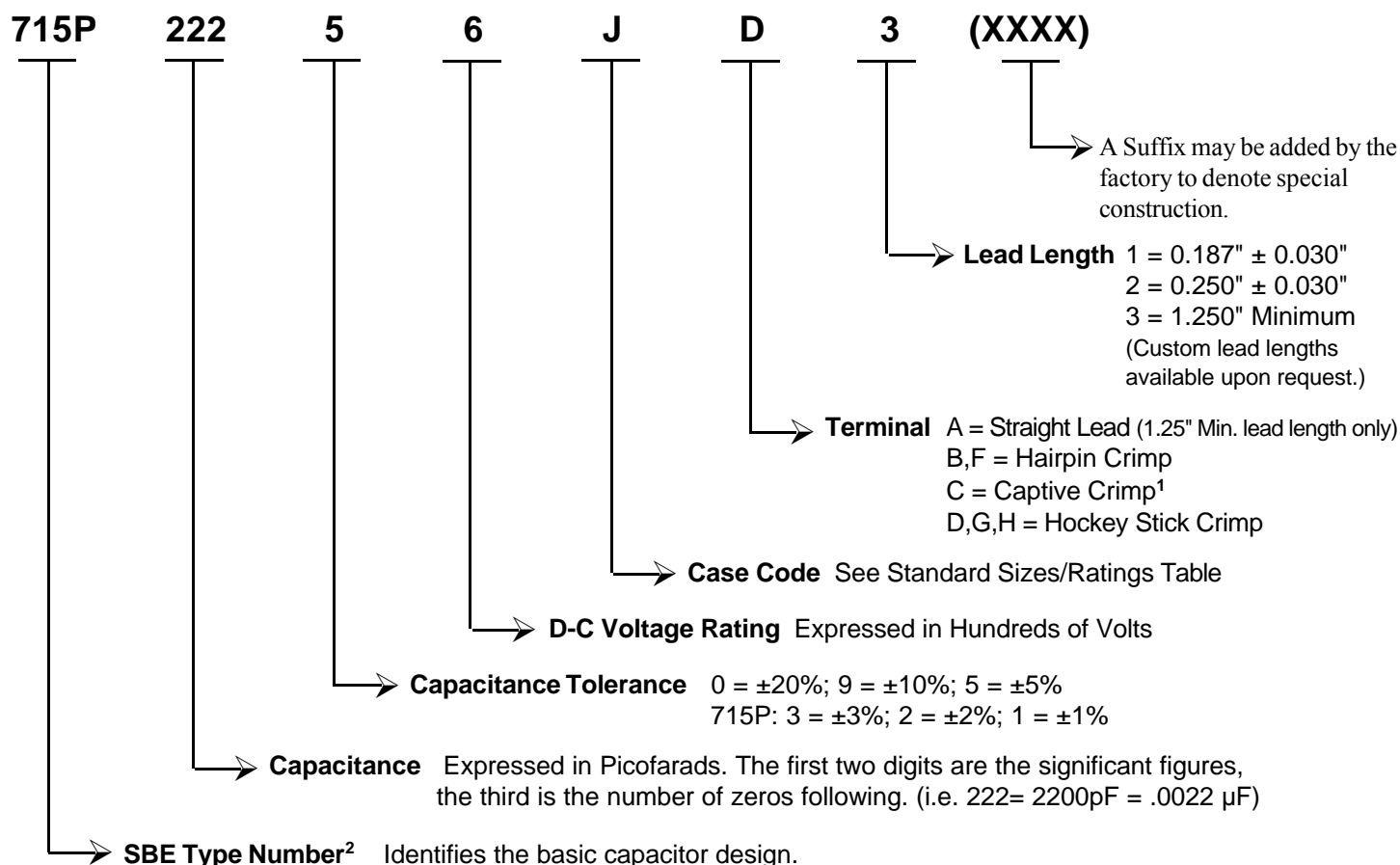




Ordering/Part Number Information



¹ Terminal C has a fixed length of 0.156" \pm 0.020" therefore it is not necessary to indicate the lead length digit when ordering. Available for "L" case code parts only.

² The 715P and 716P 200, 400 and 600 VDC ratings are single-section designs constructed of plain polypropylene film with extended foil. The 800 VDC ratings and above are series-section, extended foil designs manufactured with plain polypropylene film and utilize a floating common of metallized polypropylene, which provides self-healing characteristics. All 715P and 716P designs are non-inductively wound.

Standard Marking Format

Sample Marking on unit

SBE715P600V
222J 9510

Description

SBE - SB Electronics identification
715P - Type number
600V - D-C Voltage rating, Volts
222J - Capacitance and tolerance code
9510 - Weekly date code
(i.e. 10th week of 1995)

Tolerance codes per EIA Standards

F	$\pm 1\%$
G	$\pm 2\%$
H	$\pm 3\%$
J	$\pm 5\%$
K	$\pm 10\%$
M	$\pm 20\%$

Complete application engineering service for optimum results in the use of the Orange Drop is available, including additional performance data. Sample, price quote and delivery information is also readily available. Please contact us.

ORANGE DROP® is a registered trademark of SB Electronics, Inc.

131 SOUTH MAIN STREET - BARRE, VT 05641-4854 USA Tel: 802-476-4146 Fax: 802-476-4149



Application Data/Information

To determine the ESR, maximum peak current and maximum RMS current rating for a particular capacitor, use the following calculations:

$$\text{ESR (milliohms)} = \frac{\text{D.F.}}{2\pi f C} \times 10000$$

$$I_{\text{PEAK}} (\text{amps}) = 1.5C \frac{dv}{dt}$$

$$I_{\text{RMS}} (\text{amps}) = \frac{2\pi C V_{\text{RMS}}}{1000}$$

- f = operating frequency in KHz.
- C = capacitance in μF .
- D.F. = maximum dissipation factor in %.
- dv/dt = maximum pulse rise time in volts/ μsec .
- V_{RMS} = maximum operating A-C voltage, determined from RMS voltage.
vs. frequency curve at specific operating frequency.

Ripple Current

Maximum values of current are derived from the RMS Voltage vs. Frequency performance curves. For sine waves, the ripple current is simply the RMS Voltage at the frequency of the application divided by the reactance. However for nonsinusoidal waveforms, the true RMS value of the current must be determined from the customer's specific application and compared to the RMS values as derived from the performance curves. It is important to remember that the dissipation factor the performance curves are based on is for a sine wave at a particular frequency. The allowed performance for a nonsinusoidal waveform may be less than the curves would indicate if it has a faster rise time. We encourage you to contact us with your specific application requirements.

Voltage and Temperature Limits

The voltage limit specified by the horizontal line for each voltage rating is determined by either the dielectric strength or the corona inception voltage. Where the curve starts to drop off with frequency is where heating limits start to take effect. It is based on true RMS values. The curves are also based on the maximum ambient temperature of +85°C. This allows for a 20 degree increase in temperature between the ambient and the hot spot within the unit. The maximum temperature for polypropylene is +105°C. Special cooling techniques or operations below +85°C may allow the units to operate at a higher voltage than the curves indicate (not greater than the maximum indicated by the horizontal line, however).

For waveforms with very high Crest Factors the Peak-to-Peak voltages must be taken into consideration so that they do not exceed the maximum corona voltages. Corona is a peak-to-peak phenomena even though it is specified as an RMS voltage. The rated Peak-to-Peak corona inception is 2.8 times the maximum specified RMS voltage rating. Please consult SB Electronics, Inc. design engineering department for specific applications.



Low Loss Polypropylene Film ORANGE DROP® Capacitors

Polypropylene plastic film is employed as the dielectric in Type 715P Orange Drop capacitors. Type 715P capacitors are ideal for applications where high A-C current flow is found; as in switching power supplies, r-f generators, electronic lighting ballasts, resonant circuits, snubbers and pulse-forming networks where dielectric heating is often a problem.

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.

The 200VDC, 400VDC and 600VDC ratings are single section, extended foil designs allowing for high frequency, high current applications. The 800VDC and above ratings are series wound with extended foil and incorporate a floating common of metallized polypropylene which provides self-healing characteristics in addition to high frequency, high current capabilities.

Performance characteristics, as well as curves showing typical variations in electrical characteristics as a function of temperature and frequency, are given below and on the following pages.

Performance Characteristics

Operating Temperature Range:

The standard operating temperature range is -55°C to +85°C. The Type 715P may be operated up to +105°C providing the D-C working voltage is reduced by 50%. For specific derating of A-C voltage above +85°C please contact our design engineering department.

Insulation Resistance:

After a two (2) minute charge at rated voltage or 500VDC, whichever is less:

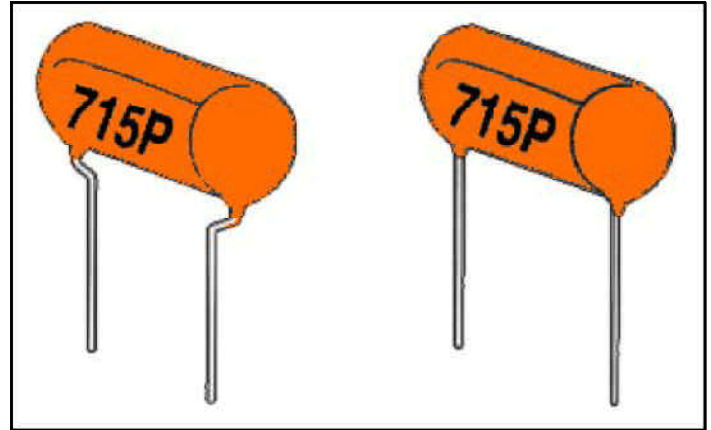
At +25°C: 400,000 MΩ for C ≤ .5 μF
200,000 MΩ-μF for C > .5 μF

At +85°C: 20,000 MΩ for C ≤ .5 μF
10,000 MΩ-μF for C > .5 μF

At +105°C: 2,000 MΩ for C ≤ .5 μF
1,000 MΩ-μF for C > .5 μF

Capacitance, Tolerance and Dissipation Factor:

Capacitors shall be measured at a frequency of 1000 Hertz at +25°C. The maximum dissipation factor shall be 0.1%.



Dielectric Withstanding Voltage:

Capacitors rated below 800VDC shall withstand a D-C potential of 250% of rated voltage applied between terminals for not more than 5 seconds.

Capacitors rated 800VDC and above shall withstand a D-C potential of 200% of rated voltage applied between terminals for not more than 5 seconds.

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 then dry in circulating air for 4 hours. Measure insulation resistance after a 2 minute charge at +25°C and rated voltage or 500VDC, whichever is less. Minimum product of insulation resistance and capacitance shall be 50,000 megohm-microfarads after test but need not exceed 100,000 megohms.

D-C 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%.

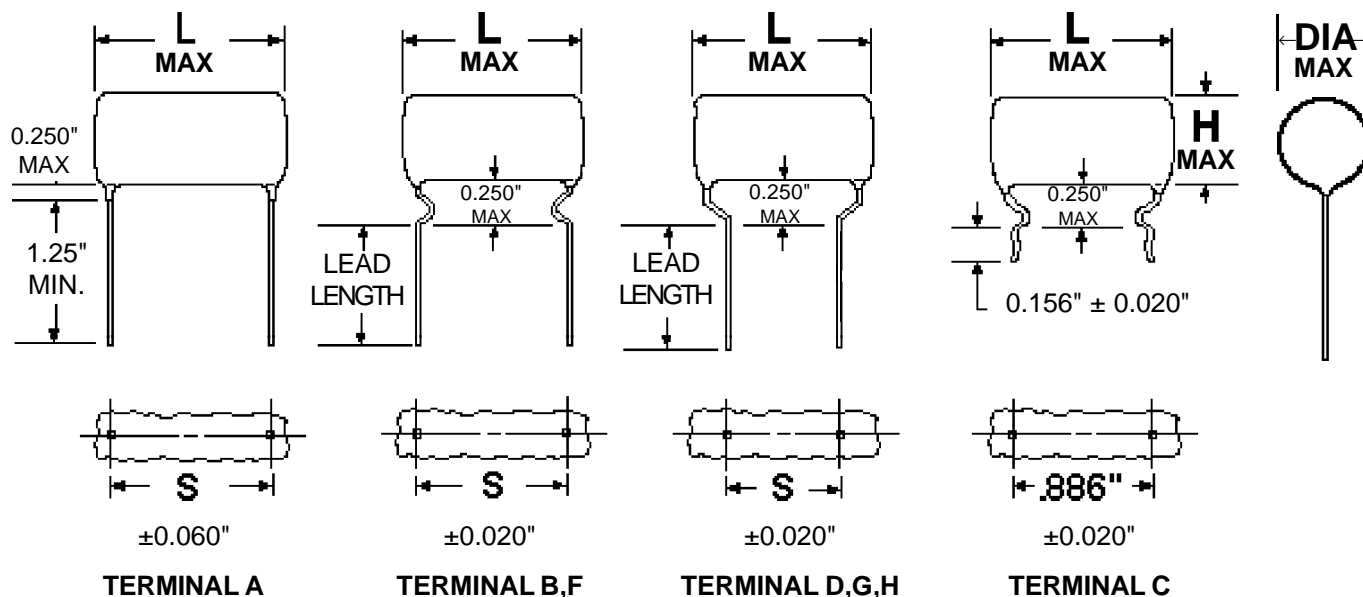
A-C Life Test:

Capacitors shall withstand the maximum 60 Hertz A-C voltage for a period of 500 hours at +85°C.

Rated D-C Voltage	Max. 60 Hz A-C Voltage
200	155
400,600	200
800 to 2000	500



Standard Lead Styles



Standard Lead Spacing

CASE CODE	S, inches (metric, mm in paranthesis)						
	Term. A	Term. B	Term. D	Term C*	Term. F	Term.G	Term. H
J	0.500	0.500	0.375	---	0.394 (10)	0.295 (7.5)	0.197 (5)
K	0.688	0.688	0.375	---	0.590 (15)	0.394 (10)	0.295 (7.5)
L	1.031	0.969	0.719	0.886 (22.5)	0.886 (22.5)	0.590 (15)	---
M	1.406	1.344	1.094	---	---	1.083 (27.5)	---

* Terminal C is designed for printed circuit boards requiring a lead spacing of 0.886" with board hole sizes of 0.044" to 0.048" in diameter. Available for "L" case code parts only. Please consult us if you have a specific requirement.

Additional Specifications

Lead Wire:

Tinned copper-clad steel
(.032" diameter, #20 AWG)

Encapsulation:

Conformal coating of flame retardant orange epoxy (meets UL94V-2 specifications)

Please note:

It is not possible to list every capacitance value, tolerance, special design or any combination of these parameters available. Therefore, please contact us with your exact requirements. Custom designs can be quickly developed by our engineering department to meet your needs.

All dimensions in inches, for metric conversion use 1" = 25.4 mm.



