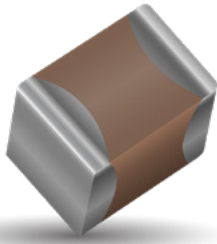


# Automotive MLCC

## General Specifications



### GENERAL DESCRIPTION

KYOCERA AVX has supported the Automotive Industry requirements for Multilayer Ceramic Capacitors consistently for more than 25 years. Products have been developed and tested specifically for automotive applications and all manufacturing facilities are QS9000 and VDA 6.4 approved.

KYOCERA AVX is using AECQ200 as the qualification vehicle for this transition. A detailed qualification package is available on request and contains results on a range of part numbers.

### HOW TO ORDER

0805	5	A	104	K	4	T	2	A
<b>Size</b> 0402 0603 0805 1206 1210 1812	<b>Voltage</b> 6.3V = 6 10V = Z 16V = Y 25V = 3 35V = D 50V = 5 100V = 1 200V = 2 500V = 7	<b>Dielectric</b> NP0 = A X7R = C X8R = F	<b>Capacitance Code (in pF)</b> 2 Sig. Digits + Number of Zeros e.g. 10 F = 106	<b>Capacitance Tolerance</b> B = ± 0.1pF (<10pF)* C = ± 0.25pF (<10pF)* D = ± 0.5pF (<10pF)* F = ± 1%* G = ± 2%* J = ± 5% (<=1µF) K = ± 10% M = ± 20%	<b>Failure Rate</b> 4=Automotive	<b>Terminations</b> T = Plated Ni and Sn Z = FLEXITERM®** U = Conductive Epo  **X7R      X8R only	<b>Packaging</b> 2 = 7" Reel 4 = 13" Reel	<b>Special Code</b> A = Std. Product
				*NPO only				
					Contact factory for availability of Tolerance Options for Specific Part Numbers.			
					NOTE: Contact factory for non-specified capacitance values 0402 case size available in T termination only.			

### COMMERCIAL VS AUTOMOTIVE MLCC PROCESS COMPARISON

	Commercial	Automotive
<b>Administrative</b>	Standard Part Numbers. No restriction on who purchases these parts.	Specific Automotive Part Number. Used to control supply of product to Automotive customers.
<b>Lot Qualification (Destructive Physical Analysis - DPA)</b>	As per EIA RS469	Increased sample plan stricter criteria.
<b>Visual/Cosmetic Quality</b>	Standard process and inspection	100% inspection
<b>Application Robustness</b>	Standard sampling for accelerated wave solder on X7R dielectrics	Increased sampling for accelerated wave solder on X7R and NP0 followed by lot by lot reliability testing.

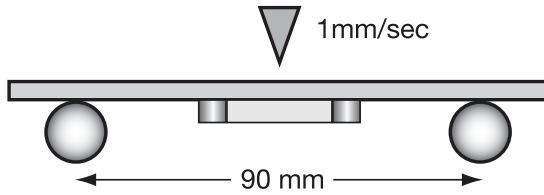
All Tests have Accept/Reject Criteria 0/1

# Automotive MLCC

## NP0/X7R Dielectric

### FLEXITERM FEATURES

- a) Bend Test  
The capacitor is soldered to the PC Board as shown:



Typical bend test results are shown below:

Style	Conventional	Soft Term
0603	>2mm	>5
0805	>2mm	>5
1206	>2mm	>5

- a) Temperature Cycle testing  
FLEXITERM® has the ability to withstand at least 1000 cycles between -55°C and +125°C

