

For 600V to 5000V Applications

Capacitance Range	10 pF to 0.100 μ F (25°C, 1.0 $\pm$ 0.2 Vrms at 1kHz, for $\leq$ 1000 pF use 1 MHz)
Capacitance Tolerances	$\pm$ 5%, $\pm$ 10%, $\pm$ 20%
Dissipation Factor	0.1% max. (+25°C, 1.0 $\pm$ 0.2 Vrms, 1kHz, for $\leq$ 1000 pF use 1 MHz)
Operating Temperature Range	-55°C to +125°C
Temperature Characteristic	0 $\pm$ 30 ppm/°C (0VDC)
Voltage Ratings	600, 630, 1000, 1500, 2000, 2500, 3000, 4000 & 5000 VDC (+125°C)
Insulation Resistance (+25°C, at 500 VDC)	100K M Ω min. or 1000 M Ω - μ F min., whichever is less
Insulation Resistance (+125°C, at 500 VDC)	10K M Ω min. or 100 M Ω - μ F min., whichever is less
Dielectric Strength	Minimum 120% rated voltage for 5 seconds at 50 mA max. current

Case Size		0805		1206				1210						1808								1812							
Soldering		Reflow/Wave		Reflow/Wave				Reflow Only						Reflow Only								Reflow Only							
(L) Length	mm (in.)	2.10 ±0.20 (0.085 ±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 (0.177 ±0.012)							
(W) Width	mm (in.)	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 ±0.008)							
(T) Thickness	mm (in.)	1.35 (0.053)		1.80 (0.071)				2.80 (0.110)						2.20 (0.087)								2.80 (0.100)							
(t) Terminal	min max	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)							
Voltage(V)	600 630 1000	600 630 1000	600 630 1000 1500 2000	600 630 1000 1500 2000	600 630 1000 1500 2000 3000	600 630 1000 1500 2000 3000	600 630 1000 1500 2000 3000	600 630 1000 1500 2000 2500 3000 4000	600 630 1000 1500 2000 2500 3000 4000	600 630 1000 1500 2000 2500 3000 4000	600 630 1000 1500 2000 2500 3000 4000	600 630 1000 1500 2000 2500 3000 4000	600 630 1000 1500 2000 2500 3000 4000	600 630 1000 1500 2000 2500 3000 4000	600 630 1000 1500 2000 2500 3000 4000														
Cap (pF)	5 10R5 1.0 1R0 1.2 1R2 1.5 1R5 1.8 1R8 2.2 2R2 2.7 2R7 3.3 3R3 3.9 3R9 4.7 4R7 5.6 5R6 6.8 6R8 8.2 8R2 10 100 12 120 15 150 18 180 22 220 27 270 33 330 39 390 47 470 56 560 68 680 82 820 100 101 120 121 150 151 180 181 220 221 270 271 330 331 390 391 470 471 560 561 680 681 750 751 820 821 1000 102 1200 122 1500 152 1800 182 2200 222 2700 272 3300 332 3900 392 4700 472 5600 562 6800 682 8200 822 0.010 0.012 0.015 0.018 0.022 0.027 0.033 0.047 0.056 0.068 0.100 0.12 0.15 0.18 0.22 0.27 0.33 0.334	600 630 1000 1500 2000 3000 4000 5000 6000 7000 8000 9000 10000 11000 12000 13000 14000 15000 16000 17000 18000 19000 20000 21000 22000 23000 24000 25000 26000 27000 28000 29000 30000 31000 32000 33000 34000 35000 36000 37000 38000 39000 40000 41000 42000 43000 44000 45000 46000 47000 48000 49000 50000 51000 52000 53000 54000 55000 56000 57000 58000 59000 60000 61000 62000 63000 64000 65000 66000 67000 68000 69000 70000 71000 72000 73000 74000 75000 76000 77000 78000 79000 80000 81000 82000 83000 84000 85000 86000 87000 88000 89000 90000 91000 92000 93000 94000 95000 96000 97000 98000 99000 100000 101000 102000 103000 104000 105000 106000 107000 108000 109000 110000 111000 112000 113000 114000 115000 116000 117000 118000 119000 120000 121000 122000 123000 124000 125000 126000 127000 128000 129000 130000 131000 132000 133000 134000 135000 136000 137000 138000 139000 140000 141000 142000 143000 144000 145000 146000 147000 148000 149000 150000 151000 152000 153000 154000 155000 156000 157000 158000 159000 160000 161000 162000 163000 164000 165000 166000 167000 168000 169000 170000 171000 172000 173000 174000 175000 176000 177000 178000 179000 180000 181000 182000 183000 184000 185000 186000 187000 188000 189000 190000 191000 192000 193000 194000 195000 196000 197000 198000 199000 200000 201000 202000 203000 204000 205000 206000 207000 208000 209000 210000 211000 212000 213000 214000 215000 216000 217000 218000 219000 220000 221000 222000 223000 224000 225000 226000 227000 228000 229000 230000 231000 232000 233000 234000 235000 236000 237000 238000 239000 240000 241000 242000 243000 244000 245000 246000 247000 248000 249000 250000 251000 252000 253000 254000 255000 256000 257000 258000 259000 260000 261000 262000 263000 264000 265000 266000 267000 268000 269000 270000 271000 272000 273000 274000 275000 276000 277000 278000 279000 280000 281000 282000 283000 284000 285000 286000 287000 288000 289000 290000 291000 292000 293000 294000 295000 296000 297000 298000 299000 300000 301000 302000 303000 304000 305000 306000 307000 308000 309000 310000 311000 312000 313000 314000 315000 316000 317000 318000 319000 320000 321000 322000 323000 324000 325000 326000 327000 328000 329000 330000 331000 332000 3330																											

