



Introduction

These ceramic capacitors use high dielectric constant ($K > 1000$) ferroelectric materials based on barium titanate. Key features of this capacitor class include its non-linear temperature characteristics, reliable voltage and frequency performance and predictable change of capacitance with time. The capacitors available in this class have temperature characteristic codes of Z5P. Other codes are also available having dielectric constants usually, but not necessarily, greater than 4000. The capacitors available in this class have temperature characteristic codes of T3M, Y5R, Y5U, Y5V, Z5P and Z5U.

Application

1. High voltage power supplies
2. Voltage multipliers
3. By-pass circuits
4. Coupling circuits
5. Filters

Specifications

Capacitance and Dissipation Factor Measurement Methods:

Capacitance and Dissipation Factor are measured at a standard frequency of 1 KHz. A temperature of 25°C is used with an applied test voltage of less than 2 Volts AC. The allowable dissipation factor will be no greater than 2.5%.

Voltage Ratings:

500 V_{DC} to 15 KV_{DC} (see tables)

Capacitance Tolerances Available:

Tolerance	Code Letter
±5	J
±10%	K
±20%	M
+80, -20%	Z
+100, -0%	P

Dielectric Withstand Voltage:

Capacitors must meet the original manufacturer's specifications following application of 2 times the rated D.C. voltage for 5±1 seconds or 1.5 times the rated voltage for NY2 Series.

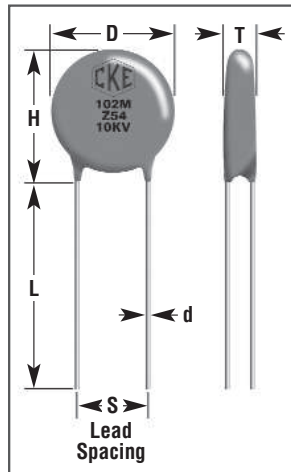
Insulation Resistance:

Insulation resistance shall be 10,000 megohms or greater with a test temperature of 25°C. Measurements are made between component terminals following a 2 minute charge at 100 Volts DC. Charging currents will be limited to no more than 50 milliamperes.

Temperature Characteristics Available:

The temperature characteristics table follows the EIA Standard RS-198-C. The first letter in the table indicates the low temperature limit followed by a number which sets the upper temperature limit. The final letter sets the maximum capacitance deviation acceptable over the designated range with 25°C serving as the reference point.

1st Letter	Number	Last Letter
X= -55°C	5= +85°C	F= ±7.5%
Y= -30°C	6= +105°C	P= ±10%
Z= +10°C	7= +125°C	R= ±15%
		S= ±22%
		T= +22%/-33%
		U= +22%/-56%
		V= +22%/-82%



Life Testing Method:

These capacitors are designed to withstand voltages of at least 1.5 times the rated DC voltage for at least 1000 hours at 85°C. A change of capacitance of no more than 10% is acceptable when tested 24 hours later. Dissipation Factor changes are limited to 5% with Insulation Resistance values of no less than 1000 megohms.

Temperature Ratings:

Class II capacitors are intended to operate within the temperature limits set forth in EIA RS-198-C but may be stored at temperatures ranging from -55°C to +125°C without harm.

Humidity Resistance:

Capacitors must have a minimum insulation resistance of 1000 megohms and a maximum Dissipation Factor of 5% following exposure to a relative humidity of 95% for 100 hours at 40°C.

Construction

Coating Materials:

All Capacitors with 500 VDC ratings and 1 KVDC ratings are coated with a flame retardant, baked-on phenolic coating applied using the wet-dip method. Those rated 2 KV and above, are coated with a flame retardant, dry process fluid-bed epoxy. Diameter and thickness dimensions shown in the tables apply to epoxy as well as phenolic-coated units.

Lead Coatings:

On straight leads, the coatings shall not extend beyond 1/8 inch below the bottom of the capacitor disk. On bent or formed leads, the coating will not be allowed beyond the kink which is the seating plane of the capacitor.

