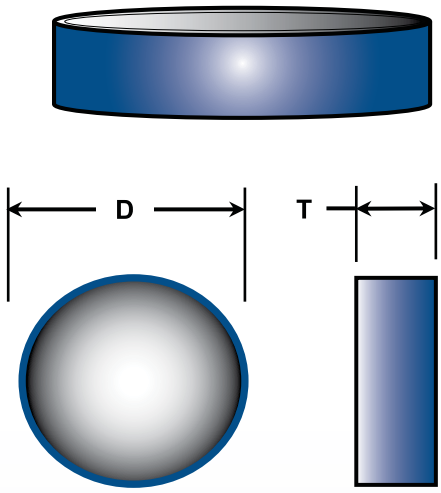
High Voltage Single Layer Bare Disc Capacitors

Military & Commercial Grade - 3 kVDC to 10 kVDC



1. Termination Type: 100% fired-on silver

CalRamic Technologies LLC manufactures a series of highly reliable, single layer, ceramic disc capacitors that are designed and 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, X5R, X7R and X5U 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)	X7R	X5R	X5U
Material Classification	Type I, Ultra Stable, K76	Type II, Stable, K2350	Type II, Stable, K2500	Type II, Stable, K5000
Coefficient of Thermal Expansion	9 x 10^{-6} / °C	11 x 10^{-6} / °C	11 x 10^{-6} / °C	11 x 10^{-6} / °C
Density	72 g / in^3			
Operating Temperature Range	-55 to +125°C		-55 to +85°C	
Aging Rate	0	-2% Max per decade hour		-3% Max per decade hour
Temperature Coefficient	±30 PPM / °C	±15%		+22 / -56%
Voltage Coefficient	Negligible	-20% Max @ WVDC		-35% Max @ WVDC
Capacitance Range	1.6 pF to 310 pF	52 pF to 9500 pF	55 pF to 0.010 µF	100 pF to 0.018 µF
Voltage Range	3 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			

1. Standard inspection and Group A testing, when required, is performed in accordance with applicable requirements of MIL-PRF-49467, DSCC 87125, DSCC 89087 and NASA GSFC S-311-15C.
2. Special testing including 100% Partial Discharge (Corona) is available upon request.
3. Custom voltages, package sizes and capacitance values available. Contact factory.
4. Higher voltage parts may require 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.
5. Testing of higher voltage parts before installation and / or application of supplemental encapsulation, may be done in a suitable, non-contaminating dielectric fluid like FC-40.
6. Large ceramic capacitors are susceptible to damage when exposed to thermal and / or mechanical shock. Ensure care is taken while handling and during installation, or consider selecting leaded alternatives as detailed in catalog page CRT-0006.

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Electrical / Mechanical Characteristics

