



## Polypropylene Film Capacitors ORANGE DROP<sup>®</sup>, Low Loss



Polypropylene plastic film is employed as the dielectric in Type 715P ORANGE DROP<sup>®</sup> capacitors. Type 715P capacitors are ideal for applications where high AC current flow is found, as in certain solid-state TV vertical circuits, r-f generators and pulse-forming networks where dielectric heating is often a problem.

The polypropylene dielectric film is similar to polystyrene in that it can handle high AC currents due to its low loss but with the added advantage of an operating temperature to + 105°C.

Capacitance change with temperature is less than 3% over the entire operating temperature range. The temperature coefficient is negative and virtually linear at 180PPM/°C over the temperature range of + 25°C to + 105°C. This characteristic means the Type 715P is suitable for matching with positive TC resistors and inductors to maintain circuit stability.

Type 715P ORANGE DROP<sup>®</sup> capacitors are conformally coated with a flame retardant epoxy.

Performance characteristics, as well as curves showing typical variation in electrical characteristics as a function of temperature and frequency, are given.

### PERFORMANCE CHARACTERISTICS

**Operating Temperature:** - 55°C to + 85°C standard; up to + 105°C when working voltage is reduced to 50% of the + 85°C rating.

**Insulation Resistance:** After a 2 minute charge at rated voltage or 500 V, whichever is less.

At + 25°C: 400,000 Megohm for  $C \leq .5\mu\text{F}$ .  
200,000 Megohm - Microfarads for  $C > .5$  Microfarads.

At + 85°C: 20,000 Megohm for  $C \leq .5$  Microfarads.  
10,000 Megohm - Microfarads for  $C > .5$  Microfarads.

At + 105°C: 2000 Megohm for  $C \leq .5\mu\text{F}$ .  
1000 Megohm - Microfarads for  $C > .5$  Microfarads.

### Capacitance, Tolerance and Dissipation Factor:

Capacitors shall be measured at a frequency of 1000Hz at + 25°C or else be referred to measurements made at that frequency and temperature. The maximum dissipation factor shall be 0.1%.

**Dielectric Withstanding Voltage:** Capacitors rated below 1000 volts shall withstand a DC potential of 250% of rated voltage applied between terminals for not more than 5 seconds. Capacitors rated 1000 volts and above shall withstand a DC potential of 200% of rated voltage applied between the terminals for not more than 5 seconds. The test voltage must be applied and discharged through a resistor of one ohm per volt.

**Humidity Test:** Condition capacitors with no voltage applied for 72 hours at 95% relative humidity and + 75°C. Remove capacitors from humidity chamber, wipe surface dry of moisture and dry in circulating air for 4 hours. Measure insulation resistance after a two minute charge at + 25°C and rated voltage or 500 VDC, whichever is less. Minimum product of insulation resistance and capacitance shall be 50,000 Megohm-microfarads after test but need not exceed 100,000 Megohm. Not more than one failure in 12 units tested shall be permitted.

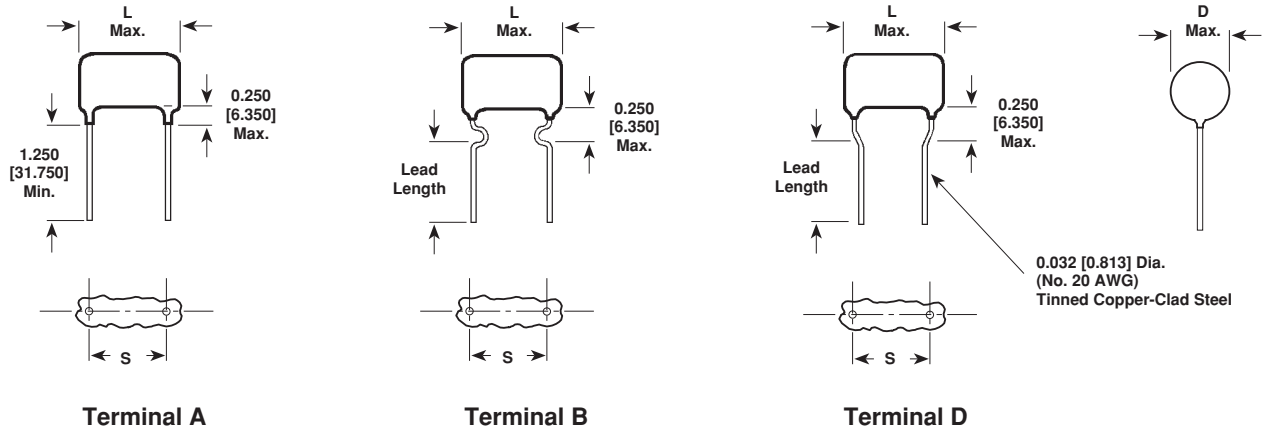
**DC Life Test:** Capacitors are capable of withstanding a 500 hour life test at + 85°C at 150% of rated working voltage. After test, capacitance shall not have changed by more than 5% of initial value, insulation resistance shall not have decreased by more than 50% of the initial limit and dissipation factor shall not have increased to more than 0.1%.

