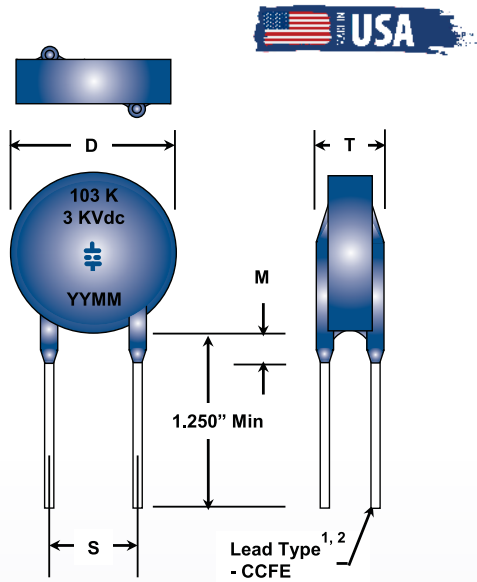


# High Voltage Radial Leaded Disc Capacitors

## Negative TC Low Loss Commercial Level - 3 kVDC to 20 kVDC



**CalRamic Technologies LLC** manufactures a series of highly reliable, single layer, conformally coated, negative temperature compensating, leaded ceramic disc capacitors that deliver both very stable and predictable performance characteristics typically associated with low loss dielectrics.

These capacitors, which draw on thirty plus years of proven design and process experience, are manufactured under strict quality control guidelines and utilize a double action press to minimize gradients within the dielectric powder, producing a finished capacitor with a uniform fired ceramic density and unparalleled performance in high voltage applications. Leaded construction limits risk for damage due to exposure to mechanical and thermal stress.

Essential where low losses and tight capacitance tolerances are critical, 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.

1. Lead Size: D30, D40 @ 0.025" Dia (#22 AWG) [0.64mm]  
D50 & Larger @ 0.032" Ø (#20 AWG) [0.81mm]
2. Standard / RoHS - 100% Tin Plate
3. Order of marking may vary depending on size of capacitor

### Performance Characteristics

Specification	Dielectric Type				
	CR01	CR03	CR09	CR17	CR22
Material Classification	N750 (U2J)	N1500 (P3K)	N2200 (R3L)	N4700 (T3M)	N5600 (U3N)
Coefficient of Thermal Expansion	$11 \times 10^{-6} / ^\circ\text{C}$	$11 \times 10^{-6} / ^\circ\text{C}$	$11 \times 10^{-6} / ^\circ\text{C}$	$11 \times 10^{-6} / ^\circ\text{C}$	$11 \times 10^{-6} / ^\circ\text{C}$
Density	72 g / in <sup>3</sup>				
Operating Temperature Range	-55 to +125°C				
Aging Rate	0				
Temperature Coefficient	-750 PPM / °C ±10% Max	-1500 PPM / °C ±17% Max	-2200 PPM / °C ±24% Max	-4700 PPM / °C ±52% Max	-5600 PPM / °C ±59% Max
Voltage Coefficient	-4% Max @ WVDC			-7% Max @ WVDC	
Capacitance Range	2.0 pF to 600 pF	5.5 pF to 1699 pF	15 pF to 4500 pF	29 pF to 8500 pF	34 pF to 0.010 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 @ +125°C	10,000 MΩ or 100 MΩ - µF, W/E is less				
Dissipation Factor	0.2% Max				
DWV	1.5 x WVDC				

### General Information

1. Custom voltages, package sizes and capacitance values available. Contact factory.
2. 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.
3. Testing of higher voltage parts before installation and / or supplemental encapsulation, may be done in a suitable, non-contaminating dielectric fluid like FC-40.
4. 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.