Working Voltage	Disc Style	Dimensions [in]			Capacitance Range [pF]							
					NPO		X5R		X7R		X5U	
		D Max	T Nom	T Max	Min	Max	Min	Max	Min	Max	Min	Max
3 kVDC	D0606	0.220	0.060	0.075	8.4	10	270	340	260	320	500	600
	D0706	0.245	0.060	0.075	9.7	12	320	370	300	350	570	670
	D0806	0.275	0.060	0.075	12	15	410	500	380	470	730	900
	D1006	0.330	0.060	0.075	20	24	640	780	600	730	1200	1400
	D1206	0.400	0.060	0.075	28	34	920	1100	870	1100	1700	2000
	D1406	0.460	0.060	0.075	38	46	1300	1500	1200	1400	2200	2700
	D1606	0.525	0.060	0.075	50	61	1600	2000	1500	1900	3000	3600
	D1806	0.590	0.060	0.075	63	77	2100	2500	2000	2400	3700	4600
	D2006	0.650	0.060	0.075	78	95	2600	3100	2400	2900	4600	5600
	D2206	0.710	0.060	0.075	94	110	3100	3800	2900	3500	5600	6800
	D2406	0.775	0.060	0.075	110	140	3700	4500	3500	4200	6600	8100
	D2606	0.840	0.060	0.075	130	160	4300	5300	4100	5000	7800	9500
	D2906	0.930	0.060	0.075	150	200	5000	6500	4700	6200	9000	12000
	D3206	1.030	0.060	0.075	200	240	6600	8000	6200	7500	12000	14000
	D3606	1.150	0.060	0.075	230	310	7400	10000	7000	9500	13000	18000
5 kVDC	D0610	0.220	0.125	0.100	5.1	6.2	160	200	150	190	300	370
	D0710	0.245	0.125	0.100	5.8	6.9	190	220	180	210	350	400
	D0810	0.275	0.125	0.100	7.3	9.2	250	300	230	280	410	540
	D1010	0.330	0.125	0.100	12	15	390	473	370	440	700	850
	D1210	0.400	0.125	0.100	17	21	560	680	520	640	1000	1200
	D1410	0.460	0.125	0.100	23	28	760	920	700	860	1400	1600
	D1610	0.525	0.125	0.100	30	37	990	1200	930	1100	1800	2200
	D1810	0.590	0.125	0.100	38	47	1300	1500	1200	1400	2300	2800
	D2010	0.650	0.125	0.100	47	57	1500	1800	1500	1800	2800	3400
	D2210	0.710	0.125	0.100	57	69	1900	2300	1800	2100	3400	4000
	D2410	0.775	0.125	0.100	69	83	2200	2700	2100	2600	4000	4900
	D2610	0.840	0.125	0.100	79	97	2600	3100	2500	3000	4700	5700
	D2910	0.930	0.125	0.100	92	120	3000	3900	2900	3700	5500	7100
	D3210	1.030	0.125	0.100	120	150	3900	4800	3800	4500	7200	8700
	D3610	1.150	0.125	0.100	140	180	4500	6100	4200	5700	8000	11000
	D4010	1.280	0.125	0.100	190	230	6200	7500	5800	7000	11000	13000
7.5 kVDC	D0615	0.220	0.180	0.150	3.4	4.1	110	140	110	130	200	240
	D0715	0.245	0.180	0.150	3.9	4.6	130	150	120	150	230	270
	D0815	0.275	0.180	0.150	5	6.1	170	200	150	190	300	360
	D1015	0.330	0.180	0.150	7.8	9.6	260	310	240	300	460	570
	D1215	0.400	0.180	0.150	12	14	370	460	350	430	670	820
	D1415	0.460	0.180	0.150	15	19	510	610	470	580	900	1100
	D1615	0.525	0.180	0.150	20	25	660	800	620	750	1200	1450
	D1815	0.590	0.180	0.150	25	31	830	1000	780	960	1500	1800
	D2015	0.650	0.180	0.150	31	38	1000	1200	970	1200	1900	2200
	D2215	0.710	0.180	0.150	37	46	1300	1500	1200	1400	2200	2700
	D2415	0.775	0.180	0.150	45	55	1500	1800	1400	1700	2700	3300
	D2615	0.840	0.180	0.150	53	65	1700	2100	1600	2000	3100	3800
	D2915	0.930	0.180	0.150	60	80	2000	2600	1900	2500	3700	4700
