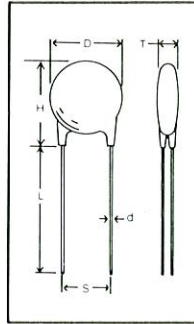


# CLASS II – Frequency/Temperature Stable Ceramic Disk Capacitors – Type FSP

## General

NOTE: Revisions of EIA RS-198 prior to Revision C combined semi-stable and Higher-K general purpose ceramic capacitors under the Class II designation. Class II now refers specifically and only to semi-stable ceramic capacitors as defined below. Class III now refers to High-K general purpose capacitors and Class IV has been created for reduced titanate or barrier layer type capacitors which were formerly identified as Class III.



Maida produces a special series of Class II ceramic capacitors which are stable in both frequency and temperature response characteristics. This group is characterized by capacitance values which vary: (1) by  $\pm 10\%$  or less with changes in temperature over the range of  $+10\text{C}$  to  $+85\text{C}$ , and (2) by less than  $-10\%$  over the frequency range from 1 KHz to 100 MHz. Their EIA temperature characteristic is Z5P. These capacitors are suited for wide-band audio or R.F. coupling and by-pass applications where frequency stability is of specific concern.

## Specifications

### Capacitance and Dissipation Factor:

Capacitance and dissipation factor shall be measured at a frequency of 1 KHz at  $25\text{C}$  with less than 2.0 volts A.C. applied. The maximum dissipation factor shall be 2.5%.

### Capacitance Tolerances Available:

Tolerance	Code Letter
$\pm 10\%$	K
$\pm 20\%$	M
+80%, -20%	Z
+100%, -0% (GMV)	P

### Voltage Ratings:

500 VDC – 30 KVDC (see tables)

### Insulation Resistance:

The insulation resistance shall not be less than 10,000 megohms at  $25\text{C}$  when measured between terminals after a 2-minute charge at 100 volts D.C. with the charging current limited to 50 milliamps.

### Dielectric Withstand Voltage:

After applying twice rated D.C. voltage for  $5 \pm 1$  seconds, capacitors shall meet the original requirements.

### Temperature Characteristics Available:

A 3-digit code per EIA RS-198-C is used. The first letter denotes the lower temperature limit. A number then designates the upper temperature limit. A last letter defines the maximum variation of capacitance over this range using the  $+25\text{C}$  value as the reference.

1st Letter	Number	Last Letter
Z = $+10\text{C}$	5 = $+85\text{C}$	P = $\pm 10\%$

### Temperature Ratings:

Class II frequency stable capacitors operate within the temperature limits of  $+10\text{C}$  to  $+85\text{C}$ . Storage temperatures may vary from  $-55\text{C}$  to  $+125\text{C}$  without affecting ratings.

### Life Test:

Capacitors shall withstand a potential of 1.5 times the rated D.C. voltage for a period of 1000 hours at  $85\text{C}$ . When tested 24 hours after the completion of the test, the capacitance change shall be no more than 10%; the maximum D.F. shall be 5.0%; and the minimum I.R. shall be 1000 megohms.

### Humidity Resistance:

After exposure to a relative humidity of 95% for 100 hours at  $40\text{C}$ , capacitors shall have a minimum I.R. of 1000 megohms and a D.F. of 5.0% maximum.

## Construction

### Coating Materials:

Maida's standard disk capacitors are conformally coated either with a dry-process fluid-bed epoxy or with a baked-on phenolic coating applied by a wet-dip method. Diameter and thickness dimensions shown in the tables are for the epoxy-coated units. These sizes are typically  $1/32$  inch (.031) larger in diameter than for phenolic-coated capacitors of identical values. Each coating is flame retardant.

### Coating Control on Leads:

Straight leads – the coating will not extend more than  $1/8$ " onto the leads as measured from a tangent line drawn to the bottom of the disk.

Formed leads – the coating will not extend below that kink which defines the "seating plane" of the capacitor.