Type 715P Standard Sizes/Ratings¹

Value, μ F	Part Number ²	L MAX	DIA MAX	H MAX	Value, μ F	Part Number ²	L MAX	DIA MAX	H MAX	Value, μ F	Part Number ²	L MAX	DIA MAX	H MAX
200V D-C / 155V A-C*					1200V D-C / 475V A-C*					1600V D-C / 500V A-C*				
.01	715P10392J	.70	.25	.31	.0033	715P33296J	.70	.32	.36	.0027	715P272912L	1.25	.38	.42
.012	715P12392J	.70	.26	.32	.0039	715P39296J	.70	.34	.38	.0033	715P332912L	1.25	.32	.38
.015	715P15392J	.70	.28	.34	.0047	715P47296J	.70	.34	.38	.0039	715P392912L	1.25	.34	.40
.018	715P18392J	.70	.29	.35	.0056	715P56296J	.70	.36	.40	.0047	715P472912L	1.25	.36	.42
.022	715P22392J	.70	.31	.37	.0068	715P68296J	.70	.38	.42	.0056	715P562912L	1.25	.38	.44
.027	715P27392J	.70	.33	.39	.0082	715P82296K	.90	.34	.38	.0068	715P682912L	1.25	.41	.47
.033	715P33392J	.70	.36	.42	.01	715P10396K	.90	.36	.40	.0082	715P822912L	1.25	.44	.50
.039	715P39392K	.90	.32	.38	.012	715P12396K	.90	.38	.42	.01	715P103912L	1.25	.47	.53
.047	715P47392K	.90	.34	.40	.015	715P15396K	.90	.42	.46	.012	715P123912L	1.25	.51	.57
.056	715P56392K	.90	.37	.43	.018	715P18396K	.90	.44	.48	.015	715P153912L	1.25	.55	.61
.068	715P68392K	.90	.39	.45	.022	715P22396K	.90	.48	.52	.018	715P183912M	1.65	.50	.56
.082	715P82392L	1.25	.36	.42	.027	715P27396L	1.25	.43	.47	.022	715P223912M	1.65	.54	.60
.1	715P10492L	1.25	.38	.44	.033	715P33396L	1.25	.46	.50	.027	715P273912M	1.65	.59	.65
.12	715P12492L	1.25	.41	.47	.039	715P39396L	1.25	.49	.53	.033	715P333912M	1.65	.64	.70
.15	715P15492L	1.25	.44	.5	.047	715P47396L	1.25	.52	.56	.039	715P393912M	1.65	.68	.74
.18	715P18492L	1.25	.47	.53	.056	715P56396L	1.25	.56	.60	.047	715P473912M	1.65	.74	.80
.22	715P22492L	1.25	.51	.57	.068	715P68396L	1.25	.60	.64	2000V D-C / 500V A-C*				
.27	715P27492M	1.65	.49	.55	.082	715P82396L	1.25	.65	.69	.001	715P102916L	1.25	.29	.33
.33	715P33492M	1.65	.53	.59	.1	715P10496L	1.25	.71	.75	.0012	715P122916L	1.25	.30	.34
.39	715P39492M	1.65	.56	.62	.12	715P12496M	1.65	.65	.69	.0015	715P152916L	1.25	.32	.36
.47	715P47492M	1.65	.60	.66	.15	715P15496M	1.65	.71	.75	.0018	715P182916L	1.25	.34	.38
400V D-C / 200V A-C*					.18	715P18496M	1.65	.77	.81	.0022	715P222916L	1.25	.35	.39
.0039	715P39294J	.70	.34	.38	.22	715P22496M	1.65	.83	.85	.0027	715P272916L	1.25	.38	.42
.0047	715P47294J	.70	.38	.38	800V D-C / 450V A-C*					.0033	715P332916L	1.25	.40	.44
.0056	715P56294J	.70	.36	.40	.0056	715P56298L	1.25	.28	.34	.0039	715P392916L	1.25	.43	.47
.0068	715P68294J	.70	.29	.35	.0068	715P68298L	1.25	.29	.35	.0047	715P472916L	1.25	.46	.50
.0082	715P82294J	.70	.30	.36	.0082	715P82298L	1.25	.31	.37	.0056	715P562916L	1.25	.49	.53
.01	715P10394J	.70	.30	.36	.01	715P10398L	1.25	.33	.39	.0068	715P682916L	1.25	.52	.56
.012	715P12394J	.70	.32	.38	.012	715P12398L	1.25	.35	.41	.0082	715P822916L	1.25	.56	.60
.015	715P15394J	.70	.34	.40	.015	715P15398L	1.25	.38	.44	.01	715P103916L	1.25	.61	.65
.018	715P18394K	.90	.31	.37	.018	715P18398L	1.25	.41	.47	.012	715P123916M	1.65	.54	.58
.022	715P22394K	.90	.33	.39	.022	715P22398L	1.25	.44	.50	.015	715P153916M	1.65	.59	.63
.027	715P27394K	.90	.36	.42	.027	715P27398L	1.25	.47	.53	.018	715P183916M	1.65	.63	.67
.033	715P33394K	.90	.38	.44	.033	715P33398L	1.25	.51	.57	.022	715P223916M	1.65	.69	.73
.039	715P39394L	1.25	.35	.41	.039	715P39398M	1.65	.47	.53	.027	715P273916M	1.65	.74	.78
.047	715P47394L	1.25	.37	.43	.047	715P47398M	1.65	.50	.56	.033	715P333916M	1.65	.81	.85
.056	715P56394L	1.25	.39	.45	.056	715P56398M	1.65	.53	.59	2000V D-C / 500V A-C*				
.068	715P68394L	1.25	.42	.48	.068	715P68398M	1.65	.58	.64	.001	715P102920L	1.25	.29	.33
.082	715P82394L	1.25	.45	.51	.082	715P82398M	1.65	.62	.68	.0012	715P122920L	1.25	.30	.34
.1	715P10494L	1.25	.48	.54	.1	715P10498M	1.65	.67	.73	.0015	715P152920L	1.25	.32	.36
.12	715P12494L	1.25	.52	.58	1000V D-C / 450V A-C*					.0018	715P182920L	1.25	.34	.38
.15	715P15494L	1.25	.56	.62	.0056	715P562910L	1.25	.28	.34	.0022	715P222920L	1.25	.35	.39
.18	715P18494M	1.65	.54	.60	.0068	715P682910L	1.25	.29	.35	.0027	715P272920L	1.25	.38	.42
.22	715P22494M	1.65	.58	.64	.0082	715P822910L	1.25	.31	.37	.0033	715P332920L	1.25	.40	.44
.27	715P27494M	1.65	.63	.69	.01	715P103910L	1.25	.33	.39	.0039	715P392920L	1.25	.43	.47
.33	715P33494M	1.65	.70	.76	.012	715P123910L	1.25	.35	.41	.0047	715P472920L	1.25	.46	.50
.39	715P39494M	1.65	.75	.81	.015	715P153910L	1.25	.38	.44	.0056	715P562920L	1.25	.49	.53
.47	715P47494M	1.65	.82	.88	.018	715P183910L	1.25	.41	.47	.0068	715P682920L	1.25	.52	.56
600V D-C / 200V A-C*					.022	715P223910L	1.25	.44	.50	.0082	715P822920L	1.25	.56	.60
.001	715P10296J	.70	.35	.39	.027	715P273910L	1.25	.47	.53	.01	715P103920L	1.25	.61	.65
.0012	715P12296J	.70	.36	.40	.033	715P333910L	1.25	.51	.57	.012	715P123920M	1.65	.54	.58
.0015	715P15296J	.70	.32	.36	.039	715P393910M	1.65	.47	.53	.015	715P153920M	1.65	.59	.63
.0018	715P18296J	.70	.34	.38	.047	715P473910M	1.65	.50	.56	.018	715P183920M	1.65	.63	.67
.0022	715P22296J	.70	.33	.37	.056	715P563910M	1.65	.53	.59	.022	715P223920M	1.65	.69	.73
.0027	715P27296J	.70	.35	.39	.068	715P683910M	1.65	.58	.64	.027	715P273920M	1.65	.74	.78
					.082	715P823910M	1.65	.62	.68	.033	715P333920M	1.65	.81	.85
					.1	715P104910M	1.65	.67	.73					

¹ Shaded part numbers, when ordered as $\pm 5\%$ tolerance with D3 leads, are standard stock items available through the Sprague/Vishay Distribution Network. For complete part number add letter and number for terminal style and lead length in accordance with Ordering Information. (i.e. 715P10452LD3)

² To complete part number for proper tolerance, terminal style and lead length please refer to Ordering/Part Number Information page.

* Please refer to performance curves for RMS Voltage vs. Frequency characteristics.



Additional Technical Data/Specifications

Corona Start Voltage

D-C Rating	Typical Corona Start Voltage, RMS
200	300
400,600	325
800,1000	600
1200	625
1600,2000	650

Maximum Dissipation Factor (D.F.) in %

Cap Range (μF)	200V-600V		800V/1000V		1200V		1600V/2000V	
	20KHz	100KHz	20KHz	100KHz	20KHz	100KHz	20KHz	100KHz
.001 - .01	.029	.040	.039	.088	.035	.068	.033	.059
.012 - .022	.031	.050	.040	.098	.043	.111	.039	.093
.027 - .047	.034	.071	.055	.175	.047	.132	.041	.102
.056 - .068	.037	.089	.058	.193	--	--	--	--
.082 - .1	.042	.116	.063	.220	--	--	--	--
.12 - .15	.049	.158	--	--	--	--	--	--
.18 - .22	.059	.217	--	--	--	--	--	--
.27 - .33	.074	.309	--	--	--	--	--	--
.39 - .47	.093	.427	--	--	--	--	--	--

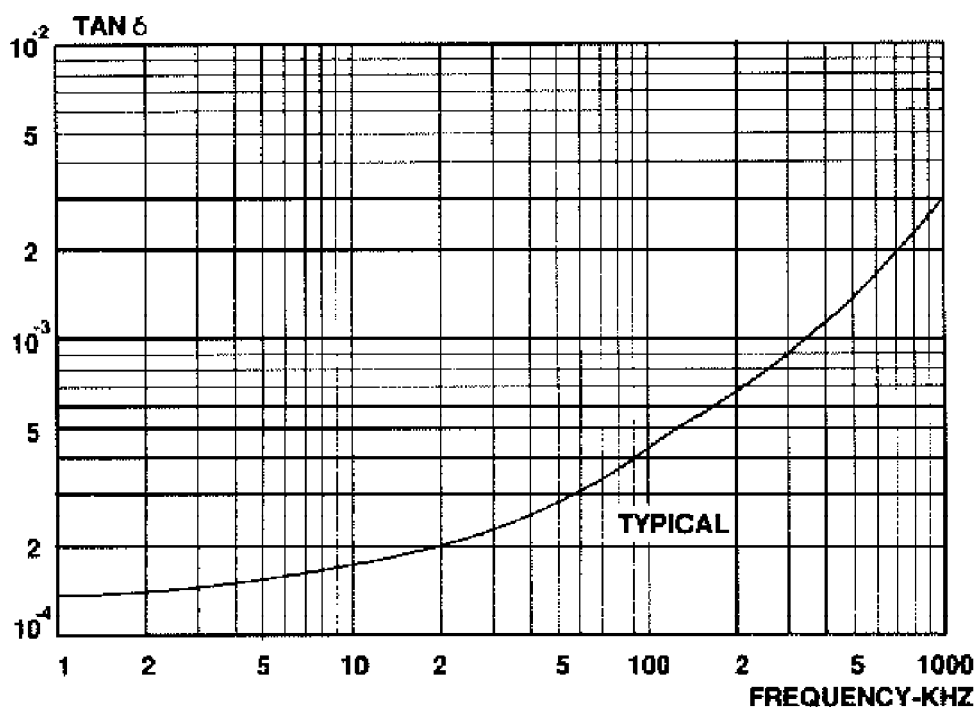
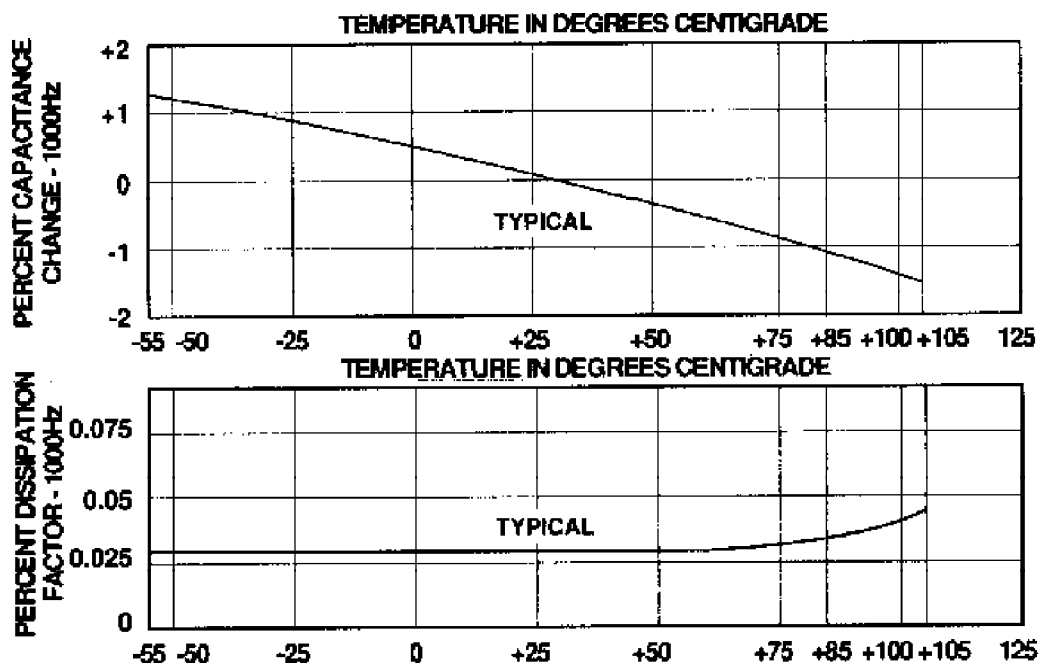
Maximum Pulse Rise Time (dv/dt) in Volt/μsec

Cap Value (μF)	200V	400V	600V	800V/1000V	1200V	1600V/2000V
.001	-	-	19900	-	-	43200
.0012	-	-	18200	-	-	39500
.0015	-	-	16200	-	-	35300
.0018	-	-	14800	-	-	32200
.0022	-	-	13400	-	-	29100
.0027	-	-	12100	-	25000	26300
.0033	-	-	11000	-	22600	23800
.0039	-	10100	10100	-	20800	21900
.0047	-	9200	9200	-	18900	19900
.0056	-	8400	8400	16400	17400	18300
.0068	-	7600	7600	14900	15700	16600
.0082	-	6900	6500	13600	14300	15100
.01	4400	6300	5900	12300	13000	13700
.012	4100	5700	5400	11200	11900	11600
.015	3600	5100	4800	10000	10600	10300
.018	3300	4400	4400	9200	9000	9400
.022	3000	4000	4000	8300	8100	8500
.027	2700	3600	3300	7500	7300	7700
.033	2400	3200	3000	6800	6600	7000
.039	2100	2800	2800	6200	6100	-
.047	1900	2500	2500	5300	5600	-
.056	1800	2300	2300	4800	-	-
.068	1600	2100	2100	4400	-	-
.082	1400	1900	1900	4000	-	-
.1	1200	1700	1700	3600	-	-
.12	1100	1600	1500	-	-	-
.15	1000	1400	1300	-	-	-
.18	910	1200	1200	-	-	-
.22	820	1100	1100	-	-	-
.27	690	970	-	-	-	-
.33	620	880	-	-	-	-
.39	570	810	-	-	-	-
.47	520	740	-	-	-	-

Note: dv/dt ratings based on measurements made at junction of the wire leads and capacitor body.

