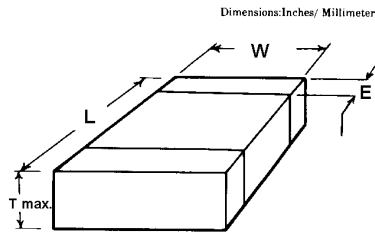


PART NUMBERING

Part Number Example: CMC-016/104KX0603TF									
CMC	-	016	/	104	K	X	0603	T	F
Type		Rated DC Voltage		Capacitance Code (pF)*	Tolerance Code	Dielectric Material**	Case Size	Package Code***	RoHs Compliant
* Capacitance Code: First two digits represent significant figures, third digit represents multiplier (number of zeros).									
** Dielectric Material: N = NPO, X = X7R, X5 = X5R, Y = Y5V									
*** Package Code: T = 7" Tape & Reel, T13 = 13" Tape & Reel, W = Waffle.									



CAPACITANCE RANGE (pF-EIA)

EIA/TC	W VDC	01005	0201	0402	0603	0805	1206	1210	1812	1825	2225
NPO	200				0R5-681	0R5-122	0R5-562	5R0-103	100-183	100-473	270-563
	100				0R5-472	0R5-103	0R5-473	5R0-104	100-154	100-563	270-683
	50		0R5-101	0R5-152	0R5-103	0R5-333	0R5-104	5R0-154	100-224	150-104	270-823
	25		0R5-101	0R5-222	0R5-153	0R5-473	0R5-104	5R0-224	100-224	150-104	270-823
	16	0R2-101	0R5-101	0R5-222	0R5-153	0R5-473	0R5-124	5R0-224	100-224	150-104	270-823
	10	0R2-101	0R5-101	0R5-222	0R5-153	0R5-473		5R0-224	100-224	150-104	270-823
	6.3	0R2-101	0R5-101	0R5-222	0R5-153	0R5-473					
X7R	200				121-103	121-563	121-154	121-474	102-105	471-105	471-225
	100			221-472	221-104	121-474	121-225	121-225	102-475	471-155	471-475
	50		101-102	101-104	101-105	121-225	102-475	104-106	223-106	471-225	471-106
	35		101-102	101-104	101-105	102-475	102-106	104-106	223-106	471-225	471-106
	25		101-332	101-104	101-105	102-475	102-106	104-226	223-226	471-225	471-106
	16		100-103	101-224	101-105	102-106	102-106	104-226	223-336	471-225	471-106
	10	101-102	100-103	101-224	101-106	102-106	102-226	104-476	223-336	471-225	471-106
6.3		100-104	101-105	101-106	102-106	102-226	104-476	223-336	471-225	471-106	
X5R	100						102-225		105-475		
	50		101-471	102-104	101-105	121-475	103-106	105-106	105-106		
	35		101-471	102-225	101-475	121-475	103-226	105-106	105-106		
	25		101-104	102-225	101-106	121-226	103-476	225-226	106-226		
	16	101-681	101-224	102-225	101-106	102-226	103-476	475-107	106-336		
	10	101-103	101-105	102-106	101-226	102-476	103-107	106-107	225-107		
	6.3	101-104	101-105	102-106	101-226	102-476	103-107	226-227	336-107		
4	101-104	101-105	102-156	101-226	102-476	103-107	226-227	336-107			
Y5V	100				101-332						
	50			102-223	101-474	102-225	104-475	224-106			
	35			102-223	101-474	102-225	104-106	224-226			
	25			102-224	101-105	102-475	104-106	224-226	226		
	16		103	102-474	101-225	102-106	224-226	224-476	226-476		
	10		472-103	102-105	101-475	102-106	224-226	224-476	476-107		
	6.3		103-104	103-105	102-106	102-226	335-107	226-107	107		
4		103-104	103-105	102-106	102-226	335-107	226-107	107			

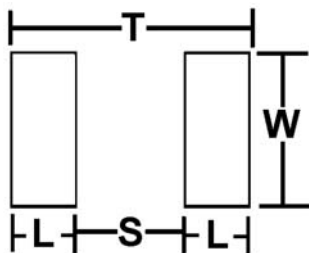
SIZE AND CAPACITANCE SPECIFICATIONS

DIMENSIONS: mm (INCHES)

