	J	J	J	J	J	J	J				
270	27	G	G	G	J	J	J	J	J	J	J	J				
330	33	G	G	G	J	J	J	J	J	J	J	J				
390	39	G	G	G	J	J	J	J	J	J	J	J				
470	47	G	G	G	J	J	J	J	J	J	J	J				
510	51	G	G	G	J	J	J	J	J	J	J	J				
560	56	G	G	G	J	J	J	J	J	J	J	J				
680	68	G	G	G	J	J	J	J	J	J	J	J				
820	82	G	G	G	J	J	J	J	J	J	J	J				
101	100	G	G	G	J	J	J	J	J	J	J	J				
121	120	G	G	G	J	J	J	J	J	J	J	J				
151	150	G	G	G	J	J	J	J	J	J	J	J				
181	180	G	G	G	J	J	J	J	J	J	J	J				
221	220	G	G	G	J	J	J	J	J	J	J	J				
271	270	G	G	G	J	J	J	J	J	J	J	J				
331	330	G	G	G	J	J	J	J	J	J	J	J				
391	390	G	G		J	J	J	J	J	J	J	J				
471	470	G	G		J	J	J	J	J	J	J	J				
561	560				J	J	J	J	J	J	J	J				
681	680				J	J	J	J	J	J	J	J				
821	820				J	J	J	J	J	J	J	J				
102	1000				J	J	J	J	J	J	J	J	J	J	J	J
122	1200												J	J	M	M
152	1500												J	J	M	M
182	1800												J	J	M	M
222	2200												J	J	M	M
272	2700															
332	3300															
392	3900															
472	4700															
103	10nF															
		25V	50V	100V	25V	50V	100V	25V	50V	100V	200V	500V	25V	50V	100V	200V
		AP03 = 0603			AP05 = 0805			AP06 = 1206					AP10 = 1210			



Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max.	0.33	0.56	0.71	0.90	0.94	1.02	1.27	1.40	1.52	1.78	2.29	2.54	2.79
Thickness	(0.013)	(0.022)	(0.028)	(0.035)	(0.037)	(0.040)	(0.050)	(0.055)	(0.060)	(0.070)	(0.090)	(0.100)	(0.110)
	PAPER					EMBOSSED							

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# APS COTS+ X7R Series

## Capacitance Range

		AP03 = 0603					AP05 = 0805					AP06 = 1206					AP10 = 1210				AP12 = 1812		AP20 = 2220			
		16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	500V	16V	25V	50V	100V	50V	100V	25V	50V	100V
102	Cap 1000	G	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	K	K	K	K	K	K			
182	(pF) 1800	G	G	G	G		J	J	J	J	J	J	J	J	J	J	J	K	K	K	K	K	K			
222	2200	G	G	G	G		J	J	J	J	J	J	J	J	J	J	J	K	K	K	K	K	K			
332	3300	G	G	G	G		J	J	J	J	J	J	J	J	J	J	J	K	K	K	K	K	K			
472	4700	G	G	G	G		J	J	J	J	J	J	J	J	J	J	J	K	K	K	K	K	K			
103	0.01	G	G	G	G		J	J	J	J	J	J	J	J	J	J	J	K	K	K	K	K	K			
123	0.012	G	G	G			J	J	J	M								K	K	K	K	K	K			
153	0.015	G	G	G			J	J	J	M								K	K	K	K	K	K			
183	0.018	G	G	G			J	J	J	M								K	K	K	K	K	K			
223	0.022	G	G	G			J	J	J	M								K	K	K	K	K	K			
273	0.027	G	G	G			J	J	J	M								K	K	K	K	K	K			
333	0.033	G	G	G			J	J	J	M								K	K	K	K	K	K			
473	0.047	G	G	G			J	J	J	M								K	K	K	K	K	K			
563	0.056	G	G	G			J	J	J	M								K	K	K	M	K	K			
683	0.068	G	G	G			J	J	J	M								K	K	K	M	K	K			
823	0.082	G	G	G			J	J	J	M								K	K	K	M	K	K			
104	0.1	G	G	G			J	J	M	M								K	K	K	M	K	K			
124	0.12						J	J	M	N								K	K	K	P	K	K			
154	0.15						M	N	M	N								K	K	K	P	K	K			
224	0.22						M	N	M	N								M	M	M	P	M	M			
334	0.33						N	N	M	N								P	P	P	Q	X	X			
474	0.47						N	N	M	N								P	P	P	Q	X	X			
684	0.68						N	N	N									M	Q	Q	Q					
105	Cap 1.0						N	N	N									M	Q	Q	Q					
155	(µF) 1.5																	P	Q	Q	X	X	X			
225	2.2																	Q	Q	Q						
335	3.3																	Q	Q	Q						
475	4.7																	Q	Q							
106	10																								Z	Z
226	22																								Z	Z
		16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	500V	16V	25V	50V	100V	50V	100V	25V	50V	100V
		AP03 = 0603					AP05 = 0805					AP06 = 1206					AP10 = 1210				AP12 = 1812		AP20 = 2220			

Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER					EMBOSSED							

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# APS COTS+ X8R/L Series

## Capacitance Range

### X8R

SIZE			AP03 = 0603		AP05 = 0805		AP06 = 1206	
			25V	50V	25V	50V	25V	50V
331	Cap	330	G	G	J	J		
471	(pF)	470	G	G	J	J		
681		680	G	G	J	J		
102		1000	G	G	J	J	J	J
152		1500	G	G	J	J	J	J
222		2200	G	G	J	J	J	J
332		3300	G	G	J	J	J	J
472		4700	G	G	J	J	J	J
682		6800	G	G	J	J	J	J
103	Cap	0.01	G	G	J	J	J	J
153	(µF)	0.015	G	G	J	J	J	J
223		0.022	G	G	J	J	J	J
333		0.033	G	G	J	J	J	J
473		0.047	G	G	J	J	J	J
683		0.068	G		N	N	M	M
104		0.1			N	N	M	M
154		0.15			N	N	M	M
224		0.22			N		M	M
334		0.33					M	M
474		0.47					M	
684		0.68						
105		1						
WVDC			25V	50V	25V	50V	25V	50V
SIZE			0603		0805		1206	

### X8L

SIZE			AP03 = 0603			AP05 = 0805			AP06 = 1206			
			25V	50V	100V	25V	50V	100V	16V	25V	50V	100V
331	Cap	330		G	G		J	J				
471	(pF)	470		G	G		J	J				
681		680		G	G		J	J				
102		1000		G	G		J	J				
152		1500		G	G		J	J			J	J
222		2200		G	G		J	J			J	J
332		3300		G	G		J	J			J	J
472		4700		G	G		J	J			J	J
682		6800		G	G		J	J			J	J
103	Cap	0.01		G	G		J	J	J		J	J
153	(µF)	0.015	G	G		J	J	J			J	J
223		0.022	G	G		J	J	J			J	J
333		0.033	G	G		J	J	N			J	J
473		0.047	G	G		J	J	N			J	J
683		0.068	G	G		J	J				J	J
104		0.1	G	G		J	J				J	M
154		0.15				J	N		J	J	J	Q
224		0.22				N	N		J	J	J	Q
334		0.33				N			J	M	P	Q
474		0.47				N			M	M	P	
684		0.68							M			
105		1							M			
WVDC			25V	50V	100V	25V	50V	100V	16V	25V	50V	100V
SIZE			0603			0805			1206			

Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER					EMBOSSED							



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