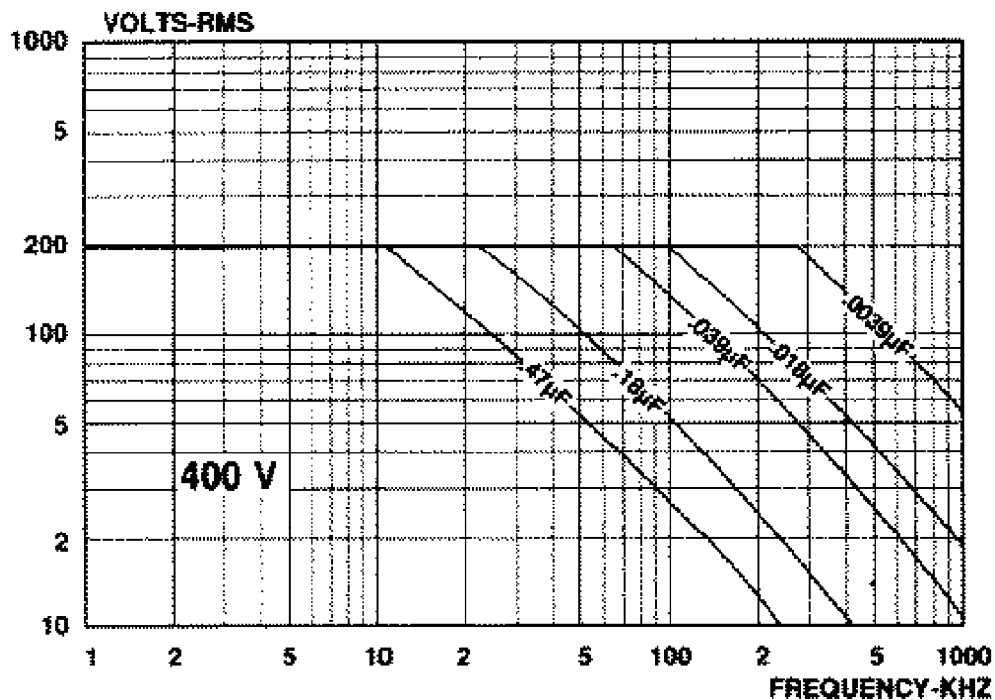
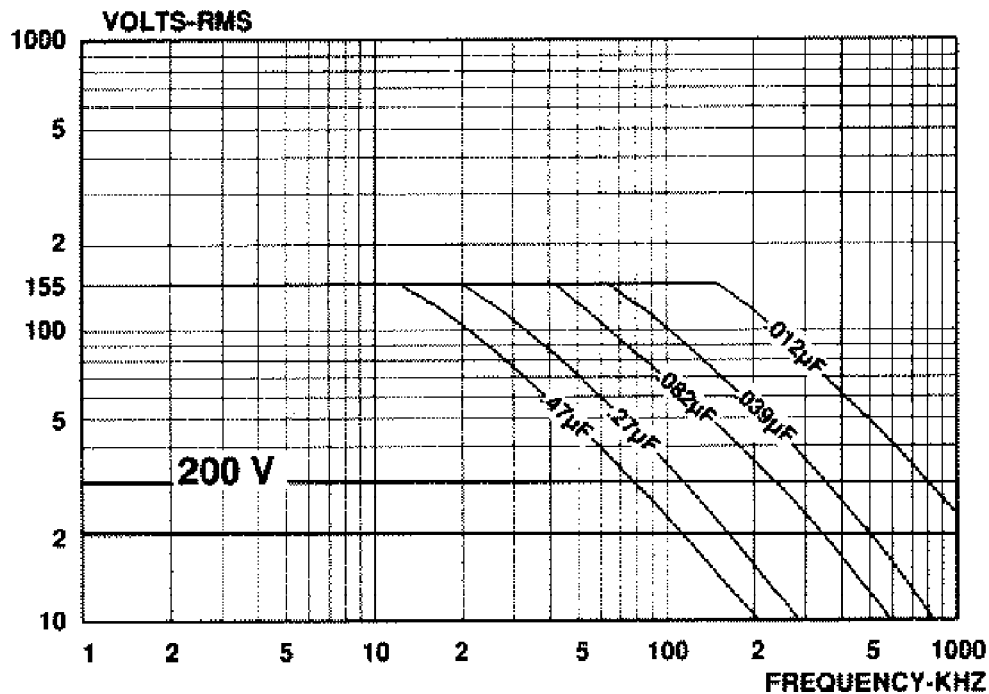


Type 715P Performance Characteristics @ +85°



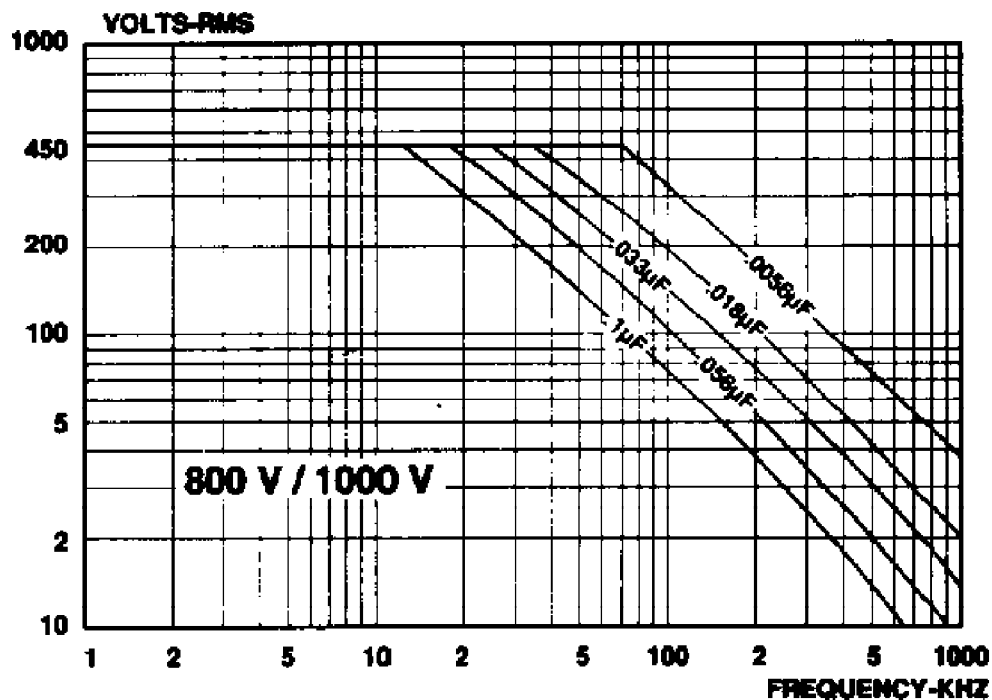
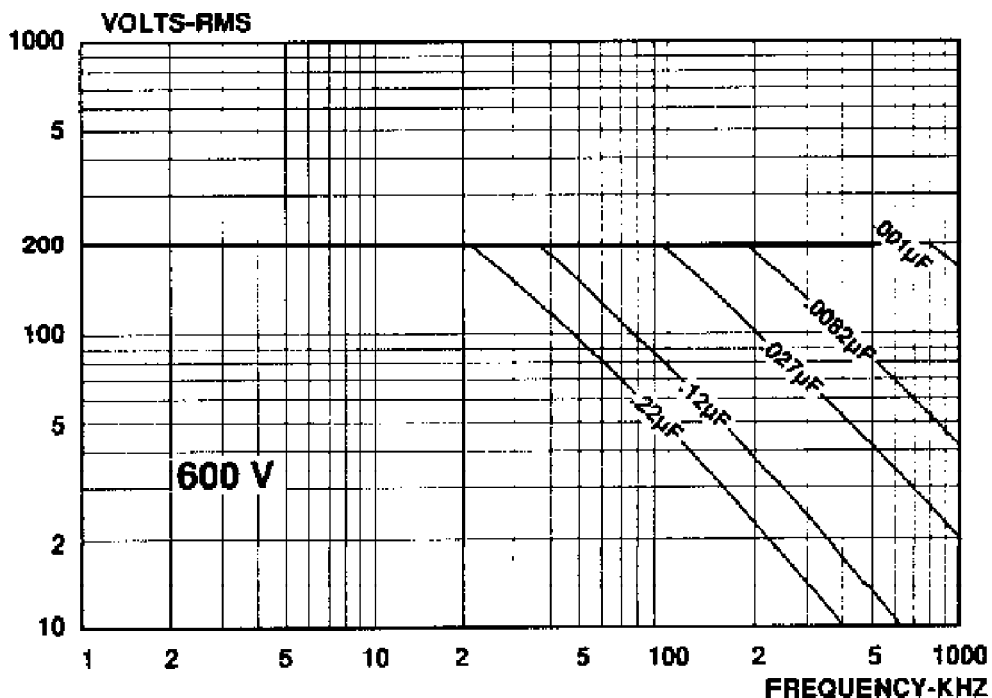


Type 715P Performance Characteristics @ +85°



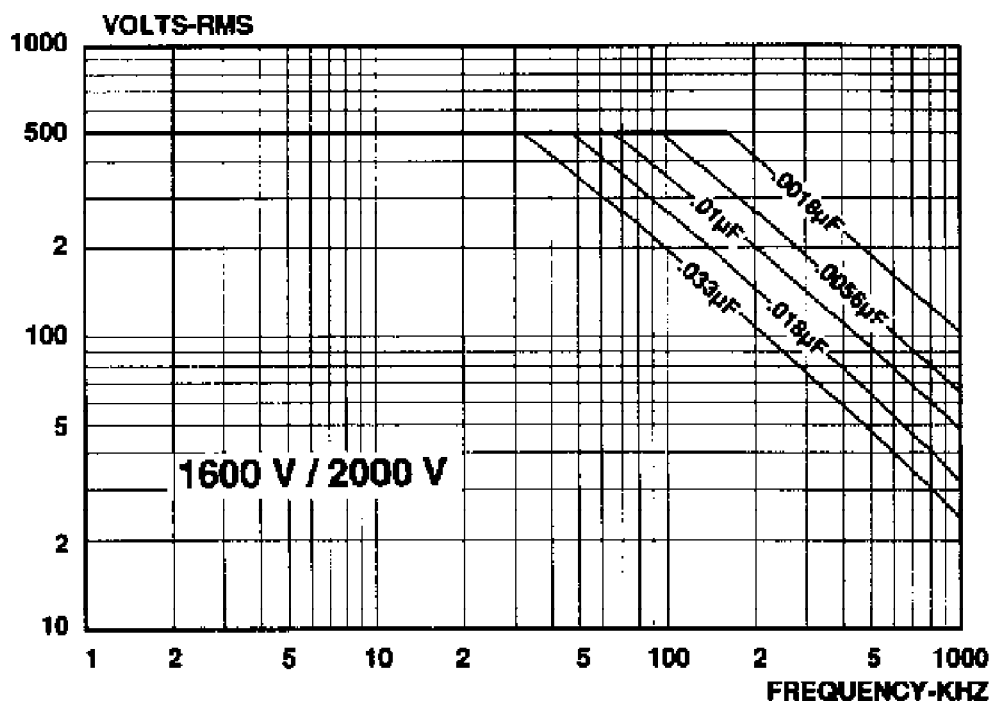
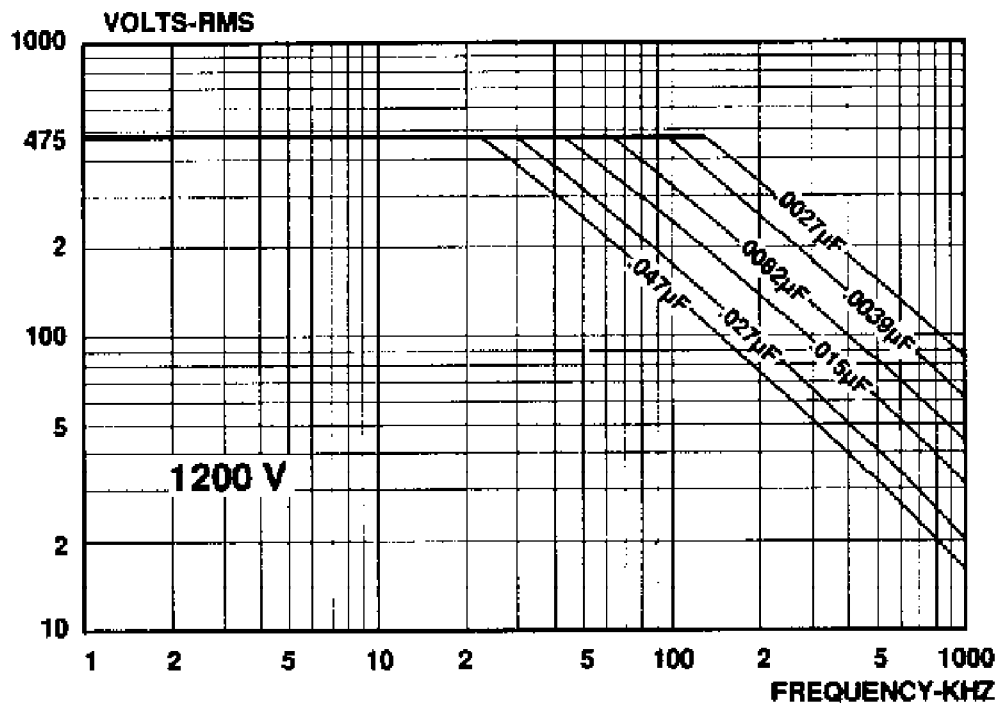


Type 715P Performance Characteristics @ +85°



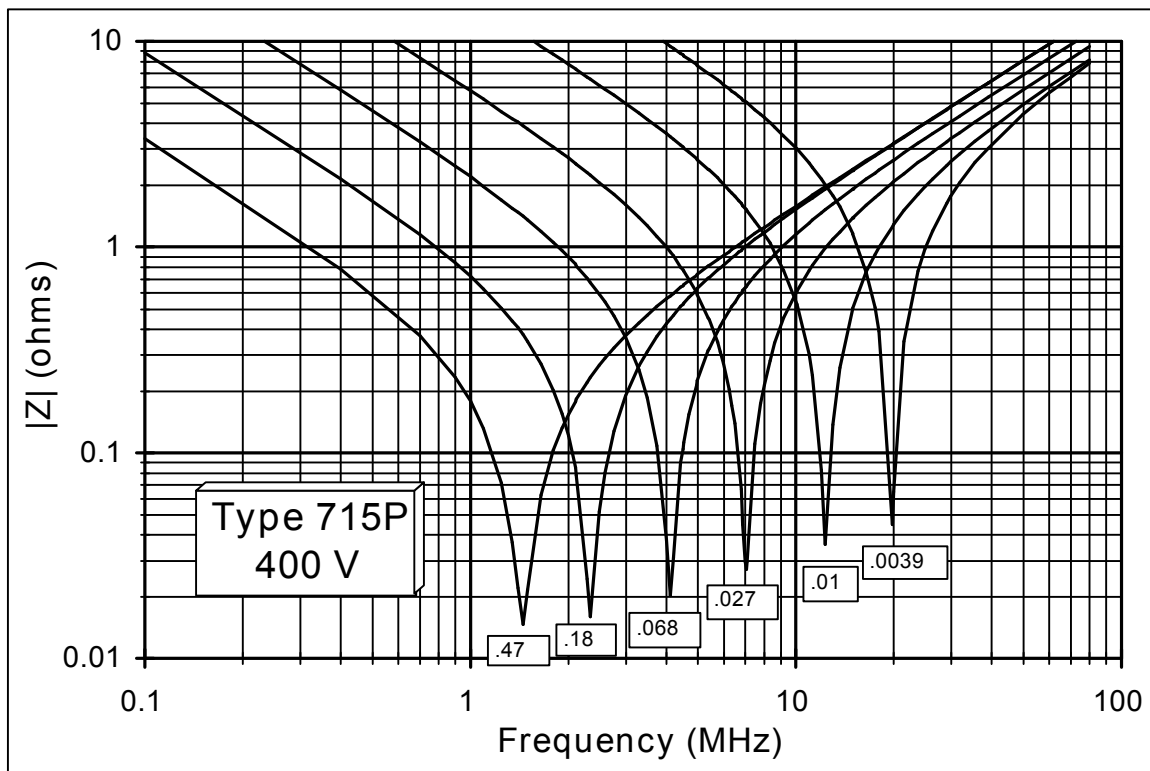
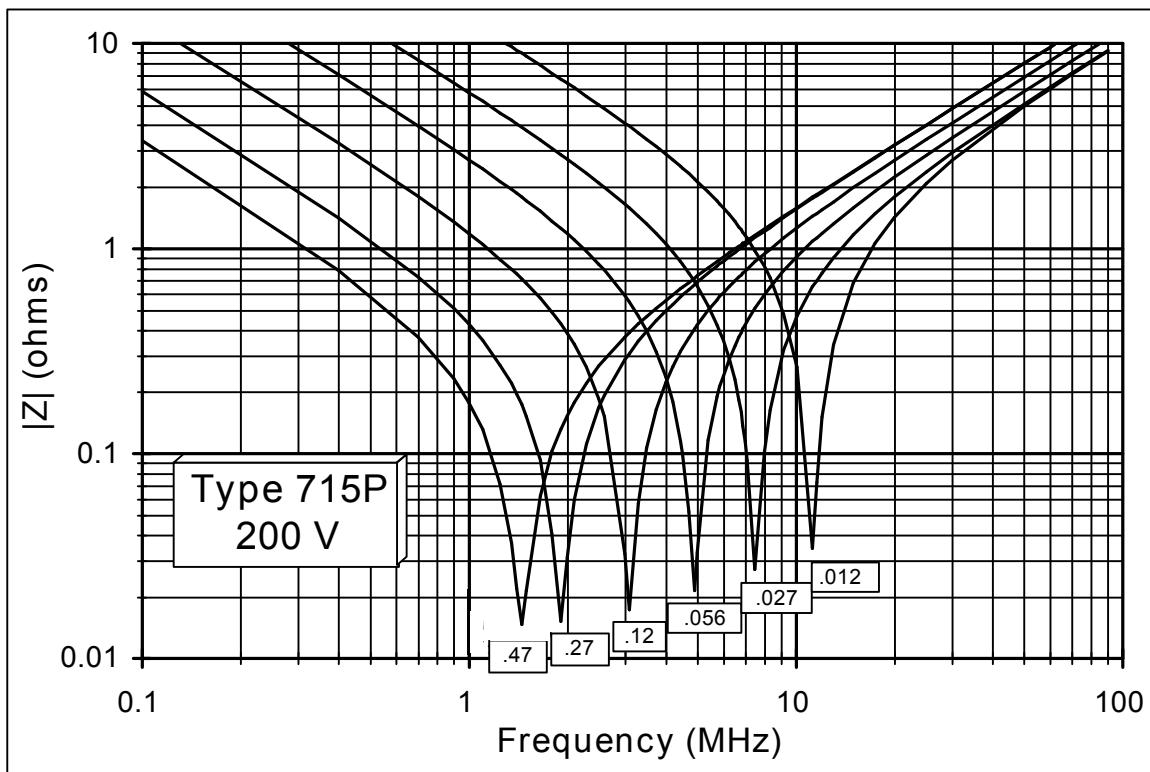


