General Specifications



GENERAL DESCRIPTION

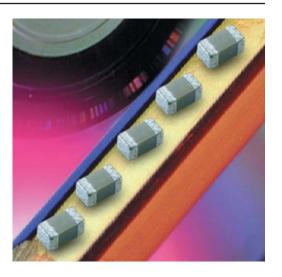
With increased requirements from the automotive industry for additional component robustness, AVX recognized the need to produce a MLCC with enhanced mechanical strength. It was noted that many components may be subject to severe flexing and vibration when used in various under the hood automotive and other harsh environment applications.

To satisfy the requirement for enhanced mechanical strength, AVX had to find a way of ensuring electrical integrity is maintained whilst external forces are being applied to the component. It was found that the structure of the termination needed to be flexible and after much research and development, AVX launched FLEXITERM®. FLEXITERM® is designed to enhance the mechanical flexure and temperature cycling performance of a standard ceramic capacitor with an X7R dielectric. The industry standard for flexure is 2mm minimum. Using FLEXITERM®, AVX provides up to 5mm of flexure without internal cracks. Beyond 5mm, the capacitor will generally fail "open".

As well as for automotive applications FLEXITERM® will provide Design Engineers with a satisfactory solution when designing PCB's which may be subject to high levels of board flexure.

PRODUCT ADVANTAGES

- High mechanical performance able to withstand, 5mm bend test quaranteed.
- Increased temperature cycling performance, 3000 cycles and beyond.
- Flexible termination system.
- Reduction in circuit board flex failures.
- Base metal electrode system.
- Automotive or commercial grade products available.



APPLICATIONS

High Flexure Stress Circuit Boards

 e.g. Depanelization: Components near edges of board.

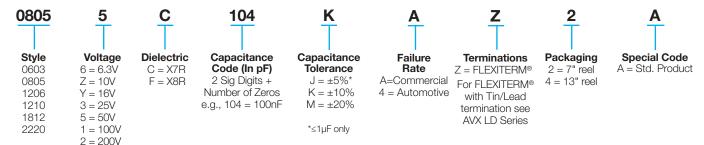
Variable Temperature Applications

- Soft termination offers improved reliability performance in applications where there is temperature variation.
- e.g. All kind of engine sensors: Direct connection to battery rail.

Automotive Applications

- Improved reliability.
- Excellent mechanical performance and thermo mechanical performance.

HOW TO ORDER



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





Specifications and Test Methods



PERFORMANCE TESTING

AEC-Q200 Qualification:

 Created by the Automotive Electronics Council

 Specification defining stress test qualification for passive components

Testing:

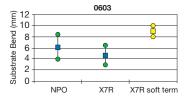
Key tests used to compare soft termination to

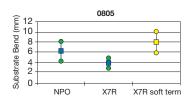
AEC-Q200 qualification:

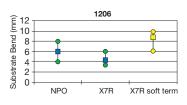
- Bend Test
- Temperature Cycle Test

BOARD BEND TEST RESULTS

AEC-Q200 Vrs AVX FLEXITERM® Bend Test







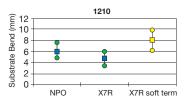


TABLE SUMMARY

Typical bend test results are shown below:

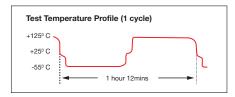
Style	Conventional Termination	FLEXITERM®
0603	>2mm	>5mm
0805	>2mm	>5mm
1206	>2mm	>5mm

TEMPERATURE CYCLE TEST PROCEDURE

Test Procedure as per AEC-Q200:

The test is conducted to determine the resistance of the component when it is exposed to extremes of alternating high and low temperatures.