**AC Life Test:** Capacitors shall withstand the maximum 60Hz voltage for a period of 500 hours at + 85°C.

Rated DC Voltage	Maximum 60Hz Voltage
200	155
400, 600	200
800, 1200, 1600	500

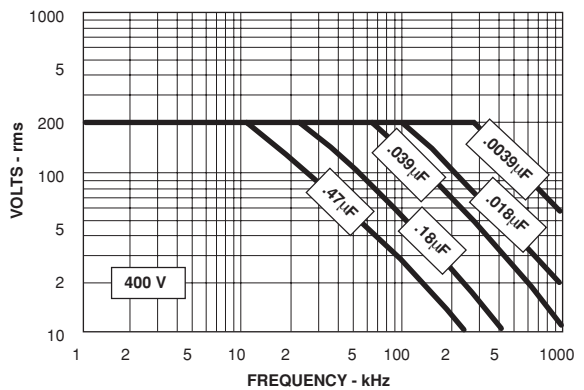
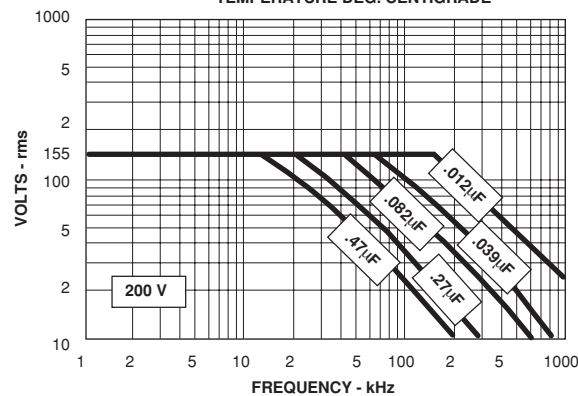
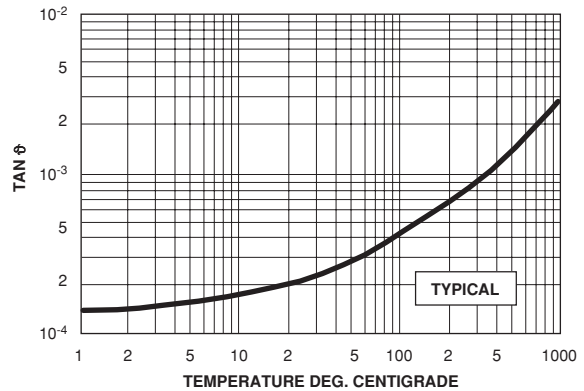
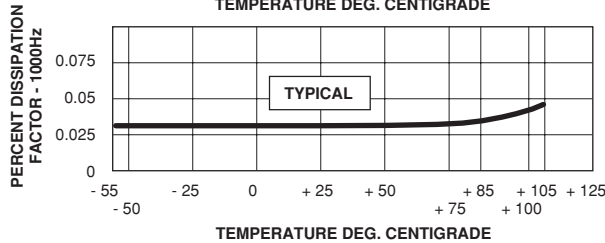
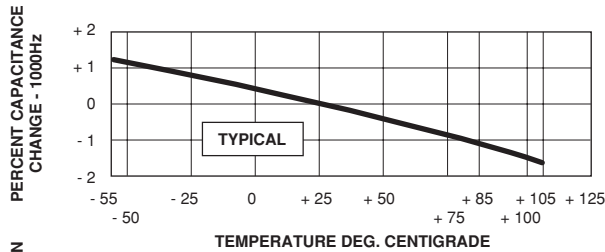
Not more than one failure allowed in 12 units tested.

