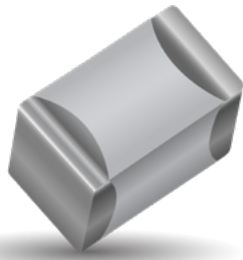


General Purpose MLCC with FLEXITERM®, KGF series

General Specifications



GENERAL DESCRIPTION

With increased Industry requirements for additional component robustness, KAVX 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 harsh environment applications.

To satisfy the requirement for enhanced mechanical strength, KYOCERA 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, KYOCERA AVX launched FLEXITERM®. FLEXITERM® is designed to enhance the mechanical flexure and temperature cycling performance of a standard ceramic capacitor. The industry standard for flexure is 2mm minimum. Using FLEXITERM®, KYOCERA AVX provides up to 5mm of flexure without internal cracks. Beyond 5mm, the capacitor will generally fail "open".

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 guaranteed
- Increased temperature cycling performance, 3000 cycles and beyond
- Flexible termination system
- Reduction in circuit board flex failures
- Base metal electrode system

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.

HOW TO ORDER

KGF	15	A	R7	1H	103	K	T
Series	Size	Thickness	Dielectric	Voltage	Capacitance Code Code (in pF)	Capacitance Tolerance	Packaging
General Purpose FLEXITERM®	05 = 0402 15 = 0603 21 = 0805 31 = 1206 32 = 1210 42 = 1808	43 = 1812 44 = 1825 55 = 2220 56 = 2225 91 = 3640	See Cap Chart COG=CG X7R=R7 X8R=R8 X8L=L8	1C = 16V 1E = 25V 1H = 50V 2A = 100V 2D = 200V 2E = 250V 2H = 500V 2J = 630V 3A = 1000V 3N = 1500V 3D = 2000V 3E = 2500V 3U = 3000V 3G = 4000V 3H = 5000V	2 Significant Digits +Number of zeros eg. 10µF = 106 10nF = 103 47pF = 470	B = ± 0.1pF(<10pF)* C = ± 0.25pF(<10pF)* D = ± 0.5pF(<10pF)* G = ±2%* F = ±1%* J = ±5% K = ±10% M = ±20%	See Table Below



