

## Polypropylene Film Capacitors ORANGE DROP®, Low Loss



Polypropylene plastic film is employed as the dielectric in Type 715P ORANGE DROP® 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.



**RoHS**  
COMPLIANT

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 180 PPM/°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® 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  $C \leq 0.5 \mu\text{F}$   
 200 000 Megohm - Microfarads for  $C > 0.5$  Microfarads  
 At + 85 °C: 20 000 Megohm for  $C \leq 0.5$  Microfarads  
 10 000 Megohm - Microfarads for  $C > 0.5$  Microfarads  
 At + 105 °C: 2000 Megohm for  $C \leq 0.5 \mu\text{F}$   
 1000 Megohm - Microfarads for  $C > 0.5$  Microfarads

**Capacitance Tolerance and Dissipation Factor:**

Capacitors shall be measured at a frequency of 1000 Hz 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 1 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.

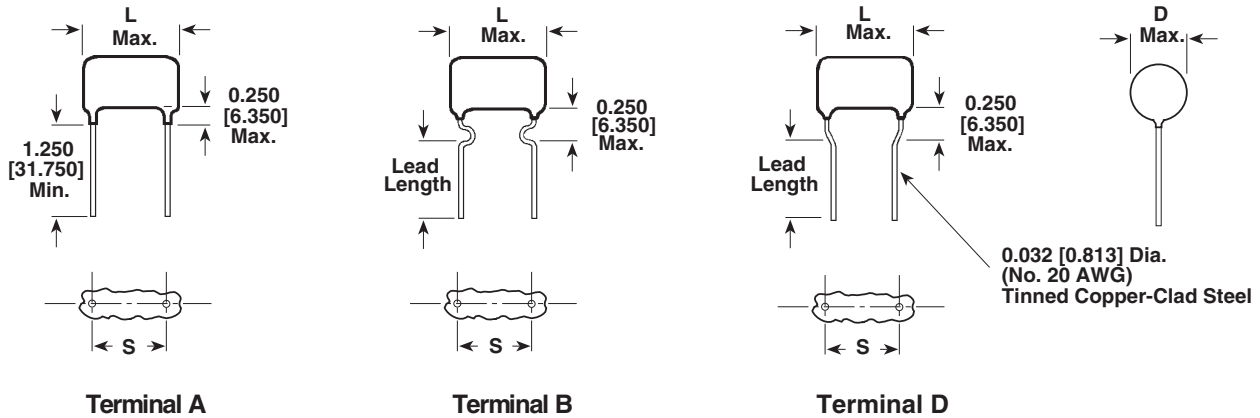
**DC Life Test:** Capacitors are capable of withstanding a 500 hour life test at + 85 °C at 150 % of rated working voltage. After test, capacitance shall not have changed by more than 5 % of initial value, insulation resistance shall not have decreased by more than 50 % of the initial limit and dissipation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

