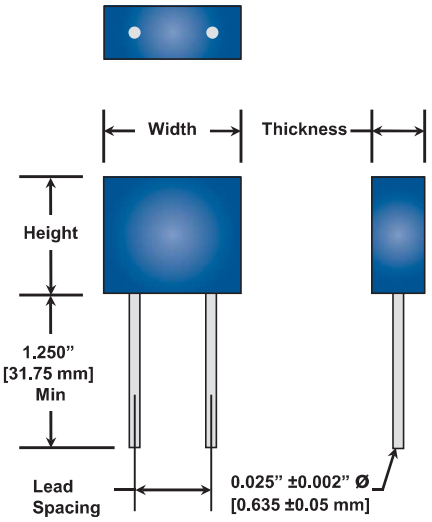
High Temperature – High Voltage Leaded Capacitors

200ºC Rated NPO & HTX7R – 50 Vdc to 10kVdc



1. Lead Type: #22 AWG, CCFE silver plated 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 +200ºC, 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	11 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 @ ≤ 1 kVDC / 1.2 x WVDC @ WVDC > 1 kVDC		

Mechanical Dimensions

Dimensions inches [mm]	Product Style						
	HTR01	HTR02	HTR03	HTR04	HTR05	HTR06	HTR07
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]
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]
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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MADE IN USA

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Electrical Characteristics

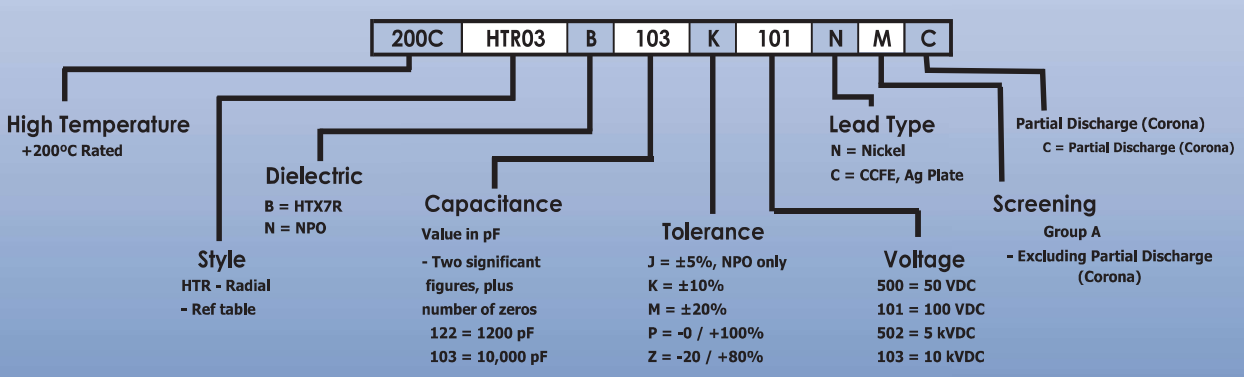
HTNPO Capacitance Range [Max]								
Style		HTR01	HTR02	HTR03	HTR04	HTR05	HTR06	HTR07
WVDC	50	562	562	562	253	683	104	•
	100	472	472	472	223	563	823	•
	200	392	392	392	183	473	683	•
	500	182	182	272	103	333	473	•
	1000	561	561	102	332	183	273	104
	2000	•	•	•	561	392	562	223
	3000	•	•	•	•	272	392	153
	4000	•	•	•	•	681	222	472
	5000	•	•	•	•	•	102	372
	10000	•	•	•	•	•	•	122

HTX7R Capacitance Range														
Style		HTR01		HTR02		HTR03		HTR04		HTR05		HTR06		HTR07	
Cap Range		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	•	•
	100	683	104	683	104	683	104	394	684	105	155	155	225	•	•
	200	273	393	273	393	393	563	154	224	564	824	824	125	•	•
	500	392	562	392	562	682	103	223	333	224	334	334	474	•	•
	1000	102	152	102	152	182	272	562	822	563	823	823	124	394	564
	2000	•	•	•	•	•	•	102	152	153	223	183	273	863	124
	3000	•	•	•	•	•	•	•	•	562	822	822	103	333	473
	4000	•	•	•	•	•	•	•	•	252	392	392	562	153	183
	5000	•	•	•	•	•	•	•	•	•	•	222	332	103	123
	10000	•	•	•	•	•	•	•	•	•	•	•	•	222	332

Notes

1. 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].
2. Special testing including Partial Discharge (Corona) is available for product rated at ≥500 VDC. Contact factory for more information.
3. Custom voltages, package sizes and capacitance values available. Contact factory.
4. X7R dielectrics are not intended for AC line filtering applications.
5. Large ceramic capacitors, even leaded devices are susceptible to damage when exposed to thermal and / or mechanical shock. Refer to Technical Bulletin AN103/AN112 for handling and installation recommendations.