## DIMENSIONS in inches [millimeters]



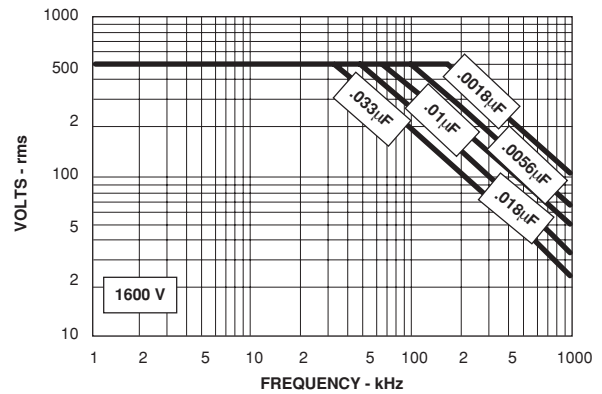
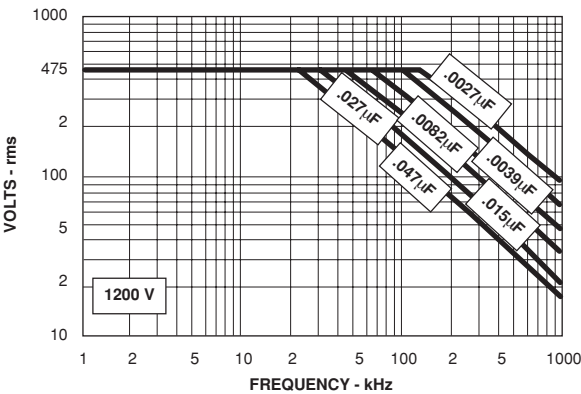
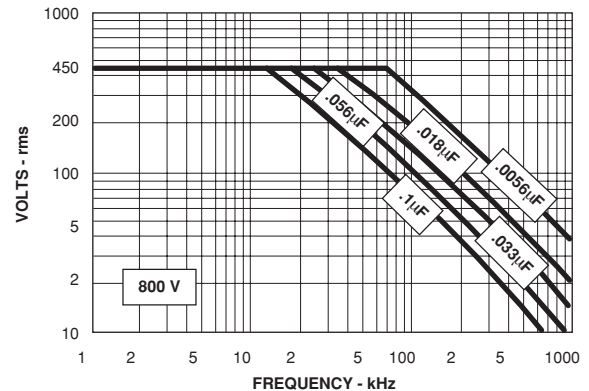
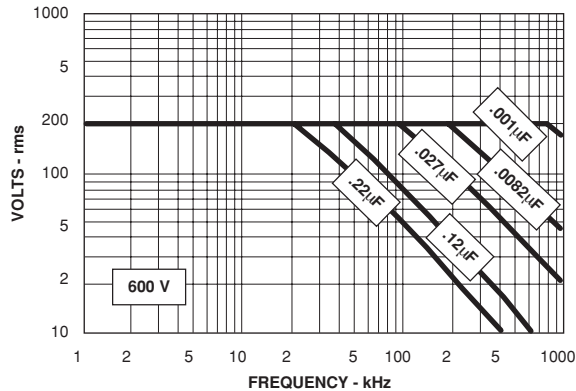
CASE CODE	L (Max.)	S		
		Terminal A ± 0.060 [1.524]	Terminal B ± 0.030 [0.762]	Terminal D ± 0.030 [0.762]
J	0.75 [19.050]	0.500 [12.700]	0.500 [12.700]	0.375 [9.525]
K	0.95 [24.130]	0.688 [17.475]	0.688 [17.475]	0.375 [9.525]
L	1.30 [33.020]	1.031 [26.187]	0.969 [24.613]	0.719 [18.263]
M	1.70 [43.180]	1.406 [35.712]	1.344 [34.138]	1.094 [27.788]