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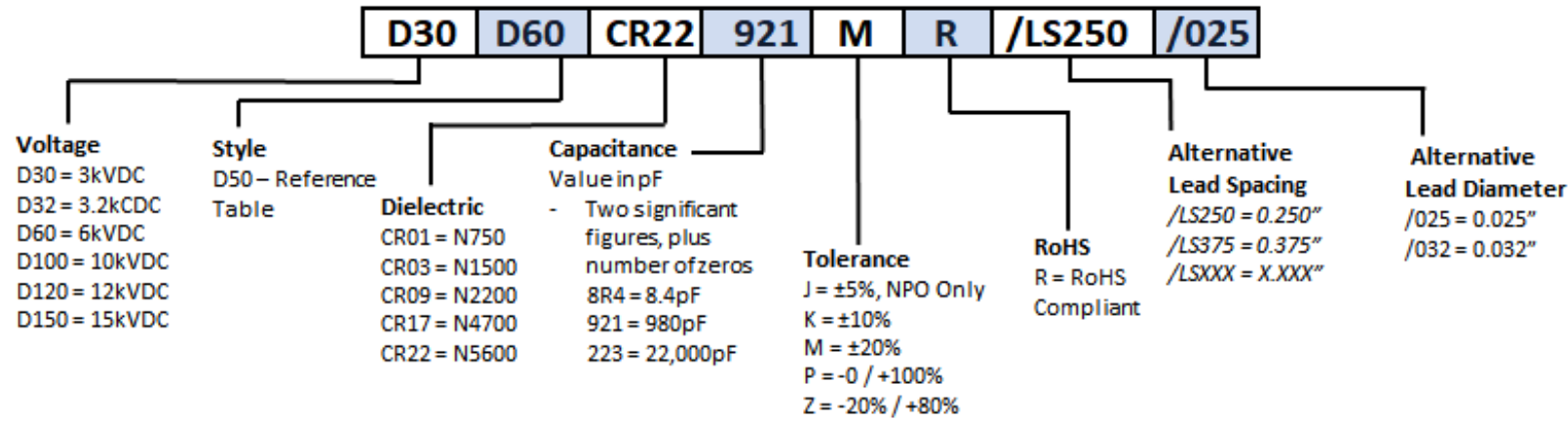
## Negative TC Low Loss Commercial Level - 3 kVDC to 20 kVDC