NOTE: Contact factory for non-specified capacitance values



High Voltage MLC Chips

For 600V to 5000V Applications

NP0 (C0G) CAPACITANCE RANGE – PREFERRED SIZES ARE SHADED

Case Size	1825								2220								2225								3640										
Soldering	Reflow Only								Reflow Only								Reflow Only								Reflow Only										
(L) Length mm	4.60 ±0.50								5.70 ±0.50								5.70 ±0.50								9.14 ±0.25										
(L) Length (in.)	(0.181 ±0.020)								(0.224 ±0.020)								(0.225 ±0.010)								(0.360 ±0.010)										
(W) Width mm	6.30 ±0.40								5.00 ±0.40								6.30 ±0.40								10.2 ±0.25										
(W) Width (in.)	(0.248 ±0.016)								(0.197 ±0.016)								(0.250 ±0.010)								(0.400 ±0.010)										
(T) Thickness mm	3.40								3.40								3.40								2.54										
(T) Thickness (in.)	(0.134)								(0.134)								(0.100)								(0.100)										
(t) Terminal min	0.75 ±0.35								0.85 ±0.35								0.85 ±0.35								0.76 (0.030)										
(t) Terminal max	(0.030 ±0.014)								(0.033 ±0.014)								(0.033 ±0.014)								1.52 (0.060)										
Voltage (V)	600	630	1000	1500	2000	2500	3000	4000	600	630	1000	1500	2000	2500	3000	4000	5000	600	630	1000	1500	2000	2500	3000	4000	5000	600	630	1000	1500	2000	2500	3000	4000	5000
Cap (pF)	1.5 1R5																																		
	1.8 1R8																																		
	2.2 2R2																																		
	2.7 2R7																																		
	3.3 3R3																																		
	3.9 3R9																																		
	4.7 4R7																																		
	5.6 5R6																																		
	6.8 6R8																																		
	8.2 8R2																																		
	10 100	E	E	G	E	F	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	F	F									
	12 120	E	E	G	E	F	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	F	F									
	15 150	E	E	G	E	F	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	F	F									
	18 180	E	E	G	E	F	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	F	F									
	22 220	E	E	G	E	F	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	F	F									
	27 270	E	E	G	E	F	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	F	F									
	33 330	E	E	G	E	F	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	F	F									
	39 390	E	E	G	E	F	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	F	F									
	47 470	E	E	G	E	F	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	F	G								G	
	56 560	E	E	G	E	F	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	F	G								G	
	68 680	E	E	G	E	F	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	F	G								G	
	82 820	E	E	G	E	F	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	F	G								G	
	100 101	E	E	G	E	F	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	G	G			G	G	G	G	G	G	
