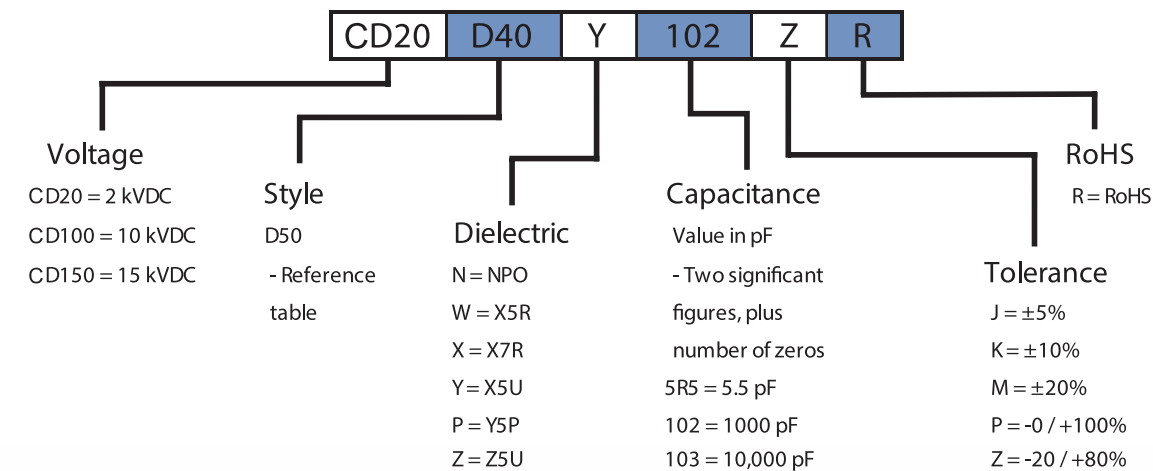


# High Voltage Radial Leded Disc Capacitors

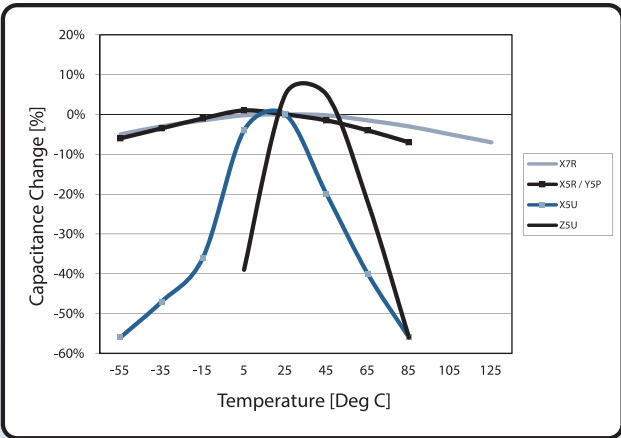
Commercial/Industrial Applications - 2 kVDC to 20 kVDC