Type 715P Performance Characteristics @ +85°





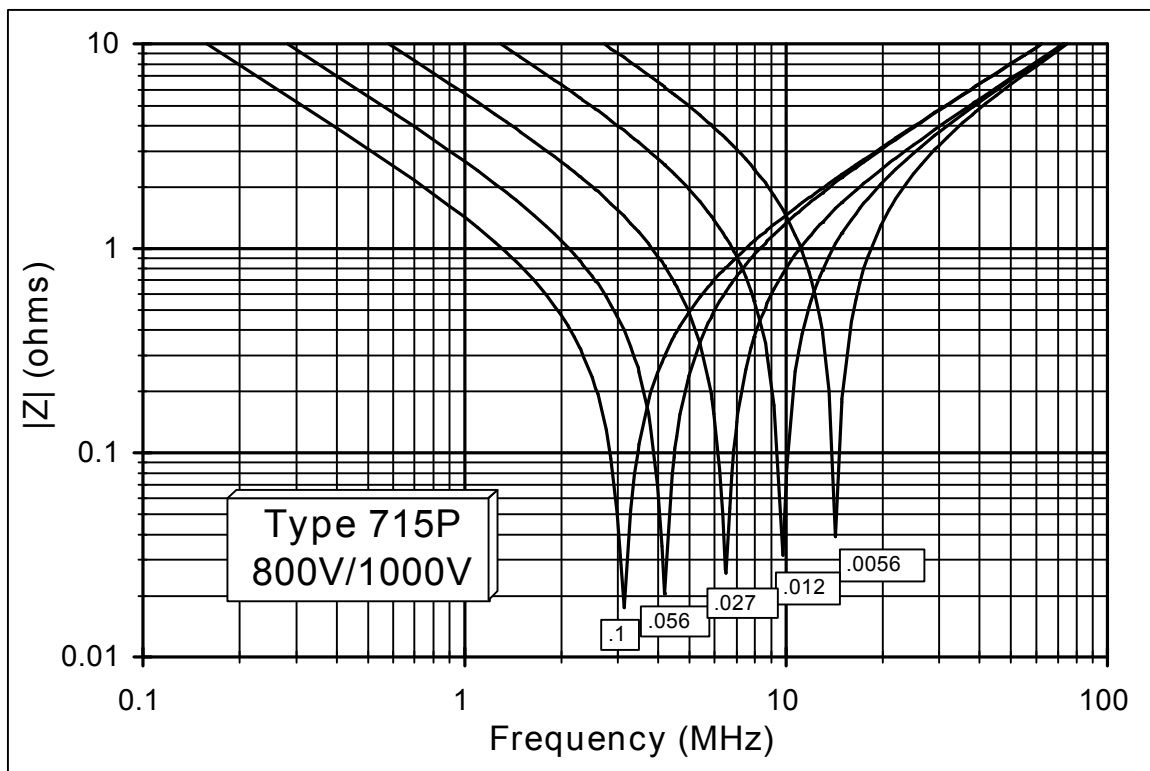
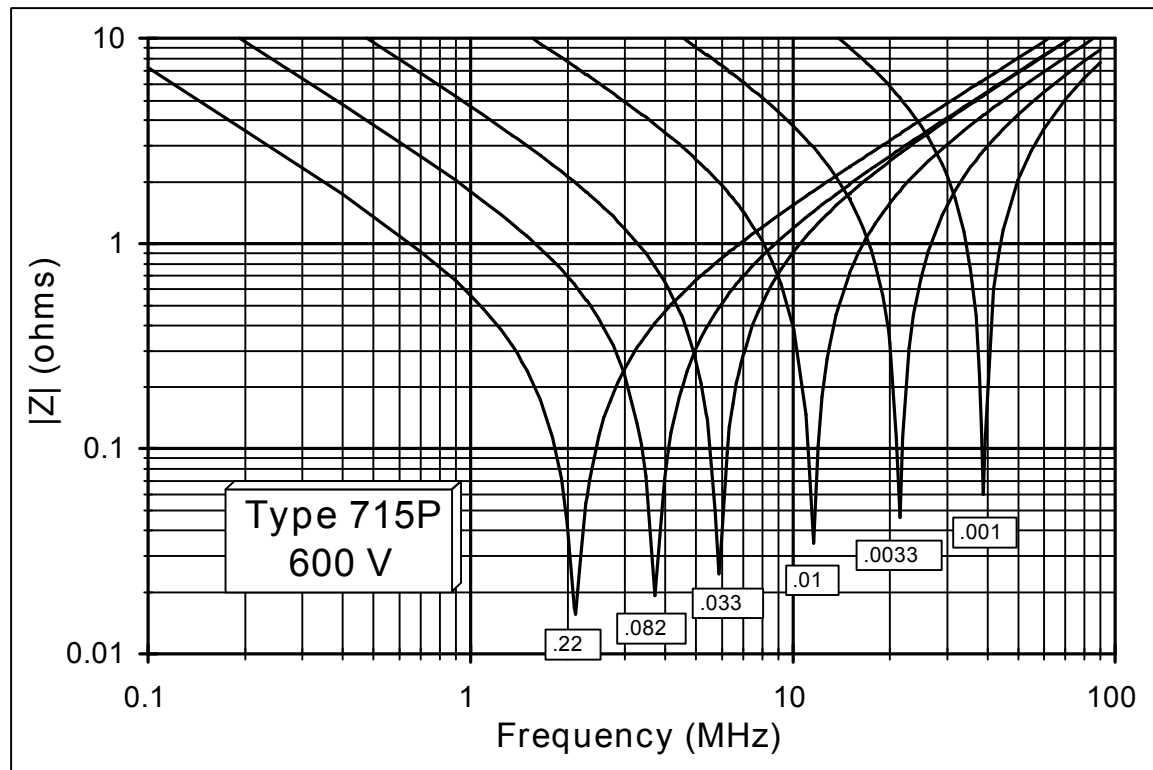
Typical Impedance vs. Frequency



Please note: Capacitance values above are in μF . The resonant frequency and impedance shown above apply to units with a 0.250" lead length and are typical values only. Please contact us for additional data. Thank you.



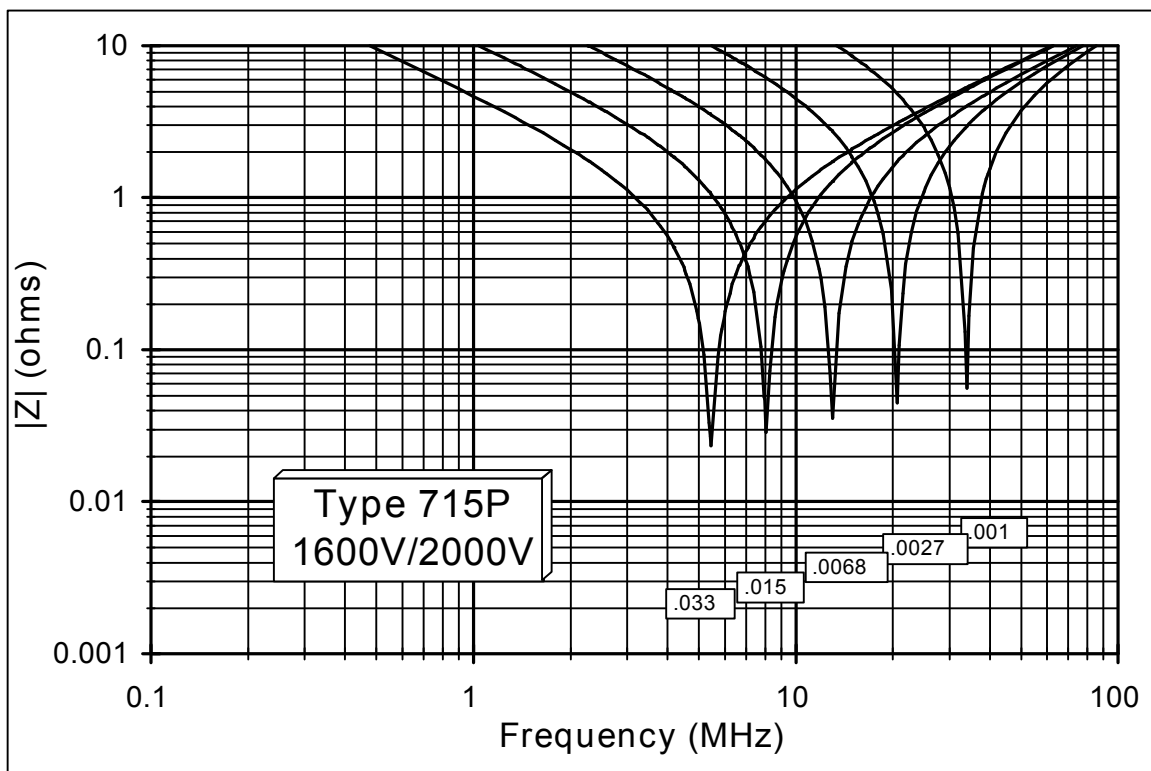
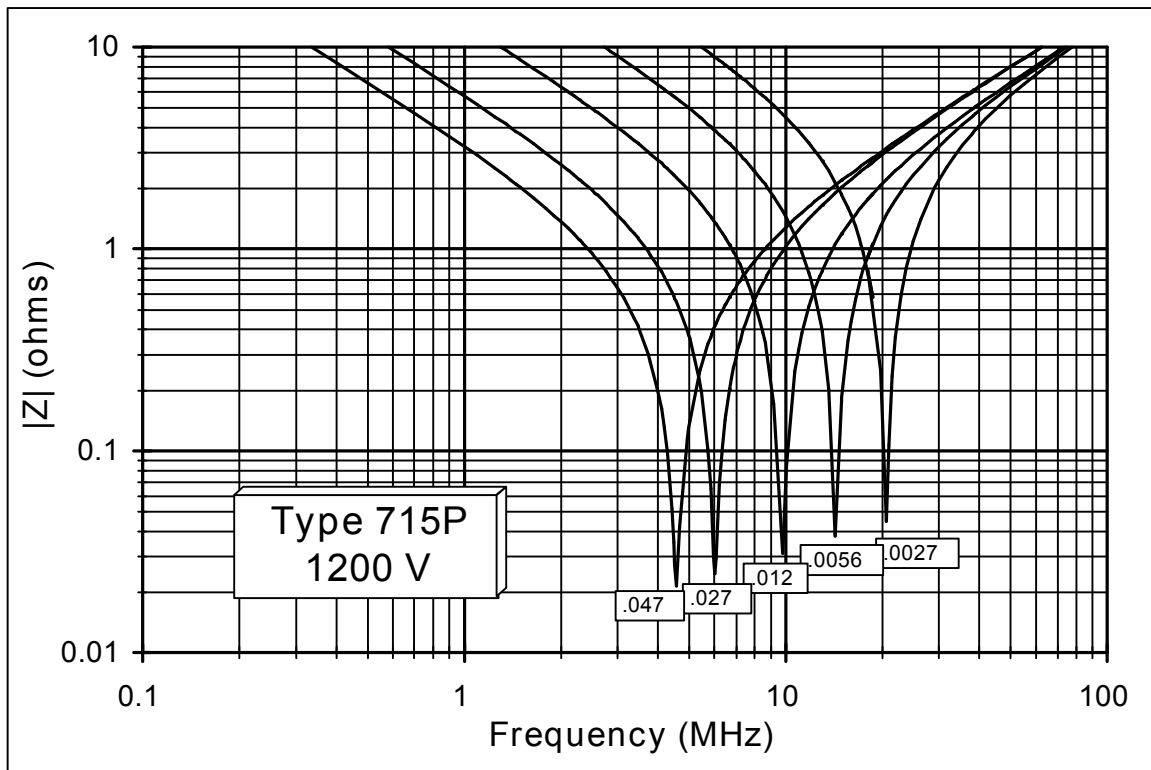
Typical Impedance vs. Frequency



Please note: Capacitance values above are in μF . The resonant frequency and impedance shown above apply to units with a 0.250" lead length and are typical values only. Please contact us for additional data. Thank you.



Typical Impedance vs. Frequency



Please note: Capacitance values above are in μF . The resonant frequency and impedance shown above apply to units with a 0.250" lead length and are typical values only. Please contact us for additional data. Thank you.

High Performance Polypropylene Film ORANGE DROP® Capacitors

The Type 716P Orange Drop is a high performance version of the popular 715P series. It is made from polypropylene film and foil with copper leads, making it ideal for high pulse applications. The 716P offers the ultimate in high pulse current and high RMS current capability. It also has a pressed profile for best utilization of board space.

Polypropylene's very low dissipation factor combined with copper leads make the 716P ideal for snubber, resonant circuit and switching applications. High frequency response further adds to the 716P's performance.

The 200VDC, 400VDC and 600VDC ratings are single section, extended foil designs allowing for high frequency, high current applications. The 800VDC and above ratings are series wound with extended foil and incorporate a floating common of metallized polypropylene which provides self-healing characteristics in addition to high frequency, high current capabilities.

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 716P is suitable for matching with positive TC resistors and inductors to maintain circuit stability.

Performance characteristics, as well as curves showing typical variations in electrical characteristics as a function of temperature and frequency, are given below and on the following pages.

Performance Characteristics

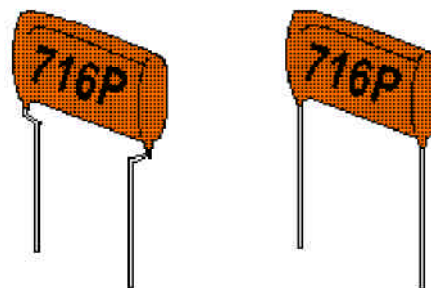
Operating Temperature Range:

The standard operating temperature range is -55°C to +85°C. The Type 716P may be operated up to +105°C providing the D-C working voltage is reduced by 50%. For specific derating of A-C voltage above +85°C please contact our design engineering department.