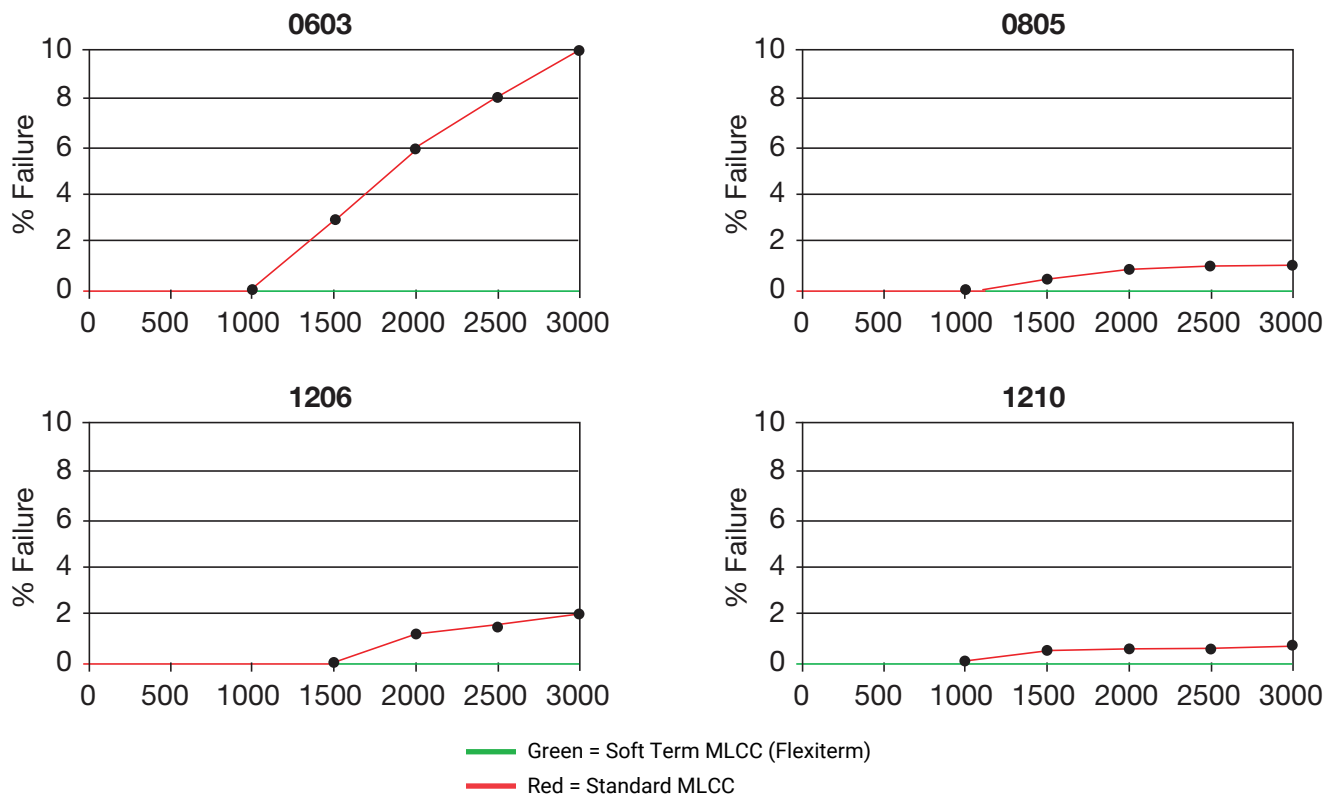
PACKAGING CODES

Code	EIA (inch)	IEC(mm)	7" Paper	7" Embossed	13" Paper	13" Embossed
05	0402	1005	H		N	
15	0603	1608	T		M	
21	0805	2012	T	U	M	L
31	1206	3216	T	U	M	L
32	1210	3225		U		L
42	1808	4520		Y		K
43	1812	4532		V		S
44	1825	4564		V		S
55	2220	5750		V		S
56	2225	5763		V		S

General Purpose MLCC with FLEXITERM®, KGF series

Specifications and Test Methods

BEYOND 1000 CYCLES: TEMPERATURE CYCLE TEST RESULTS

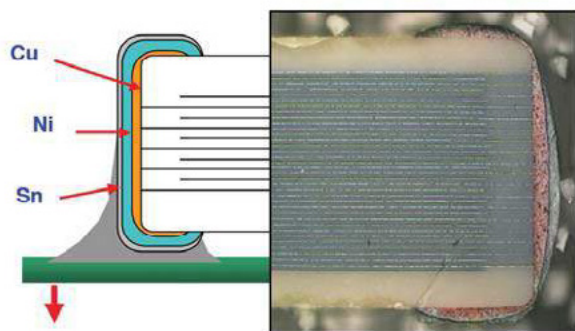


Soft Term - No Defects up to 3000 cycles

FLEXITERM® TEST SUMMARY

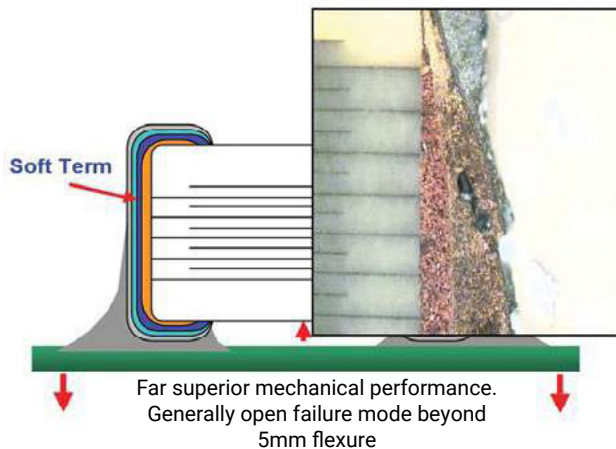
- FLEXITERM® provides improved performance compared to standard termination systems.
- Board bend test improvement by a factor of 2 to 4 times.
- Temperature Cycling:
 - 0% Failure up to 3000 cycles
 - No ESR change up to 3000 cycle

WITHOUT SOFT TERMINATION



Major fear is of latent board flex failures.

WITH SOFT TERMINATION



General Purpose MLCC with FLEXITERM® - NP0, 25V to 500V



Capacitance Range

SIZE		0603		0805			1206					1210				
Soldering		Reflow/Wave		Reflow/Wave			Reflow/Wave					Reflow/Wave				
(L) Length	mm	1.6 ± 0.15		2.01 ± 0.2			3.2 ± 0.2					3.2 ± 0.2				
	(in.)	(0.063 ± 0.006)		(0.079 ± 0.008)			(0.126 ± 0.008)					(0.126 ± 0.008)				
(W) Width	mm	0.81 ± 0.15		1.25 ± 0.2			1.6 ± 0.2					2.5 ± 0.2				
	(in.)	(0.032 ± 0.006)		(0.049 ± 0.008)			(0.063 ± 0.008)					(0.098 ± 0.008)				
(t) Terminal	mm	0.35 ± 0.15		0.5 ± 0.25			0.5 ± 0.25					0.5 ± 0.25				
	(in.)	(0.014 ± 0.006)		(0.02 ± 0.01)			(0.02 ± 0.01)					(0.02 ± 0.01)				
WVDC		25V	50V	25V	50V	100V	50V	100V	200V	250V	500V	50V	100V	200V	250V	500V
0R5	0.5			B	B	B										
1R0	1.0			B	B	B										
100	10			B	B	B										
120	12			B	B	B										
150	15			B	B	B										
180	18			B	B	B										
220	22			B	B	B										
270	27			B	B	B										
330	33			B	B	B										
390	39			B	B	B										
470	47			B	B	B										
560	56															
680	68															
820	82															
101	100															
121	120															
151	150															
181	180															
221	220															
271	270															
331	330															
391	390															
471	470															
561	560															
681	680															
821	820															
102	1000	A	B													
122	1200	A	B													
152	1500	A	B													
222	2200	A					G	G	G	G	G					G
272	2700	A					G	G	G	G	G	G	G	G	G	G
332	3300	A					G	G	G	G	G	G	G	G	G	G
392	3900	A					G	G	G	G	G	G	G	G	G	G
472	4700	A					G	G	G	G	G	G	G	G	G	G
562	5600	A					G	G	G	G	G	G	G	G	G	G
682	6800	A					G	G	G	G	G	G	G	G	G	G
822	8200	A					G	G	G	G	G	G	G	G	G	G
103	10000	A					G	G	G	G	G	K	K	K	K	K
123	12000											K	K	K	K	K
153	15000											L	L	L	L	L
183	18000											L	L	L	L	L
223	22000											L	L	L	L	L
273	27000											L	L	L	L	L
333	33000											L	L	L	L	L
393	39000															
473	47000															
563	56000															
683	68000															
823	82000															
104	100000															
WVDC		25V	50V	25V	50V	100V	50V	100V	200V	250V	500V	50V	100V	200V	250V	500V
SIZE		0603		0805			1206					1210				