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

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

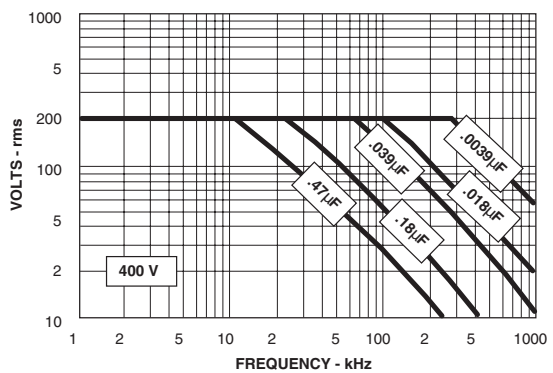
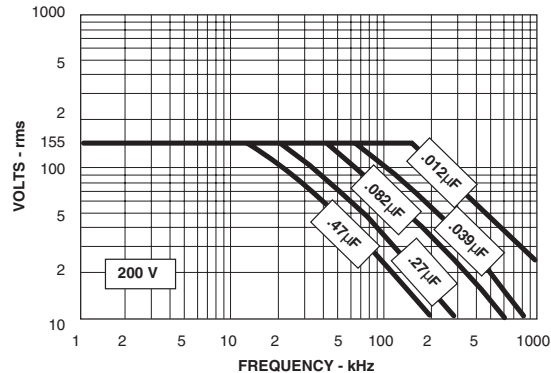
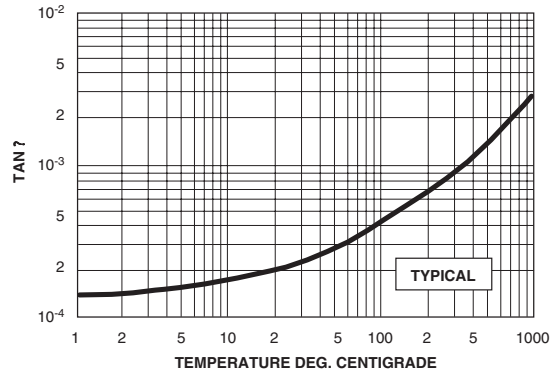
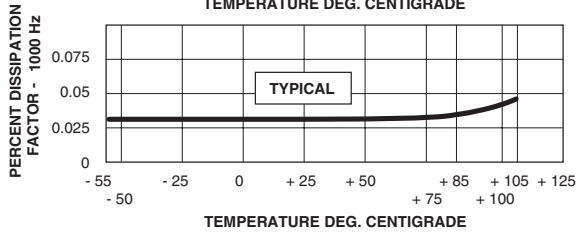
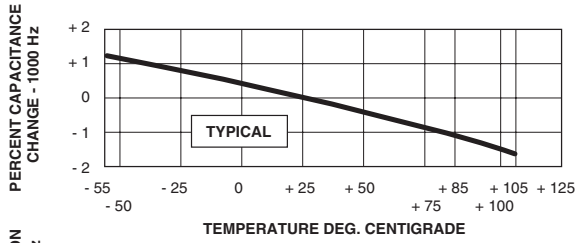
Not more than one failure allowed in 12 units tested.

## DIMENSIONS in inches (millimeters)



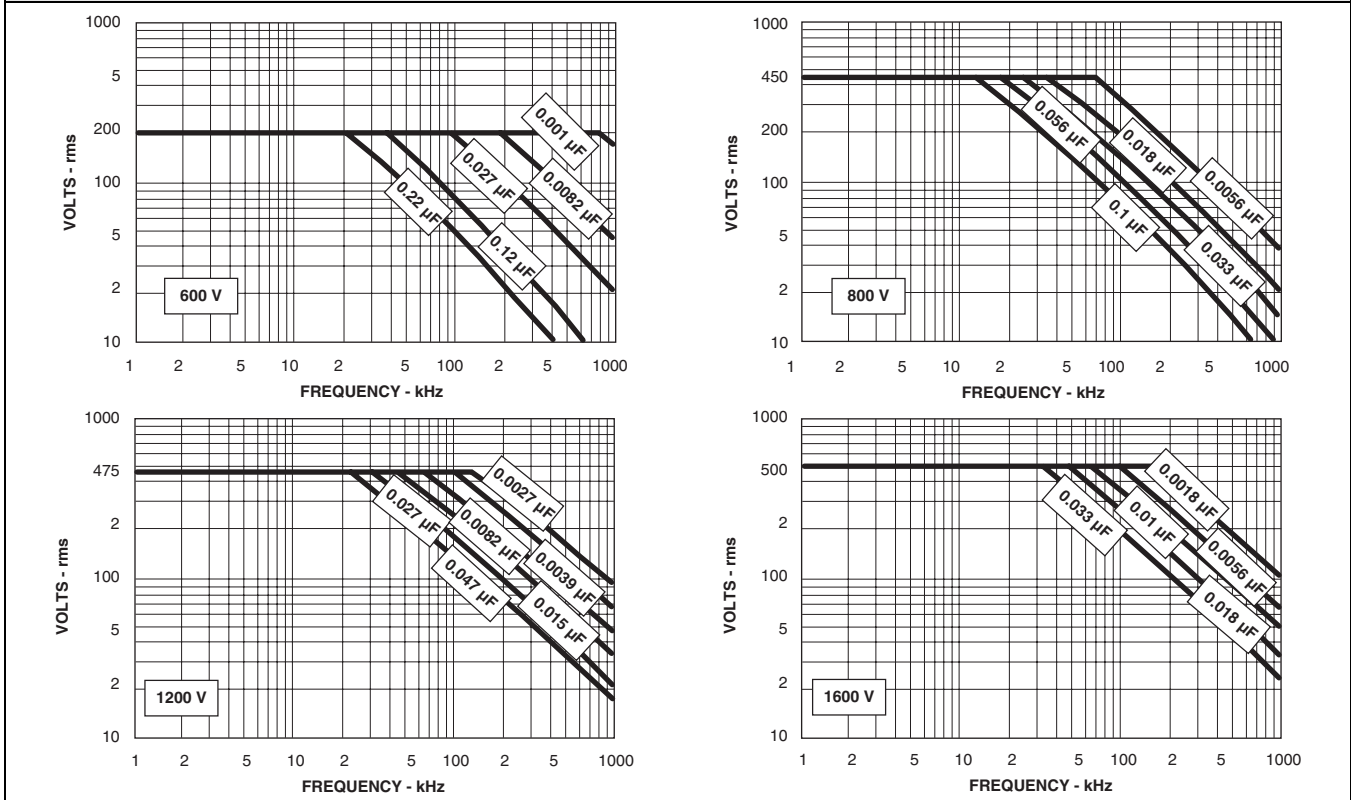
| CASE CODE | L (Max.)      | S                             |                               |                               |
|-----------|---------------|-------------------------------|-------------------------------|-------------------------------|
|           |               | Terminal A<br>± 0.060 [1.524] | Terminal B<br>± 0.030 [0.762] | Terminal D<br>± 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)

