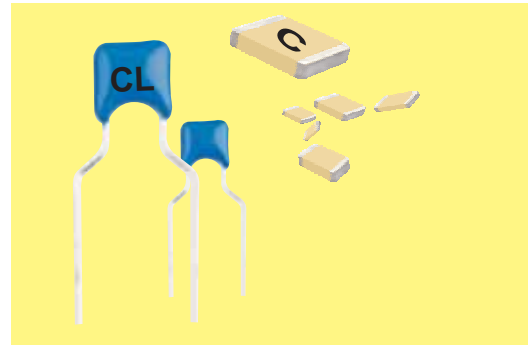


MULTILAYER CERAMIC CAPACITORS C and CL SERIES

Description

Multilayer ceramic capacitors cover capacitance range from 1pF to 10μF, operating voltages from 16Vdc up to 10kVdc. KEKO VARICON offers THD(leaded) and SMD products.

Such capacitors are suited for by-pass and coupling applications or for frequency discriminating circuits. KEKO VARICON also offers multilayer ceramic chip SAFETY capacitors (class X and Y) and Line-by-pass and Across the Line Capacitors.



Features

- Capacitance range1 pF to 10μF.
- Rated DC Voltage U_r 16,24,50,100,250,300,500, 1kV to 10kV.
- 19 Model sizes available0603 up to 9080 for SMD components.
- 4 Model sizes available..... 602, 802, 902, 1103 for Leaded components.
- Dielectric Types NPo, X7R / Y5V / Z5U.
 - Npo(CG) - dielectric constant around 90 (very stable characteristics-T,f,U, low capacitance).*
 - X7R(2R1) - dielectric constant around 3000 (higher capacitance in the same case size as Npo).*
 - Y5V,Z5U(2F4) - dielectric constant around 15000 (very high capacitance in small case sizes).*
- Maximum operating temperature - +85 °C.
- Safety capacitors class X and Y, Line-by-pass and Across the Line Capacitors
- Available with straight and crimped leads.
- Lead free components. ^{us}
- UL, CSA approval.

	DIELECTRIC		
	NPo (CG)	X7R (2R1)	Y5V (2F4)
Capacitance range	1 pF to 10μF		
Capacitance tolerance *	C, D, G, J, K, M	K, M, S, Z	M, S, Z
Dissipation Factor tg δ	15*10 ⁻⁴ for C≥50pF or 1.5*(150/C+7)*10 ⁻⁴	350*10 ⁻⁴	350*10 ⁻⁴
Measuring Frequency (for C and tg δ)	1 MHz for C≤1000pF 1 kHz for C>1000pF	1 MHz for C≤100pF 1 kHz for C>100pF	1 kHz
Measuring Voltage (C, tg δ)	1 Vrms	0.3 Vrms	0.3 Vrms
Rated Voltage	16V - 10kV		
Test Voltage (16V -10kV)**	16V-100V = 2,5*Ur 200V-500V = 1,5*Ur+100V > 500V = 1,2*Ur		
Insulating Resistance Ri	Ri≥10000MΩ (for Cr≤10nF) Ri≥100/Cr [Ω] (for Cr>10nF)	Ri≥4000MΩ (for Cr≤25nF) Ri≥100/Cr [Ω] (for Cr>25nF)	
Measuring Voltage for Ri	16 - 1kV= Ur		
Temperature Range	-55°C to +125°C	-55°C to +125°C	-25°C to +85°C
Temperature Characteristics	0±30ppm/°C	±15%	±30% / -80%
Climatic Categoroz	55 / 125 / 56	55 / 125 / 56	25 / 85 / 21
Temperature Range	23°C		
Voltage Dependence	No	Yes	Yes
Aging (per hour decade)	0	<2%	<6%
Termination (chip)	AgPd or Ni barrier		
Packaging	Bulk or Taped		
Standard	IEC 60384-21,22 for SMD; IEC 60384-8,9 for leaded THD IEC 60286-3 for taped SMD; IEC 60286-3 for taped leaded THD		