Case Size	0603(KGF15)		0805(KGF21)		1206(KGF31)				1210(KGF32)						
Thickness Letter	A	B	B	A	B	N	D	G	Q	B	F	G	K	L	
Max Thickness (mm)	0.90	0.95	0.94	1.45	0.94	1.27	1.45	1.78	0.94	1.02	1.52	1.78	2.29	2.80	
Carrier Tape	PAPER	PAPER	PAPER	EMB	PAPER	EMB	EMB	EMB	PAPER	EMB	EMB	EMB	EMB	EMB	
Packaging Code 7"reel	H	T	T	U	T	U	U	U	T	U	U	U	U	U	
Packaging Code 13"reel	N	M	M	L	M	L	L	L	M	L	L	L	L	L	
PAPER									EMBOSSED(EMB)						

General Purpose MLCC with FLEXITERM® - NP0, 630V to 5000V

Capacitance Range

SIZE	0805		1206				1210				1808						1812						1825						2220						2225																							
(L) Length	Soldering	Reflow/Wave	Reflow/Wave				Reflow Only				Reflow Only						Reflow Only						Reflow Only						Reflow Only																													
	mm	2.10 ± 0.20	3.30 ± 0.30				3.30 ± 0.40				4.60 ± 0.50						4.60 ± 0.50						4.60 ± 0.50						5.70 ± 0.50						5.70 ± 0.50																							
(W) Width	(in.)	(0.083 ± 0.008)	(0.130 ± 0.012)				(0.130 ± 0.016)				(0.181 ± 0.020)						(0.181 ± 0.020)						(0.181 ± 0.020)						(0.224 ± 0.020)						(0.224 ± 0.020)																							
	mm	1.25 ± 0.20	1.60 ± 0.30/-0.10				2.50 ± 0.30				2.00 ± 0.20						3.20 ± 0.30						6.30 ± 0.40						5.00 ± 0.40						6.30 ± 0.40																							
(t) Terminal	(in.)	(0.049 ± 0.008)	(0.063 ± 0.012/-0.004)				(0.098 ± 0.012)				(0.079 ± 0.008)						(0.126 ± 0.012)						(0.248 ± 0.016)						(0.197 ± 0.016)						(0.248 ± 0.016)																							
	mm	0.50 ± 0.20	0.60 ± 0.20				0.75 ± 0.35				0.75 ± 0.35						0.75 ± 0.35						0.75 ± 0.35						0.85 ± 0.35						0.85 ± 0.35																							
	(in.)	(0.020 ± 0.008)	(0.024 ± 0.008)				(0.030 ± 0.014)				(0.030 ± 0.014)						(0.030 ± 0.014)						(0.030 ± 0.014)						(0.033 ± 0.014)						(0.033 ± 0.014)																							
WVDC		630	1000	630	1000	1500	2000	630	1000	1500	2000	630	1000	1500	2000	2500	3000	4000	630	1000	1500	2000	2500	3000	4000	630	1000	1500	2000	2500	3000	4000	630	1000	1500	2000	2500	3000	4000	5000	630	1000	1500	2000	2500	3000	4000	5000										
Cap (pF) 1.5		1R5	Z					B	B	B	B																																															
1.8		1R8	Z					B	B	B	B																																															
2.2		2R2	Z					B	B	B	B																																															
2.7		2R7	Z					B	B	B	B							A	A	A	A	A	A																																			
3.3		3R3	Z					B	B	B	B							A	A	A	A	A	A																																			
3.9		3R9	Z					B	B	B	B							A	A	A	A	A	A																																			
4.7		4R7	Z					B	B	B	B							A	A	A	A	A	A																																			
5.6		5R6	Z					B	B	B	B							A	A	A	A	A	A																																			
6.8		6R8	Z					B	B	B	B							A	A	A	A	A	A																																			
8.2		8R2	Z					B	B	B	B							A	A	A	A	A	A																																			
10		100	Z	A				B	B	B	B	B	E	E	E	E	E	A	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	E	C	C	C	C	C	C	C	C	Z	Z	Z	Z	Z	Z	D	D	D	D	D	D	D		
12		120	Z	A				B	B	B	B	B	E	E	E	E	E	A	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	E	C	C	C	C	C	C	C	C	C	Z	Z	Z	Z	Z	Z	Z	D	D	D	D	D	D	D
15		150	Z	A				B	B	B	B	B	E	E	E	E	E	A	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	E	C	C	C	C	C	C	C	C	C	Z	Z	Z	Z	Z	Z	Z	D	D	D	D	D	D	D
