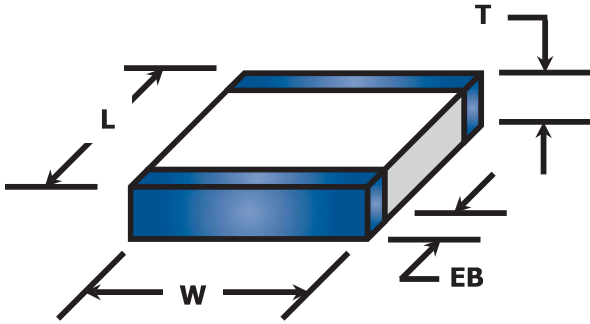


High Voltage Multi-Layer Pulse Chip Capacitors

Military & Commercial Level Class 1 Negative TC Low Loss – 500 Vdc to 10 kVdc



CalRamic Technologies LLC manufactures a series of highly reliable, military / commercial level high voltage, multi-layer ceramic chip capacitors that are conservatively designed and intended specifically for use in demanding high current, high voltage applications.

Intended for continuous operation at full rated voltage and across the entire operating temperature range, these capacitors utilize an inherently low loss dielectric material and a special internal design specifically intended to provide a device that exhibits very low ESR / ESL characteristics, especially at higher frequencies.

Available with stable CR09 dielectric material, these capacitors are ideally suited for high current pulse discharge applications.

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Performance Characteristics

Specification	Dielectric Type
	CR09
Material Classification	N2200 (R3L)
Coefficient of Thermal Expansion	11 x 10 ⁻⁶ / °C
Density	72 g / in ³
Operating Temperature Range	-55 to +125°C
Aging Rate	Negligible
Temperature Coefficient	-2200 PPM / °C ±24% Max
Voltage Coefficient	-7% Max @ WVDC
Capacitance Range	120 pF to 1.0 µF
Voltage Range	500 VDC to 10 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 ≤ 1250 Vdc / 1.2 X WVDC > 1250 Vdc

Mechanical Dimensions

Dimensions in [mm]	Product Style																
	HV1515	HV1812	HV1825	HV2020	HV2225*	HV2520*	HV3333*	HV3530*	HV4040*	HV4540*	HV5440*	HV5550*	HV6560*	HV7030*	HV9040*	HV11050*	HV13060*
Length [L] ToL ±	0.150 [3.81] 0.015 [0.38]	0.180 [4.57] 0.020 [0.51]	0.180 [4.57] 0.020 [0.51]	0.200 [5.08] 0.020 [0.51]	0.220 [5.59] 0.020 [0.51]	0.250 [6.35] 0.020 [0.51]	0.330 [8.38] 0.030 [0.76]	0.350 [8.89] 0.030 [0.76]	0.400 [10.2] 0.030 [0.76]	0.450 [11.43] 0.030 [0.76]	0.540 [13.7] 0.030 [0.76]	0.550 [14.0] 0.030 [0.76]	0.650 [16.5] 0.030 [0.76]	0.700 [17.8] 0.030 [0.76]	0.900 [22.9] 0.030 [0.76]	1.100 [27.9] 0.030 [0.76]	1.300 [33.0] 0.030 [0.76]
Width [W] ToL ±	0.150 [3.81] 0.015 [0.38]	0.120 [4.57] 0.015 [0.38]	0.250 [6.35] 0.020 [0.51]	0.200 [5.08] 0.020 [0.51]	0.250 [6.35] 0.020 [0.51]	0.200 [5.08] 0.020 [0.51]	0.330 [8.38] 0.030 [0.76]	0.300 [7.62] 0.030 [0.76]	0.400 [10.2] 0.030 [0.76]	0.400 [10.2] 0.030 [0.76]	0.400 [10.2] 0.030 [0.76]	0.500 [12.7] 0.030 [0.76]	0.600 [15.2] 0.030 [0.76]	0.300 [7.62] 0.030 [0.76]	0.400 [10.2] 0.030 [0.76]	0.500 [12.7] 0.030 [0.76]	0.600 [15.2] 0.030 [0.76]
Thickness [T] Max	0.140 [3.55]	0.100 [2.54]	0.160 [4.07]	0.180 [4.57]	0.200 [5.08]	0.180 [4.57]	0.220 [5.59]	0.220 [5.59]	0.220 [5.59]	0.220 [5.59]	0.220 [5.59]	0.220 [5.59]	0.220 [5.59]	0.220 [5.59]	0.220 [5.59]	0.220 [5.59]	0.220 [5.59]
EB Min - Max	0.010 - 0.030 [0.254 - 0.762]	0.010 - 0.040 [0.254 - 1.02]	0.010 - 0.040 [0.254 - 1.02]	0.010 - 0.040 [0.254 - 1.02]	0.010 - 0.040 [0.254 - 1.02]	0.020 - 0.060 [0.51 - 1.52]	0.020 - 0.060 [0.51 - 1.52]	0.020 - 0.060 [0.51 - 1.52]	0.020 - 0.060 [0.51 - 1.52]	0.020 - 0.060 [0.51 - 1.52]	0.020 - 0.060 [0.51 - 1.52]	0.020 - 0.060 [0.51 - 1.52]	0.020 - 0.060 [0.51 - 1.52]	0.020 - 0.060 [0.51 - 1.52]	0.020 - 0.060 [0.51 - 1.52]	0.020 - 0.060 [0.51 - 1.52]	0.020 - 0.060 [0.51 - 1.52]