	D3215	1.030	0.180	0.150	80	98	2600	3200	2500	3000	4800	5800
	D3615	1.150	0.180	0.150	90	120	3000	4000	2800	3800	5300	7400
	D4015	1.280	0.180	0.150	120	150	4100	5000	3800	4700	7400	9000
10 kVDC	D0620	0.220	0.235	0.200	2.5	3.1	84	100	78	95	150	180
	D0720	0.245	0.235	0.200	2.9	3.5	96	110	90	110	170	200
	D0820	0.275	0.235	0.200	3.8	4.6	120	150	110	140	220	270
	D1020	0.330	0.235	0.200	5.9	7.2	190	230	180	220	350	420
	D1220	0.400	0.235	0.200	8.5	10	280	340	260	320	500	610
	D1420	0.460	0.235	0.200	12	14	380	480	350	430	680	820
	D1620	0.525	0.235	0.200	15	18	500	600	470	560	890	1000
	D1820	0.590	0.235	0.200	19	23	620	770	580	720	1100	1400
	D2020	0.650	0.235	0.200	24	28	770	940	730	880	1400	1700
	D2220	0.710	0.235	0.200	28	34	930	1100	870	1100	1700	2000
	D2420	0.775	0.235	0.200	34	41	1100	1400	1000	1300	2000	2400
	D2620	0.840	0.235	0.200	40	48	1300	1600	1200	1500	2400	2900
	D2920	0.930	0.235	0.200	46	60	1500	2000	1400	1800	2700	3500
	D3220	1.030	0.235	0.200	60	73	2000	2400	1900	2300	3600	4300
	D3620	1.150	0.235	0.200	68	93	2200	3000	2100	2800	4000	5500
	D4020	1.280	0.235	0.200	94	110	3100	3700	2900	3500	5600	6800
15 kVDC	D0630	0.220	0.350	0.300	1.6	2.1	55	68	52	64	100	120
	D0730	0.245	0.350	0.300	1.9	2.3	64	76	60	71	120	130
	D0830	0.275	0.350	0.300	2.4	3.1	52	100	76	94	150	180
	D1030	0.330	0.350	0.300	3.9	4.8	130	160	120	150	230	280
	D1230	0.400	0.350	0.300	5.7	6.9	180	230	180	210	340	410
	D1430	0.460	0.350	0.300	7.7	9.4	250	300	230	290	450	550
	D1630	0.525	0.350	0.300	10	12	330	400	310	370	600	720
	D1830	0.590	0.350	0.300	12	16	410	510	390	480	750	920
	D2030	0.650	0.350	0.300	16	20	520	620	490	590	930	1100
	D2230	0.710	0.350	0.300	19	23	620	760	580	710	1100	1360
	D2430	0.775	0.350	0.300	23	28	740	910	690	850	1300	1600
	D2630	0.840	0.350	0.300	26	32	870	1000	820	1000	1600	1900
	D2930	0.930	0.350	0.300	30	40	1000	1300	950	1200	1800	2400
	D3230	1.030	0.350	0.300	40	49	1300	1600	1300	1500	2400	2900
	D3630	1.150	0.350	0.300	45	60	1500	2000	1400	1900	2700	3600
	D4030	1.280	0.350	0.300	60	77	2100	2500	1900	2300	3700	4500
20 kVDC	D1040	0.330	0.460	0.400	3.2	3.5	100	110	98	100	190	200
	D1240	0.400	0.460	0.400	4.6	5	150	170	140	160	270	300
	D1440	0.460	0.460	0.400	6.2	6.8	200	220	190	210	360	400
	D1640	0.525	0.460	0.400	8.1	8.9	270	290	250	270	480	520
	D1840	0.245	0.460	0.400	10	11	330	370	310	350	600	670
	D2040	0.650	0.460	0.400	13	14	410	450	390	430	750	820
	D2240	0.710	0.460	0.400	15	17	500	550	470	520	900	1000
	D2440	0.775	0.460	0.400	18	20	600	660	560	620	1100	1200
	D2640	0.812	0.460	0.400	21	23	700	770	660	720	1300	1400
	D2940	0.930	0.460	0.400	24	30	810	960	760	900	1500	1700
	D3240	1.030	0.460	0.400	32	36	1000	1200	1000	1100	1900	2100
	D3640	1.150	0.460	0.400	36	45	1200	1500	1100	1400	2200	2600
	D4040	1.280	0.460	0.400	50	56	1700	1800	1600	1700	3000	3300