18		180	Z	A				B	B	B	B	B	E	E	E	E	E	A	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	E	C	C	C	C	C	C	C	C	C	Z	Z	Z	Z	Z	Z	Z	D	D	D	D	D	D	D
22		220	Z	A				B	B	B	B	B	E	E	E	E	E	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	E	C	C	C	C	C	C	C	C	C	Z	Z	Z	Z	Z	Z	Z	D	D	D	D	D	D	D
27		270	Z	A				B	B	B	B	B	E	E	E	E	E	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	E	C	C	C	C	C	C	C	C	C	Z	Z	Z	Z	Z	Z	Z	D	D	D	D	D	D	D
33		330	Z	A				B	B	B	D	D	E	E	E	E	E	A	A	A	A	A	A	A	A	C	B	B	B	B	B	B	B	B	E	C	C	C	C	C	C	C	C	C	Z	Z	Z	Z	Z	Z	Z	D	D	D	D	D	D	D
39		390	Z	A				B	B	B	D	D	E	E	E	E	E	A	A	A	A	A	A	A	A	C	B	B	B	B	B	B	B	B	E	C	C	C	C	C	C	C	C	C	Z	Z	Z	Z	Z	Z	Z	D	D	D	D	D	D	D
47		470	Z	A				B	B	D	D	D	E	E	E	E	E	A	A	A	A	A	A	A	A	C	B	B	B	B	B	B	B	B	E	C	C	C	C	C	C	C	C	C	Z	Z	Z	Z	Z	Z	Z	D	D	D	D	D	D	D
56		560	Z	A				B	B	D	D	D	E	E	E	E	E	A	A	A	A	A	A	A	A	C	B	B	B	B	B	B	B	B	E	C	C	C	C	C	C	C	C	C	Z	Z	Z	Z	Z	Z	Z	D	D	D	D	D	D	D
68		680	Z	A				B	B	D	D	D	E	E	E	E	E	A	A	A	A	A	A	A	A	C	B	B	B	B	B	B	B	B	E	C	C	C	C	C	C	C	C	C	Z	Z	Z	Z	Z	Z	Z	D	D	D	D	D	D	D
82		820	B	A				B	B	D	D	D	E	E	E	E	E	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	F	C	C	C	C	C	C	C	C	C	Z	Z	Z	Z	Z	Z	Z	D	D	D	D	D	D	D
100		101	B	A				B	B	D	D	D	E	E	E	E	E	A	A	A	A	A	A	A	C	C	B	B	B	B	B	B	B	J	C	C	C	C	C	C	C	C	C	Z	Z	Z	Z	Z	Z	Z	D	D	D	D	D	D	D	
120		121	A	A				B	B	D	A	A	E	E	E	E	E	A	A	A	A	A	A	A	C	C	B	B	B	B	B	B	B	J	C	C	C	C	C	C	C	C	C	Z	Z	Z	Z	Z	Z	Z	D	D	D	D	D	D	D	
150		151	A	A				B	B	D	A	A	E	E	E	H	H	H	A	A	A	A	A	A	C	C	B	B	B	B	B	B	B	J	C	C	C	C	C	C	C	C	C	Z	Z	Z	Z	Z	Z	Z	D	D	D	D	D	D	D	
180		181	A	A				B	B	A	A	A	E	H	H	H	H	A	A	A	A	A	A	A	C	C	B	B	B	B	B	B	B	F	F	C	C	C	C	C	C	C	C	Z	Z	Z	Z	Z	Z	Z	D	D	D	D	D	D	D	
220		221	A					B	A	A	A	A	E	H	H	H	H	A	A	A	A	A	A	A	C	C	B	B	B	B	B	B	F	F	C	C	C	C	C	C	C	C	C	Z	Z	Z	Z	Z	Z	Z	D	D	D	D	D	D	D	
270		271	A					D	A	A	A	A	E	H	H	H	H	A	A	A	A	A	A	A	C	C	B	B	B	B	B	B	F	F	C	C	C	C	C	C	C	C	C	Z	Z	Z	Z	Z	Z	Z	D	D	D	D	D	D	D	
330		331	A					D	A	A	A	A	E	H	H	H	H	A	A	A	A	A	A	A	C	C	B	B	B	F	F	F	F	F	C	C	C	C	C	C	C	C	C	C	Z	Z	Z	Z	Z	Z	Z	D	D	D	D	D	D	D
390		391	A					D	A	A	A	A	E	H	H	H	H	A	A	A	A	A	A	A	C	C	B	B	B	F	F	F	F	F	C	C	C	C	C	C	C	C	C	C	Z	Z	Z	Z	Z	Z	Z	D	D	D	D	D	D	D
470		471	A					D	A	A	A	A	E	H	H	H	H	A	A	A	A	A	A	A	C	C	B	B	F	F	F	F	F	C	C	C	C	C	C	C	C	C	C	Z	Z	Z	Z	Z	Z	Z	D	D	D	D	D	D	D	
560		561	A					D	A	A			E	H	H	H	H	A	A	A	A	A	A	A	C	C	B	B	F	F	F	F	F	C	C	C	C	C	C	C	C	C	C	Z	Z	Z	Z	Z	Z	Z	D	D	D	D	D	D	D	
680		681	A					D	A				E	H	H	H	H	A	A	A	A	A	A	A	C	C	B	B	F	F	F	F	F	C	C	C	C	C	C	C	C	C	C	Z	Z	Z	Z	Z	Z	Z	D	D	D	D	D	D	D	
750		751	A					A	A				E	H	H	H	H	A	A	A	A	A	A	A	C	C	B	B	F	F	F	F	F	C	C	C	C	C	C	C	C	C	C	Z	Z	Z	Z	Z	Z	Z	D	D	D	D	D	D	D	
820		821	A					A	A				E	H	H	H	H	A	A	A	A	A	A	A	C	C	B	B	F	F	F	F	F	C	C	C	C	C	C	C	C	C	C	Z	Z	Z	Z	Z	Z	Z	D	D	D	D	D	D	D	
1000		102						A	A				E	H	J	J	A	A	A	A	A	A	A	A	C	C	B	B	F	F	F	F	J	J	C	C	C	C	C	C	C	C	C	Z	Z	Z	Z	Z	Z	Z	D	D	D	D	D	D	D	
1200		122						A					E	H	J	J	B	C	A	A	A	A	A	A	C	C	B	B	F	F	F			C	C	C	C	C	C	C	C	C	Z	Z	Z	Z	C	C	C	D	D	D	D	D	D			
1500		152						A					E	J	L	L	B	C							C	C	B	B	F	F	F			C	C	C	C	C	C	C	C	F	F	F	Z	Z	Z	Z	C	C	C	D	D	D	D	D		
1800		182						A					E	L	L	L	B	C							C	C	B	B	F	F	F			C	C	C	C	C	C	C	C	F	F	F	Z	Z	Z	Z	C	C	C	D	D	D	D	D		
2200		222						A					E	L																																												