| µF<br>± 10 % TOLERANCE | PART NUMBER       | SIZE                |                     |
|------------------------|-------------------|---------------------|---------------------|
| 200 VDC/155 VAC**      |                   |                     |                     |
|                        |                   | L                   | D                   |
| 0.012                  | 715P12392J        | 0.75 [19.05]        | 0.37 [9.40]         |
| <b>0.015</b>           | <b>715P15392J</b> | <b>0.75 [19.05]</b> | <b>0.37 [9.40]</b>  |
| 0.018                  | 715P18392J        | 0.75 [19.05]        | 0.37 [9.40]         |
| <b>0.022</b>           | <b>715P22392J</b> | <b>0.75 [19.05]</b> | <b>0.37 [9.40]</b>  |
| 0.027                  | 715P27392J        | 0.75 [19.05]        | 0.42 [10.67]        |
| <b>0.033</b>           | <b>715P33392J</b> | <b>0.75 [19.05]</b> | <b>0.42 [10.67]</b> |
| 0.039                  | 715P39392K        | 0.95 [24.13]        | 0.40 [10.16]        |
| <b>0.047</b>           | <b>715P47392K</b> | <b>0.95 [24.13]</b> | <b>0.40 [10.16]</b> |
| 0.056                  | 715P56392K        | 0.95 [24.13]        | 0.45 [11.43]        |
| <b>0.068</b>           | <b>715P68392K</b> | <b>0.95 [24.13]</b> | <b>0.45 [11.43]</b> |
| 0.082                  | 715P82392L        | 1.30 [33.02]        | 0.45 [11.43]        |
| <b>0.1</b>             | <b>715P10492L</b> | <b>1.30 [33.02]</b> | <b>0.45 [11.43]</b> |
| 0.12                   | 715P12492L        | 1.30 [33.02]        | 0.55 [13.97]        |
| <b>0.15</b>            | <b>715P15492L</b> | <b>1.30 [33.02]</b> | <b>0.55 [13.97]</b> |
| 0.18                   | 715P18492L        | 1.30 [33.02]        | 0.62 [15.75]        |
| 0.22                   | 715P22492L        | 1.30 [33.02]        | 0.62 [15.75]        |
| 0.27                   | 715P27492M        | 1.70 [43.18]        | 0.65 [16.51]        |
| <b>0.33</b>            | <b>715P33492M</b> | <b>1.70 [43.18]</b> | <b>0.65 [16.51]</b> |
| 0.39                   | 715P39492M        | 1.70 [43.18]        | 0.75 [19.05]        |
| <b>0.47</b>            | <b>715P47492M</b> | <b>1.70 [43.18]</b> | <b>0.75 [19.05]</b> |

\* Bolded 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.