Lead Wire Material and Configurations:

Lead wire material is tin-plated copper wire of 22 or 20 AWG. Capacitors with diameters of 12 mm or less, or voltage values less than 8 KV will be of the smaller gauge. Standard lead configurations are straight and at least 1 inch long, and formed or cut leads are available on special order (drawings required on special configurations). Lead spacings are available from the tables.

Component Marking:

Both inking and laser equipment are used to mark these components. Each capacitor shall bear the manufacturer's initials "CKE" across the top, followed by the capacitance, tolerance, temperature code and voltage where space permits. When space is limited, the temperature characteristic code may be omitted.

Ordering Information:

Component values should be selected from the information provided in the tables, and orders should be placed using the convention described below. For special orders, contact CKE using the contact information provided at the end of this document.

CK2 Manufacturer's Code	Y5P Temperature Characteristics Code	102 Capacitor Value (pf)	M Capacitance Tolerance Code	10KV DC Voltage Rating
CK2 or NY2 for Class II Capacitors	From Temperature Characteristics Table to the Left	3 Digits Total 1st two are Significant Third is Multiplier 0=X1 1=X10 2=X100 3=X1000 9=X10000	K=±10% M=±20% Z=+80, -20% P=+100, -0%	From Table

Example: CK2Z5U471K5KV
This is a capacitor with Z5U temperature characteristics, a capacitance of 470 pf, a capacitance tolerance of ±10% with a rated DC voltage of 5 KV.



CAPACITORS

Maximum Diameter (mm)	Maximum Capacitance Available (pf)-Y5P Temperature Coefficient									CK2 Series	
	500V _{DC}	1KV _{DC}	2KV _{DC}	3KV _{DC}	4KV _{DC}	5KV _{DC}	6KV _{DC}	8KV _{DC}	10KV _{DC}	12KV _{DC}	15KV _{DC}
Max. Thickness (mm) ▶	4.0	5.0	6.0	6.0	7.0	7.0	8.0	9.0	10.0	10.0	12.0
6	1000	680	470	300	270						
7	1500	1000	680	470	330	270					
8	2200	1500	1000	680	470	330	240	220			
9	3300	2200	1500	1000	680	470	330	270	220	180	
10	3900	2700	1800	1200	1000	680	470	330	270	240	220
12	4700	3900	2200	1800	1500	1000	680	680	470	390	330
14	6800	4700	3300	2200	1800	1500	1000	820	680	470	390
16	10000	6800	4700	2700	2200	2000	1500	1000	820	680	470
18		10000	6800	3300	3000	2700	2200	1500	1200	1000	680
20			10000	4700	3900	3300	2700	2000	1500	1200	1000

Maximum Diameter (mm)	Maximum Capacitance Available (pf)-Y5U Temperature Coefficient									CK2 Series	
	500V _{DC}	1KV _{DC}	2KV _{DC}	3KV _{DC}	4KV _{DC}	5KV _{DC}	6KV _{DC}	8KV _{DC}	10KV _{DC}	12KV _{DC}	15KV _{DC}
Max. Thickness (mm) ▶	4.0	5.0	6.0	6.0	7.0	7.0	8.0	9.0	10.0	10.0	12.0
6	2200	1500	1000								
7	3300	2200	1500	820	680	470					
8	4700	3300	2200	1200	1000	680	470	390			
9	6800	4700	3300	1800	1200	1000	680	470	430		
10	10000	6800	3900	2200	1500	1200	1000	680	560	470	
12	15000	8200	4700	2700	2200	1800	1500	1000	820	680	470
14	22000	10000	6800	3300	3300	2700	2200	1500	1200	1000	680
16	27000	15000	10000	4700	3900	3300	2700	2200	1800	1500	1000
18	33000	22000	15000	6800	4700	3900	3300	2700	2200	1800	1200
20	39000	30000	22000	10000	6800	4700	3900	3300	2700	2200	1500