# The Economic Approach for U.S. Manufactured High Volume Disc Capacitors

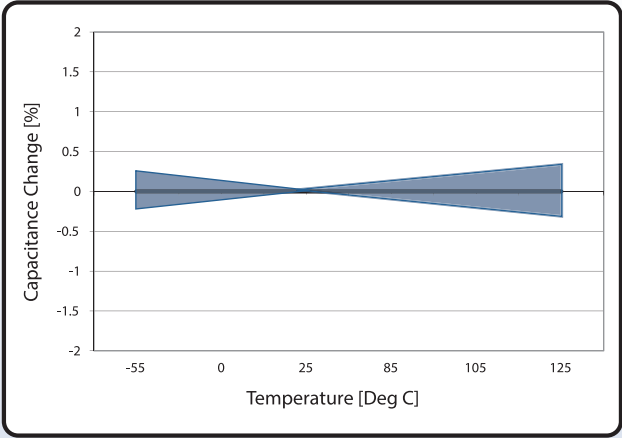
### Part Number / Ordering Information



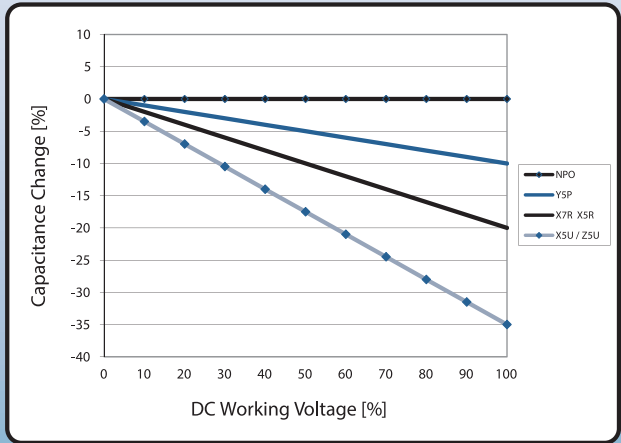
Performance Charts (Typical)



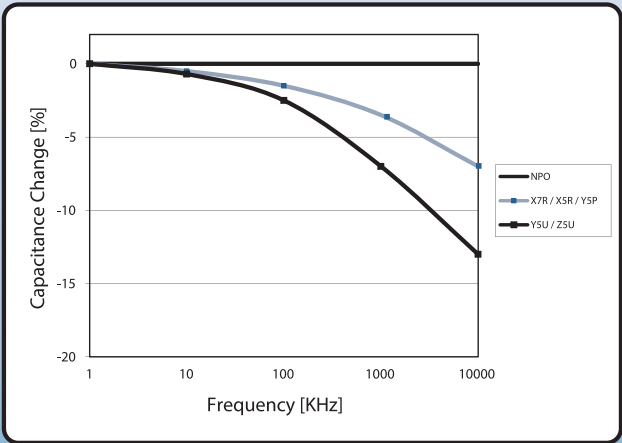
Class II Temperature Coefficient



NPO Temperature Coefficient



Voltage Coefficient



Capacitance Vs Frequency

### High Voltage Ceramic Capacitors 2 KVDC - 20 KVDC Commercial/ Industrial Applications



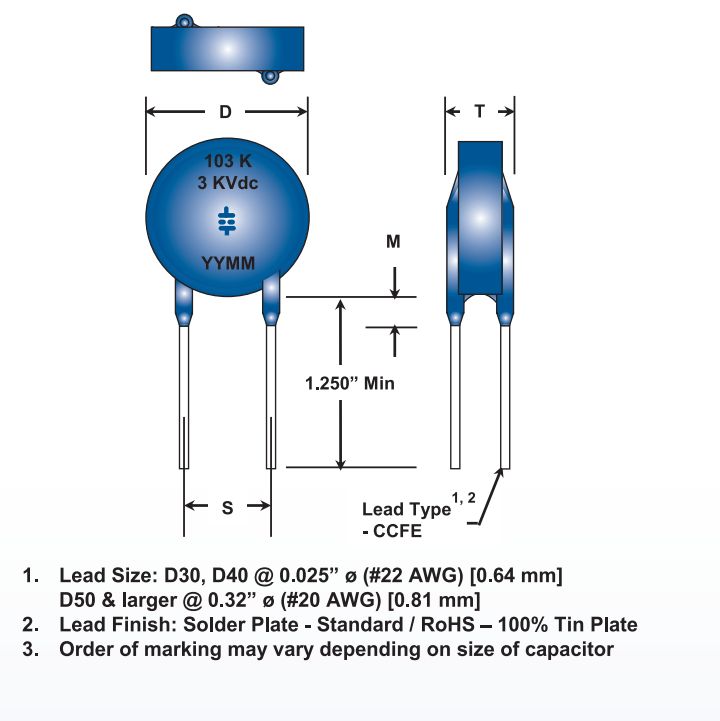
(775) 851-3580  
5462 Louie Lane  
Reno, NV 89511 USA  
calramic.com

ISO 9001-2008 Certified



# High Voltage Radial Leaded Disc Capacitors

## Commercial/Industrial Applications - 2 kVDC to 20 kVDC



**CalRamic Technologies LLC** manufactures a series of single layer, conformally coated, ceramic disc capacitors, designed with leaded terminals and intended for those applications associated with commercial or industrial environments. These capacitors are manufactured under strict quality control guidelines to ensure unparalleled performance in high voltage applications.