- Sample lot size quantity 77 pieces
- TC chamber cycle from -55°C to +125°C for 1000 cycles
- Interim electrical measurements at 250, 500, 1000 cycles
- Measure parameter capacitance dissipation factor, insulation resistance

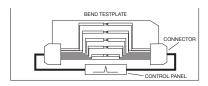


BOARD BEND TEST PROCEDURE

According to AEC-Q200

Test Procedure as per AEC-Q200:
Sample size: 20 components
Span: 90mm Minimum deflection spec: 2 mm

- Components soldered onto FR4 PCB (Figure 1)
- Board connected electrically to the test equipment (Figure 2)



LOADING KNIFE

MOUNTING ASSEMBLY

DIGITAL

CALIPER

CONTROL PANEL

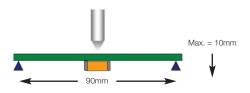
Fig 1 - PCB layout with electrical connections

Fig 2 - Board Bend test equipment

AVX ENHANCED SOFT TERMINATION BEND TEST PROCEDURE

Bend Test

The capacitor is soldered to the printed circuit board as shown and is bent up to 10mm at 1mm per second:



- The board is placed on 2 supports 90mm apart (capacitor side down)
- The row of capacitors is aligned with the load stressing knife



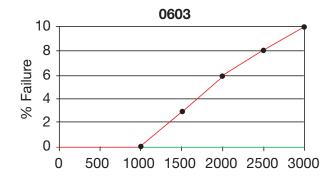
- The load is applied and the deflection where the part starts to crack is recorded (Note: Equipment detects the start of the crack using a highly sensitive current detection circuit)
- The maximum deflection capability is 10mm

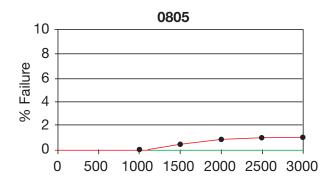


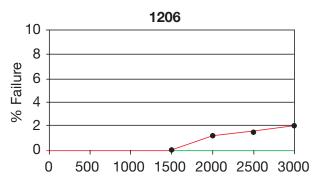
Specifications and Test Methods

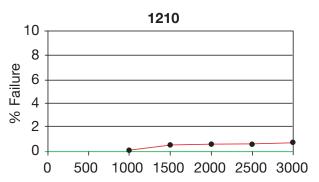


BEYOND 1000 CYCLES: TEMPERATURE CYCLE TEST RESULTS









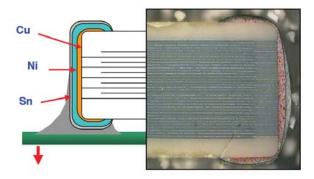
Soft Term - No Defects up to 3000 cycles

AEC-Q200 specification states 1000 cycles compared to AVX 3000 temperature cycles.

FLEXITERM® TEST SUMMARY

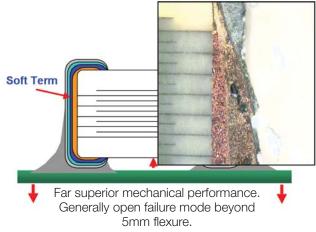
- Qualified to AEC-Q200 test/specification with the exception of using AVX 3000 temperature cycles (up to +150°C bend test guaranteed greater than 5mm).
- FLEXITERM® provides improved performance compared to standard termination systems.
- Board bend test improvement by a factor of 2 to 4 times.
- Temperature Cycling:
 - 0% Failure up to 3000 cycles
 - No ESR change up to 3000 cycles

WITHOUT SOFT TERMINATION



Major fear is of latent board flex failures.