EIA	01005	0201	0402	0603	0805	1206	1210	1812	1825	2225
Length	0.4 ± 0.02	0.6 ± 0.03	1.00 ± 0.10	1.60 ± 0.15	2.01 ± 0.20	3.2 ± 0.20	3.20 ± 0.20	4.5 ± 0.30	4.5 ± 0.30	5.72 ± 0.25
	(0.016 ± 0.0008)	(0.0236 ± 0.001)	(0.040 ± 0.004)	(0.063 ± 0.006)	(0.079 ± 0.008)	(0.126 ± 0.008)	(0.126 ± 0.008)	(0.177 ± 0.012)	(0.177 ± 0.012)	(0.225 ± 0.010)
Width	0.2 ± 0.02	0.3 ± 0.03	0.50 ± 0.10	0.81 ± 0.15	1.25 ± 0.20	1.60 ± 0.20	2.50 ± 0.20	3.20 ± 0.40	6.40 ± 0.40	6.35 ± 0.25
	(0.008 ± 0.0008)	(0.0118 ± 0.001)	(0.020 ± 0.004)	(0.032 ± 0.006)	(0.049 ± 0.008)	(0.063 ± 0.008)	(0.098 ± 0.008)	(0.126 ± 0.008)	(0.252 ± 0.016)	(0.25 ± 0.01)
Thickness	0.2 ± 0.02	0.3 ± 0.03	0.60	0.90	1.4	1.78	2.70	3.05	2.30	2.30
	(0.008 ± 0.0008)	(0.0118 ± 0.001)	(0.024)	(0.035)	(0.055)	(0.07)	(0.106)	(0.12)	(0.08)	(0.08)
Endband	0.07~0.14	0.15 ± 0.05	0.25 ± 0.15	0.35 ± 0.15	0.50 ± 0.25	0.50 ± 0.25	0.50 ± 0.25	0.60 ± 0.35	0.6 ± 0.35	0.64 ± 0.39
	(0.0028 ~ 0.0055)	(0.006 ± 0.005)	(0.010 ± 0.006)	(0.014 ± 0.006)	(0.020 ± 0.10)	(0.020 ± 0.010)	(0.020 ± 0.010)	(0.024 ± 0.014)	(0.024 ± 0.014)	(0.025 ± 0.015)

TOLERANCE CODE

Tolerance	±0.1pF	±0.25pF	±0.50pF	±1.0%	±2.0%	±5%	±10%	±20%	-0% ~ +100%	-20% ~ +80%
Code	B	C	D	F	G	J	K	M	P (GMV)	Z



RECOMMENDED PAD DIMENSIONS (INCHES (MM))

Chip Size	L	W	S	T
01005	.006~0.009 (0.15~0.24)	.006~.009 (0.16~0.24)	0.006~0.007 (0.11~0.18)	.016~.022 (0.41~0.66)
0201	0.010 (0.254)	0.016 (0.406)	0.010 (0.254)	0.040 (1.000)
0402	0.020 (0.060)	0.022 (0.560)	0.017 (0.431)	0.059 (1.500)
0504	0.030 (0.800)	0.050 (1.270)	0.020 (0.060)	0.090 (2.290)
0603	0.030 (0.800)	0.030 (0.800)	0.030 (0.800)	0.100 (2.540)
0805	0.040 (1.000)	0.050 (1.270)	0.040 (1.000)	0.120 (3.050)
1005	0.040 (1.000)	0.050 (1.270)	0.060 (1.520)	0.140 (3.560)
0907	0.040 (1.000)	0.070 (1.780)	0.050 (1.270)	0.130 (3.300)
1206	0.040 (1.000)	0.065 (1.650)	0.080 (2.030)	0.160 (4.060)
1505	0.040 (1.000)	0.050 (1.270)	0.110 (3.300)	0.190 (4.820)
1805	0.040 (1.000)	0.050 (1.270)	0.130 (3.300)	0.210 (5.330)
1210	0.040 (1.000)	0.100 (2.540)	0.080 (2.030)	0.160 (4.060)
1808	0.050 (1.270)	0.080 (2.030)	0.130 (3.300)	0.230 (5.840)
1812	0.050 (1.270)	0.120 (3.050)	0.130 (3.300)	0.230 (5.840)
1825*	0.050 (1.270)	0.250 (6.350)	0.130 (3.300)	0.230 (5.840)
2225*	0.050 (1.270)	0.250 (6.350)	0.170 (4.310)	0.270 (6.860)
3640*	0.060 (1.520)	0.400 (10.100)	0.300 (0.800)	0.420 (10.700)

*These sizes are recommended for use with IR and vapor phase soldering only and the use of stress relieving lead frames with them is recommended.