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Part Number / Ordering Information

D	1030	W	122	K	153	M

Disc
D = Bare disc

Style
1030
- Reference table

Dielectric
N = NPO
W = X5R
X = X7R
Y = X5U

Capacitance
Value in pF
- Two significant figures, plus number of zeros
8R4 = 8.4 pF
122 = 1200 pF
223 = 22,000 pF

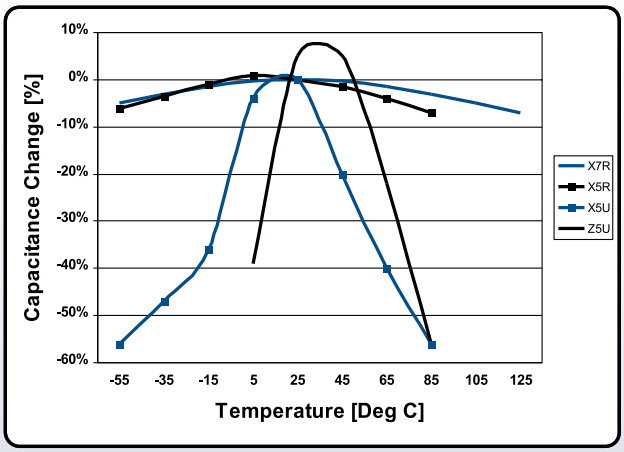
Tolerance
J = ±5%, NPO only
K = ±10%
M = ±20%
P = -0 / +100%
Z = -20 / +80%

Voltage
302 = 3 kVDC
103 = 10 kVDC
153 = 15 kVDC

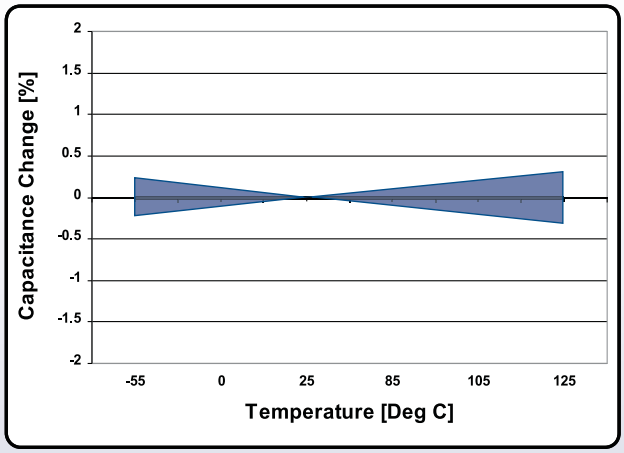
Screening
M = Group A

Note: Group A is not included unless designated in part number

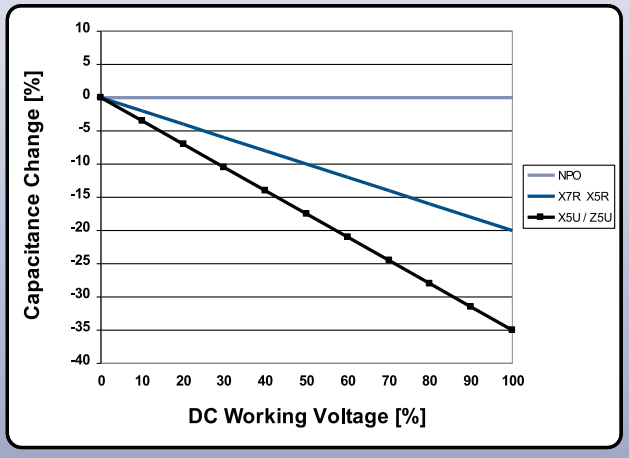
Performance Charts (Typical)



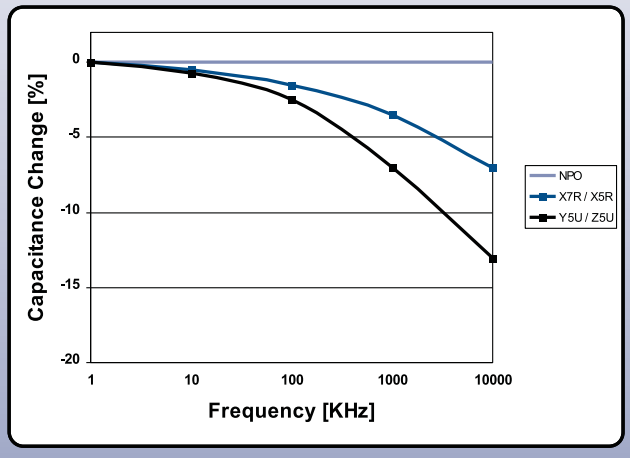
Class II Temperature Coefficient



NPO Temperature Coefficient



Voltage Coefficient



Capacitance Vs Frequency

C