	120 121	E	E	G	E	F	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	G	G			G	G	G	G	G	G	
	150 151	E	E	G	E	F	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	G	G			G	G	G	G	G	G	
	180 181	E	E	G	E	F	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	G	G			G	G	G	G	G	G	
	220 221	E	E	G	E	F	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	G	G			G	G	G	G	G	G	
	270 271	E	E	G	E	F	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	G	G			G	G	G	G	G	G	
	330 331	E	E	G	E	F	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	G	G			G	G	G	G	G	G	
	390 391	E	E	G	E	F	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	G	G			G	G	G	G	G	G	
	470 471	E	E	G	E	F	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	G	G			G	G	G	G	G	G	
	560 561	E	E	G	E	F	F	F	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	G	G			G	G	G	G	G	G	
	680 681	E	E	G	E	F	F	G	E	E	E	E	E	E	F	F		E	E	E	E	E	E	E	G	G			G	G	G	G	G	G	
	750 751	E	E	G	E	F	F	G	E	E	E	E	E	E	F	F		E	E	E	E	E	E	E	G	G			G	G	G	G	G	G	
	820 821	E	E	G	E	F	F	G	E	E	E	E	E	E	F	F		E	E	E	E	E	E	E	G	G			G	G	G	G	G	G	
	1000 102	E	E	G	E	F	F	G	E	E	E	E	E	E	F	F		E	E	E	E	E	E	E	G	G			G	G	G	G	G	G	
	1200 122	E	E	G	E	F	G	G	E	E	E	E	E	E	G	G		E	E	E	E	E	E	F	F	G			G	G	G	G	G	G	
	1500 152	E	E	G	F	G	G	G	E	E	E	F	F	G	G	G		E	E	E	E	E	E	F	F	G			G	G	G	G	G	G	
	1800 182	E	E	G	F	G	G	G	E	E	E	F	F	G	G	G		E	E	E	E	E	E	G	G	G			G	G	G	G	G	G	
	2200 222	E	E	G	G	G	G	G	E	E	E	G	G	G	G	G		E	E	E	E	E	E	G	G	G			G	G	G	G	G	G	
	2700 272	E	E	G	G	G	G	G	E	E	E	G	G	G	G	G		E	E	E	F	F	G	G	G	G			G	G	G	G	G	G	
	3300 332	E	E	G	G	G			E	E	E	G	G					E	E	E	F	F	G	G	G				G	G	G	G	G	G	
	3900 392	E	E	G	G	G			E	E	E	G	G					E	E	E	G	G							G	G	G	G	G	G	
	4700 472	E	E	G	G	G			E	E	E	G	G					F	F	F	G	G							G	G	G	G	G	G	
	5600 562	F	F	G	G	G			F	F	F	G	G					F	F	F	G	G							G	G	G	G	G	G	
	6800 682	F	F	G	G	G			G	G	G	G	G					F	F	F	G	G							G	G	G	G	G	G	
	8200 822	F	F	G	G	G			G	G	G	G	G					G	G	G	G	G							G	G	G	G	G	G	
Cap (µF)	0.010	103	F	F	G	G			G	G	G							G	G	G	G	G							G	G	G	G	G	G	
	0.012	123	F	F	G				G	G	G							G	G	G									G	G	G				
	0.015	153	F	F					G	G								G	G	G									G	G	G				
	0.018	183	F	F					G	G								G	G	G									G	G	G				
	0.022	223	F	F					G	G								G	G	G									G	G	G				
	0.027	227	F	F					G	G								G	G	G									G	G					
	0.033	333	F	F					G	G								G	G	G									G	G					
	0.039	393	G	G					G	G								G	G	G									G	G					
	0.047	473	G	G					G	G								G	G	G									G	G					
	0.056	563	G	G					G	G								G	G	G									G	G					
	0.068	683	G	G														G	G	G															
	0.100	104																G	G	G															
Voltage (V)	600	630	1000	1500	2000	2500	3000	4000	600	630	1000	1500	2000	2500	3000	4000	5000	600	630	1000	1500	2000	2500	3000	4000	5000	600	630	1000	1500	2000	2500	3000	4000	5000
Case Size	1825								2220								2225								3640										