Part Number / Ordering Information



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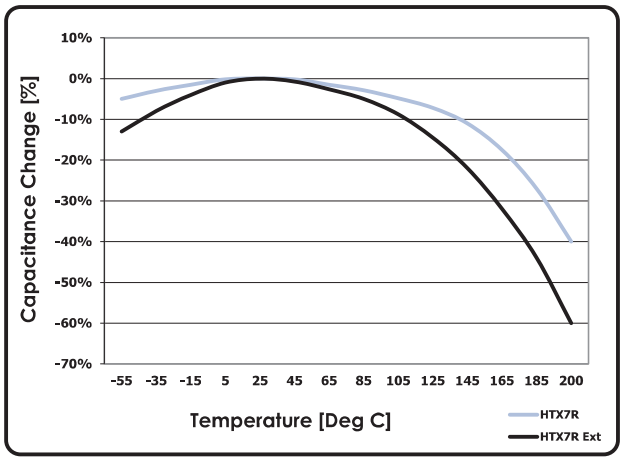
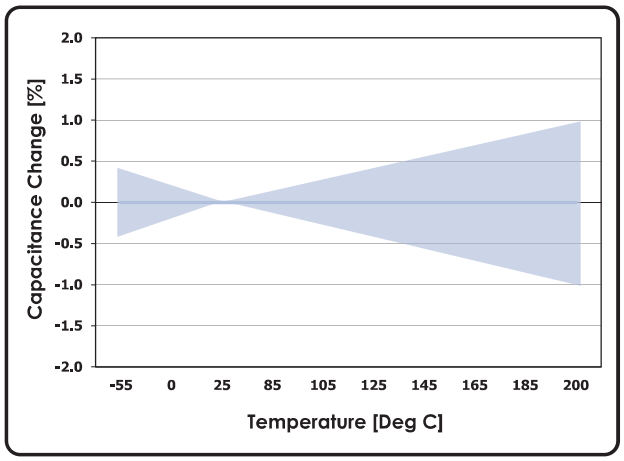
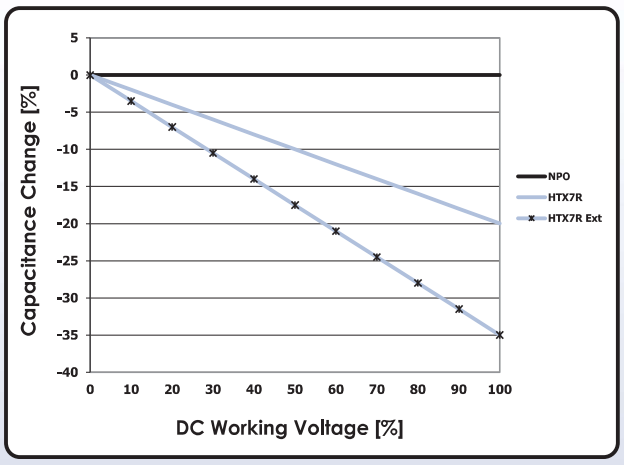
Performance Charts (Typical)



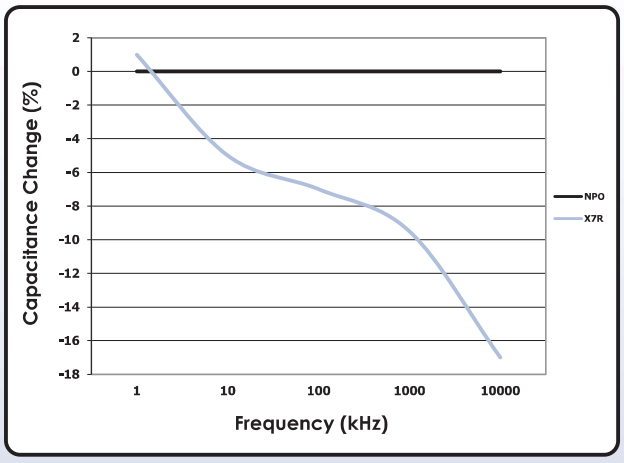
HTX7R Temperature Coefficient



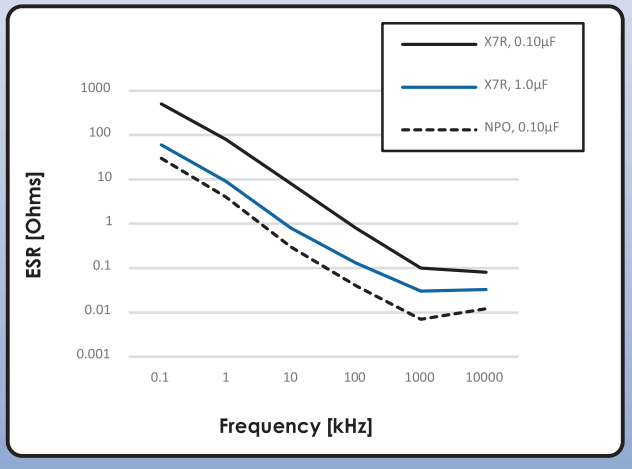
HTNPO Temperature Coefficient



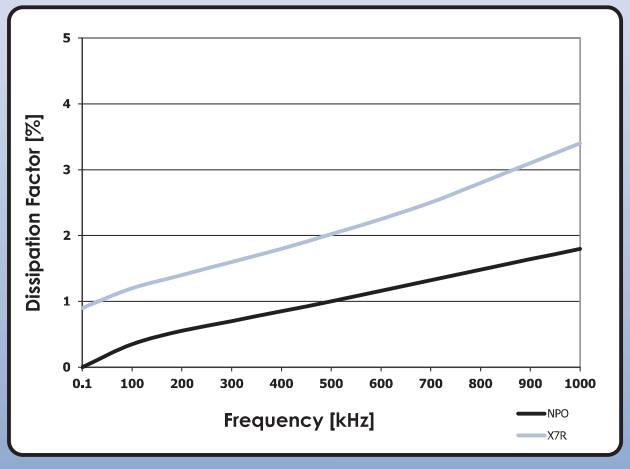
Voltage Coefficient



Capacitance Vs Frequency



ESR Vs Frequency



DF Vs Frequency