\*\* 60 Hz rms

# Type 715P

Vishay Sprague

Polypropylene Film Capacitors  
ORANGE DROP®, Low Loss



| <b>STANDARD RATINGS</b> in inches (millimeters) |                   |                     |      |                     |
|---|-------------------|---------------------|------|---------------------|
| $\mu\text{F}$                                   | PART NUMBER       | L                   | SIZE |                     |
| $\pm 10\%$ TOLERANCE                            |                   |                     |      | D                   |
| <b>400 VDC/200 VAC**</b>                        |                   |                     |      |                     |
| 0.0039  | 715P39294J        | 0.75 [19.05]        |      | 0.40 [10.16]        |
| 0.0047  | 715P47294J        | 0.75 [19.05]        |      | 0.40 [10.16]        |
| 0.0056  | 715P56294J        | 0.75 [19.05]        |      | 0.40 [10.16]        |
| 0.0068  | 715P68294J        | 0.75 [19.05]        |      | 0.40 [10.16]        |
| 0.0082  | 715P82294J        | 0.75 [19.05]        |      | 0.40 [10.16]        |
| <b>0.01</b>                                     | <b>715P10394J</b> | <b>0.75 [19.05]</b> |      | <b>0.40 [10.16]</b> |
| 0.012   | 715P12394J        | 0.75 [19.05]        |      | 0.45 [11.43]        |
| <b>0.015</b>                                    | <b>715P15394J</b> | <b>0.75 [19.05]</b> |      | <b>0.45 [11.43]</b> |
| 0.018   | 715P18394K        | 0.95 [24.13]        |      | 0.45 [11.43]        |
| 0.022   | 715P22394K        | 0.95 [24.13]        |      | 0.45 [11.43]        |
| 0.027   | 715P27394K        | 0.95 [24.13]        |      | 0.50 [12.70]        |
| <b>0.033</b>                                    | <b>715P33394K</b> | <b>0.95 [24.13]</b> |      | <b>0.50 [12.70]</b> |
| 0.039   | 715P39394L        | 1.30 [33.02]        |      | 0.50 [12.70]        |
| 0.047   | 715P47394L        | 1.30 [33.02]        |      | 0.50 [12.70]        |
| 0.056   | 715P56394L        | 1.30 [33.02]        |      | 0.55 [13.97]        |
| 0.068   | 715P68394L        | 1.30 [33.02]        |      | 0.55 [13.97]        |
| 0.082   | 715P82394L        | 1.30 [33.02]        |      | 0.60 [15.24]        |
| 0.1   | 715P10494L        | 1.30 [33.02]        |      | 0.60 [15.24]        |
| 0.12  | 715P12494L        | 1.30 [33.02]        |      | 0.65 [16.51]        |
| <b>0.15</b>                                     | <b>715P15494L</b> | <b>1.30 [33.02]</b> |      | <b>0.65 [16.51]</b> |
| 0.18  | 715P18494M        | 1.70 [43.18]        |      | 0.70 [17.78]        |
| <b>0.22</b>                                     | <b>715P22494M</b> | <b>1.70 [43.18]</b> |      | <b>0.70 [17.78]</b> |
| 0.27  | 715P27494M        | 1.70 [43.18]        |      | 0.80 [20.32]        |
| <b>0.33</b>                                     | <b>715P33494M</b> | <b>1.70 [43.18]</b> |      | <b>0.80 [20.32]</b> |
| 0.39  | 715P39494M        | 1.70 [43.18]        |      | 0.90 [22.86]        |
| <b>0.47</b>                                     | <b>715P47494M</b> | <b>1.70 [43.18]</b> |      | <b>0.90 [22.86]</b> |