General Purpose MLCC with FLEXITERM® - NP0, 630V to 5000V

Thickness Table



Case Size	0805(KGF21)			1206(KGF31)				1210(KGF32)					1808(KGF42)			1812(KGF43)				1825(KGF44)		2220(KGF55)		2225(KGF56)	
Thickness Letter	Z	B	A	B	D	G	A	E	G	H	J	L	A	B	C	B	E	F	J	C	F	Z	C	D	G
Max Thickness (mm)	0.85	0.94	1.45	0.94	1.45	1.78	1.80	1.45	1.78	1.80	2.21	2.80	1.45	1.80	2.21	1.45	1.80	2.21	2.80	2.21	2.80	2.21	2.80	2.21	2.80
Carrier Tape	EMB	EMB	EMB	EMB	EMB	EMB	EMB	EMB	EMB	EMB	EMB	EMB	EMB	EMB	EMB	EMB	EMB	EMB	EMB	EMB	EMB	EMB	EMB	EMB	EMB
Packaging Code 7"reel	U	U	U	U	U	U	U	U	U	U	U	U	Y	Y	Y	V	V	V	V	V	V	V	V	V	V
Packaging Code 13"reel	L	L	L	L	L	L	L	L	L	L	L	L	K	K	K	S	S	S	S	S	S	S	S	S	S
	EMBOSSSED(EMB)																								