These capacitors, which draw on thirty plus years of proven design and process experience, utilize double action pressing to minimize gradients within the dielectric powder and produce a finished capacitor with a uniform fired ceramic density.

Capacitors are available with ultra stable Class I, NPO dielectrics, essential where low losses and tight capacitance tolerances are critical and stable Class II, YSP, X5R, X7R, X5U and Z5U dielectric materials, which are intended for those applications where added dielectric losses and less precision can be tolerated.

These capacitors are ideally suited as snubbers for switching power supplies, coupling and decoupling capacitors, inverter circuitry, lighting ballasts, and other high voltage pulse applications.

### Performance Characteristics

Specification	Dielectric Type (EIA Designation)					
	NPO (COG)	YSP	X7R	X5R	X5U	Z5U
Material Classification	Type I, Ultra Stable, K76	Type II, Stable, K2450	Type II, Stable, K2350	Type II, Stable, K2500	Type II, Stable, K5000	Type II, Stable, K10000
Coefficient of Thermal Expansion	9 x 10 <sup>-6</sup> / °C	11 x 10 <sup>-6</sup> / °C				
Density	72 g / in <sup>3</sup>					
Operating Temperature Range	-55 to +125°C	-30 to +85°C	-55 to +125°C	-55 to +85°C		+10 to +85°C
Aging Rate	0	-2% Max per decade hour			-3% Max per decade hour	
Temperature Coefficient	±30 PPM / °C	±10%	±15%		+22 / -56%	
Voltage Coefficient	Negligible	-20% Max @ WVDC	-20% Max @ WVDC		-35% Max @ WVDC	
Capacitance Range	1.6 pF to 400 pF	52 pF to 0.013 µF	52 pF to 0.0123 µF	52 pF to 0.013 µF	100 pF to 0.023 µF	200 pF to 0.046 µF
Voltage Range	2 kVDC to 20 kVDC					
Insulation Resistance @ +25°C	100,000 MΩ or 1000 MΩ · µF, W/E is less					
Insulation Resistance @ T Max	10,000 MΩ or 100 MΩ · µF, W/E is less					
Dissipation Factor	0.1% Max	2.5% Max				
DWV	1.5 x WVDC					

### General Information

1. Standard inspections performed in accordance with applicable requirements of MIL-PRF-49467 on an AQL basis.
2. Custom voltages, package sizes, dielectrics and capacitance values available. Contact factory.
3. Higher voltage parts may require further encapsulation to prevent surface arc over and breakdown. When required, parts should first be cleaned and oven dried at +85°C. Silicone rubbers or a suitable epoxy may be used and de-airing of encapsulates is recommended.
4. Testing of higher voltage parts before installation and / or supplemental encapsulation, may be done in a suitable, non-contaminating dielectric fluid like FC-40.
5. Large ceramic capacitors, even leaded devices are susceptible to damage when exposed to thermal and / or mechanical shock. Refer to Technical Bulletin AN103 for handling and installation recommendations.