# Automotive MLCC-NP0

## Capacitance Range



SIZE		0402		0603				0805					1206					
Soldering		Reflow/Wave		Reflow/Wave				Reflow/Wave					Reflow/Wave					
WVDC		25V	50V	25V	50V	100V	200V	25V	50V	100V	200V	250V	25V	50V	100V	200V	250V	500V
0R5	0.5	C	C	G	G	G	G	J	J	J	N	N	J	J	J	J	J	J
1R0	1.0	C	C	G	G	G	G	J	J	J	N	N	J	J	J	J	J	J
1R2	1.2	C	C	G	G	G	G	J	J	J	N	N	J	J	J	J	J	J
1R5	1.5	C	C	G	G	G	G	J	J	J	N	N	J	J	J	J	J	J
1R8	1.8	C	C	G	G	G	G	J	J	J	N	N	J	J	J	J	J	J
2R2	2.2	C	C	G	G	G	G	J	J	J	N	N	J	J	J	J	J	J
2R7	2.7	C	C	G	G	G	G	J	J	J	N	N	J	J	J	J	J	J
3R3	3.3	C	C	G	G	G	G	J	J	J	N	N	J	J	J	J	J	J
3R9	3.9	C	C	G	G	G	G	J	J	J	N	N	J	J	J	J	J	J
4R7	4.7	C	C	G	G	G	G	J	J	J	N	N	J	J	J	J	J	J
5R6	5.6	C	C	G	G	G	G	J	J	J	N	N	J	J	J	J	J	J
6R8	6.8	C	C	G	G	G	G	J	J	J	N	N	J	J	J	J	J	J
8R2	8.2	C	C	G	G	G	G	J	J	J	N	N	J	J	J	J	J	J
100	10.0	C	C	G	G	G	G	J	J	J	N	N	J	J	J	J	J	J
120	12	C	C	G	G	G	G	J	J	J	N	N	J	J	J	J	J	J
150	15	C	C	G	G	G	G	J	J	J	N	N	J	J	J	J	J	J
180	18	C	C	G	G	G	G	J	J	J	N	N	J	J	J	J	J	J
220	22	C	C	G	G	G	G	J	J	J	N	N	J	J	J	J	J	J
270	27	C	C	G	G	G	G	J	J	J	N	N	J	J	J	J	J	J
330	33	C	C	G	G	G	G	J	J	J	N	N	J	J	J	J	J	J
390	39	C	C	G	G	G	G	J	J	J	N	N	J	J	J	J	J	J
470	47	C	C	G	G	G	G	J	J	J	N	N	J	J	J	J	J	J
510	51	C	C	G	G	G	G	J	J	J	N	N	J	J	J	J		
560	56	C	C	G	G	G	G	J	J	J	N	N	J	J	J	J		
680	68	C	C	G	G	G	G	J	J	J	N	N	J	J	J	J		
820	82	C	C	G	G	G	G	J	J	J	N	N	J	J	J	J		
101	100	C	C	G	G	G	G	J	J	J	N	N	J	J	J	J		
121	120			G	G	G		J	J	J	N	N	J	J	J	J		
151	150			G	G	G		J	J	J	N	N	J	J	J	J		
181	180			G	G	G		J	J	J	N	N	J	J	J	J		
221	220			G	G	G		J	J	J	N	N	J	J	J	J		
271	270			G	G	G		J	J	J	N	N	J	J	J	J		
331	330			G	G	G		J	J	J	N	N	J	J	J	J		
391	390			G	G			J	J	J			J	J	J	J		
471	470			G	G			J	J	J			J	J	J	J		
561	560			G	G			J	J	J			J	J	J	J		
681	680			G	G			J	J	J			J	J	J	J		
821	820							J	J	J			J	J	J	J		
102	1000							J	J	J			J	J	J	J		
122	1200																	
152	1500																	
182	1800																	
222	2200																	
272	2700																	
332	3300																	
392	3900																	
472	4700																	
103	10nF																	
WVDC		25V	50V	25V	50V	100V	200V	25V	50V	100V	200V	250V	25V	50V	100V	200V	250V	500V
Size		0402		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							



# Automotive MLCC - X8R

## Capacitance Range



SIZE			0603			0805			1206	
Soldering			Reflow/Wave			Reflow/Wave			Reflow/Wave	
WVDC	WVDC	WVDC	25V	50V	100V	25V	50V	100V	25V	50V
472	pF	4700	G	G	G	J	J	J	J	J
562		5600	G	G	G	J	J	J	J	J
682		6800	G	G	G	J	J	J	J	J
822		8200	G	G	G	J	J	J	J	J
103	uF	0.01	G	G	G	J	J	J	J	J
123		0.012	G	G		J	J	N	J	J
153		0.015	G	G		J	J	N	J	J
183		0.018	G	G		J	J	N	J	J
223		0.022	G	G		J	J	N	J	J
273		0.027	G	G		J	J		J	J
333		0.033	G	G		J	J		J	J
393		0.039	G	G		J	J		J	J
473		0.047	G	G		J	J		J	J
563		0.056	G			N	N		M	M
683		0.068	G			N	N		M	M
823		0.082				N	N		M	M
104		0.1				N	N		M	M
124		0.12				N	N		M	M
154		0.15				N	N		M	M
184		0.18				N			M	M
224		0.22				N			M	M
274		0.27							M	M
334		0.33							M	M
394		0.39							M	M
474		0.47							M	Q
684		0.68							Q	Q
824		0.82							Q	Q
105		1							Q	Q
WVDC	WVDC	WVDC	25V	50V	100V	25V	50V	100V	25V	50V
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							