Insulation Resistance:

After a two (2) minute charge at rated voltage or 500VDC, whichever is less:

At +25°C:	400,000 MΩ for C ≤ .5 μF 200,000 MΩ-μF for C > .5 μF
At +85°C:	20,000 MΩ for C ≤ .5 μF 10,000 MΩ-μF for C > .5 μF
At +105°C:	2,000 MΩ for C ≤ .5 μF



Capacitance, Tolerance and Dissipation Factor:

Capacitors shall be measured at a frequency of 1000 Hertz at +25°C. The maximum dissipation factor shall be 0.1%.

Dielectric Withstanding Voltage:

Capacitors rated below 800VDC shall withstand a D-C potential of 250% of rated voltage applied between terminals for not more than 5 seconds.

Capacitors rated 800VDC and above shall withstand a D-C potential of 200% of rated voltage applied between terminals for not more than 5 seconds.

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 then dry in circulating air for 4 hours. Measure insulation resistance after a 2 minute charge at +25°C and rated voltage or 500VDC, whichever is less. Minimum product of insulation resistance and capacitance shall be 50,000 megohm-microfarads after test but need not exceed 100,000 megohms.

D-C Life Test:

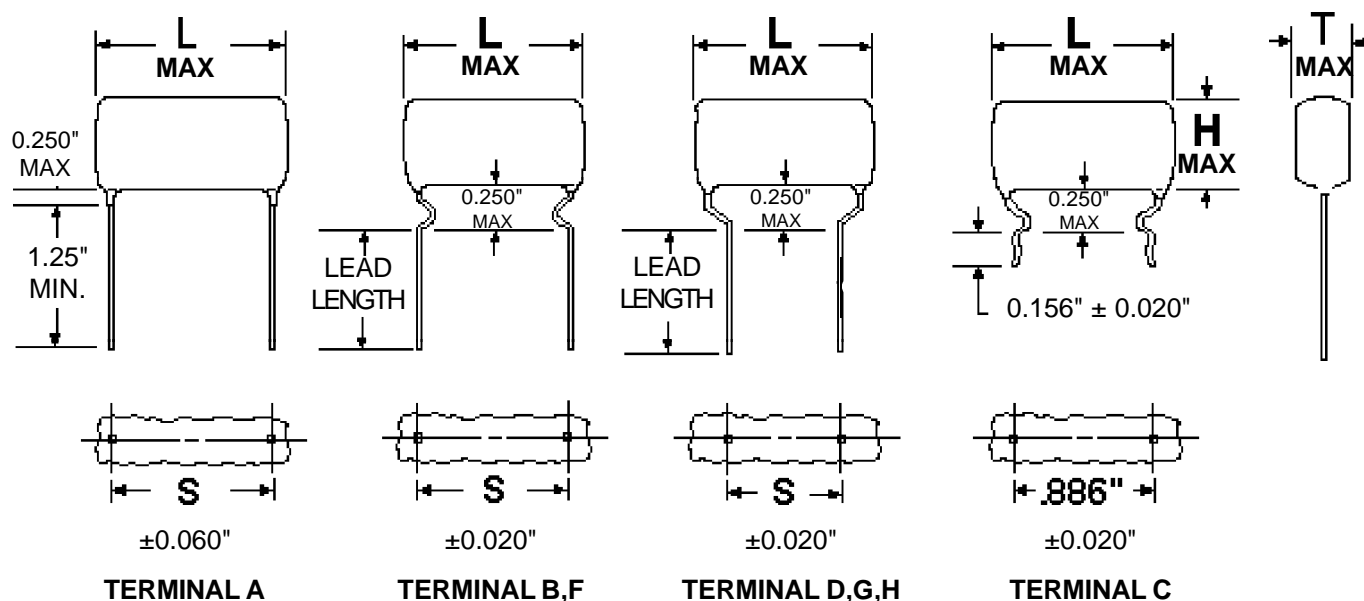
Capacitors are capable of withstanding a 500 hour life test at +85°C at 150% of rated working voltage. After test, capacitance shall not have changed by more than 5% of initial value, insulation resistance shall not have decreased by more than 50% of the initial limit and dissipation factor shall not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

A-C Life Test:

Capacitors shall withstand the maximum 60 Hertz A-C voltage for a period of 500 hours at +85°C.

Rated D-C Voltage	Max. 60 Hz A-C Voltage
200	155
400,600	200
800 to 2000	500

Standard Lead Styles



Standard Lead Spacing

CASE CODE	S, inches (metric, mm in paranthesis)						
	Term. A	Term. B	Term. D	Term C*	Term. F	Term.G	Term. H
J	0.500	0.500	0.375	---	0.394 (10)	0.295 (7.5)	0.197 (5)
K	0.688	0.688	0.375	---	0.590 (15)	0.394 (10)	0.295 (7.5)
L	1.031	0.969	0.719	0.886 (22.5)	0.866 (22.5)	0.590 (15)	---
M	1.406	1.344	1.094	---	---	1.083 (27.5)	---

* Terminal C is designed for printed circuit boards requiring a lead spacing of 0.886" with board hole sizes of 0.044" to 0.048" in diameter. Available for "L" case code parts only. Please consult us if you have a specific requirement.

Additional Specifications

Lead Wire:

Tinned copper. See standard sizes/ratings table for diameter size, "d".

Encapsulation:

Conformal coating of flame retardant orange epoxy (meets UL94V-2 specifications)

Please note:

It is not possible to list every capacitance value, tolerance, special design or any combination of these parameters available. Therefore, please contact us with your exact requirements. Custom designs can be quickly developed by our engineering department to meet your needs.

All dimensions in inches, for metric conversion use 1" = 25.4 mm.



Type 716P Standard Sizes/Ratings¹

Value,µF	Part Number ²	L max	T max	H max	d	Value,µF	Part Number ²	L max	T max	H max	d	Value,µF	Part Number ²	L max	T max	H max	d
200V D-C / 155V A-C*						1200V D-C / 475V A-C*						1600V D-C / 500V A-C*					
.01	716P10392J	.70	.25	.37	.032	.0033	716P33296J	.70	.25	.45	.032	.0027	716P272912L	1.25	.28	.48	.032
.012	716P12392J	.70	.27	.39	.032	.0039	716P39296J	.70	.26	.46	.032	.0033	716P332912L	1.25	.30	.49	.032
.015	716P15392J	.70	.26	.45	.032	.0047	716P47296J	.70	.28	.47	.032	.0039	716P392912L	1.25	.30	.54	.032
.018	716P18392J	.70	.25	.45	.032	.0056	716P56296J	.70	.30	.49	.032	.0047	716P472912L	1.25	.32	.56	.032
.022	716P22392J	.70	.27	.46	.032	.0068	716P68296J	.70	.32	.51	.032	.0056	716P562912L	1.25	.34	.58	.032
.027	716P27392J	.70	.29	.48	.032	.0082	716P82296J	.70	.32	.56	.032	.0068	716P682912L	1.25	.37	.61	.032
.033	716P33392J	.70	.32	.51	.032	.01	716P10396J	.70	.34	.58	.032	.0082	716P822912L	1.25	.38	.67	.032
.039	716P39392J	.70	.32	.56	.032	.012	716P12396K	.95	.31	.55	.032	.01	716P103912L	1.25	.42	.70	.032
.047	716P47392J	.70	.34	.58	.032	.015	716P15396K	.95	.34	.58	.032	.012	716P123912L	1.25	.45	.73	.032
.056	716P56392K	.95	.30	.55	.032	.018	716P18396K	.95	.36	.60	.032	.015	716P153912L	1.25	.46	.84	.032
.068	716P68392K	.95	.33	.57	.032	.022	716P22396K	.95	.39	.63	.032	.018	716P183912L	1.25	.50	.88	.032
.082	716P82392K	.95	.36	.60	.032	.027	716P27396K	.95	.41	.69	.032	.022	716P223912L	1.25	.54	.93	.032
.1	716P10492K	.95	.39	.63	.032	.033	716P33396K	.95	.44	.73	.032	.027	716P273912L	1.25	.60	.99	.032
.12	716P12492K	.95	.40	.69	.032	.039	716P39396K	.95	.48	.76	.032	.033	716P333912M	1.70	.53	.91	.040
.15	716P15492K	.95	.45	.73	.032	.047	716P47396L	1.25	.42	.70	.040	.039	716P393912M	1.70	.57	.96	.040
.18	716P18492L	1.25	.39	.67	.040	.056	716P56396L	1.25	.45	.73	.040	.047	716P473912M	1.70	.62	1.01	.040
.22	716P22492L	1.25	.43	.71	.040	.068	716P68396L	1.25	.45	.84	.040	.056	716P563912M	1.70	.68	1.07	.040
.27	716P27492L	1.25	.47	.75	.040	.082	716P82396L	1.25	.49	.88	.040	2000V D-C / 500V A-C*					
.33	716P33492L	1.25	.47	.86	.040	.1	716P10496L	1.25	.54	.93	.040	.001	716P102916L	1.25	.28	.47	.032
.39	716P39492L	1.25	.51	.90	.040	.12	716P12496L	1.25	.59	.97	.040	.0012	716P122916L	1.25	.29	.48	.032
.47	716P47492L	1.25	.56	.95	.040	.15	716P15496M	1.70	.55	.93	.040	.0015	716P152916L	1.25	.30	.50	.032
.56	716P56492L	1.25	.61	1.00	.040	.18	716P18496M	1.70	.59	.98	.040	.0018	716P182916L	1.25	.31	.55	.032
.68	716P68492M	1.70	.56	.94	.040	.22	716P22496M	1.70	.65	1.04	.040	.0022	716P222916L	1.25	.32	.56	.032
.82	716P82492M	1.70	.61	1.00	.040	800V D-C / 450V A-C*						.0027	716P272916L	1.25	.35	.59	.032
1.0	716P10592M	1.70	.68	1.07	.040	.0056	716P56298L	1.25	.25	.45	.032	.0033	716P332916L	1.25	.37	.61	.032
400V D-C / 200V A-C*						.0068	716P68298L	1.25	.27	.46	.032	.0039	716P392916L	1.25	.38	.67	.032
.0039	716P39294J	.70	.24	.36	.032	.0082	716P82298L	1.25	.29	.48	.032	.0047	716P472916L	1.25	.41	.69	.032
.0047	716P47294J	.70	.25	.37	.032	.01	716P10398L	1.25	.29	.53	.032	.0056	716P562916L	1.25	.43	.72	.032
.0056	716P56294J	.70	.24	.44	.032	.012	716P12398L	1.25	.31	.55	.032	.0068	716P682916L	1.25	.47	.75	.032
.0068	716P68294J	.70	.24	.44	.032	.015	716P15398L	1.25	.34	.58	.032	.0082	716P822916L	1.25	.47	.85	.032
.0082	716P82294J	.70	.25	.45	.032	.018	716P18398L	1.25	.37	.61	.032	.01	716P103916L	1.25	.51	.90	.032
.01	716P10394J	.70	.27	.46	.032	.022	716P22398L	1.25	.38	.67	.032	.012	716P123916L	1.25	.55	.94	.032
.012	716P12394J	.70	.29	.48	.032	.027	716P27398L	1.25	.42	.70	.032	.015	716P153916M	1.70	.49	.87	.040
.015	716P15394J	.70	.31	.50	.032	.033	716P33398L	1.25	.46	.74	.032	.018	716P183916M	1.70	.53	.91	.040
.018	716P18394K	.95	.28	.47	.032	.039	716P39398L	1.25	.46	.84	.032	.022	716P223916M	1.70	.58	.96	.040
.022	716P22394K	.95	.30	.49	.032	.047	716P47398L	1.25	.50	.88	.032	.027	716P273916M	1.70	.63	1.02	.040
.027	716P27394K	.95	.31	.55	.032	.056	716P56398L	1.25	.54	.93	.032	.033	716P333916M	1.70	.69	1.08	.040
.033	716P33394K	.95	.33	.57	.032	.068	716P68398L	1.25	.59	.98	.032	2000V D-C / 500V A-C*					
.039	716P39394K	.95	.36	.60	.032	.082	716P82398L	1.70	.52	.90	.040	.001	716P102920L	1.25	.28	.47	.032
.047	716P47394K	.95	.39	.62	.032	.1	716P10498L	1.70	.57	.96	.040	.0012	716P122920L	1.25	.29	.48	.032
.056	716P56394K	.95	.40	.68	.032	.12	716P12498L	1.70	.62	1.01	.040	.0015	716P152920L	1.25	.30	.50	.032
.068	716P68394K	.95	.43	.72	.032	.14	716P14498L	1.70	.67	1.06	.040	.0018	716P182920L	1.25	.31	.55	.032
.082	716P82394L	1.25	.38	.67	.040	1000V D-C / 450V A-C*						.0022	716P222920L	1.25	.32	.56	.032
.1	716P10494L	1.25	.42	.70	.040	.0056	716P562910L	1.25	.25	.45	.032	.0027	716P272920L	1.25	.35	.59	.032
.12	716P12494L	1.25	.45	.73	.040	.0068	716P682910L	1.25	.27	.46	.032	.0033	716P332920L	1.25	.37	.61	.032
.15	716P15494L	1.25	.46	.84	.040	.0082	716P822910L	1.25	.29	.48	.032	.0039	716P392920L	1.25	.38	.67	.032
.18	716P18494L	1.25	.50	.89	.040	.01	716P103910L	1.25	.29	.53	.032	.0047	716P472920L	1.25	.41	.69	.032
.22	716P22494L	1.25	.57	.95	.040	.012	716P123910L	1.25	.31	.55	.032	.0056	716P562920L	1.25	.43	.72	.032
.27	716P27494L	1.25	.63	1.01	.040	.015	716P153910L	1.25	.34	.58	.032	.0068	716P682920L	1.25	.47	.75	.032
.33	716P33494M	1.70	.57	.96	.040	.018	716P183910L	1.25	.37	.61	.032	.0082	716P822920L	1.25	.47	.85	.032
.39	716P39494M	1.70	.62	1.01	.040	.022	716P223910L	1.25	.38	.67	.032	.01	716P103920L	1.25	.51	.90	.032
.47	716P47494M	1.70	.68	1.07	.040	.027	716P273910L	1.25	.42	.70	.032	.012	716P123920L	1.25	.55	.94	.032
600V D-C / 200V A-C*						.033	716P333910L	1.25	.46	.74	.032	.015	716P153920M	1.70	.49	.87	.040
.001	716P10296J	.70	.27	.46	.032	.039	716P393910L	1.25	.46	.84	.032	.018	716P183920M	1.70	.53	.91	.040
.0012	716P12296J	.70	.24	.44	.032	.047	716P473910L	1.25	.50	.88	.032	.022	716P223920M	1.70	.58	.96	.040
.0015	716P15296J	.70	.26	.45	.032	.056	716P563910L	1.25	.54	.93	.032	.027	716P273920M	1.70	.63	1.02	.040
.0018	716P18296J	.70	.27	.46	.032	.068	716P683910L	1.25	.59	.98	.032	.033	716P333920M	1.70	.69	1.08	.040
.0022	716P22296J	.70	.28	.48	.032	.082	716P823910M	1.70	.52	.90	.040						
.0027	716P27296J	.70	.25	.44	.032	.1	716P104910M	1.70	.57	.96	.040						
						.12	716P124910M	1.70	.62	1.01	.040						
						.14	716P144910M	1.70	.67	1.06	.040						

¹ Type 716P capacitors are available through the Sprague/Vishay Distribution Network on special order.

² To complete part number for proper tolerance, terminal style and lead length please refer to Ordering/Part Number Information page.

* Please refer to performance curves for RMS Voltage vs. Frequency characteristics.