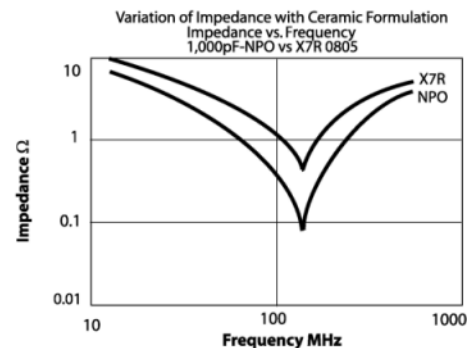
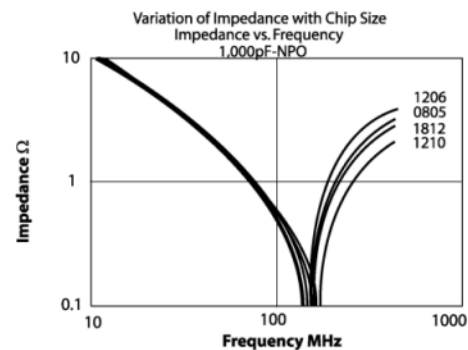
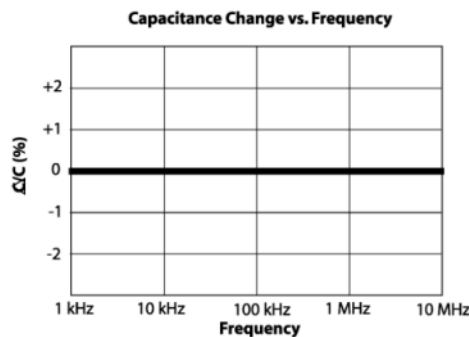
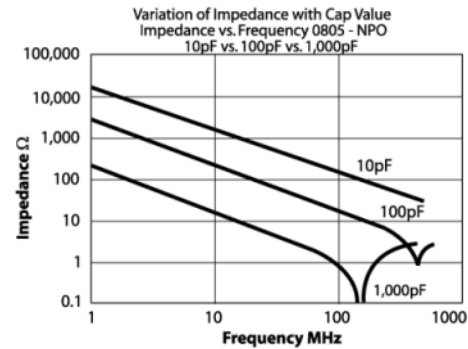
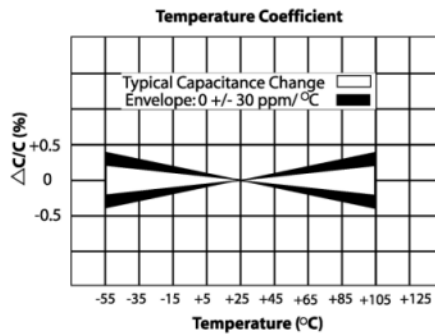
NPO ceramics, Class I, offer one of the most stable capacitor dielectric available. Typical capacitance change with life is less than $\pm 0.1\%$ for NPOs, 1/5 that shown by most other dielectrics.

The NPO formulation usually has Q (Quality Factor) in excess of 1000 and show little capacitance or Q changes with frequency.

The inherent stability of these devices makes them ideally suited for use in precision applications such as oscillator, filtering and timing circuits.

SPECIFICATIONS

Performance Characteristics	
Operating Temperature Range	-55°C ~ +125°C.
Temperature Coefficient	0ppm/°C \pm 30ppm/°C from -55°C ~ +125°C.
Withstanding Voltage (between leads)	2.5 times rated voltage, 50mA maximum for 1 second
Capacitance Tolerance	$\pm 0.1\text{pF}$, $\pm 0.25\text{pF}$, & $\pm 0.50\text{pF}$ @ $< 10\text{pF}$. $\pm 1\%$, $\pm 2\%$, $\pm 5\%$, & $\pm 10\%$ @ $\geq 10\text{pF}$.
Maximum Dissipation Factor % (25°C)	0.1 maximum
Minimum Insulation Resistance (25°C)	10G Ω or 500meg Ω x Farads, whichever is less, measured @ rated voltage.
Testing Conditions (25°C)	1MHz \pm 50Hz @ 1.0Vrms \pm 0.20Vrms (values $\leq 100\text{pF}$). 1KHz \pm 50Hz @ 1.0Vrms \pm 0.20Vrms (values $> 100\text{pF}$).

