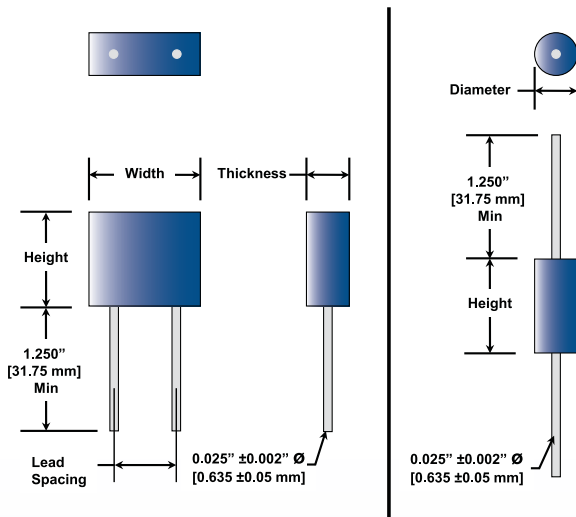


High Temperature - High Voltage Leaded Capacitors

200° C Rated NPO / HTX7R – 50 Vdc to 10 KVdc



Lead Type: #22 AWG, silver plated, CCFE or solid nickel

CalRamic Technologies LLC manufactures a series of highly reliable, encapsulated radial / axial leaded ceramic capacitors that are designed specifically for those severe conditions where the capacitor may be exposed to elevated levels of mechanical stress and high temperature conditions. These assemblies are packaged in a high resistance, high temperature rated case and backfilled with a high temperature epoxy that provides enhanced electrical isolation and added environmental protection.

Intended for continuous operation at full rated voltage and across the entire operating temperature range of -55 to +200°C, these capacitors utilize a special internal design specifically intended to reduce electric field stresses, thereby providing a device that exhibits very low ESR characteristics and no reduction in insulation resistance with life.

Available with ultra stable Class I, NPO and stable Class II, X7R dielectric materials, these capacitors are ideally suited for a variety of extreme applications associated with the high temperature aerospace, down-hole mining and automotive industries.

Performance Characteristics

Specification	Dielectric Type (EIA Designation)		
	NPO (COG)	HTX7R	HTX7R [Extended Range]
Material Classification	Type I, Ultra Stable, K90	Type II, Stable, K2100	Type II, Stable, K2500
Coefficient of Thermal Expansion	9 x 10 ⁻⁶ / °C		
Density	72 g / in ³		
Operating Temperature Range	-55 to +200°C		
Aging Rate	0	-2% Max per decade hour	
Temperature Coefficient	±60 PPM / °C	+15 / -40%	+15 / -60%
Voltage Coefficient	Negligible	-20% Max @ WVDC	-35% Max @ WVDC
Maximum Capacitance	0.10 µF HTR / 0.010 µF HTA	1.8 µF HTR / 0.68 µF HTA	2.7 µF HTR / 1.0 µF HTA
Voltage Range	50 VDC to 10 kVDC		
Insulation Resistance @ +25°C	100,000 MΩ or 1000 MΩ - µF, W/E is less		
Insulation Resistance @ 200°C	100 MΩ or 1 MΩ - µF, W/E is less		
Dissipation Factor	0.1% Max	2.0% Max	
DWV	2 x WVDC @ WVDC < 200 VDC / 1.5 x WVDC @ 200 VDC WVDC < 1 kVDC / 1.2 x WVDC @ WVDC 1 kVDC		

Mechanical Dimensions

Dimensions inches [mm]	Product Style												
	HTR01	HTR02	HTR03	HTR04	HTR05	HTR06	HTR07	HTA10	HTA11	HTA12	HTA13	HTA14	
Width - Max	0.200 [5.08]	0.200 [5.08]	0.200 [5.08]	0.300 [7.60]	0.500 [12.70]	0.700 [17.80]	1.500 [38.10]	0.170 [4.32]	0.270 [6.86]	0.400 [10.16]	0.500 [12.70]	0.750 [19.10]	
Height - Max	0.200 [5.08]	0.200 [5.08]	0.200 [5.08]	0.300 [7.60]	0.500 [12.70]	0.400 [10.16]	0.750 [19.05]	•	•	•	•	•	
Thickness - Max	0.100 [2.54]	0.100 [2.54]	0.150 [3.81]	0.150 [3.81]	0.250 [6.35]	0.250 [6.35]	0.300 [7.62]	•	•	•	•	•	
Diameter - Max	•	•	•	•	•	•	•	0.100 [2.54]	0.135 [3.43]	0.155 [3.94]	0.200 [5.08]	0.375 [9.53]	
Lead Spacing ±0.030 [0.762]	0.100 [2.54]	0.200 [5.08]	0.100 [2.54]	0.200 [5.08]	0.400 [10.16]	0.500 [12.70]	1.375 [34.93]	•	•	•	•	•	