## PERFORMANCE CHARACTERISTICS





**PERFORMANCE CHARACTERISTICS**



**STANDARD RATINGS\*** in inches [millimeters]

± 10% TOLERANCE µF	PART NUMBER	SIZE	
		L	D
<b>200 VDC/155 VAC**</b>			
.012	715P12392J	0.75 [19.05]	0.37 [9.40]
.015	715P15392J	0.75 [19.05]	0.37 [9.40]
.018	715P18392J	0.75 [19.05]	0.37 [9.40]
.022	715P22392J	0.75 [19.05]	0.37 [9.40]
.027	715P27392J	0.75 [19.05]	0.42 [10.67]
.033	715P33392J	0.75 [19.05]	0.42 [10.67]
.039	715P39392K	0.95 [24.13]	0.40 [10.16]
.047	715P47392K	0.95 [24.13]	0.40 [10.16]
.056	715P56392K	0.95 [24.13]	0.45 [11.43]
.068	715P68392K	0.95 [24.13]	0.45 [11.43]
.082	715P82392L	1.30 [33.02]	0.45 [11.43]
.1	715P10492L	1.30 [33.02]	0.45 [11.43]
.12	715P12492L	1.30 [33.02]	0.55 [13.97]
.15	715P15492L	1.30 [33.02]	0.55 [13.97]
.18	715P18492L	1.30 [33.02]	0.62 [15.75]
.22	715P22492L	1.30 [33.02]	0.62 [15.75]
.27	715P27492M	1.70 [43.18]	0.65 [16.51]
.33	715P33492M	1.70 [43.18]	0.65 [16.51]
.39	715P39492M	1.70 [43.18]	0.75 [19.05]
.47	715P47492M	1.70 [43.18]	0.75 [19.05]

\* Shaded items, when ordered as ± 5% tolerance with D3 leads, are standard capacitors in stock and available through the Sprague® Distribution Network. To complete the Type 715P Part Number, add the "D3" suffix and change the capacitance tolerance code number from a "9" to a "5" to indicate ± 5% (i.e., 715P10456LD3). Any other Part Number, value or type may easily be ordered as a Special.

\*\* 60Hz rms.