### Lead Wires:

Material - Standard leads are tin-plated copper, either 22 AWG or 20 AWG. All capacitors which are both smaller than  $1/2$ " maximum diameter and rated below 8 KVDC use 22 AWG. All others have 20 AWG.

Configuration - Standard leads are straight and long (1" minimum). Cut and/or formed leads are available. See page 25 for some of the many lead forms available.

Lead Spacing - On standard capacitors, nominal lead spacing is determined primarily by disk diameter. See capacitance tables. Other lead spacings are available on request.

## Marking

Laser marking and ink-stamp marking methods are used. All units shall be marked with "MDC", rated capacitance, capacitance tolerance, temperature characteristic code, and rated voltage. 500-volt capacitors shall have no voltage marking. On smaller units where space is limited the "MDC" may be omitted. Date coding is available.

## How To Order

Standard disk capacitors from the following tables should be ordered by Maida Style Number according to the following format:

D64FSP Style	681 Capacitance Code	K Tolerance Code	1KV DC Voltage
from first column of table	3 digits-2 are significant figures, last is a multiplier.	K= $\pm 10\%$ M= $\pm 20\%$ Z= $+80\%, -20\%$ P= $+100\%, -0\%$ (GMV)	from table
Phenolic coating available for voltages 2KV and less. Omit leading "D" in style number.	multipliers 0 = $\times 1$ 1 = $\times 10$ 2 = $\times 100$ 3 = $\times 1000$ 9 = $\times 0.1$		(omit for 500V ratings.)



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## Maximum Capacitance Available (pF) - Type FSP -Z5P Temperature Coefficient

STYLE	D MAX	L.S.	500V	1KV	2KV	3KV	4KV	5KV	6KV	8KV	9KV	10KV	12KV	15KV	18KV	20KV	22KV	25KV	30KV
MAX. THICKNESS			.170	.190	.220	.250	.260	.310	.340	.400	.430	.460	.520	.610	.710	.770	*	*	*
D59FSP	.282	.200	390	270	150	91	68	47	36										
D58FSP	.312	.200	620	430	220	150	100	82	62										
D60FSP	.344	.250	820	560	300	200	150	120	91										
D73FSP	.375	.250	1100	750	390	270	200	160	130										
D68FSP	.407	.250	1500	910	510	330	270	200	180	150	130	110	91	68	39	27			
D61FSP	.469	.300	2000	1500	750	510	390	330	270	200	180	160	150	110	75	62	43	24	
D71FSP	.532	.375	3000	2000	1100	750	560	430	360	270	240	220	180	150	120	100	82	56	24
D62FSP	.594	.375	3900	2700	1500	1000	750	560	470	360	330	300	240	200	160	150	120	91	56
D69FSP	.656	.500	5100	3300	1800	1200	910	750	620	470	430	360	300	240	200	180	160	150	91
D64FSP	.720	.500	6200	4300	2200	1500	1100	910	750	560	510	470	390	300	270	220	200	180	130
D63FSP	.782	.500	7500	5100	2700	1800	1500	1100	910	680	620	560	470	360	300	270	240	220	180
D67FSP	.844	.500	9100	6200	3300	2200	1600	1300	1100	820	750	680	560	430	360	330	300	270	220
D65FSP	.906	.500	10000	7500	3900	2700	2000	1500	1300	1000	820	750	620	510	430	390	360	300	270
D76FSP	.969	.500	12000	9100	4300	3000	1220	1800	1500	1100	1000	910	750	620	510	430	390	360	300
D66FSP	1.100	.500	→	11000	5600	3900	2300	2400	2000	1500	1300	1200	1000	750	620	560	510	470	390
D70FSP	1.350	.500	→	18000	9100	6200	4700	3600	3000	2200	2000	1800	1500	1200	1000	910	820	750	620

\*Various encapsulation available, contact our Engineering Department.