* Surface Mount Tabs Recommended - See Page 58

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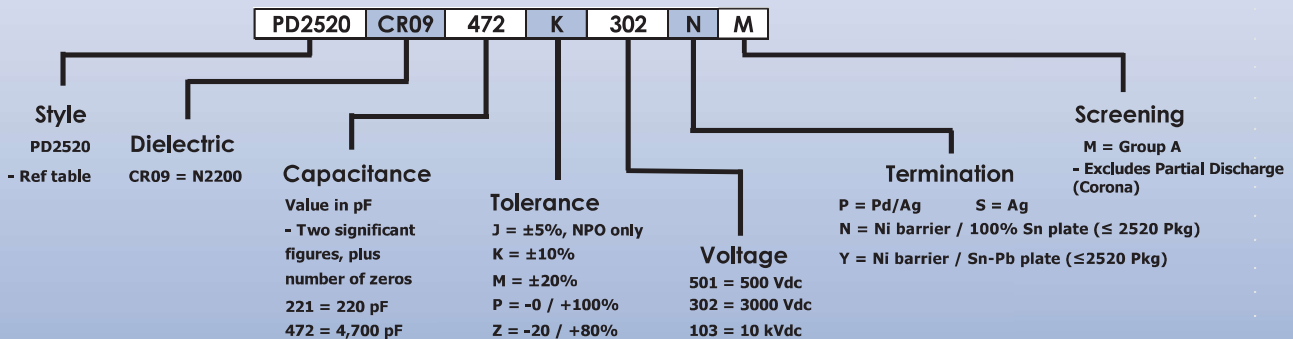
Electrical Characteristics

(CR09) Capacitance Range																		
Style	1515	1812	1825	2020	2225	2520	3015	3530	4020	4040	4540	5550	6560	7030	9040	11050	13060	
Min Cap	121	121	121	181	181	221	181	271	281	271	271	471	471	471	471	471	471	
WVDC	500	223	223	563	473	104	683	563	154	124	274	274	474	824	334	474	684	105
	1000	153	123	393	333	683	393	333	104	683	154	184	274	684	224	394	564	824
	2000	222	202	682	562	822	822	682	223	153	333	333	683	474	473	823	124	184
	3000	•	•	332	332	562	472	332	123	103	223	223	393	104	273	563	823	124
	4000	•	•	•	•	•	•	721	332	222	562	562	123	563	822	183	273	393
	5000	•	•	•	•	•	•	•	•	152	472	472	103	183	562	123	183	273
	7000	•	•	•	•	•	•	•	•	•	•	•	•	153	•	392	822	123
	10000	•	•	•	•	•	•	•	•	•	•	•	•	•	•	272	472	822