### Electrical / Mechanical Characteristics

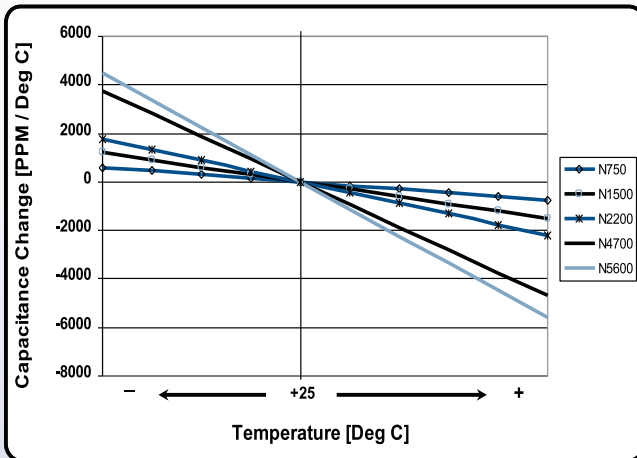
Working Voltage	Disc Style	Dimensions [in]				Capacitance Range [pF]									
		D Max	S ± 0.030	T Max	M Max	CR01		CR03		CR09		CR17		CR22	
						Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
3 kVDC	D30	0.3	0.25	0.210	0.125	14	18	37	50	100	130	190	250	230	300
	D40	0.4	0.25	0.210	0.125	20	37	55	100	150	280	280	530	330	630
	D50	0.5	0.375	0.210	0.125	45	73	130	200	340	550	640	1000	750	1200
	D60	0.6	0.375	0.210	0.125	80	96	220	260	600	720	1200	1300	1400	1600
	D70	0.7	0.5	0.210	0.125	100	150	280	410	750	1100	1500	2100	1700	2500
	D80	0.8	0.5	0.210	0.125	150	180	420	500	1200	1300	2200	2500	2500	3000
	D90	0.9	0.5	0.210	0.125	180	250	500	700	1400	1900	2600	3600	3000	4200
	D100	1	0.5	0.210	0.125	250	310	670	870	1900	2300	3500	4400	4100	5200
	D120	1.2	0.5	0.210	0.125	320	480	880	1300	2400	3600	4500	6900	5300	8100
D140	1.4	0.625	0.210	0.125	500	600	1400	1600	3800	4500	7100	8500	8300	10000	
5 kVDC	D30	0.3	0.25	0.250	0.125	8	10	22	30	60	82	120	150	140	180
	D40	0.4	0.25	0.250	0.125	12	22	33	62	89	170	170	320	200	370
	D50	0.5	0.375	0.250	0.125	27	44	74	120	210	330	390	620	450	730
	D60	0.6	0.375	0.250	0.125	48	57	140	150	360	430	680	820	800	960
	D70	0.7	0.5	0.250	0.125	60	90	170	240	450	670	850	1200	1000	1500
	D80	0.8	0.5	0.250	0.125	90	100	250	300	680	820	1300	1500	1500	1800
	D90	0.9	0.5	0.250	0.125	110	150	300	420	810	1100	1600	2100	1800	2500
	D100	1	0.5	0.250	0.125	150	190	410	520	1100	1400	2100	2600	2500	3100
	D120	1.2	0.5	0.250	0.125	190	290	530	800	1500	2200	2700	4100	3200	4800
D140	1.4	0.625	0.250	0.125	300	360	820	990	2300	2700	4300	5100	5000	6000	
7.5 kVDC	D30	0.3	0.25	0.310	0.150	5.5	7	15	20	40	54	76	100	89	120
	D40	0.4	0.25	0.310	0.150	8	15	22	41	60	110	120	210	140	250
	D50	0.5	0.375	0.310	0.150	18	29	50	81	140	220	260	410	300	490
	D60	0.6	0.375	0.310	0.150	32	38	87	100	240	280	450	540	530	640
	D70	0.7	0.5	0.310	0.150	40	60	110	160	300	450	570	850	670	1000
	D80	0.8	0.5	0.310	0.150	60	72	170	200	450	540	850	1000	1000	1200
	D90	0.9	0.5	0.310	0.150	72	100	200	280	540	760	1100	1400	1200	1700
	D100	1	0.5	0.310	0.150	98	120	270	340	730	950	1400	1700	1700	2100
	D120	1.2	0.5	0.310	0.150	130	190	350	530	950	1400	1800	2700	2200	3200
D140	1.4	0.625	0.310	0.150	200	240	550	660	1500	1800	2900	3400	3300	4000	
10 kVDC	D30	0.3	0.25	0.440	0.170	4	5	11	15	30	41	57	77	67	91
	D40	0.4	0.25	0.440	0.170	6	11	17	31	45	85	84	160	99	180
	D50	0.5	0.375	0.440	0.170	14	22	37	60	110	160	200	310	230	360
	D60	0.6	0.375	0.440	0.170	24	28	66	79	180	210	340	410	400	480
	D70	0.7	0.5	0.440	0.170	30	45	83	120	230	330	430	640	500	750
	D80	0.8	0.5	0.440	0.170	45	54	130	150	340	410	640	770	750	910
	D90	0.9	0.5	0.440	0.170	54	76	150	210	410	570	760	1000	900	1200
	D100	1	0.5	0.440	0.170	73	95	210	260	550	710	1100	1300	1300	1500
	D120	1.2	0.5	0.440	0.170	95	140	270	400	720	1100	1400	2000	1600	2400
D140	1.4	0.625	0.440	0.170	150	180	410	490	1200	1300	2200	2500	2500	3000	
15 kVDC	D30	0.3	0.25	0.545	0.175	3	3.5	7.5	10	20	27	38	51	45	60
	D40	0.4	0.25	0.545	0.175	4	7.5	11	20	30	56	56	100	66	120
	D50	0.5	0.375	0.545	0.175	9	14	25	40	68	110	130	200	150	240
	D60	0.6	0.375	0.545	0.175	16	19	44	53	120	140	230	270	270	320
	D70	0.7	0.5	0.545	0.175	20	30	55	82	150	220	290	420	340	500
	D80	0.8	0.5	0.545	0.175	30	36	83	100	230	270	430	510	500	600
	D90	0.9	0.5	0.545	0.175	36	51	99	140	270	380	510	720	600	850
	D100	1	0.5	0.545	0.175	49	63	140	170	370	470	690	890	810	1000
	D120	1.2	0.5	0.545	0.175	64	97	180	260	480	730	900	1300	1100	1600
D140	1.4	0.625	0.545	0.175	99	120	280	330	750	900	1500	1700	1700	2000	
20 kVDC	D50	0.5	0.375	0.650	0.175	7	11	19	30	51	83	96	150	120	180
	D60	0.6	0.375	0.650	0.175	12	14	33	39	89	100	170	200	200	240
	D70	0.7	0.5	0.650	0.175	15	22	42	62	120	160	220	320	250	370
	D80	0.8	0.5	0.650	0.175	23	27	62	75	170	200	320	380	380	450
	D90	0.9	0.5	0.650	0.175	27	38	74	100	210	280	380	540	450	630
	D100	1	0.5	0.650	0.175	37	47	110	130	280	350	520	670	610	790
	D120	1.2	0.5	0.650	0.175	48	73	140	200	360	550	680	1000	800	1200
D140	1.4	0.625	0.650	0.175	75	90	210	240	560	670	1100	1200	1300	1500	