Device Ratings and Characteristics

NPo(CG), X7R(2R1), Y5V(2F4) // 16V and 25V

Size	NPo (CG)						X7R (2R1)						Y5V (2F4)						
	0603		0805		1206		0603		0805		1206		0603		0805		1206		
	Rated Voltage						Rated Voltage						Rated Voltage						
Cn	Code	16V	25V	16V	25V	16V	25V	16V	25V	16V	25V	16V	25V	16V	25V	16V	25V	16V	25V
1 - 8,2pF																			
10	100																		
12	120																		
15	150																		
18	180																		
22	220																		
27	270																		
33	330																		
39	390																		
47	470																		
56	560																		
68	680																		
82	820																		
100	101							101		101		101							
120	121																		
150	151																		
180	181																		
220	221																		
270	271																		
330	331																		
390	391																		
470	471																		
560	561																		
680	681																		
820	821																		
1nF	102																		
1.2	122																		
1.5	152																		
1.8	182																		
2.2	222													222		222		222	
2.7	272																		
3.3	332																		
3.9	392																		
4.7	472																		
5.6	562																		
6.8	682																		
8.2	822																		
10	103																		
12	123	103																	
15	153																		
18	183																		
22	223																		
27	273																		
33	333																		
39	393				333														
47	473																		
56	563																		
68	683																		
82	823																		
100	104																		
120	124					104		104											
...	...																		
220	224							224											
...	...																		
470	474																		
...	...																		
1μF	105																		
...	...																		
2.2	225													105					
...	...																		
4.7	475																		
...	...																		
10	106																		
...	...																		

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Device Ratings and Characteristics

NPo(CG) // 50V and 100V

NPo (CG)


Size	0603		0805		1206		1210		1808		1812		2220		2225	
	Rated Voltage															
Cn Code	50V	100V	50V	100V	50V	100V	50V	100V	50V	100V	50V	100V	50V	100V	50V	100V
1 - 8,2pF							100	100	100							
10 100																
12 120																
15 150																
18 180																
22 220																
27 270													270		270	
33 330																
39 390																
47 470																
56 560																
68 680																
82 820																
100 101																
120 121																
150 151																
180 181																
220 221																
270 271																
330 331																
390 391																
470 471																
560 561																
680 681																
820 821		681														
1nF 102																
1.2 122																
1.5 152																
1.8 182																
2.2 222																
2.7 272																
3.3 332				272												
3.9 392	332															
4.7 472																
5.6 562																
6.8 682																
8.2 822						682										
10 103								822		822						
12 123			103													
15 153																
18 183																
22 223																
27 273												223				
33 333																
39 393						333	333	333	333							
47 473																
56 563														473		473
68 683													563		563	
82 823																
100 104																
120 124																
150 154																
180 184																
220 224																
270 274																
330 334																
390 394																

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Device Ratings and Characteristics

X7R(2R1) // 50V and 100V

X7R (2R1)









Size																
	0603		0805		1206		1210		1808		1812		2220		2225	
Cn Code	Rated Voltage															
	50V		100V		50V		100V		50V		100V		50V		100V	
100 pF	101															
120	121															
150	151															
180	181															
220	221															
270	271															
330	331					331										
390	391						471	471								
470	471															
560	561															
680	681															
820	821										102					
1 nF	102															
1.2	122															
1.5	152															
1.8	182												222		222	
2.2	222															
2.7	272															
3.3	332															
3.9	392															
4.7	472															
5.6	562															
6.8	682															
8.2	822															
10	103															
12	123															
15	153															
18	183															
22	223															
27	273		223													
33	333															
39	393															
47	473															
56	563															
68	683															
82	823															
100	104															
120	124	104			104											
150	154															
180	184															
220	224															
270	274															
330	334															
390	394			334												
470	474															
560	564					474	474	474								
680	684															
820	824										684					
1 μF	105															
1.2	125					105	105	105	105							
1.5	155															
1.8	185															
2.2	225												155		155	
2.7	275															
3.3	335															
3.9	395															
4.7	475															
5.6	565															
6.8	685															

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Device Ratings and Characteristics

Y5V, Z5U (2F4) // 50V and 100V

Y5V (Z5U)

Size																
	0603		0805		1206		1210		1808		1812		2220		2225	
Cn Code	Rated Voltage															
	50V	100V	50V	100V	50V	100V	50V	100V	50V	100V	50V	100V	50V	100V	50V	100V
2.2nF 222																
2.7 272																
3.3 332																
3.9 392																
4.7 472						472										
5.6 562																
6.8 682																
8.2 822																
10 103							103		103							
12 123																
15 153																
18 183																
22 223																
27 273																
33 333																
39 393		333														
47 473																
56 563											222					
68 683																
82 823																
100 104												104		104		
120 124																
150 154																
180 184																
220 224				184												
270 274	224															
330 334																
390 394																
470 474																
560 564																
680 684																
820 824						684										
1 uF 105																
1.2 125			105													
1.5 155								125		125						
1.8 185																
2.2 225																
2.7 275						225		225		225			225			
3.3 335												275				
3.9 395																
4.7 475																
5.6 565																
6.8 685																
8.2 825																
10 106													825			
12 126																
15 156													106			
18 186														106		825
22 226																
27 276																
33 336																
39 396																
47 476																
56 566																
68 686																
82 826																