Additional Technical Data/Specifications

Corona Start Voltage

D-C Rating	Typical Corona Start Voltage, RMS
200	300
400,600	325
800,1000	600
1200	625
1600,2000	650

Maximum Dissipation Factor (D.F.) in %

Cap Range(μF)	200V-600V		800V/1000V		1200V		1600V/2000V	
	20KHz	100KHz	20KHz	100KHz	20KHz	100KHz	20KHz	100KHz
.001 - .012	.028	.034	.037	.075	.034	.064	.032	.053
.015 - .027	.029	.038	.037	.078	.035	.067	.037	.078
.033 - .068	.030	.046	.038	.087	.042	.104	.037	.079
.082 - .1	.031	.053	.048	.135	--	--	--	--
.12 - .33	.034	.176	.049	.141	--	--	--	--
.39 - .56	.038	.107	--	--	--	--	--	--
.68 - 1.0	.047	.167	--	--	--	--	--	--

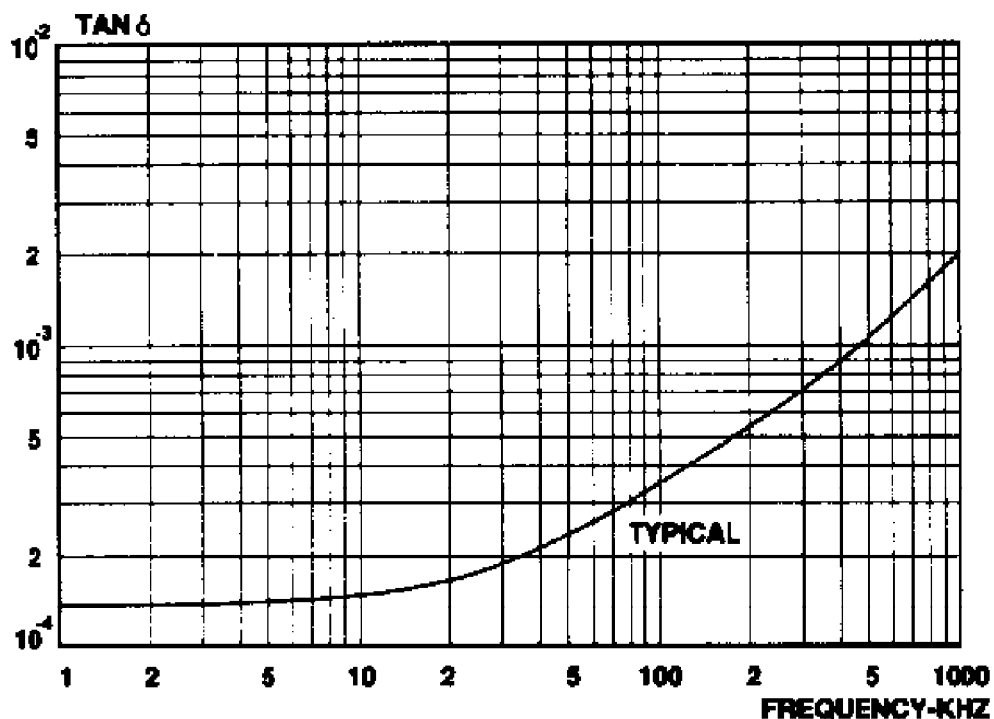
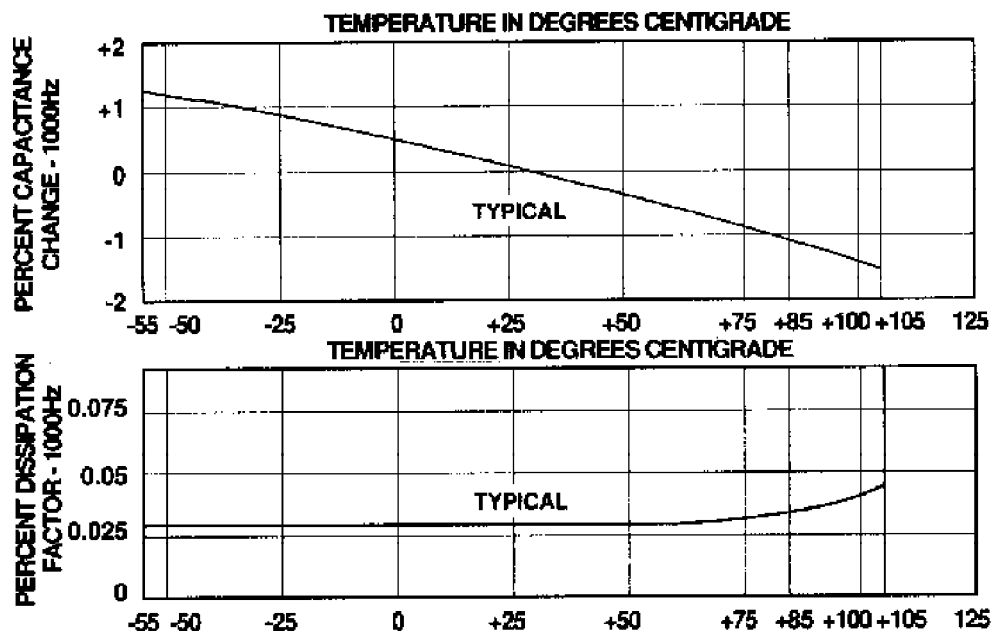
Maximum Pulse Rise Time (dv/dt) in Volt/μsec

Cap Value (μF)	200V	400V	600V	800V/1000V	1200V	1600V/2000V
.001	-	-	20700	-	-	43200
.0012	-	-	18900	-	-	39500
.0015	-	-	16900	-	-	35300
.0018	-	-	15400	-	-	32200
.0022	-	-	14000	-	-	29100
.0027	-	-	12600	-	25000	26300
.0033	-	-	11400	-	22600	23800
.0039	-	10500	10500	-	20800	21900
.0047	-	9500	9500	-	18900	19900
.0056	-	8700	8700	16400	17400	18300
.0068	-	7900	7900	14900	15700	16600
.0082	-	7200	7200	13600	14300	15100
.01	4600	6500	6500	12300	13000	13700
.012	4200	6000	5400	11200	11900	12500
.015	3800	5300	4800	10000	10600	10300
.018	3400	4400	4400	9200	9700	9400
.022	3100	4000	4000	8300	8800	8500
.027	2800	3600	3600	7500	7900	7700
.033	2500	3200	3200	6800	6600	7000
.039	2300	3000	3000	6200	6100	-
.047	2100	2700	2500	5700	5600	-
.056	1800	2500	2300	5200	5100	-
.068	1600	2300	2100	4700	-	-
.082	1500	1900	1900	4000	-	-
.1	1300	1700	1700	3600	-	-
.12	1200	1600	1600	3300	-	-
.15	1100	1400	1300	-	-	-
.18	910	1300	1200	-	-	-
.22	820	1200	1100	-	-	-
.27	740	1100	-	-	-	-
.33	670	880	-	-	-	-
.39	620	810	-	-	-	-
.47	560	740	-	-	-	-
.56	520	-	-	-	-	-
.68	430	-	-	-	-	-
.82	400	-	-	-	-	-
1.0	360	-	-	-	-	-

Note: dv/dt ratings based on measurements made at junction of the wire leads and capacitor body.

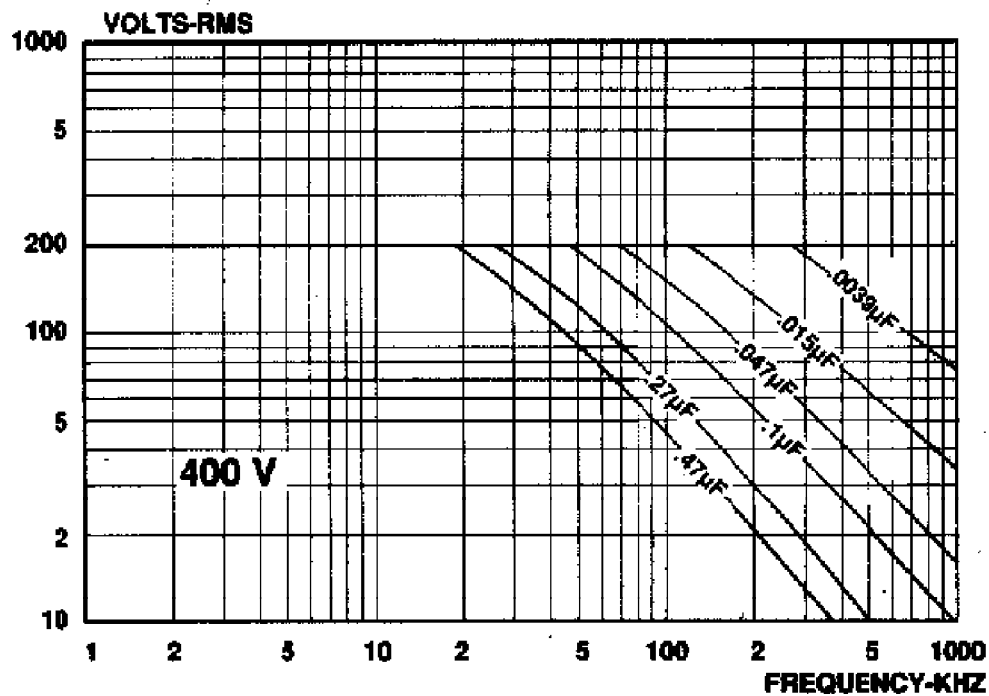
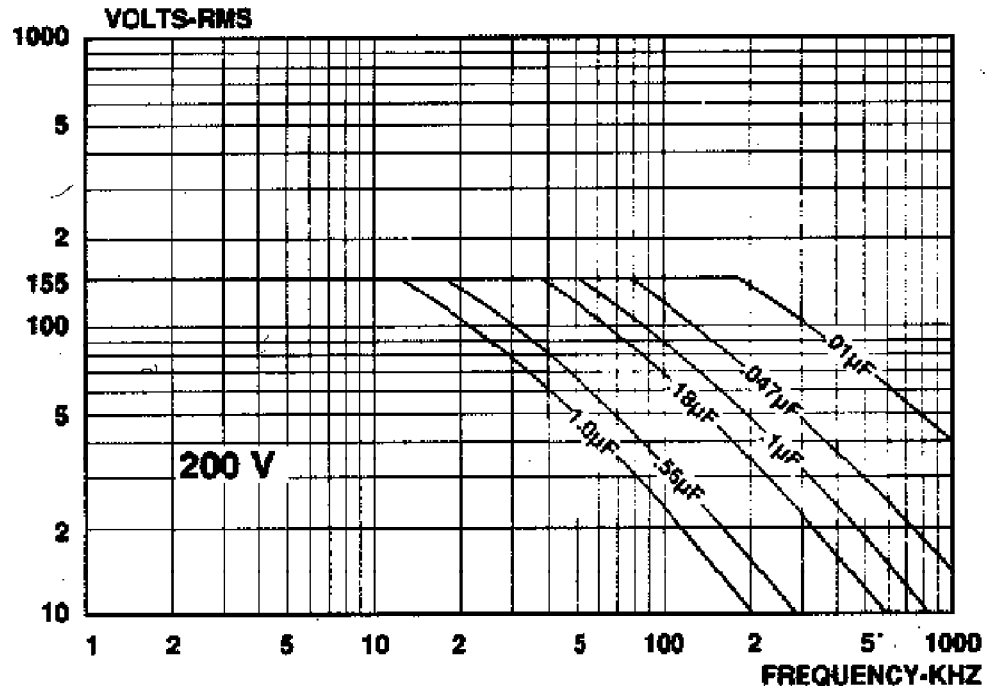


Type 716P Performance Characteristics @ +85°



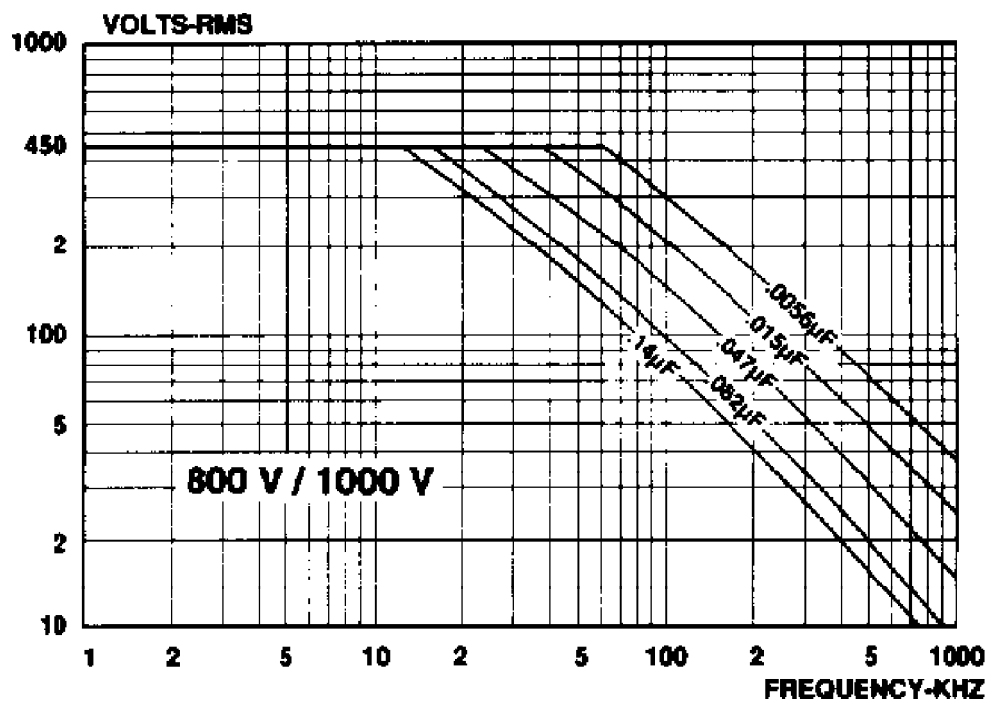
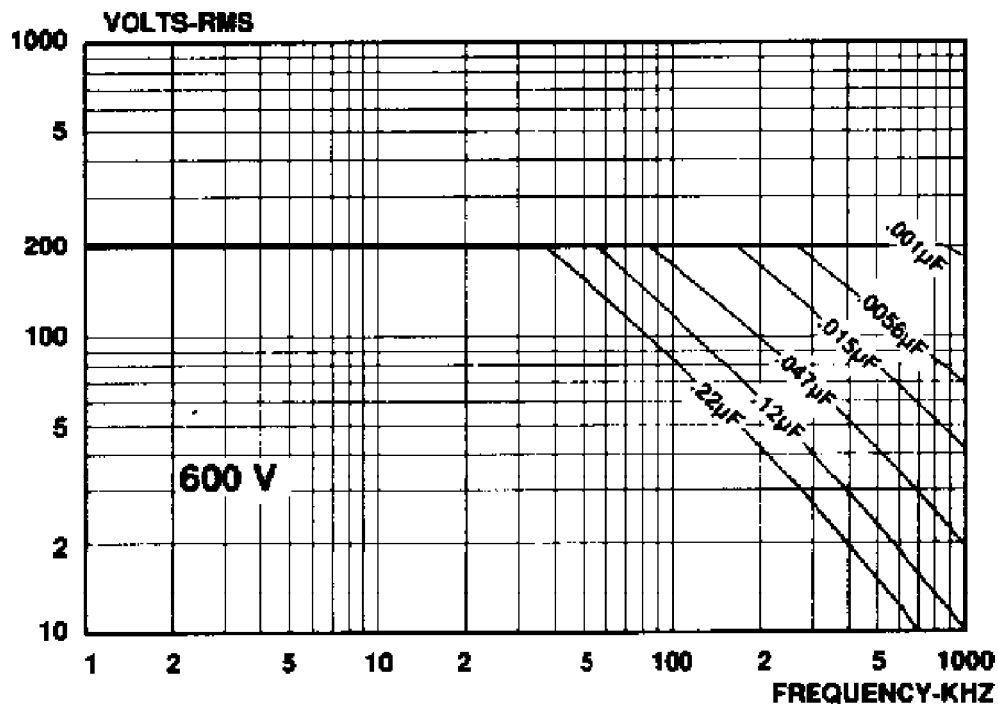