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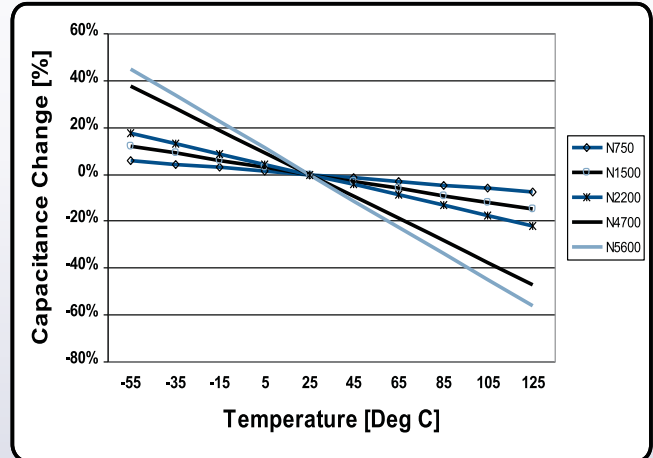
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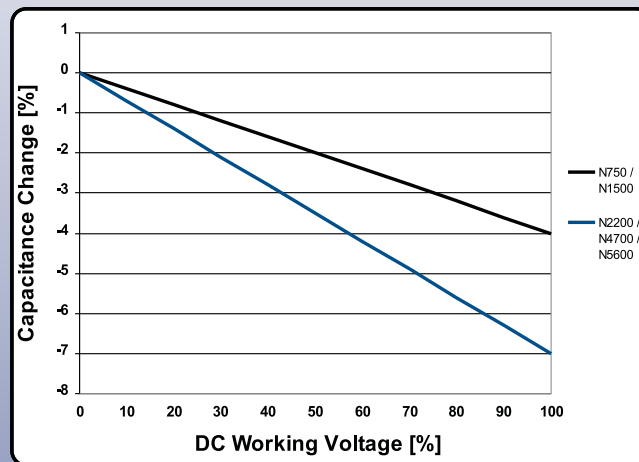
## Performance Charts (Typical)



Temperature Coefficient [PPM / °C]



Temperature Coefficient [% Vs Temp]



Voltage Coefficient