# High Voltage Radial Leaded Disc Capacitors

## Commercial/Industrial Applications - 2 kVDC to 20 kVDC

WVDC	Disc Style	Dimensions [in (mm)]				Capacitance Range [pF]											
		D Max	S ±0.030" (0.762)	T Max	M Max	NPO		Y5P		X7R		X5R		X5U		Z5U	
						Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
2 kVDC	D30	0.300 (7.62)	0.250 (6.35)	0.190 (4.83)	0.125 (3.18)	11	15	350	480	330	450	350	480	650	1100	1300	1700
	D40	0.400 (10.16)	0.250 (6.35)	0.190 (4.83)	0.125 (3.18)	16	31	530	1000	500	1000	530	1000	1000	1800	2000	3700
	D50	0.500 (12.70)	0.375 (9.53)	0.190 (4.83)	0.125 (3.18)	36	60	1200	1900	1100	1800	1200	1900	2200	3500	4400	7300
	D60	0.600 (15.24)	0.375 (9.53)	0.190 (4.83)	0.125 (3.18)	50	80	1700	2600	1500	2500	1700	2600	2800	4600	7800	10000
	D70	0.700 (17.78)	0.500 (12.70)	0.190 (4.83)	0.125 (3.18)	82	120	2700	4000	2600	3700	2700	4000	4800	7300	9800	14000
	D80	0.800 (20.32)	0.500 (12.70)	0.190 (4.83)	0.125 (3.18)	120	140	4000	5000	3700	4500	4000	5000	7200	8800	14000	17000
	D90	0.900 (22.86)	0.500 (12.70)	0.190 (4.83)	0.125 (3.18)	140	200	4800	6900	4500	6500	4800	6900	8600	12300	17000	25000
	D100	1.000 (25.4)	0.500 (12.70)	0.190 (4.83)	0.125 (3.18)	190	260	6500	8400	6100	8000	6500	8400	12000	15000	23000	30000
	D120	1.200 (30.48)	0.500 (12.70)	0.190 (4.83)	0.125 (3.18)	260	400	8500	13000	8000	12300	8500	13000	15000	23000	31000	46000
	D30	0.300 (7.62)	0.250 (6.35)	0.210 (5.33)	0.125 (3.18)	8.4	12	270	370	260	350	270	370	500	670	1000	1300
3 kVDC	D40	0.400 (10.16)	0.250 (6.35)	0.210 (5.33)	0.125 (3.18)	12	24	410	780	380	730	410	780	730	1400	1500	2900
	D50	0.500 (12.70)	0.375 (9.53)	0.210 (5.33)	0.125 (3.18)	28	46	920	1500	870	1400	920	1500	1700	2700	3400	5600
	D60	0.600 (15.24)	0.375 (9.53)	0.210 (5.33)	0.125 (3.18)	38	61	1300	2000	1200	1900	1300	2000	2200	3600	6000	7300
	D70	0.700 (17.78)	0.500 (12.70)	0.210 (5.33)	0.125 (3.18)	63	95	2100	3100	2000	2900	2100	3100	3700	5600	7500	11000
	D80	0.800 (20.32)	0.500 (12.70)	0.210 (5.33)	0.125 (3.18)	94	110	3100	3800	2900	3500	3100	3800	5500	6800	11000	13000
	D90	0.900 (22.86)	0.500 (12.70)	0.210 (5.33)	0.125 (3.18)	110	160	3700	5300	3500	5000	3700	5300	6600	9500	13000	19000
	D100	1.000 (25.4)	0.500 (12.70)	0.210 (5.33)	0.125 (3.18)	150	200	5000	6500	4700	6200	5000	6500	9000	12000	18000	13000
	D120	1.200 (30.48)	0.500 (12.70)	0.210 (5.33)	0.125 (3.18)	200	310	6600	10000	6200	9500	6600	10000	12000	18000	24000	36000
	D140	1.400 (35.56)	0.625 (15.88)	0.210 (5.33)	0.125 (3.18)	310	350	10000	12000	9600	12000	10000	12000	19000	22000	37000	45000
	5 kVDC	D30	0.300 (7.62)	0.250 (6.35)	0.250 (6.35)	0.125 (3.18)	5.1	6.9	160	220	150	210	160	220	300	400	600