General Purpose MLCC with FLEXITERM® - X8R/X8L

Capacitance Range

X8R

SIZE		0402		0603		0805		1206	
Soldering		Reflow/Wave		Reflow/Wave		Reflow/Wave		Reflow/Wave	
(L) Length	mm (in.)	1.0 ± 0.1 (0.04 ± 0.1)		1.6 ± 0.15 (0.063 ± 0.006)		2.01 ± 0.2 (0.079 ± 0.008)		3.2 ± 0.2 (0.126 ± 0.008)	
(W) Width	mm (in.)	0.5 ± 0.1 (0.02 ± 0.004)		0.81 ± 0.15 (0.032 ± 0.006)		1.25 ± 0.2 (0.049 ± 0.008)		1.6 ± 0.2 (0.063 ± 0.008)	
(t) Terminal	mm (in.)	0.25 ± 0.15 (0.01 ± 0.006)		0.35 ± 0.15 (0.014 ± 0.006)		0.5 ± 0.25 (0.02 ± 0.01)		0.5 ± 0.25 (0.02 ± 0.01)	
WVDC		50V		25V	50V	100V	25V	50V	100V
271	Cap 270	A	A	A	A				
331	(pF) 330	A	A	A	A	B	B	B	
471	470	A	A	A	A	B	B	B	
681	680	A	A	A	A	B	B	B	
102	1000	A	A	A	A	B	B	B	B
152	1500	A	A	A	A	B	B	B	B
182	1800	A	A	A	A	B	B	B	B
222	2200	A	A	A	A	B	B	B	B
272	2700	A	A	A	A	B	B	B	B
332	3300	A	A	A	A	B	B	B	B
392	3900	A	A	A	A	B	B	B	B
472	4700	A	A	A	A	B	B	B	B
562	5600		A	A	A	B	B	B	B
682	6800		A	A	A	B	B	B	B
822	8200		A	A	A	B	B	B	B
103	Cap 0.01		A	A	A	B	B	B	B
123	(uF) 0.012		A	A		B	B	B	B
153	0.015		A	A		B	B	A	B
183	0.018		A	A		B	B	A	B
223	0.022		A	A		B	B	A	B
273	0.027		A	A		B	B		B
333	0.033		A	A		B	B		B
393	0.039		A	A		B	B		B
473	0.047		A	A		B	B		B
563	0.056		A			A	A		N
683	0.068		A			A	A		N
823	0.082					A	A		N
104	0.1					A	A		N
124	0.12					A	A		N
154	0.15					A	A		N
184	0.18					A			N
224	0.22					A			N
274	0.27								N
334	0.33								N
394	0.39								E
474	0.47								E
684	0.68								G
824	0.82								G
105	1								G
WVDC		50V		25V	50V	100V	25V	50V	100V
SIZE		0402		0603		0805		1206	
Case Size	0402(KGF05)	0603(KGF15)		0805(KGF21)		1206(KGF31)		1210(KGF32)	
Thickness Letter	A	A	B	B	A	B	N	E	G
Max Thickness	0.56	0.90	0.95	0.94	1.45	0.94	1.27	1.52	1.78
Carrier Tape	PAPER	PAPER	PAPER	PAPER	EMB	PAPER	EMB	EMB	EMB
Packaging Code 7" reel	H	T	T	T	U	T	U	U	U
Packaging Code 13" reel	N	M	M	M	L	M	L	L	L
Paper					EMBOSSED (EMB)				

X8L

SIZE		0603		0805		1206		1210	
Soldering		Reflow/Wave		Reflow/Wave		Reflow/Wave		Reflow/Wave	
(L) Length	mm (in.)	1.6 ± 0.15 (0.063 ± 0.006)		2.01 ± 0.2 (0.079 ± 0.008)		3.2 ± 0.2 (0.126 ± 0.008)		3.2 ± 0.2 (0.126 ± 0.008)	
(W) Width	mm (in.)	0.81 ± 0.15 (0.032 ± 0.006)		1.25 ± 0.2 (0.049 ± 0.008)		1.6 ± 0.2 (0.063 ± 0.008)		2.5 ± 0.2 (0.098 ± 0.008)	
(t) Terminal	mm (in.)	0.35 ± 0.15 (0.014 ± 0.006)		0.5 ± 0.25 (0.02 ± 0.01)		0.5 ± 0.25 (0.02 ± 0.01)		0.5 ± 0.25 (0.02 ± 0.01)	
WVDC		25V	50V	100V	25V	50V	100V	16V	25V
271	Cap 270	A	A						
331	(pF) 330	A	A	A	B	B	B		
471	470	A	A	A	B	B	B		
681	680	A	A	A	B	B	B		
102	1000	A	A	A	B	B	B		
152	1500	A	A	A	B	B	B		
182	1800	A	A	A	B	B	B		
222	2200	A	A	A	B	B	B		
272	2700	A	A	A	B	B	B		
332	3300	A	A	A	B	B	B		
392	3900	A	A	A	B	B	B		
472	4700	A	A	A	B	B	B		
562	5600	A	A	A	B	B	B		
682	6800	A	A	A	B	B	B		
822	8200	A	A	A	B	B	B		
103	Cap 0.01	A	A	A	B	B	B		
123	(uF) 0.012	A	A	A	B	B	B		
153	0.015	A	A	A	B	B	B		
183	0.018	A	A	A	B	B	B		
223	0.022	A	A	A	B	B	B		
273	0.027	A	A	A	B	B	B		
333	0.033	A	A	B	B	B	A		
393	0.039	A	A		B	B	A		
473	0.047	A	A		B	B	A		
563	0.056	A	A		B	B	A		
683	0.068	A	A		B	B	A		
823	0.082	A	A		B	B	A		
104	0.1	A	A		B	B	A		
124	0.12				B	A			
154	0.15				B	A			
184	0.18				A	A			
224	0.22				A	A			
274	0.27				A				
334	0.33				A				
394	0.39				A				
474	0.47				A				
684	0.68				A				
824	0.82				A				
105	1				A				
155	1.5				A				
225	2.2				A				
475	4.7								
106	10								
WVDC		25V	50V	100V	25V	50V	100V	16V	25V
SIZE		0603		0805		1206		1210	