| <b>600 VDC/200 VAC**</b>                        |                   |                     |      |                     |
| 0.001   | 715P10296J        | 0.75 [19.05]        |      | 0.40 [10.16]        |
| 0.0012  | 715P12296J        | 0.75 [19.05]        |      | 0.40 [10.16]        |
| <b>0.0015</b>                                   | <b>715P15296J</b> | <b>0.75 [19.05]</b> |      | <b>0.40 [10.16]</b> |
| 0.0018  | 715P18296J        | 0.75 [19.05]        |      | 0.40 [10.16]        |
| <b>0.0022</b>                                   | <b>715P22296J</b> | <b>0.75 [19.05]</b> |      | <b>0.40 [10.16]</b> |
| 0.0027  | 715P27296J        | 0.75 [19.05]        |      | 0.40 [10.16]        |
| <b>0.0033</b>                                   | <b>715P33296J</b> | <b>0.75 [19.05]</b> |      | <b>0.40 [10.16]</b> |
| 0.0039  | 715P39296J        | 0.75 [19.05]        |      | 0.45 [11.43]        |
| <b>0.0047</b>                                   | <b>715P47296J</b> | <b>0.75 [19.05]</b> |      | <b>0.45 [11.43]</b> |
| 0.0056  | 715P56296J        | 0.75 [19.05]        |      | 0.45 [11.43]        |
| 0.0068  | 715P68296J        | 0.75 [19.05]        |      | 0.45 [11.43]        |
| 0.0082  | 715P82296K        | 0.95 [24.13]        |      | 0.45 [11.43]        |
| <b>0.01</b>                                     | <b>715P10396K</b> | <b>0.95 [24.13]</b> |      | <b>0.45 [11.43]</b> |
| 0.012   | 715P12396K        | 0.95 [24.13]        |      | 0.50 [12.70]        |
| <b>0.015</b>                                    | <b>715P15396K</b> | <b>0.95 [24.13]</b> |      | <b>0.50 [12.70]</b> |
| 0.018   | 715P18396K        | 0.95 [24.13]        |      | 0.55 [13.97]        |
| <b>0.022</b>                                    | <b>715P22396K</b> | <b>0.95 [24.13]</b> |      | <b>0.55 [13.97]</b> |
| 0.027   | 715P27396L        | 1.30 [33.02]        |      | 0.55 [13.97]        |
| 0.033   | 715P33396L        | 1.30 [33.02]        |      | 0.55 [13.97]        |
| 0.039   | 715P39396L        | 1.30 [33.02]        |      | 0.60 [15.24]        |
| <b>0.047</b>                                    | <b>715P47396L</b> | <b>1.30 [33.02]</b> |      | <b>0.60 [15.24]</b> |
| 0.056   | 715P56396L        | 1.30 [33.02]        |      | 0.65 [16.51]        |
| <b>0.068</b>                                    | <b>715P68396L</b> | <b>1.30 [33.02]</b> |      | <b>0.65 [16.51]</b> |
| 0.082   | 715P82396L        | 1.30 [33.02]        |      | 0.75 [19.05]        |
| <b>0.1</b>                                      | <b>715P10496L</b> | <b>1.30 [33.02]</b> |      | <b>0.75 [19.05]</b> |
| 0.12  | 715P12496M        | 1.70 [43.18]        |      | 0.75 [19.05]        |
| <b>0.15</b>                                     | <b>715P15496M</b> | <b>1.70 [43.18]</b> |      | <b>0.75 [19.05]</b> |
| 0.18  | 715P18496M        | 1.70 [43.18]        |      | 0.85 [21.59]        |
| <b>0.22</b>                                     | <b>715P22496M</b> | <b>1.70 [43.18]</b> |      | <b>0.85 [21.59]</b> |

\* Bolded items, when ordered as  $\pm 5\%$  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  $\pm 5\%$  (i.e., 715P10456LD3). Any other Part Number, value or type may easily be ordered as a Special.