Notes

- Standard inspection and Group A testing when required, is performed in accordance with applicable requirements of MIL-PRF-49467.
- Special testing including Ultrasound (C-SAM) and Partial Discharge (Corona) is available. Contact factory for more information.
- Custom package sizes / aspect ratios, voltages and capacitance values available. Contact factory for more details.
- Large ceramic capacitors are susceptible to damage when exposed to thermal and/or mechanical shock. Refer to Technical Bulletin AN101/AN112 for handling and installation recommendations.
- High voltage products may require conformal coating to prevent possible arc over.
- Testing of higher voltage parts before installation and / or supplemental encapsulation, may be done in a suitable, non-contaminating dielectric fluid like FC-40.

Part Number / Ordering Information



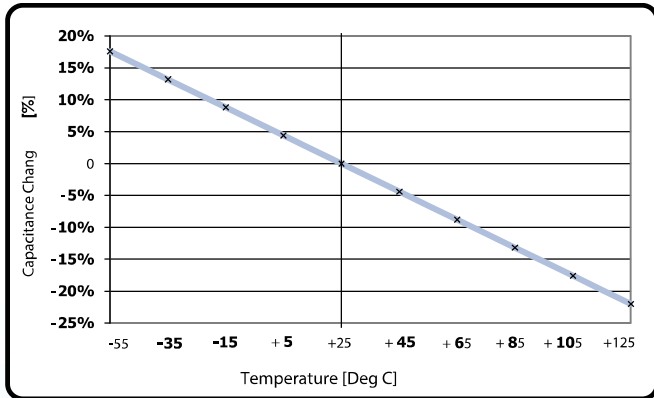
Note: Group A Screening is not included unless indicated in part number
Capacitors terminated with P, S or N terminations are classified as RoHS compliant

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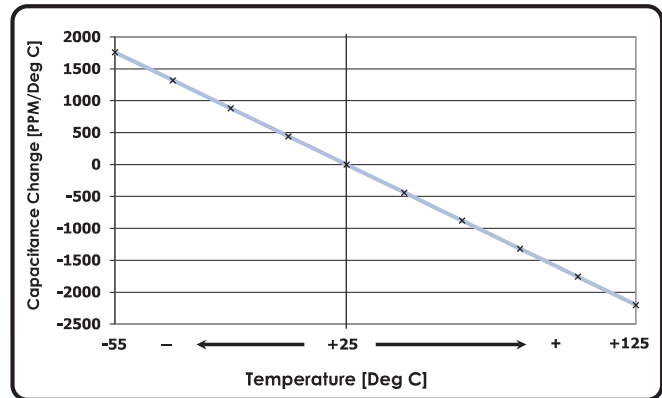
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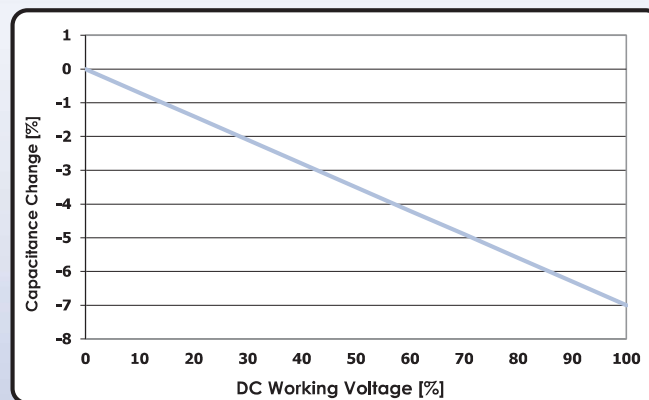
Performance Charts (Typical)



**CR09 (N2200) Temperature Coefficient
% Cap Change Vs Temp**



**CR09 (N2200) Temperature Coefficient
PPM Cap Change Vs Temp**



CR09 (N2200) Voltage Coefficient

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