High Voltage MLC Chips

For 600V to 5000V Applications

X7R Dielectric

Performance Characteristics

Capacitance Range	10 pF to 0.82 μ F (25°C, 1.0 $\pm$ 0.2 Vrms at 1kHz)
Capacitance Tolerances	$\pm$ 10%; $\pm$ 20%; +80%, -20%
Dissipation Factor	2.5% max. (+25°C, 1.0 $\pm$ 0.2 Vrms, 1kHz)
Operating Temperature Range	-55°C to +125°C
Temperature Characteristic	$\pm$ 15% (0VDC)
Voltage Ratings	600, 630, 1000, 1500, 2000, 2500, 3000, 4000 & 5000 VDC (+125°C)
Insulation Resistance (+25°C, at 500 VDC)	100K M Ω min. or 1000 M Ω - μ F min., whichever is less
Insulation Resistance (+125°C, at 500 VDC)	10K M Ω min. or 100 M Ω - μ F min., whichever is less
Dielectric Strength	Minimum 120% rated voltage for 5 seconds at 50 mA max. current

X7R CAPACITANCE RANGE – PREFERRED SIZES ARE SHADED

Case Size	0805	1206	1210	1808	1812
Soldering	Reflow/Wave	Reflow/Wave	Reflow Only	Reflow Only	Reflow Only
(L) Length mm	2.10 $\pm$ 0.20 (0.085 $\pm$ 0.008)	3.30 $\pm$ 0.30 (0.130 $\pm$ 0.012)	3.30 $\pm$ 0.40 (0.130 $\pm$ 0.016)	4.60 $\pm$ 0.50 (0.181 $\pm$ 0.020)	4.60 $\pm$ 0.50 (0.177 $\pm$ 0.012)
(W) Width mm	1.25 $\pm$ 0.20 (0.049 $\pm$ 0.008)	1.60 $\pm$ 0.30/-0.10 (0.063 $\pm$ 0.012/-0.004)	2.50 $\pm$ 0.30 (0.098 $\pm$ 0.012)	2.00 $\pm$ 0.20 (0.079 $\pm$ 0.008)	3.20 $\pm$ 0.30 (0.126 $\pm$ 0.008)
(T) Thickness mm	1.35 (0.053)	1.80 (0.071)	2.80 (0.110)	2.20 (0.087)	2.80 (0.100)
(t) Terminal min max	0.50 $\pm$ 0.20 (0.020 $\pm$ 0.008)	0.60 $\pm$ 0.20 (0.024 $\pm$ 0.008)	0.75 $\pm$ 0.35 (0.030 $\pm$ 0.014)	0.75 $\pm$ 0.35 (0.030 $\pm$ 0.014)	0.75 $\pm$ 0.35 (0.030 $\pm$ 0.014)
Voltage(V)	600 630 1000	600 630 1000 1500 2000	600 630 1000 1500 2000	600 630 1000 1500 2000 2500 3000 4000	600 630 1000 1500 2000 2500 3000 4000
Cap (pF)	100 101 X X X C C E E E E E E E E E E	120 121 X X X C C E E E E E E E E E E	150 151 X X X C C E E E E E E E E E E	180 181 X X X C C E E E E E E E E E E	220 221 X X X C C E E E E E E E E E E
	270 271 X X X C C E E E E E E E E E E	330 331 X X X C C E E E E E E E E E E	390 391 X X X C C E E E E E E E E E E	470 471 X X X C C E E E E E E E E E E	560 561 X X X C C E E E E E E E E E E
	680 681 X X X C C E E E E E E E E E E	750 751 X X X C C E E E E E E E E E E	820 821 X X X C C E E E E E E E E E E	1000 102 X X X C C E E E E E E E E E E	1200 122 X X X C C E E E E E E E E E E
	1500 152 X X X C C E E E E E E E E E E	1800 182 X X X C C E E E E E E E E E E	2200 222 X X X C C E E E E E E E E E E	2700 272 C C C C C E E E E E E E E E E	3300 332 C C C C C E E E E E E E E E E
	3900 392 C C C C C E E E E E E E E E E	4700 472 C C C C C E E E E E E E E E E	5600 562 C C C C C E E E E E E E E E E	6800 682 C C C C C E E E E E E E E E E	8200 822 C C C C C E E E E E E E E E E
Cap (μ F)	0.010 103 C C C C C E E E E E E E E E E	0.015 153 C C C C C E E E E E E E E E E	0.018 183 C C C C C E E E E E E E E E E	0.022 223 C C C C C E E E E E E E E E E	0.027 273 C C C C C E E E E E E E E E E
	0.033 333 C C C C C E E E E E E E E E E	0.039 393 C C C C C E E E E E E E E E E	0.047 473 C C C C C E E E E E E E E E E	0.056 563 C C C C C E E E E E E E E E E	0.068 683 C C C C C E E E E E E E E E E
	0.082 823 C C C C C E E E E E E E E E E	0.100 104 C C C C C E E E E E E E E E E	0.150 154 C C C C C E E E E E E E E E E	0.220 224 C C C C C E E E E E E E E E E	0.270 274 C C C C C E E E E E E E E E E
	0.330 334 C C C C C E E E E E E E E E E	0.390 394 C C C C C E E E E E E E E E E	0.470 474 C C C C C E E E E E E E E E E	0.560 564 C C C C C E E E E E E E E E E	0.680 684 C C C C C E E E E E E E E E E
	0.820 824 C C C C C E E E E E E E E E E	1.000 105 C C C C C E E E E E E E E E E			
Voltage(V)	600 630 1000	600 630 1000 1500 2000	600 630 1000 1500 2000	600 630 1000 1500 2000 2500 3000 4000	600 630 1000 1500 2000 2500 3000 4000
Case Size	0805	1206	1210	1808	1812

Letter	A	C	E	F	G	X	7
Max. Thickness	0.813 (0.032)	1.448 (0.057)	1.8034 (0.071)	2.2098 (0.087)	2.794 (0.110)	0.940 (0.037)	3.30 (0.130)

NOTE: Contact factory for non-specified capacitance values

For 600V to 5000V Applications

X7R CAPACITANCE RANGE

PREFERRED SIZES ARE SHADED

[illegible]

Letter	A	C	E	F	G	X	7
Max. Thickness	0.813 (0.032)	1.448 (0.057)	1.8034 (0.071)	2.2098 (0.087)	2.794 (0.110)	0.940 (0.037)	3.30 (0.130)

NOTE: Contact factory for non-specified capacitance values