Type 716P Performance Characteristics @ +85°



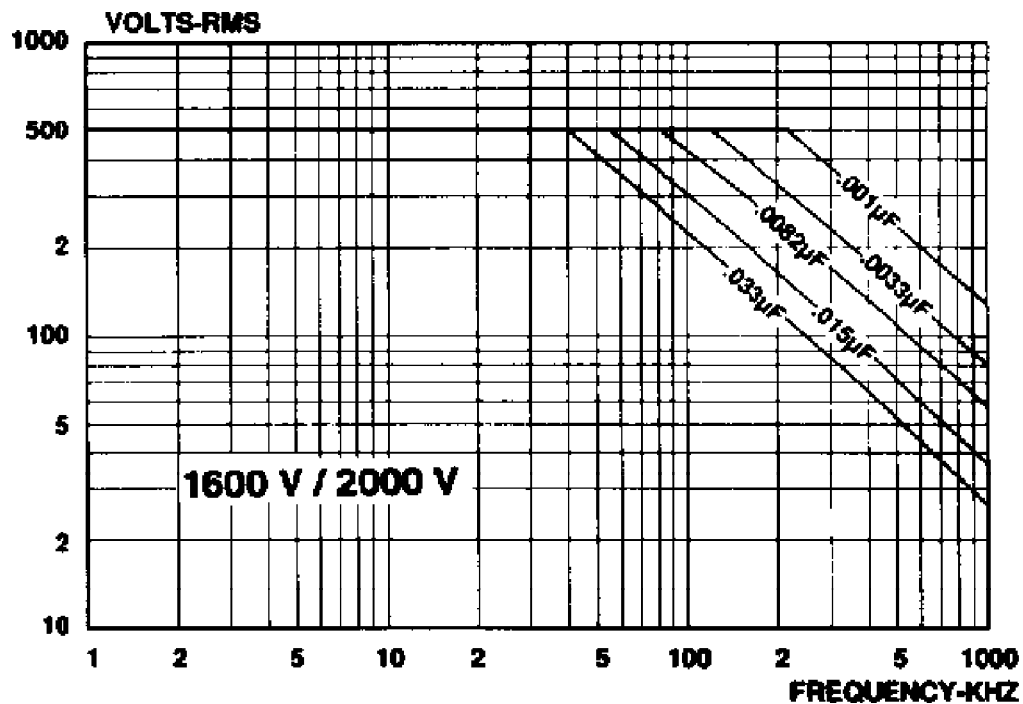
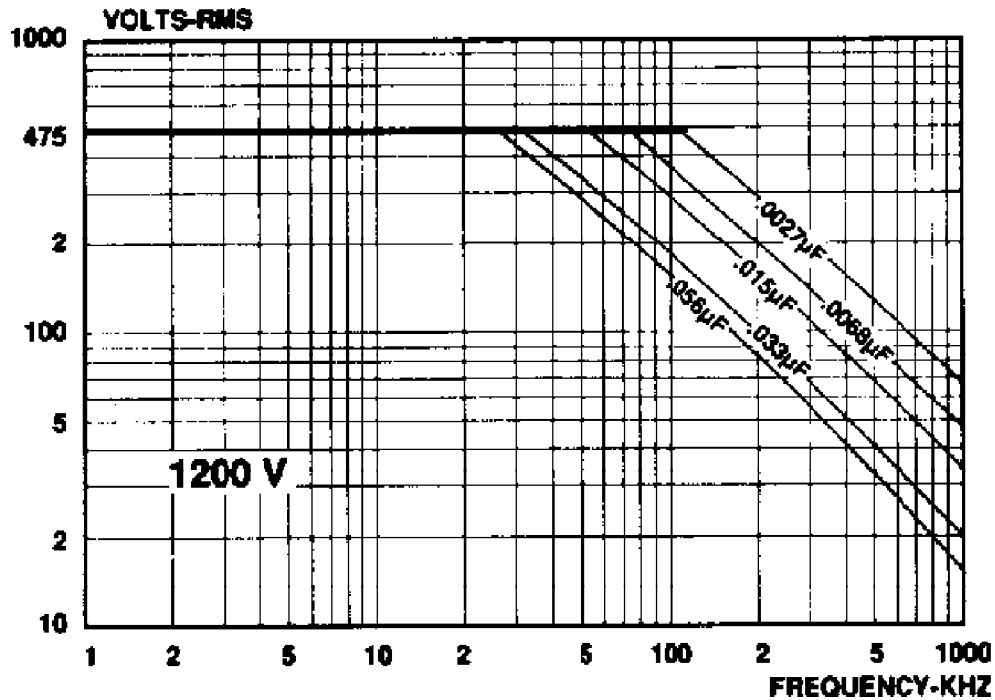


Type 716P Performance Characteristics @ +85°



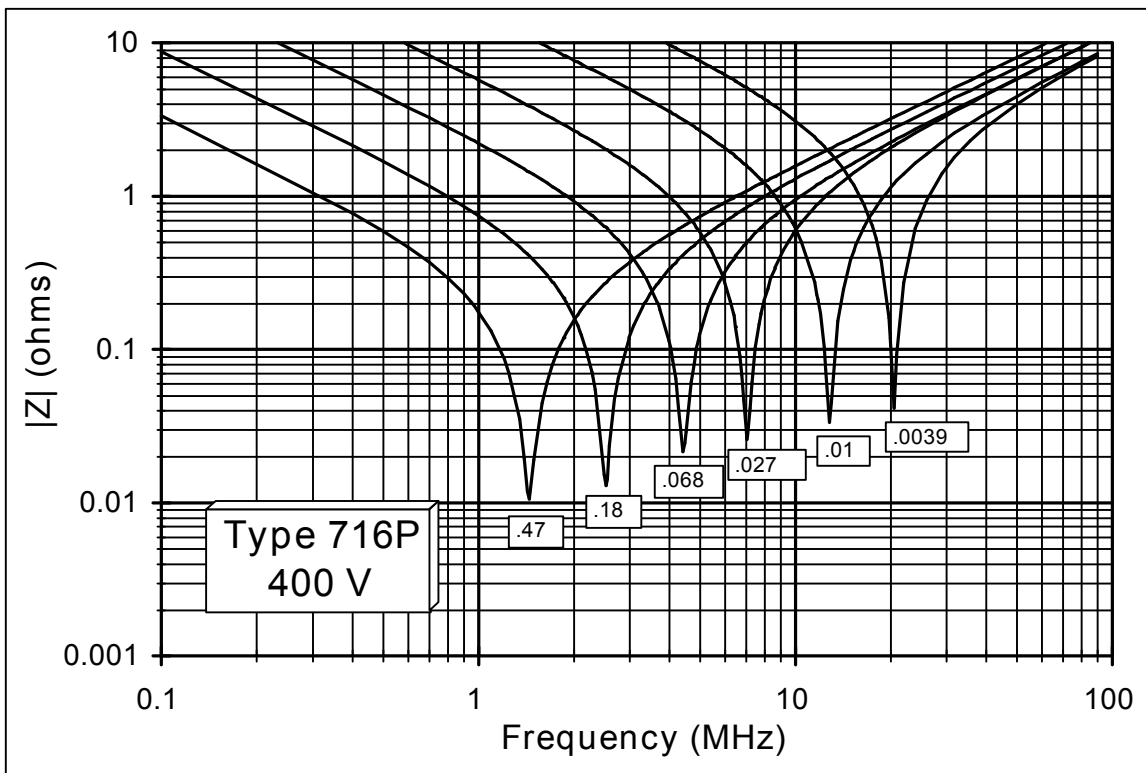
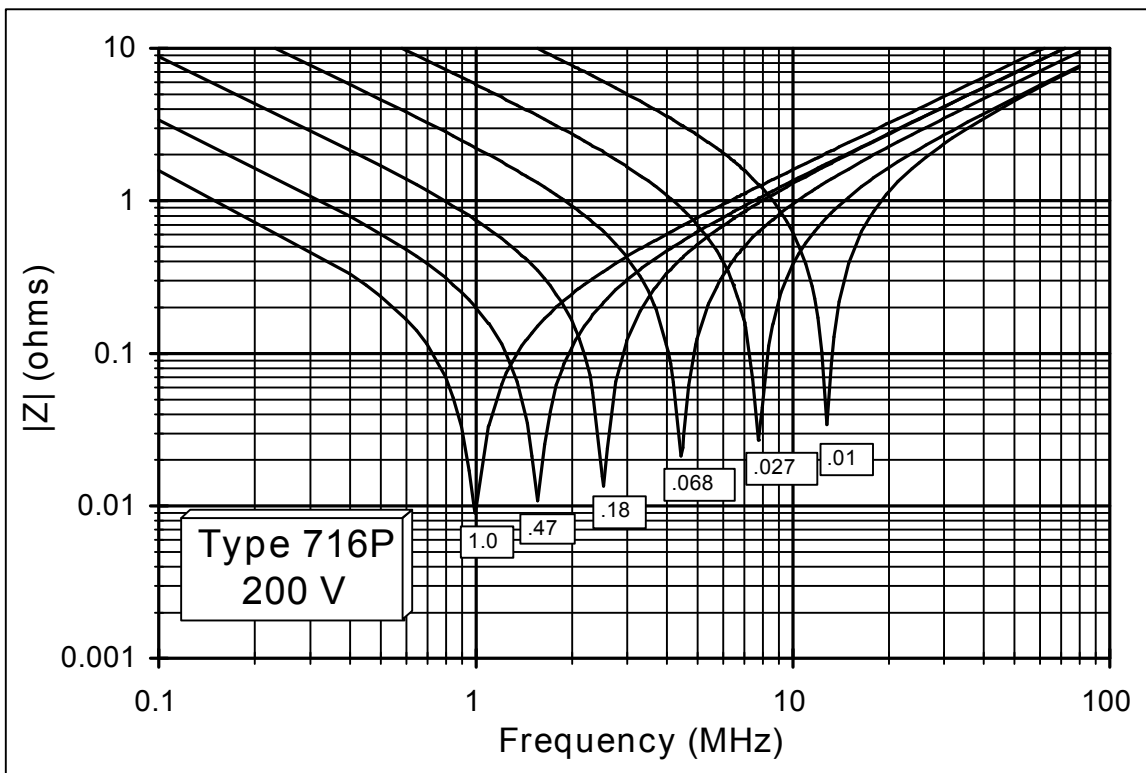


Type 716P Performance Characteristics @ +85°





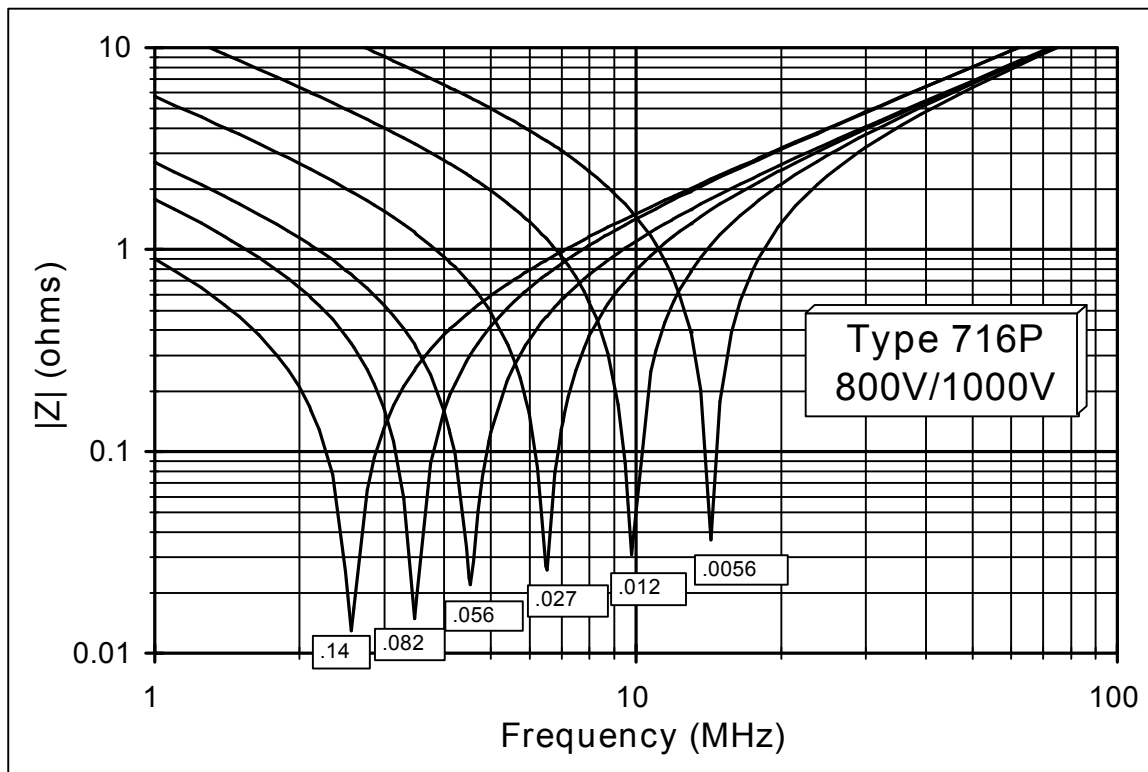
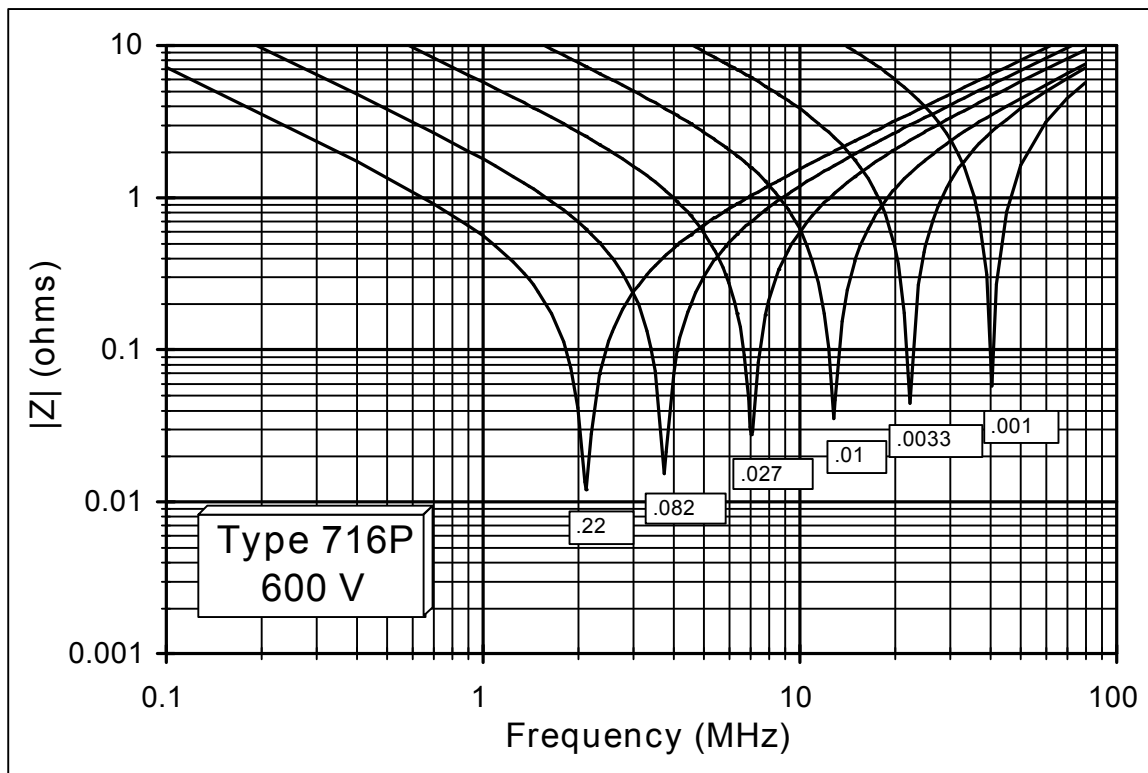
Typical Impedance vs. Frequency



Please note: Capacitance values above are in μF . The resonant frequency and impedance shown above apply to units with a 0.250" lead length and are typical values only. Please contact us for additional data. Thank you.