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Electrical Characteristics

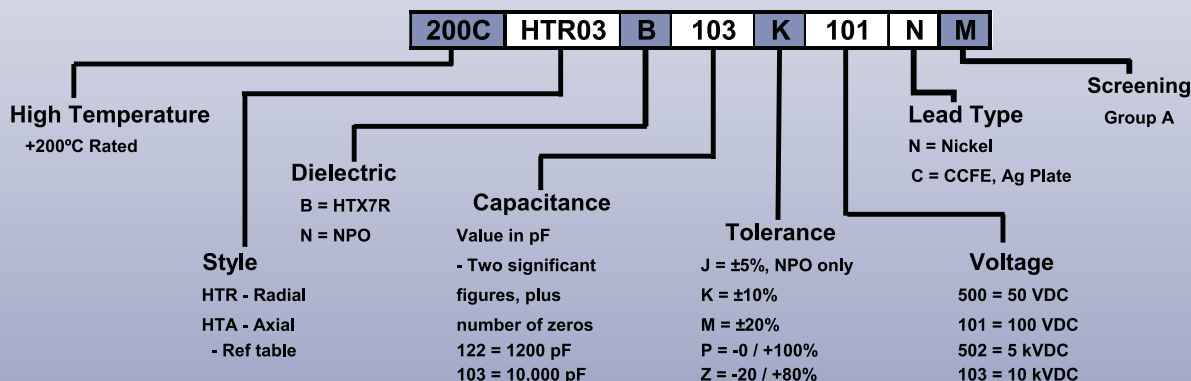
HT NPO Capacitance Range [Max]													
Style	HTR01	HTR02	HTR03	HTR04	HTR05	HTR06	HTR07	HTA10	HTA11	HTA12	HTA13	HTA14	
WVDC	50	562	562	562	253	683	104	•	142	332	103	•	•
	100	472	472	472	223	563	823	•	122	272	822	•	•
	200	392	392	392	183	473	683	•	102	252	682	•	•
	500	182	182	272	103	333	473	•	681	182	472	•	•
	1000	561	561	102	332	183	273	104	181	471	222	•	•
	2000	•	•	•	561	392	562	223	•	•	221	•	•
	3000	•	•	•	•	272	392	153	•	•	221	•	•
	4000	•	•	•	•	681	222	472	•	•	•	•	•
	5000	•	•	•	•	•	102	372	•	•	•	•	•
	10000	•	•	•	•	•	•	122	•	•	•	•	•

HTX7R Capacitance Range																									
Style	HTR01		HTR02		HTR03		HTR04		HTR05		HTR06		HTR07		HTA10		HTA11		HTA12		HTA13		HTA14		
Cap Range	STD	EXT	STD	EXT	STD	EXT	STD	EXT	STD	EXT	STD	EXT	STD	EXT	STD	EXT	STD	EXT	STD	EXT	STD	EXT	STD	EXT	
WVDC	50	823	124	823	124	823	124	474	824	125	185	185	275	•	•	273	393	683	104	184	274	274	394	684	105
	100	683	104	683	104	683	104	394	684	105	155	155	225	•	•	223	333	563	823	154	224	224	334	564	824
	200	273	393	273	393	393	563	154	224	564	824	824	125	•	•	822	123	333	473	823	124	124	184	334	474
	500	392	562	392	562	682	103	223	333	224	334	474	•	•	102	152	332	47	153	223	273	393	124	184	
	1000	102	152	102	152	182	272	562	822	563	823	823	124	394	564	271	391	681	102	272	392	562	822	333	473
	2000	•	•	•	•	•	•	102	152	153	223	183	273	863	124	•	•	•	•	561	102	152	222	682	103
	3000	•	•	•	•	•	•	•	•	562	822	822	103	333	473	•	•	•	•	391	561	102	122	332	472
	4000	•	•	•	•	•	•	•	•	252	392	392	562	153	183	•	•	•	•	•	•	271	391	122	182
	5000	•	•	•	•	•	•	•	•	•	•	222	332	103	123	•	•	•	•	•	•	•	•	821	122
	10000	•	•	•	•	•	•	•	•	•	•	•	•	222	332	•	•	•	•	•	•	•	•	•	•

Notes

- Group A screening available to MIL-PRF-49467 at +200°C. [Voltage conditioning performed at 1.5 x WVDC for product rated at ≤ 200 VDC].
- Special testing including Partial Discharge (Corona) is available for product rated at ≥500 VDC. Contact factory for more information.
- Custom voltages, package sizes and capacitance values available. Contact factory
- X7R dielectrics are not intended for AC line filtering applications.
- 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.