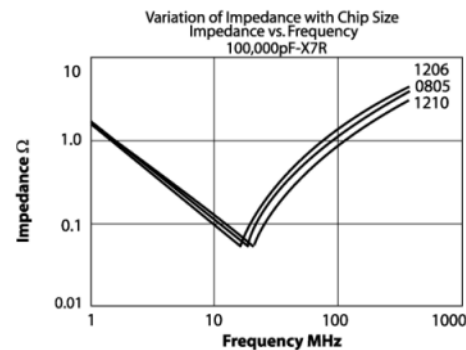
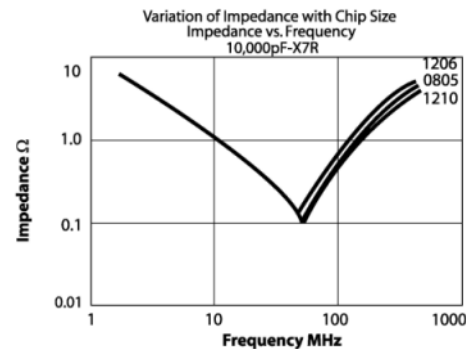
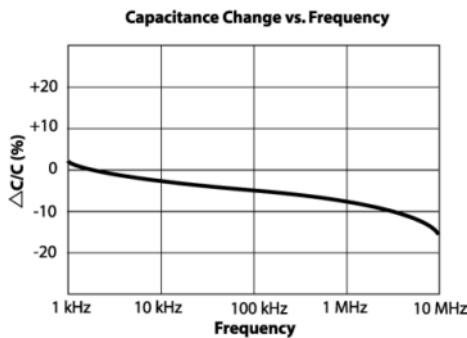
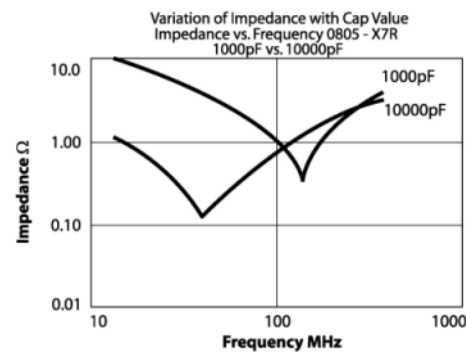
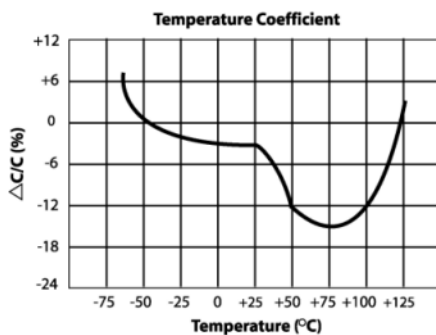


X7R ceramics, "Mid-K", Class II, are the most temperature-stable ceramics in their class. Capacitance for X7R varies under the influence of electrical operating conditions such as voltage and frequency. It also varies with time, approximately 2.5% ΔC per decade.

These devices are suited for bypass and decoupling applications, filtering, frequency discrimination, DC blocking, and voltage suppression.

SPECIFICATIONS

Performance Characteristics	
Operating Temperature Range	-55°C ~ +125°C (X7R). -55°C ~ +85°C (X5R).
Temperature Coefficient	$\pm 15\%$ $\Delta^\circ\text{C}$ maximum from -55°C ~ +125°C (X7R). $\pm 15\%$ $\Delta^\circ\text{C}$ maximum from -55°C ~ +85°C (X5R).
Withstanding Voltage (between leads)	2.5 times rated voltage, 50mA maximum for 1 second
Capacitance Tolerance	$\pm 5\%$, $\pm 10\%$, & $\pm 20\%$.
Maximum Dissipation Factor % (25°C, 1KHz)	2.5 @ 1.0Vrms, except 16 & 25VDC (X7R). 3.5 @ 16 & 25VDC (X7R). 5 @ 1.0Vrms (X5R).
Minimum Insulation Resistance (25°C)	10G Ω or 500 meg Ω x Farads, whichever is less, measured @ rated voltage.
Testing Conditions (25°C)	1KHz \pm 50Hz @ 1.0Vrms \pm 0.20Vrms (values $\leq 10\mu\text{F}$). 120Hz @ 0.5Vrms (values $> 10\mu\text{F}$).



Y5V ceramics, Class III dielectric offer the highest capacitance values available. Ideally suited for bypass and decoupling applications where space is at a premium or as replacements for tantalum capacitors. Best performance is obtained at or near room temperature and at low DC bias conditions. Their aging rate is approximately 7% per decade.

SPECIFICATIONS

Performance Characteristics	
Operating Temperature Range	-30°C ~ +85°C.
Temperature Coefficient	+22% ~ -82% Δ°C maximum from -30°C ~ +85°C.
Withstanding Voltage (between leads) (25°C)	2.5 times rated voltage, 50mA maximum for 1 second
Capacitance Tolerance	-20% / +80%.
Maximum Dissipation Factor % (25°C)	5.0
Minimum Insulation Resistance (25°C)	10G Ω or 500 meg Ω x Farads, whichever is less.
Testing Conditions (25°C)	1KHz ± 50Hz @ 1.0Vrms ± 0.20Vrms (values ≤10μF). 120Hz @ 0.5Vrms (values >10μF).