General Purpose MLCC with FLEXITERM® - X7R , 4V to 500V Capacitance Range



SIZE		0402					0603					0805					1206					1210					1812		2220																											
Soldering		Reflow/Wave					Reflow/Wave					Reflow/Wave					Reflow/Wave					Reflow Only					Reflow Only		Reflow Only																											
(L) Length	mm (in.)	1 ± 0.1 (0.04 ± 0.004)					1.6 ± 0.15 (0.063 ± 0.006)					2.01 ± 0.2 (0.079 ± 0.008)					3.2 ± 0.2 (0.126 ± 0.008)					3.2 ± 0.2 (0.126 ± 0.008)					4.5 ± 0.3 (0.177 ± 0.012)		5.7 ± 0.5 (0.224 ± 0.02)																											
(W) Width	mm (in.)	0.5 ± 0.1 (0.02 ± 0.004)					0.81 ± 0.15 (0.032 ± 0.006)					1.25 ± 0.2 (0.049 ± 0.008)					1.6 ± 0.2 (0.063 ± 0.008)					2.5 ± 0.2 (0.098 ± 0.008)					3.2 ± 0.2 (0.126 ± 0.008)		5 ± 0.4 (0.197 ± 0.016)																											
(t) Terminal	mm (in.)	0.25 ± 0.15 (0.01 ± 0.006)					0.35 ± 0.15 (0.014 ± 0.006)					0.5 ± 0.25 (0.02 ± 0.01)					0.5 ± 0.25 (0.02 ± 0.01)					0.5 ± 0.25 (0.02 ± 0.01)					0.61 ± 0.36 (0.024 ± 0.014)		0.64 ± 0.39 (0.025 ± 0.015)																											
WVDC		4V	6.3V	16V	25V	50V	6.3V	10V	16V	25V	50V	100V	200V	250V	6.3V	10V	16V	25V	50V	100V	200V	250V	16V	25V	50V	100V	200V	250V	500V	16V	25V	50V	100V	200V	250V	500V	16V	25V	50V	100V	200V	250V	500V													
101	100																																																							
221	220			A	A	A																																																		
271	270			A	A	A																																																		
331	330			A	A	A																																																		
391	390			A	A	A																																																		
471	470			A	A	A																																																		
561	560			A	A	A																																																		
681	680			A	A	A																																																		
821	820			A	A	A																																																		
102	1000			A	A	A		A	A	A	A	A	A	A				B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	G	Y	Y									
122	1220			A	A	A		A	A	A	A	A	A	A				B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	G	Y	Y									
152	1500			A	A	A		A	A	A	A	A	A	A				B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	G	Y	Y									
182	1800			A	A	A		A	A	A	A	A	A	A				B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	G	Y	Y									
222	2200			A	A	A		A	A	A	A	A	A	A				B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	G	Y	Y									
272	2700			A	A	A		A	A	A	A	A	A	A				B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	G	Y	Y									
332	3300			A	A	A		A	A	A	A	A	A	A				B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	G	Y	Y									
392	3900			A	A	A		A	A	A	A	A	A	A				B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	G	Y	Y									
472	4700			A	A	A		A	A	A	A	A	A	A				B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	G	Y	Y									
562	5600			A	A	A		A	A	A	A	A	A	A				B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	G	Y	Y									
682	6800			A	A	A		A	A	A	A	A	A	A				B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	G	Y	Y									
822	8200			A	A	A		A	A	A	A	A	A	A				B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	G	Y	Y									
103	Cap 0.01			A	A	A		A	A	A	A	A	A	A				B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	G	Y	Y										
123	(F) 0.012			A				A	A	A	A	A						B	B	B	K	K	K	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	G	Y	Y										
153	0.015			A				A	A	A	A	A						B	B	B	K	K	K	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	G	Y	Y										
183	0.018			A				A	A	A	A	A						B	B	B	K	K	K	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	G	Y	Y										
223	0.022			A				A	A	A	A	A						B	B	B	K	K	K	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	G	Y	Y										
273	0.027			A				A	A	A	A	B						B	B	B	K	K	K	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	G	Y	Y										
333	0.033			A				A	A	A	A	B						B	B	B	K	K	K	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	G	Y	Y										
393	0.039							A	A	A	A	B						B	B	B	K	K	K	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	G	Y	Y										
473	0.047							A	A	A	A	B						B	B	B	K	K	K	B	B	B	B	N	G	G	G	G	G	G	G	G	G	G	B	B	B	B	C	G	Y	Y										
563	0.056							A	A	A	A	B						B	B	B	K			B	B	B	B	N	G	G	G	G	G	G	G	B	B	B	B	C	G	Y	Y													
683	0.068							A	A	A	A	B						B	B	B	K			B	B	B	B	N	G	G	G	G	G	G	B	B	B	B	C	G	Y	Y														
823	0.082							A	A	A	A	B						B	B	B	K			B	B	B	B	N	G	G	G	G	G	B	B	B	B	C	G	G	Y	Y														
104	0.1							A	A	A	A	B						B	B	B	K			B	B	B	B	N	G	G	G	G	G	B	B	B	B	C	G	G	Y	Y														
124	0.12							A	B	B								B	B	B	K	K		B	B	B	N	N	G	G	G	G	G	B	B	B	B	F	G	G	Y	Y														
154	0.15							A	B	B								J	K	K	K			B	B	B	N	N	G	G	G	G	G	B	B	B	B	F	G	G	Y	Y														
224	0.22							A	B	B								J	K	K	K			B	B	B	N	N	G	G	G	G	G	C	C	C	F	G	G	Z	Z															
334	0.33																	K	K	K	K			B	B	B	E	G	G	G	G	G	F	F	F	G	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L				
474	0.47																	K	K	K	K			N	N	E	E	G						F	F	F	G																			
684	0.68																	K	K	K	K			N	G	G	G	G						F	F	G	K																			
105	1.0																	K	K	K	K			N	G	G	G	G						F	G	G	L																			
155	1.5																	K	K	K			G	G	G	G	G						F	G	L	L																				
225	2.2																	K	K	K			G	G	G	G	G						K	L	L	L																				
335	3.3																						G	G	G								K	L	L	L																				
475	4.7																						G	G	G								K	L	L	L																				
106	10																						G										L	L	L																					
226	22																																																							
WVDC		4V	6.3V	16V	25V	50V	6.3V	10V	16V	25V	50V	100V	200V	25																																										