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Device Ratings and Characteristics

NPo(CG) // 250V, 300V and 500V

NPo (CG)








Size	0805			1206			1210			1808			1812			2220			2225		
	Rated Voltage																				
Cn Code	250V	300V	500V	250V	300V	500V	250V	300V	500V	250V	300V	500V	250V	300V	500V	250V	300V	500V	250V	300V	500V
1 - 8,2pF							100			100			100								
10 100																					
12 120																					
15 150																					
18 180																					
22 220																					
27 270																270			270		
33 330																					
39 390																					
47 470																					
56 560																					
68 680																					
82 820																					
100 101																					
120 121																					
150 151																					
180 181																					
220 221																					
270 271																					
330 331																					
390 391																					
470 471																					
560 561			471																		
680 681																					
820 821		681																			
1nF 102																					
1.2 122						102															
1.5 152	122																				
1.8 182																					
2.2 222					182																
2.7 272									222												
3.3 332					272																
3.9 392																					
4.7 472																					
5.6 562																					
6.8 682																					
8.2 822																					
10 103																					
12 123																					
15 153																					
18 183																					
22 223																					
27 273																					
33 333																					
39 393																					
47 473																					
56 563																					
68 683																					
82 823																					
100 104																					
120 124																					
150 154																					
180 184																					
220 224																					
270 274																					
330 334																					
390 394																					

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Device Ratings and Characteristics

X7R (2R1) // 250V, 300V and 500V

X7R (2R1)

Size																					
	0805			1206			1210			1808			1812			2220			2225		
Cn Code	Rated Voltage																				
	250V	300V	500V	250V	300V	500V	250V	300V	500V	250V	300V	500V	250V	300V	500V	250V	300V	500V	250V	300V	500V
100 pF 101																					
120 121																					
150 151																					
180 181																					
220 221								221		221			221								
270 271																					
330 331																					
390 391																					
470 471																					
560 561																					
680 681																					
820 820																					
1nF 102																	102			102	
1.2 122																					
1.5 152																					
1.8 182																					
2.2 222																					
2.7 272																					
3.3 332																					
3.9 392																					
4.7 472																					
5.6 562																					
6.8 682			562																		
8.2 822																					
10 103																					
12 123		103																			
15 153																					
18 183						153															
22 223	183																				
27 273				223																	
33 333																					
39 393																					
47 473																					
56 563																					
68 683								473													
82 823								563					563								
100 104																					
120 124																					
150 154																					
180 184																					
220 224								184													
270 274										224											
330 334																					
390 394																					
470 474																					
560 564																					
680 684																					
820 824																					
1.0 uF 105																					
1.2 125																					
1.5 155																					
1.8 185																					
2.2 225																					
2.7 275																					
3.3 335																					
3.9 395																					
4.7 475																					
5.6 565																					
6.8 685																					

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Device Ratings and Characteristics

Y5V, Z5U (2F4) // 250V, 300V and 500V

Y5V (Z5U)

Size	0805			1206			1210			1808			1812			2220			2225		
	Rated Voltage																				
Cn Code	250V	300V	500V	250V	300V	500V	250V	300V	500V	250V	300V	500V	250V	300V	500V	250V	300V	500V	250V	300V	500V
2.2 nF 222																					
2.7 272																					
3.3 332								332			332										
3.9 393																					
4.7 472																					
5.6 562																					
6.8 682																					
8.2 822																					
10 103														103							
12 123																					
15 153																					
18 183			153														153			153	
22 223																					
27 273																					
33 333		273																			
39 393																					
47 473																					
56 563						473			473			473									
68 683	563				563																
82 823																					
100 104									104			104									
120 124										104			104					104			
150 154				124																	
180 184																		154		154	
220 224																					
270 274																					
330 334								274			274				274						
390 394																					
470 474																					
560 564																					
680 684													564								
820 824																	684			684	
1.0 uF 105																					
1.2 125																					
1.5 155																	125			125	
1.8 185																					
2.2 225																					
2.7 275																					
3.3 335																					
3.9 395																					
4.7 475																					
5.6 565																					
6.8 685																					
8.2 825																					
10 106																					
12 126																					
15 156																					
18 186																					
22 226																					
27 276																					
33 336																					
39 396																					
47 476																					
56 566																					
68 686																					
82 826																					

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Device Ratings and Characteristics

NPo(CG) // 1kV - 10kV

NPo (CG)