<b>STANDARD RATINGS*</b> in inches [millimeters]				
$\mu\text{F}$ $\pm 10\%$ TOLERANCE	PART NUMBER	SIZE		
		L	Dia.	
<b>400 VDC/200 VAC**</b>				
.0039	715P39294J	0.75 [19.05]	0.40 [10.16]	
.0047	715P47294J	0.75 [19.05]	0.40 [10.16]	
.0056	715P56294J	0.75 [19.05]	0.40 [10.16]	
.0068	715P68294J	0.75 [19.05]	0.40 [10.16]	
.0082	715P82294J	0.75 [19.05]	0.40 [10.16]	
.01	715P10394J	0.75 [19.05]	0.40 [10.16]	
.012	715P12394J	0.75 [19.05]	0.45 [11.43]	
.015	715P15394J	0.75 [19.05]	0.45 [11.43]	
.018	715P18394K	0.95 [24.13]	0.45 [11.43]	
.022	715P22394K	0.95 [24.13]	0.45 [11.43]	
.027	715P27394K	0.95 [24.13]	0.50 [12.70]	
.033	715P33394K	0.95 [24.13]	0.50 [12.70]	
.039	715P39394L	1.30 [33.02]	0.50 [12.70]	
.047	715P47394L	1.30 [33.02]	0.50 [12.70]	
.056	715P56394L	1.30 [33.02]	0.55 [13.97]	
.068	715P68394L	1.30 [33.02]	0.55 [13.97]	
.082	715P82394L	1.30 [33.02]	0.60 [15.24]	
.1	715P10494L	1.30 [33.02]	0.60 [15.24]	
.12	715P12494L	1.30 [33.02]	0.65 [16.51]	
.15	715P15494L	1.30 [33.02]	0.65 [16.51]	
.18	715P18494M	1.70 [43.18]	0.70 [17.78]	
.22	715P22494M	1.70 [43.18]	0.70 [17.78]	
.27	715P27494M	1.70 [43.18]	0.80 [20.32]	
.33	715P33494M	1.70 [43.18]	0.80 [20.32]	
.39	715P39494M	1.70 [43.18]	0.90 [22.86]	
.47	715P47494M	1.70 [43.18]	0.90 [22.86]	
<b>600 VDC/200 VAC**</b>				
.001	715P10296J	0.75 [19.05]	0.40 [10.16]	
.0012	715P12296J	0.75 [19.05]	0.40 [10.16]	
.0015	715P15296J	0.75 [19.05]	0.40 [10.16]	
.0018	715P18296J	0.75 [19.05]	0.40 [10.16]	
.0022	715P22296J	0.75 [19.05]	0.40 [10.16]	
.0027	715P27296J	0.75 [19.05]	0.40 [10.16]	
.0033	715P33296J	0.75 [19.05]	0.40 [10.16]	
.0039	715P39296J	0.75 [19.05]	0.45 [11.43]	
.0047	715P47296J	0.75 [19.05]	0.45 [11.43]	
.0056	715P56296J	0.75 [19.05]	0.45 [11.43]	
.0068	715P68296J	0.75 [19.05]	0.45 [11.43]	
.0082	715P82296K	0.95 [24.13]	0.45 [11.43]	
.01	715P10396K	0.95 [24.13]	0.45 [11.43]	
.012	715P12396K	0.95 [24.13]	0.50 [12.70]	
.015	715P15396K	0.95 [24.13]	0.50 [12.70]	
.018	715P18396K	0.95 [24.13]	0.55 [13.97]	
.022	715P22396K	0.95 [24.13]	0.55 [13.97]	
.027	715P27396L	1.30 [33.02]	0.55 [13.97]	
.033	715P33396L	1.30 [33.02]	0.55 [13.97]	
.039	715P39396L	1.30 [33.02]	0.60 [15.24]	
.047	715P47396L	1.30 [33.02]	0.60 [15.24]	
.056	715P56396L	1.30 [33.02]	0.65 [16.51]	
.068	715P68396L	1.30 [33.02]	0.65 [16.51]	
.082	715P82396L	1.30 [33.02]	0.75 [19.05]	
.1	715P10496L	1.30 [33.02]	0.75 [19.05]	
.12	715P12496M	1.70 [43.18]	0.75 [19.05]	
.15	715P15496M	1.70 [43.18]	0.75 [19.05]	
.18	715P18496M	1.70 [43.18]	0.85 [21.59]	
.22	715P22496M	1.70 [43.18]	0.85 [21.59]	

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\*\* 60Hz rms.