\*\* 60 Hz rms



| <b>STANDARD RATINGS</b> in inches (millimeters) |                    |                     |  |                     |
|---|--------------------|---------------------|--|---------------------|
| μF<br>± 10 % TOLERANCE                          | PART NUMBER        | SIZE                |  |                     |
|   |                    | L                   |  | D                   |
| <b>800 VDC/450 VAC**</b>                        |                    |                     |  |                     |
| 0.0056  | 715P56298L         | 1.30 [33.02]        |  | 0.50 [12.70]        |
| 0.0068  | 715P68298L         | 1.30 [33.02]        |  | 0.50 [12.70]        |
| 0.0082  | 715P82298L         | 1.30 [33.02]        |  | 0.50 [12.70]        |
| 0.01  | 715P10398L         | 1.30 [33.02]        |  | 0.50 [12.70]        |
| 0.012   | 715P12398L         | 1.30 [33.02]        |  | 0.55 [13.97]        |
| <b>0.015</b>                                    | <b>715P15398L</b>  | <b>1.30 [33.02]</b> |  | <b>0.55 [13.97]</b> |
| 0.018   | 715P18398L         | 1.30 [33.02]        |  | 0.60 [15.24]        |
| <b>0.022</b>                                    | <b>715P22398L</b>  | <b>1.30 [33.02]</b> |  | <b>0.60 [15.24]</b> |
| 0.027   | 715P27398L         | 1.30 [33.02]        |  | 0.70 [17.78]        |
| <b>0.033</b>                                    | <b>715P33398L</b>  | <b>1.30 [33.02]</b> |  | <b>0.70 [17.78]</b> |
| 0.039   | 715P39398M         | 1.70 [43.18]        |  | 0.70 [17.78]        |
| 0.047   | 715P47398M         | 1.70 [43.18]        |  | 0.70 [17.78]        |
| 0.056   | 715P56398M         | 1.70 [43.18]        |  | 0.80 [20.32]        |
| <b>0.068</b>                                    | <b>715P68398M</b>  | <b>1.70 [43.18]</b> |  | <b>0.80 [20.32]</b> |
| 0.082   | 715P82398M         | 1.70 [43.18]        |  | 0.90 [22.86]        |
| <b>0.1</b>                                      | <b>715P10498M</b>  | <b>1.70 [43.18]</b> |  | <b>0.90 [22.86]</b> |
| <b>1200 VDC/475 VAC**</b>                       |                    |                     |  |                     |
| 0.0027  | 715P272912L        | 1.30 [33.02]        |  | 0.50 [12.70]        |
| 0.0033  | 715P332912L        | 1.30 [33.02]        |  | 0.50 [12.70]        |
| 0.0039  | 715P392912L        | 1.30 [33.02]        |  | 0.50 [12.70]        |
| 0.0047  | 715P472912L        | 1.30 [33.02]        |  | 0.50 [12.70]        |
| 0.0056  | 715P562912L        | 1.30 [33.02]        |  | 0.55 [13.97]        |
| 0.0068  | 715P682912L        | 1.30 [33.02]        |  | 0.55 [13.97]        |
| 0.0082  | 715P822912L        | 1.30 [33.02]        |  | 0.60 [15.24]        |
| 0.01  | 715P103912L        | 1.30 [33.02]        |  | 0.60 [15.24]        |
| 0.012   | 715P123912L        | 1.30 [33.02]        |  | 0.65 [16.51]        |
| <b>0.015</b>                                    | <b>715P153912L</b> | <b>1.30 [33.02]</b> |  | <b>0.65 [16.51]</b> |
| 0.018   | 715P183912M        | 1.70 [43.18]        |  | 0.65 [16.51]        |
| 0.022   | 715P223912M        | 1.70 [43.18]        |  | 0.65 [16.51]        |
| 0.027   | 715P273912M        | 1.70 [43.18]        |  | 0.75 [19.05]        |
| 0.033   | 715P333912M        | 1.70 [43.18]        |  | 0.75 [19.05]        |
| 0.039   | 715P393912M        | 1.70 [43.18]        |  | 0.85 [21.59]        |
| <b>0.047</b>                                    | <b>715P473912M</b> | <b>1.70 [43.18]</b> |  | <b>0.85 [21.59]</b> |
| <b>1600 VDC/500 VAC**</b>                       |                    |                     |  |                     |
| 0.0018  | 715P182916L        | 1.30 [33.02]        |  | 0.50 [12.70]        |
| <b>0.0022</b>                                   | <b>715P222916L</b> | <b>1.30 [33.02]</b> |  | <b>0.50 [12.70]</b> |
| 0.0027  | 715P272916L        | 1.30 [33.02]        |  | 0.55 [13.97]        |
| <b>0.0033</b>                                   | <b>715P332916L</b> | <b>1.30 [33.02]</b> |  | <b>0.55 [13.97]</b> |
| 0.0039  | 715P392916L        | 1.30 [33.02]        |  | 0.60 [15.24]        |
| <b>0.0047</b>                                   | <b>715P472916L</b> | <b>1.30 [33.02]</b> |  | <b>0.60 [15.24]</b> |
| 0.0056  | 715P562916L        | 1.30 [33.02]        |  | 0.65 [16.51]        |
| <b>0.0068</b>                                   | <b>715P682916L</b> | <b>1.30 [33.02]</b> |  | <b>0.65 [16.51]</b> |
| 0.0082  | 715P822916L        | 1.30 [33.02]        |  | 0.70 [17.78]        |
| <b>0.01</b>                                     | <b>715P103916L</b> | <b>1.30 [33.02]</b> |  | <b>0.70 [17.78]</b> |
| 0.012   | 715P123916M        | 1.70 [43.18]        |  | 0.75 [19.05]        |
| <b>0.015</b>                                    | <b>715P153916M</b> | <b>1.70 [43.18]</b> |  | <b>0.75 [19.05]</b> |
| 0.018   | 715P183916M        | 1.70 [43.18]        |  | 0.85 [21.59]        |
| <b>0.022</b>                                    | <b>715P223916M</b> | <b>1.70 [43.18]</b> |  | <b>0.85 [21.59]</b> |
| 0.027   | 715P273916M        | 1.70 [43.18]        |  | 0.95 [24.13]        |
| <b>0.033</b>                                    | <b>715P333916M</b> | <b>1.70 [43.18]</b> |  | <b>0.95 [24.13]</b> |