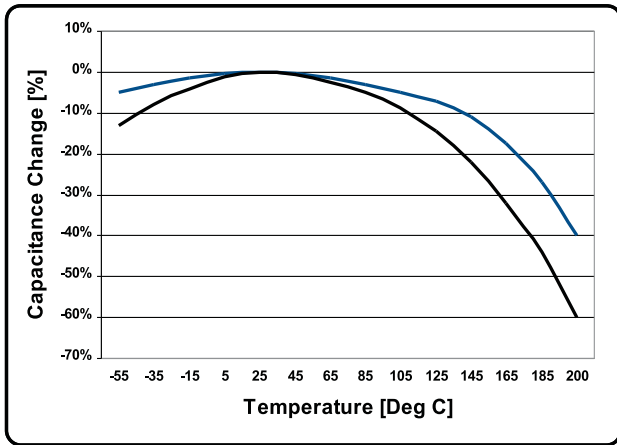
Part Number / Ordering Information



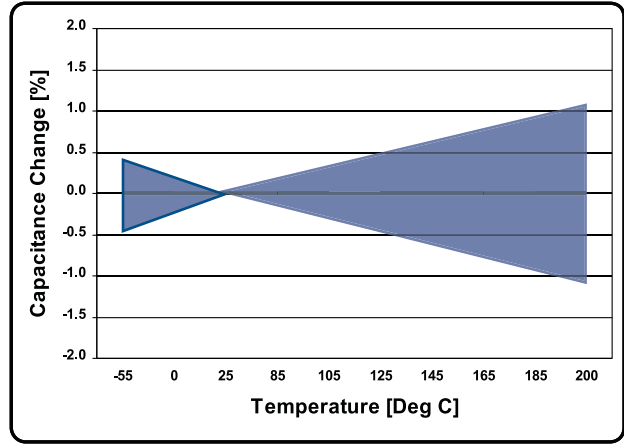
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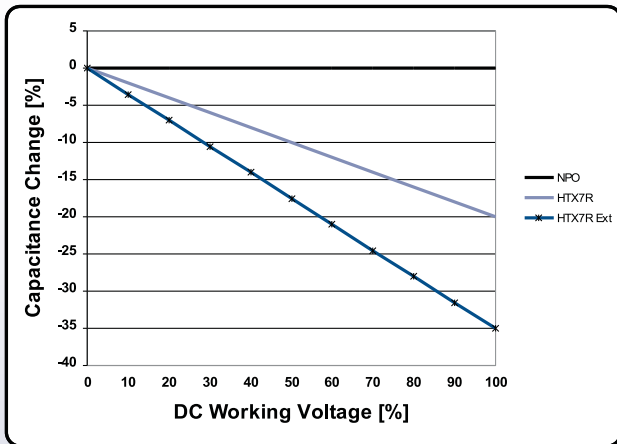
Performance Charts (Typical)



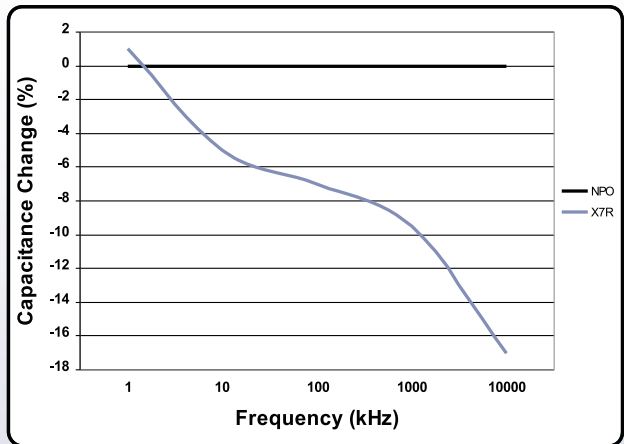
HTX7R Temperature Coefficient



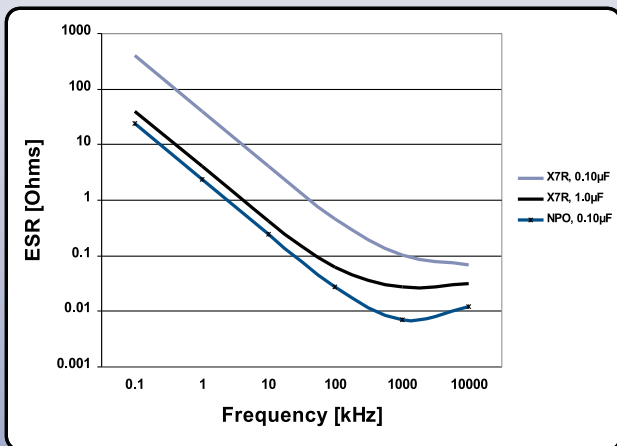
HTNPO Temperature Coefficient



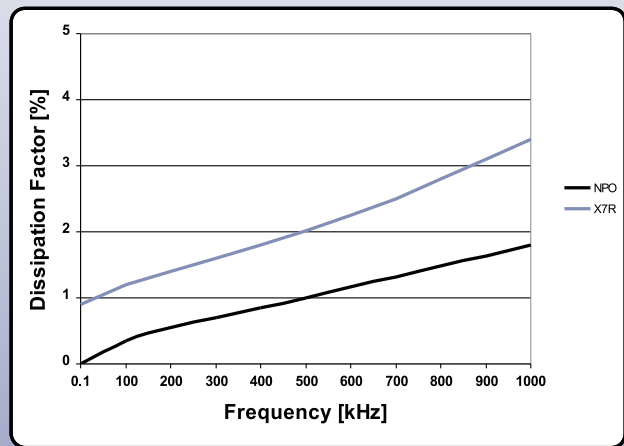
Voltage Coefficient



Capacitance Vs Frequency



ESR Vs Frequency



DF Vs Frequency