Maximum Diameter (mm)	Maximum Capacitance Available (pf)-Y5V Temperature Coefficient									CK2 Series	
	500V _{DC}	1KV _{DC}	2KV _{DC}	3KV _{DC}	4KV _{DC}	5KV _{DC}	6KV _{DC}	8KV _{DC}	10KV _{DC}	12KV _{DC}	15KV _{DC}
Max. Thickness (mm) ▶	4.0	5.0	6.0	6.0	7.0	7.0	8.0	9.0	10.0	10.0	12.0
6	3300	2200	1500	820							
7	4700	3300	2200	1500	1200	1000					
8	8200	4700	3300	2200	1500	1200	1000				
9	10000	6800	4700	3300	2200	1800	1200	1000			
10	15000	8200	6800	3900	3300	2200	1800	1500	1000		
12	22000	10000	8200	4700	3900	3300	3000	2200	1500	1000	
14	33000	15000	10000	6800	5600	4700	3900	3300	2200	1500	
16	47000	22000	15000	8200	7500	6800	4700	3900	3300	2200	
18	68000	33000	22000	12000	10000	8200	6800	4700	4300	3600	
20	100000	47000	33000	15000	12000	10000	8200	6800	5600	4700	

Maximum Diameter (mm)	Maximum Capacitance Available (pf)-Z5P Temperature Coefficient									CK2 Series	
	500V _{DC}	1KV _{DC}	2KV _{DC}	3KV _{DC}	4KV _{DC}	5KV _{DC}	6KV _{DC}	8KV _{DC}	10KV _{DC}	12KV _{DC}	
Max. Thickness (mm) ▶	4.0	5.0	5.0	6.0	6.0	7.0	7.0	8.0	9.0	10.0	
6	560	430	300	180	150	120	100				
8	1500	1000	680	390	330	270	240				
10	2700	1800	1200	680	560	470	390	300	240	200	
12	3900	2700	1800	1000	820	750	680	470	390	300	
14	5600	3900	2700	1500	1200	1000	910	680	560	470	
16	8200	5600	3600	2200	1800	1500	1200	820	680	560	
18	10000	6300	4300	2400	2000	1800	1500	1000	820	680	
20		8200	5100	3300	2700	2400	2000	1200	1000	820	

Maximum Diameter (mm)	Maximum Capacitance Available (pf)-Z5U Temperature Coefficient									CK2 Series	
	500V _{DC}	1KV _{DC}	2KV _{DC}	3KV _{DC}	4KV _{DC}	5KV _{DC}	6KV _{DC}	8KV _{DC}	10KV _{DC}	12KV _{DC}	
Max. Thickness (mm) ▶	4.0	5.0	5.0	6.0	6.0	7.0	7.0	8.0	9.0	10.0	
6	1800	1000	750	470	390	330	270				
8	3900	1800	1000	750	560	470	430				
10	6800	3000	2200	1200	1000	820	750	560	470	390	
12	10000	4700	3300	2000	1500	1200	1000	820	680	560	
14	15000	7500	4700	3000	2400	2000	1800	1200	1000	820	
16		10000	6800	3900	3300	2700	2200	1800	1200	1000	
18			8200	4700	3900	3300	2700	2000	1500	1200	
20			10000	5600	4700	3900	3600	2400	2000	1500	

- 1) 500V, 1KV, 2KV
- 2) 3KV/4KV
- 3) 5KV/6KV/8KV
- 4) 10KV/12KV

Lead Spacing 5mm	dia over 10mm, Lead Spacing = 7.5mm or 10mm
Lead Spacing 7.5mm	dia over 10mm, Lead Spacing = 10mm
Lead Spacing 10mm	dia over 15mm, Lead Spacing = 12.5mm
Lead Spacing 10mm	dia over 15mm, Lead Spacing = 12.5mm