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\*\* 60 Hz rms

# Type 715P

Vishay Sprague

Polypropylene Film Capacitors  
ORANGE DROP®, Low Loss



## STANDARD MARKING FORMAT

| SAMPLE MARKING          | DESCRIPTION   | TOLERANCE CODES PER EIA STANDARDS    |
|-------------------------|---|--------------------------------------|
| Ⓜ715P200 V<br>1239 9340 | Ⓜ Sprague® Identification<br>715P Type Number<br>200 V DC Voltage Rating, Volts<br>1239 Capacitance and Tolerance Code<br>9940 Weekly Date Code (i.e. 40th week for 1999) | 9 = ± 10 %<br>5 = ± 5 %<br>2 = ± 2 % |

## ORDERING INFORMATION

| 715P<br>TYPE | 123<br>CAPACITANCE  | 9<br>TOLERANCE                       | 2<br>DC VOLTAGE<br>RATING AT + 85<br>°C                                   | J<br>CASE<br>CODE               | D<br>TERMINAL  | 3<br>LEAD LENGTH   |
|--------------|---|--------------------------------------|---|---------------------------------|--|--|
|              | Capacitance 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 = ± 10 %<br>5 = ± 5 %<br>2 = ± 2 % | This is expressed in hundreds of volts.<br>Example: 715P<br>R5 = 50 volts | See Dimensional Configurations. | A = Straight Lead<br>B = Hairpin Crimped<br>D = Hockey Crimped | 1 = 0.187" ± 0.030"<br>[4.750 ± 0.762]<br>2 = 0.250" ± 0.030"<br>[6.350 ± 0.762]<br>3 = 1.250" [31.750]<br>Minimum |



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