General Purpose MLCC with FLEXITERM® - X7R ,
630V to 5000V
Capacitance Range



SIZE	0805				1206				1210				1808				1812				1825				2220				2225				3640																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
Soldering	Reflow/Wave				Reflow/Wave				Reflow Only				Reflow Only				Reflow Only				Reflow Only				Reflow Only				Reflow Only																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	2.10 ± 0.20 (0.083 ± 0.008)				3.30 ± 0.30 (0.130 ± 0.012)				3.30 ± 0.40 (0.130 ± 0.016)				4.60 ± 0.50 (0.181 ± 0.020)				4.60 ± 0.50 (0.181 ± 0.020)				4.60 ± 0.50 (0.181 ± 0.020)				5.70 ± 0.50 (0.224 ± 0.020)				5.70 ± 0.50 (0.224 ± 0.020)				9.14 ± 0.25 (0.360 ± 0.010)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
(W) Width	1.25 ± 0.20 (0.049 ± 0.008)				1.60 ± 0.30/-0.10 (0.063 ± 0.012/-0.004)				2.50 ± 0.30 (0.098 ± 0.012)				2.00 ± 0.20 (0.079 ± 0.008)				3.20 ± 0.30 (0.126 ± 0.012)				6.30 ± 0.40 (0.248 ± 0.016)				5.00 ± 0.40 (0.197 ± 0.016)				6.30 ± 0.40 (0.248 ± 0.016)				5.72 ± 0.25 (0.225 ± 0.010)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	0.50 ± 0.20 (0.020 ± 0.008)				0.60 ± 0.20 (0.024 ± 0.008)				0.75 ± 0.35 (0.030 ± 0.014)				0.75 ± 0.35 (0.030 ± 0.014)				0.75 ± 0.35 (0.030 ± 0.014)				0.75 ± 0.35 (0.030 ± 0.014)				0.85 ± 0.35 (0.033 ± 0.014)				0.85 ± 0.35 (0.033 ± 0.014)				0.76 (0.030) 1.52 (0.062)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
(t) Terminal	(0.020 ± 0.008) (in.)				(0.024 ± 0.008) (in.)				(0.030 ± 0.014) (in.)				(0.030 ± 0.014) (in.)				(0.030 ± 0.014) (in.)				(0.030 ± 0.014) (in.)				(0.033 ± 0.014) (in.)				(0.033 ± 0.014) (in.)				1.52 (0.062) (in.)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
WVDC	630	1000	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	2500	3000	630	1000	1500	2000	2500	3000	4000	5000																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
Cap (pF) 100	101	B	A	D	A	A	A	A	H	H	H	H																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
120	121	B	A	D	A	A	A	A	H	H	H	H																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
150	151	B	A	D	A	A	A	A	H	H	H	H																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
180	181	B	A	D	A	A	A	A	H	H	H	H																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
220	221	B	A	D	A	A	A	A	H	H	H	H	B	B	B	B	B	B	E	E	E	E																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
270	271	B	A	D	A	A	A	A	H	H	H	H	B	B	B	B	B	B	E	E	E	E																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
330	331	B	A	D	A	A	A	A	H	H	H	H	B	B	B	B	B	B	E	E	E	E																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
390	391	B	A	D	A	A	A	A	H	H	H	H	B	B	B	B	B	B	E	E	E	E																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
470	471	B	A	D	A	A	A	A	H	H	H	H	B	B	B	B	B	B	E	E	E	E	E	E																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
560	561	B	A	D	A	A	A	A	H	H	H	H	B	B	B	B	B	B	E	E	E	E	E	E																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
680	681	B	A	D	A	A	A	A	H	H	H	H	B	B	B	B	B	B	E	E	E	E	E	F	F																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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1000	102	B	A	D	A	A	A	A	H	H	H	H	B	B	B	B	B	B	E	E	E	E	F	F	C	C	C	C	C	C	C	Z	Z	Z	Z	Z	C	D	D	D	D	D	D	D	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A