D40		0.400 (10.16)	0.250 (6.35)	0.250 (6.35)	0.125 (3.18)	7.3	15	250	473	230	440	250	473	440	850	900	1700
D50		0.500 (12.70)	0.375 (9.53)	0.250 (6.35)	0.125 (3.18)	17	28	560	920	520	860	560	920	1000	1600	2100	3300
D60		0.600 (15.24)	0.375 (9.53)	0.250 (6.35)	0.125 (3.18)	23	37	760	1200	700	1100	760	1200	1400	2200	3600	4300
D70		0.700 (17.78)	0.500 (12.70)	0.250 (6.35)	0.125 (3.18)	38	57	1300	1800	1200	1800	1300	1800	2300	3400	4500	6700
D80		0.800 (20.32)	0.500 (12.70)	0.250 (6.35)	0.125 (3.18)	57	69	1900	2300	1800	2100	1900	2300	3400	4000	6800	8200
D90		0.900 (22.86)	0.500 (12.70)	0.250 (6.35)	0.125 (3.18)	69	97	2200	3100	2100	3000	2200	3100	4000	5700	8100	11000
D100		1.000 (25.4)	0.500 (12.70)	0.250 (6.35)	0.125 (3.18)	92	120	3000	3900	2900	3700	3000	3900	5500	7100	11000	14000
D120		1.200 (30.48)	0.500 (12.70)	0.250 (6.35)	0.125 (3.18)	120	180	3900	6100	3800	5700	3900	6100	7200	11000	14000	22000
D140		1.400 (35.56)	0.625 (15.88)	0.250 (6.35)	0.125 (3.18)	190	230	6200	7500	5800	7000	6200	7500	11000	13000	22000	27000
7.5 kVDC	D30	0.300 (7.62)	0.250 (6.35)	0.310 (7.87)	0.150 (3.81)	3.4	4.6	110	150	100	150	110	150	200	270	400	540
	D40	0.400 (10.16)	0.250 (6.35)	0.310 (7.87)	0.150 (3.81)	5	9.6	170	310	150	300	170	310	300	570	600	1100
	D50	0.500 (12.70)	0.375 (9.53)	0.310 (7.87)	0.150 (3.81)	12	19	370	610	350	580	370	610	670	1100	1400	2200
	D60	0.600 (15.24)	0.375 (9.53)	0.310 (7.87)	0.150 (3.81)	15	25	510	800	470	750	510	800	900	1450	2400	2900
	D70	0.700 (17.78)	0.500 (12.70)	0.310 (7.87)	0.150 (3.81)	25	38	830	1200	780	1200	830	1200	1500	2200	3000	4500
	D80	0.800 (20.32)	0.500 (12.70)	0.310 (7.87)	0.150 (3.81)	37	46	1300	1500	1200	1400	1300	1500	2200	2700	4500	5400
	D90	0.900 (22.86)	0.500 (12.70)	0.310 (7.87)	0.150 (3.81)	45	65	1500	2100	1400	2000	1500	2100	2700	3800	5400	7600
	D100	1.000 (25.4)	0.500 (12.70)	0.310 (7.87)	0.150 (3.81)	60	80	2000	2600	1900	2500	2000	2600	3700	4700	7300	9500
	D120	1.200 (30.48)	0.500 (12.70)	0.310 (7.87)	0.150 (3.81)	80	120	2600	3300	2500	3800	2600	3300	4800	7400	9500	14000
	D140	1.400 (35.56)	0.625 (15.88)	0.310 (7.87)	0.150 (3.81)	120	150	4100	5000	3800	4700	4100	5000	7400	9000	15000	18000
10 kVDC	D30	0.300 (7.62)	0.250 (6.35)	0.440 (11.18)	0.170 (4.32)	2.5	3.5	84	110	78	110	84	110	150	200	300	410
	D40	0.400 (10.16)	0.250 (6.35)	0.440 (11.18)	0.170 (4.32)	3.8	7.2	120	230	110	220	120	230	220	420	450	850
	D50	0.500 (12.70)	0.375 (9.53)	0.440 (11.18)	0.170 (4.32)	8.5	14	280	480	260	430	280	480	500	820	1000	1600
	D60	0.600 (15.24)	0.375 (9.53)	0.440 (11.18)	0.170 (4.32)	12	18	380	600	350	560	380	600	680	1000	1800	2100