<b>STANDARD RATINGS*</b> in inches [millimeters]				
$\mu\text{F}$ $\pm 10\%$ TOLERANCE	PART NUMBER	SIZE		
		L	D	
<b>800 VDC/450 VAC**</b>				
.0056	715P56298L	1.30 [33.02]	0.50 [12.70]	
.0068	715P68298L	1.30 [33.02]	0.50 [12.70]	
.0082	715P82298L	1.30 [33.02]	0.50 [12.70]	
.01	715P10398L	1.30 [33.02]	0.50 [12.70]	
.012	715P12398L	1.30 [33.02]	0.55 [13.97]	
.015	715P15398L	1.30 [33.02]	0.55 [13.97]	
.018	715P18398L	1.30 [33.02]	0.60 [15.24]	
.022	715P22398L	1.30 [33.02]	0.60 [15.24]	
.027	715P27398L	1.30 [33.02]	0.70 [17.78]	
.033	715P33398L	1.30 [33.02]	0.70 [17.78]	
.039	715P39398M	1.70 [43.18]	0.70 [17.78]	
.047	715P47398M	1.70 [43.18]	0.70 [17.78]	
.056	715P56398M	1.70 [43.18]	0.80 [20.32]	
.068	715P68398M	1.70 [43.18]	0.80 [20.32]	
.082	715P82398M	1.70 [43.18]	0.90 [22.86]	
.1	715P10498M	1.70 [43.18]	0.90 [22.86]	
<b>1200 VDC/475 VAC**</b>				
.0027	715P272912L	1.30 [33.02]	0.50 [12.70]	
.0033	715P332912L	1.30 [33.02]	0.50 [12.70]	
.0039	715P392912L	1.30 [33.02]	0.50 [12.70]	
.0047	715P472912L	1.30 [33.02]	0.50 [12.70]	
.0056	715P562912L	1.30 [33.02]	0.55 [13.97]	
.0068	715P682912L	1.30 [33.02]	0.55 [13.97]	
.0082	715P822912L	1.30 [33.02]	0.60 [15.24]	
.01	715P103912L	1.30 [33.02]	0.60 [15.24]	
.012	715P123912L	1.30 [33.02]	0.65 [16.51]	
.015	715P153912L	1.30 [33.02]	0.65 [16.51]	
.018	715P183912M	1.70 [43.18]	0.65 [16.51]	
.022	715P223912M	1.70 [43.18]	0.65 [16.51]	
.027	715P273912M	1.70 [43.18]	0.75 [19.05]	
.033	715P333912M	1.70 [43.18]	0.85 [21.59]	
.039	715P393912M	1.70 [43.18]	0.85 [21.59]	
.047	715P473912M	1.70 [43.18]	0.85 [21.59]	
<b>1600 VDC/500 VAC**</b>				
.0018	715P182916L	1.30 [33.02]	0.50 [12.70]	
.0022	715P222916L	1.30 [33.02]	0.50 [12.70]	
.0027	715P272916L	1.30 [33.02]	0.55 [13.97]	
.0033	715P332916L	1.30 [33.02]	0.55 [13.97]	
.0039	715P392916L	1.30 [33.02]	0.60 [15.24]	
.0047	715P472916L	1.30 [33.02]	0.60 [15.24]	
.0056	715P562916L	1.30 [33.02]	0.65 [16.51]	
.0068	715P682916L	1.30 [33.02]	0.65 [16.51]	
.0082	715P822916L	1.30 [33.02]	0.70 [17.78]	
.01	715P103916L	1.30 [33.02]	0.70 [17.78]	
.012	715P123916M	1.70 [43.18]	0.75 [19.05]	
.015	715P153916M	1.70 [43.18]	0.75 [19.05]	
.018	715P183916M	1.70 [43.18]	0.85 [21.59]	
.022	715P223916M	1.70 [43.18]	0.85 [21.59]	
.027	715P273916M	1.70 [43.18]	0.95 [24.13]	
.033	715P333916M	1.70 [43.18]	0.95 [24.13]	

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\*\* 60Hz rms.

**STANDARD MARKING FORMAT**

**SAMPLE MARKING**

Ⓢ715P200 V  
1239 9340

**DESCRIPTION**

Ⓢ Sprague® Identification  
715P Type Number  
200 V DC Voltage Rating, Volts  
1239 Capacitance and Tolerance Code  
9340 Weekly Date Code  
(i.e. 40th week for 1999)

**TOLERANCE CODES  
PER EIA STANDARDS**

9 = ± 10%  
5 = ± 5%  
2 = ± 2%

**ORDERING INFORMATION**

**715P**  
TYPE

**123**  
CAPACITANCE

This is expressed in picofarads. The first two digits are significant. The third is the number of zeros to follow. Values must conform to decade rating for the tolerance specified.

**9**  
TOLERANCE

9 = ± 10%  
5 = ± 5%  
2 = ± 2%

**2**  
DC VOLTAGE  
RATING @ + 85°C

This is expressed in hundreds of volts.  
Example: 715P  
R5 = 50 volts.

**J**  
CASE  
CODE

See Dimensional Configurations.

**D**  
TERMINAL

A = Straight lead.  
B = Hairpin crimped.  
D = Hockey crimped.

**3**  
LEAD LENGTH

1 = 0.187" ± 0.030"  
[4.750 ± 0.762]  
2 = 0.250" ± 0.030"  
[6.350 ± 0.762]  
3 = 1.250" [31.750]  
Minimum



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