WITH SOFT TERMINATION







X8R Dielectric Capacitance Range

WDC	25V J J J J J J J J J J J J J J J J J J	50V		
331	J J J J J J	J J J J J		
### ATT	J J J J J J	J J J J J		
681	J J J J J J	J J J J J		
102 1000 G G G J J J 1 182 1800 G G G J J J 1 222 222 2200 G G G J J J J 2332 3300 G G G J J J J 3332 3300 G G G J J J J 3392 3900 G G G J J J J 3 392 3900 G G G J J J J 3 392 3900 G G G J J J 3 392 3900 G G G J J J J 3 392 3900 G G G J J J J 3 392 3900 G G G J J J J 3 392 3900 G G G J J J J 3 392 3900 G G G J J J J 3 392 3900 G G G J J J J 3 392 3900 G G G J J J J 3 392 3900 G G G J J J J 3 392 3900 G G G J J J J 3 392 3900 G G G J J J J 3 393 300 G G G J J J J 3 393 300 G G G J J J J 3 393 300 G G G J J J J 3 393 300 G G G G J J J J 3 393 300 G G G G J J J J 3 393 300 G G G G J J J J 3 393 300 G G G G J J J J 3 393 300 G G G G G J J J J 3 393 300 G G G G J J J J 3 393 300 G G G G J J J J 3 393 300 G G G G J J J J 3 393 300 G G G G J J J J 3 393 300 G G G G J J J J 3 393 300 G G G G J J J J 3 393 300 G G G G J J J J 3 393 300 G G G G J J J J 3 393 300 G G G G J J J J 3 393 300 G G G G J J J J 3 393 300 G G G G J J J J 3 393 300 G G G G J J J J 3 393 300 G G G G J J J J 3 393 300 G G G G J J J J 3 393 300 G G G G J J J J 3 393 300 G G G G J J J J 3 393 300 G G G G J J J J 3 393 300 G G G G J J J J J 3 393 300 G G G G J J J J J 3 393 300 G G G G J J J J J 3 393 300 G G G G J J J J J 3 393 300 G G G G J J J J J 3 393 300 G G G G J J J J J 3 393 300 G G G G J J J J J 3 393 300 G G G G J J J J J 3 393 300 G G G G J J J J J 3 393 300 G G G G J J J J J 3 393 300 G G G G J J J J J 3 393 300 G G G G J J J J J J 3 393 300 G G G G J J J J J J 3 393 300 G G G G J J J J J J J 3 393 300 G G G G J J J J J J J J J J J J J J J	J J J J J J	J J J J J		
152	J J J J J J	J J J J J		
182	J J J J J	J J J J		
222 2200 G G J J 272 2700 G G J J 332 3300 G G J J 392 3900 G G J J 472 4700 G G J J 562 5600 G G J J 682 6800 G G J J 822 8200 G G J J 103 Cap 0.01 G G J J 123 (µF) 0.012 G G J J 153 0.015 G G J J 183 0.018 G G J J 183 0.018 G G J J 223 0.022 G G J J 333 0.033 G G J J 3473 0.047 G G J J	J J J J	J J J		
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472 4700 G G J J 562 5600 G G J J 682 6800 G G J J 822 8200 G G J J 103 Cap 0.01 G G G J J 123 (μF) 0.012 G G G J J J 153 0.015 G G G J	J J J J	J J		
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334 0.33	М	М		
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204 0.20	M	M		
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474 0.47	М			
684 0.68				
824 0.82				
105 1				
WVDC 25V 50V 25V 50V	25V	50V		
SIZE 0603 0805	12	206		
Letter A C E G J K M N P Q	Х	YZ		
Max. 0.33 0.56 0.71 0.90 0.94 1.02 1.27 1.40 1.52 1.78		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)	2.29	(0.100) (0.110)		
PAPER EMBOSSED	2.29 (0.090)	(0.110)		

= AEC-Q200 Qualified





X7R Dielectric Capacitance Range

1		0603						0805							1206				12	210		1812				2220		
1		16V	25V			200V	10V	16V			100V	200V	16V	25V			200V	16V			100V	16V			100V			100V
1	101																											
1	121 151						_						<u> </u>					_								-		-
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1	221																											
1	271	J	J	J	J	J	J																					\vdash
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1	391	J	J	J	J	J	J	J	J	J	J	J																
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2	182	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
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Column C	824						N	N	_				М	Q	Q	Q				Z	_	_		Х	Z			
Column C	105						N	N	N				_		Q	Q		_	Z	Z	Z	Х	Х		Z	Χ	7.5	Х
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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		16V	25V	50V	100V	200V	10V	16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	16V	25V	50V	100V	16V	25V	50V	100V	25V	50V	100V
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									08	05																2220		
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					_				_			1.									\/							
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Letter	А	С	E	G	J	K	М	N	Р	Q	Χ	Υ	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			FMBOSSED.									

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

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M39014/220778 M39014/220458 105061100000861+ CDR12BP102AKUM CDR12BP330AJUR\M500 18123A104FAT2A
CDR12BP221AJUR\M500 00 6224020001800 LD12CC104KAB1A L08052R2DEWTR 009286001203906 M39014/22-1181
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