	D70	0.700 (17.78)	0.500 (12.70)	0.440 (11.18)	0.170 (4.32)	19	28	620	940	580	880	620	940	1100	1700	2300	3400
	D80	0.800 (20.32)	0.500 (12.70)	0.440 (11.18)	0.170 (4.32)	28	34	930	1100	870	1100	930	1100	1700	2000	3400	4100
	D90	0.900 (22.86)	0.500 (12.70)	0.440 (11.18)	0.170 (4.32)	34	48	1100	1600	1000	1500	1100	1600	2000	2900	4000	5700
	D100	1.000 (25.4)	0.500 (12.70)	0.440 (11.18)	0.170 (4.32)	46	60	1500	2000	1400	1800	1500	2000	2700	3500	5500	7100
	D120	1.200 (30.48)	0.500 (12.70)	0.440 (11.18)	0.170 (4.32)	60	93	2000	3000	1900	2800	2000	3000	3600	5500	7200	11000
	D140	1.400 (35.56)	0.625 (15.88)	0.440 (11.18)	0.170 (4.32)	94	110	3100	3700	2900	3500	3100	3700	5600	6800	11000	13000
15 kVDC	D30	0.300 (7.62)	0.250 (6.35)	0.545 (13.84)	0.175 (4.45)	1.6	2.3	55	76	52	71	55	76	100	130	200	270
	D40	0.400 (10.16)	0.250 (6.35)	0.545 (13.84)	0.175 (4.45)	2.4	4.8	52	160	76	150	52	160	150	280	300	570
	D50	0.500 (12.70)	0.375 (9.53)	0.545 (13.84)	0.175 (4.45)	5.7	9.4	180	300	180	290	180	300	330	550	700	1100
	D60	0.600 (15.24)	0.375 (9.53)	0.545 (13.84)	0.175 (4.45)	7.7	12	250	400	230	370	250	400	450	720	1200	1400
	D70	0.700 (17.78)	0.500 (12.70)	0.545 (13.84)	0.175 (4.45)	12	20	410	620	390	590	410	620	750	1100	1500	2200
	D80	0.800 (20.32)	0.500 (12.70)	0.545 (13.84)	0.175 (4.45)	19	23	620	760	580	710	620	760	1100	1360	2300	2700
	D90	0.900 (22.86)	0.500 (12.70)	0.545 (13.84)	0.175 (4.45)	23	32	740	1000	690	1000	740	1000	1300	1900	2700	3800
	D100	1.000 (25.4)	0.500 (12.70)	0.545 (13.84)	0.175 (4.45)	30	40	1000	1300	950	1200	1000	1300	1800	2400	3700	4700
	D120	1.200 (30.48)	0.500 (12.70)	0.545 (13.84)	0.175 (4.45)	40	60	1300	2000	1300	1900	1300	2000	2400	3600	4800	7300
	D140	1.400 (35.56)	0.625 (15.88)	0.545 (13.84)	0.175 (4.45)	60	77	2100	2500	1900	2300	2100	2500	3700	4500	7500	9000
20 kVDC	D50	0.500 (12.70)	0.375 (9.53)	0.650 (16.51)	0.175 (4.45)	4.6	6.8	150	220	140	210	150	220	270	400	500	830
	D60	0.600 (15.24)	0.375 (9.53)	0.650 (16.51)	0.175 (4.45)	6.2	8.9	200	290	190	270	200	290	360	520	890	1000
	D70	0.700 (17.78)	0.500 (12.70)	0.650 (16.51)	0.175 (4.45)	10	14	330	450	310	430	330	450	600	820	1200	1700
	D80	0.800 (20.32)	0.500 (12.70)	0.650 (16.51)	0.175 (4.45)	15	17	500	550	470	520	500	550	900	1000	1700	2000
	D90	0.900 (22.86)	0.500 (12.70)	0.650 (16.51)	0.175 (4.45)	18	23	600	770	560	720	600	770	1100	1400	2000	2800
	D100	1.000 (25.4)	0.500 (12.70)	0.650 (16.51)	0.175 (4.45)	24	30	800	960	760	900	800	960	1500	1700	2800	300
	D120	1.200 (30.48)	0.500 (12.70)	0.650 (16.51)	0.175 (4.45)	32	45	1000	1500	1000	1400	1000	1500	1900	2600	3600	5500
	D140	1.400 (35.56)	0.625 (15.88)	0.650 (16.51)	0.175 (4.45)	50	56	1700	1800	1600	1700	1700	1800	3000	3300	5600	6800