Size	0805	1206	1210	1515	1808	1812	1825	2220	2225	2520	3640	4012	4032	5040	5550	6660	7565	9080
Cn Code																		
1 - 8,2pF																		
10 100																		
12 120																		
15 150																		
18 180																		
22 220																		
27 270																		
33 330																		
39 390																		
47 470																		
56 560																		
68 680										6kV 820								
82 820																		
100 101																		
120 121					4kV													
150 151																		
180 181					181													
220 221	1kV	2kV			3kV	4kV						7kV						
270 271		271			331	331	5kV	5kV				271						
330 331	331				331	331	5kV	5kV				6kV 391						
390 391									5kV	5kV		5kV 561						
470 471							471	471				5kV 561						
560 561		1kV			2kV	561			561	561		4kV 821						
680 681			681									6kV 821						
820 821		821				821	2kV	4kV	4kV			7kV	821	10kV				
1nF 102										4kV	4kV	7kV	3kV 122	102				
1.2 122							122	122	122				5kV 152	9kV 152	10kV			
1.5 152			1kV		1kV		182	182	182	152	152	152	4kV	8kV 152	10kV			
1.8 182			182		1kV		182	182	182	3kV	3kV	6kV		7kV 272	9kV			
2.2 222					222	222				222	222	5kV	4kV 272	6kV 272	8kV 272	10kV 272		
2.7 272														7kV 392	10kV			
3.3 332														5kV 392	8kV	10kV		
3.9 392							392	392						3kV 392	5kV 392	8kV 392	10kV 392	10kV
4.7 472															5kV	7kV	9kV	10kV
5.6 562															562	562	8kV	9kV
6.8 682							1kV	1kV		2kV 682	4kV	2kV 682	2kV			6kV	7kV	8kV
8.2 822							822	822		822	822	822	822	4kV				822
10 103										103	103			103				103
12 123										1kV	123	1kV	123	123				123
15 153										123			153	153				153
18 183														3kV				
22 223														2kV				
27 273														273				
33 333														1kV				
39 393														393				
47 473																		
56 563																		
68 683																		
82 823																		
100 104																		
120 124																		
150 154																		
180 184																		
220 224																		
270 274																		
330 334																		
390 394																		

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Device Ratings and Characteristics

X7R (2R1) // 1kV - 10kV

X7R (2R1)

Size	0805	1206	1210	1515	1808	1812	1825	2220	2225	2520	3640	4012	4032	5040	5550	6660	7565	9080
Cn Code																		
100 pF 101																		
120 121																		
150 151																		
180 181																		
220 221																		
270 271																		
330 331																		
390 391																		
470 471						4kV												
560 561						561												
680 681		2kV			3kV													
820 821		821			821			5kV					6kV					
1 nF 102				3kV				102					102					
1.2 122				122									5kV					
1.5 152						3kV	4kV	4kV	5kV				152					
1.8 182	1kV					182	182	182	182	5kV			152					
2.2 222	222									222			222					
2.7 272			2kV			272				272			272	4kV	10kV			
3.3 332				2kV						392			332	332	332			
3.9 392				392														
4.7 472																		
5.6 562		1kV					2kV	3kV	3kV					8kV				
6.8 682		682					682	682	682					7kV	10kV			
8.2 822									822	822	7kV			822	822	10kV		
10 103			1kV								6kV		4kV	6kV	9kV	103		
12 123			123							153	2kV		123	123	8kV	9kV		
15 153					1kV						183	2kV		5kV	7kV	8kV		
18 183					183						183			183	6kV	7kV	10kV	
22 223							2kV	2kV					223	4kV	223	223	223	10kV
27 273				1kV		1kV	273	273					273	273	6kV	9kV	273	10kV
33 333				333		333			2kV		3kV		333	3kV	5kV	333	8kV	9kV
39 393									393		393			393	5kV	7kV	8kV	
47 473														473	473	473	6kV	7kV
56 563							1kV							563			563	6kV
68 683							638	1kV									5kV	683
82 823								823		1kV	2kV			2kV	3kV	4kV	823	5kV
100 104									1kV	104	104	1kV		104	104	104		104
120 124									124									124
150 154													1kV		2kV	3kV		154
180 184															184	184		184
220 224																	224	224
270 274																		274
330 334																	334	
390 394											1kV							
470 474											474			1kV				2kV
560 564																		564
680 684														1kV				
820 824														824				
1 uF 105																1kV		
1.2 125																125		
1.5 155																		
1.8 185																	1kV	
2.2 225																		225
2.7 275																		

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