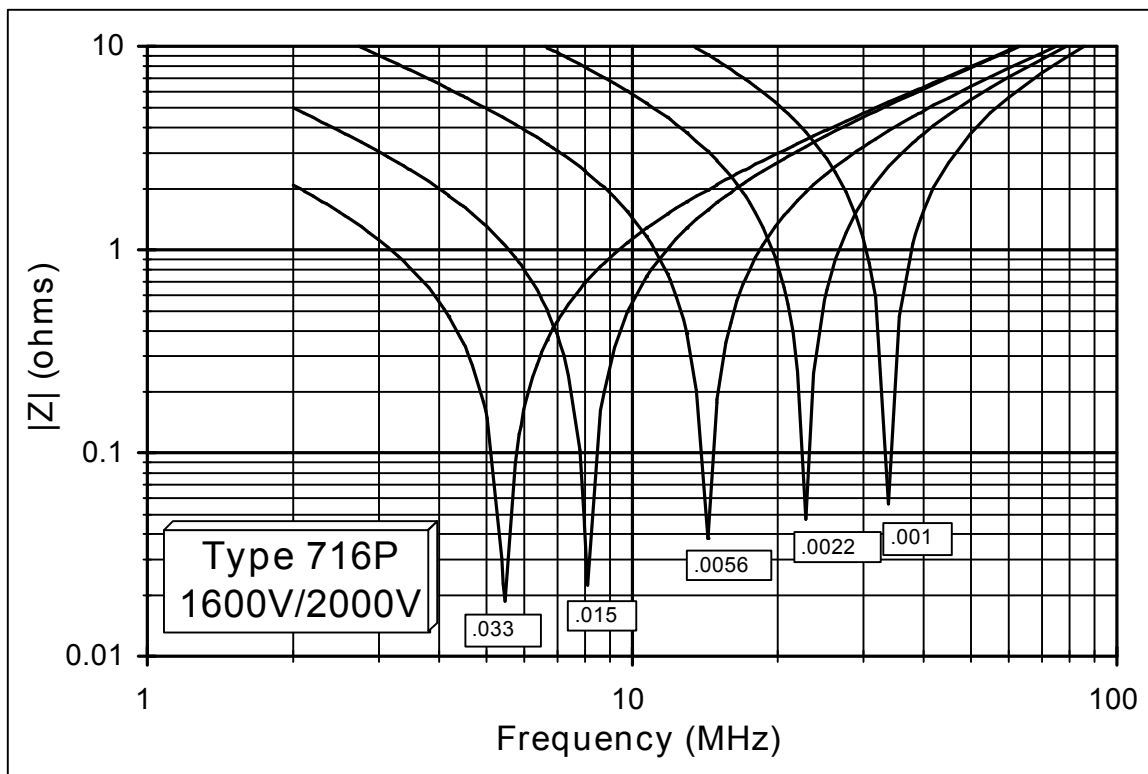
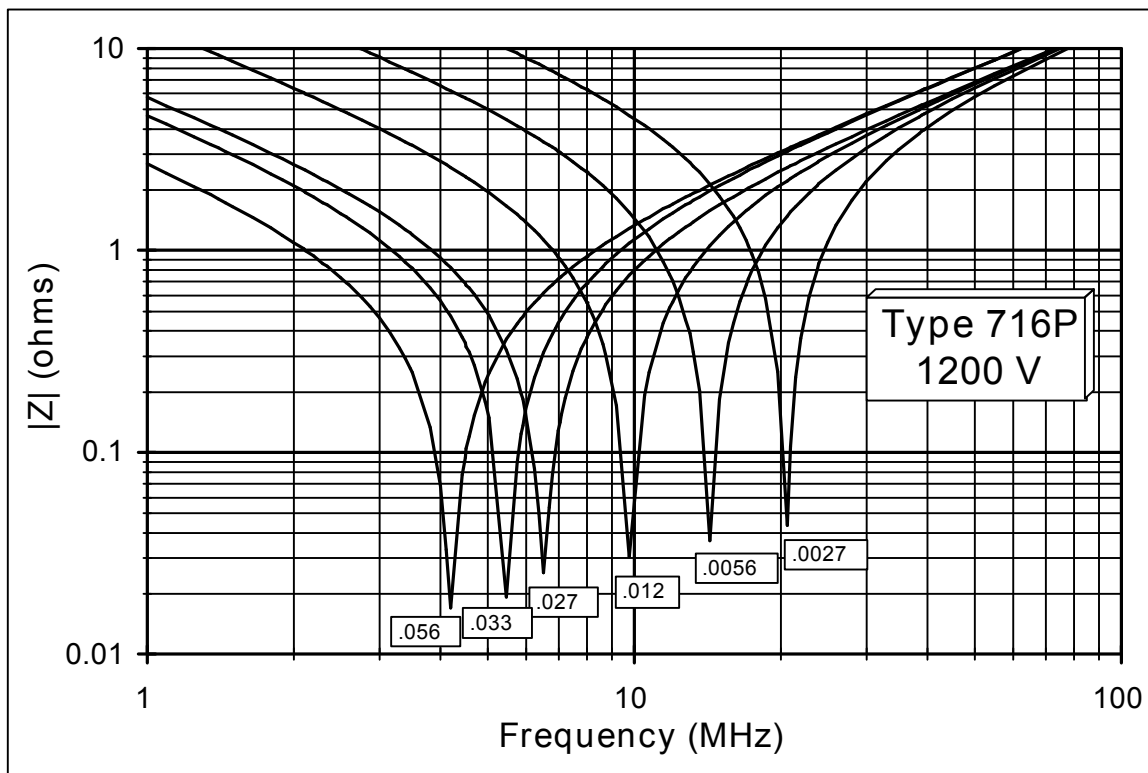
Typical Impedance vs. Frequency



Please note: Capacitance values above are in μF . The resonant frequency and impedance shown above apply to units with a 0.250" lead length and are typical values only. Please contact us for additional data. Thank you.



Typical Impedance vs. Frequency

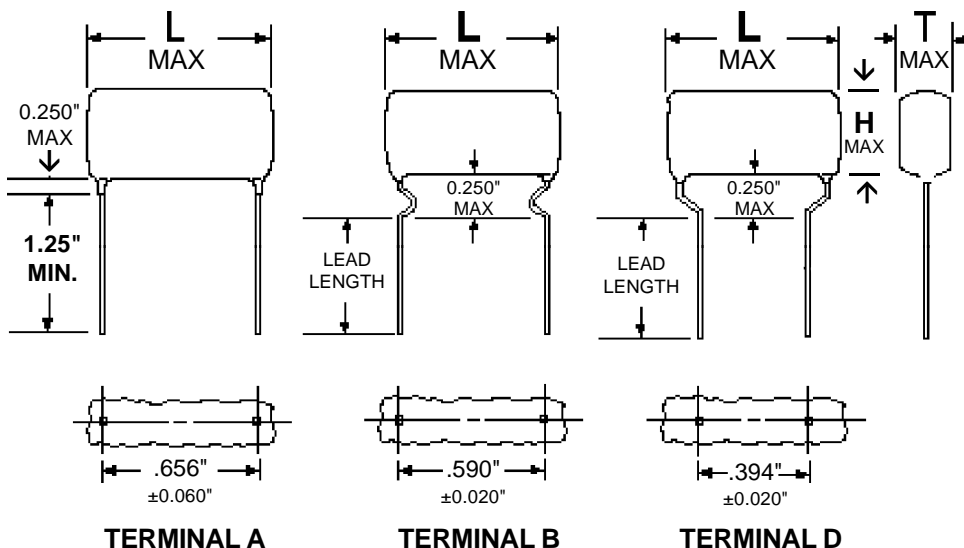


Please note: Capacitance values above are in μF . The resonant frequency and impedance shown above apply to units with a 0.250" lead length and are typical values only. Please contact us for additional data. Thank you.



Type 716P High Voltage Compact Designs

Standard Lead Styles/Lead Spacings



Specifications

Lead Wire:

Tinned Copper, #20 AWG (.032")

Maximum Dissipation Factor (%):

	@20KHz	@100KHz
1000 VDC:	.032	.054
2000 VDC:	.029	.040

Construction/Dielectric:

Non-inductively wound with extended foil. Series-section design with polypropylene film; utilizes a floating common of metallized polypropylene, which provides self-healing characteristics.

Corona Start Voltage (typical):

1000 VDC: 600 Volts RMS
2000 VDC: 650 Volts RMS

Standard Ratings/Sizes

Value(μF)	Part Number	L MAX	T MAX	H MAX	Seated Height	Max dv/dt (Volts/μsec)	Value(μF)	Part Number	L MAX	T MAX	H MAX	Seated Height	Max dv/dt (Volts/μsec)
1000V D-C / 450V A-C*							2000V D-C / 500V A-C*						
.00082	716P821910K	.85	.25	.34	.59	47500	.00022	716P221920K	.85	.25	.38	.63	102000
.001	716P102910K	.85	.25	.36	.61	43000	.00027	716P271920K	.85	.26	.39	.64	92100
.0012	716P122910K	.85	.26	.36	.61	39300	.00033	716P331920K	.85	.25	.39	.64	83300
.0015	716P152910K	.85	.25	.37	.62	35100	.00039	716P391920K	.85	.26	.39	.64	76600
.0018	716P182910K	.85	.24	.37	.62	32100	.00047	716P471920K	.85	.26	.39	.64	69600
.0022	716P222910K	.85	.25	.38	.63	29000	.00056	716P561920K	.85	.27	.40	.65	63900
.0027	716P272910K	.85	.27	.40	.65	26200	.00068	716P681920K	.85	.28	.41	.66	58000
.0033	716P332910K	.85	.26	.46	.71	23700	.00082	716P821920K	.85	.27	.48	.73	52800
.0039	716P392910K	.85	.27	.48	.73	21800	.001	716P102920K	.85	.29	.50	.75	47800
.0047	716P472910K	.85	.29	.50	.75	19900	.0015	716P152920K	.85	.33	.54	.79	39100
.0056	716P562910K	.85	.31	.52	.77	18200	.0018	716P182920K	.85	.35	.56	.81	35700
.0068	716P682910K	.85	.34	.55	.80	16500	.0022	716P222920K	.85	.38	.59	.84	32200
.0082	716P822910K	.85	.34	.58	.83	15000	.0027	716P272920K	.85	.38	.62	.87	29100
.01	716P103910K	.85	.35	.64	.89	13600	.0033	716P332920K	.85	.39	.68	.93	26300
.012	716P123910K	.85	.38	.67	.92	12400	.0039	716P392920K	.85	.42	.71	.96	24200
.015	716P153910K	.85	.43	.72	.97	11100	.0047	716P472920K	.85	.46	.75	1.00	22100
.018	716P183910K	.85	.47	.77	1.02	10100	.0056	716P562920K	.85	.47	.82	1.07	20200
.022	716P223910K	.85	.49	.84	1.09	9200	.0068	716P682920K	.85	.52	.87	1.12	18300
.027	716P273910K	.85	.55	.90	1.15	8300	.0082	716P822920K	.85	.57	.92	1.17	16700
.033	716P333910K	.85	.62	.97	1.22	7500	.01	716P103920K	.85	.63	.98	1.23	15100

¹ To complete part number for proper tolerance, terminal style and lead length please refer to Ordering/Part Number Information page.

* Please refer to the following page for RMS Voltage vs. Frequency performance curves. Additional performance characteristics may be found in the previous 716P section.

Note: dv/dt ratings based on measurements made at junction of the wire leads and capacitor body.

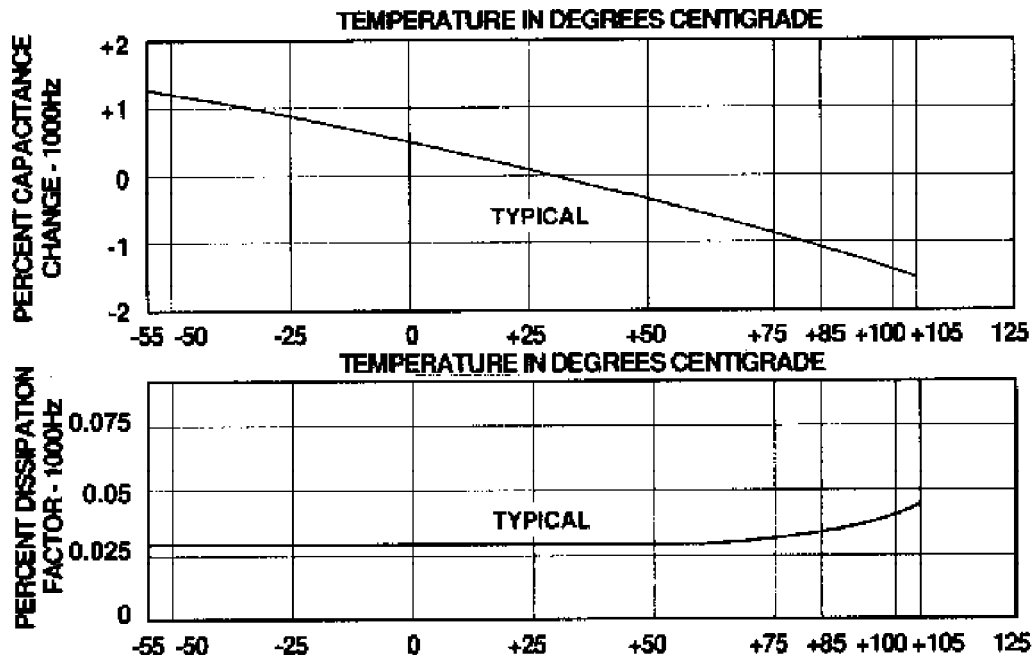
All dimensions in inches, for conversion to millimeters use 1" = 25.4 mm.

Additional ratings available, please contact us today with your requirements!

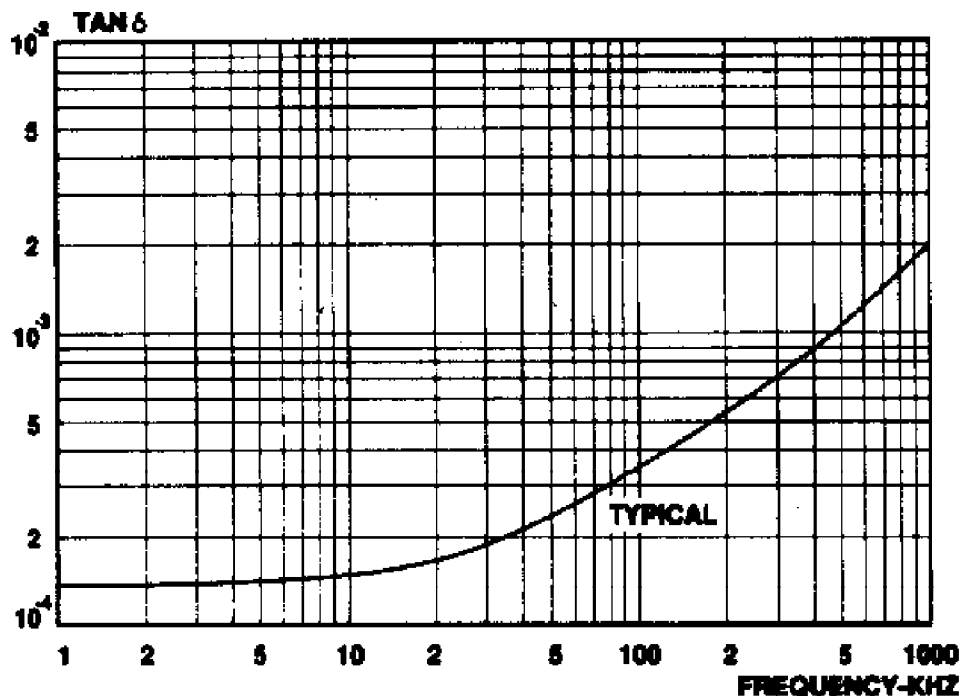


Type 716P Compact Design Performance Characteristics

Typical Temperature Characteristics @ 1 KHz

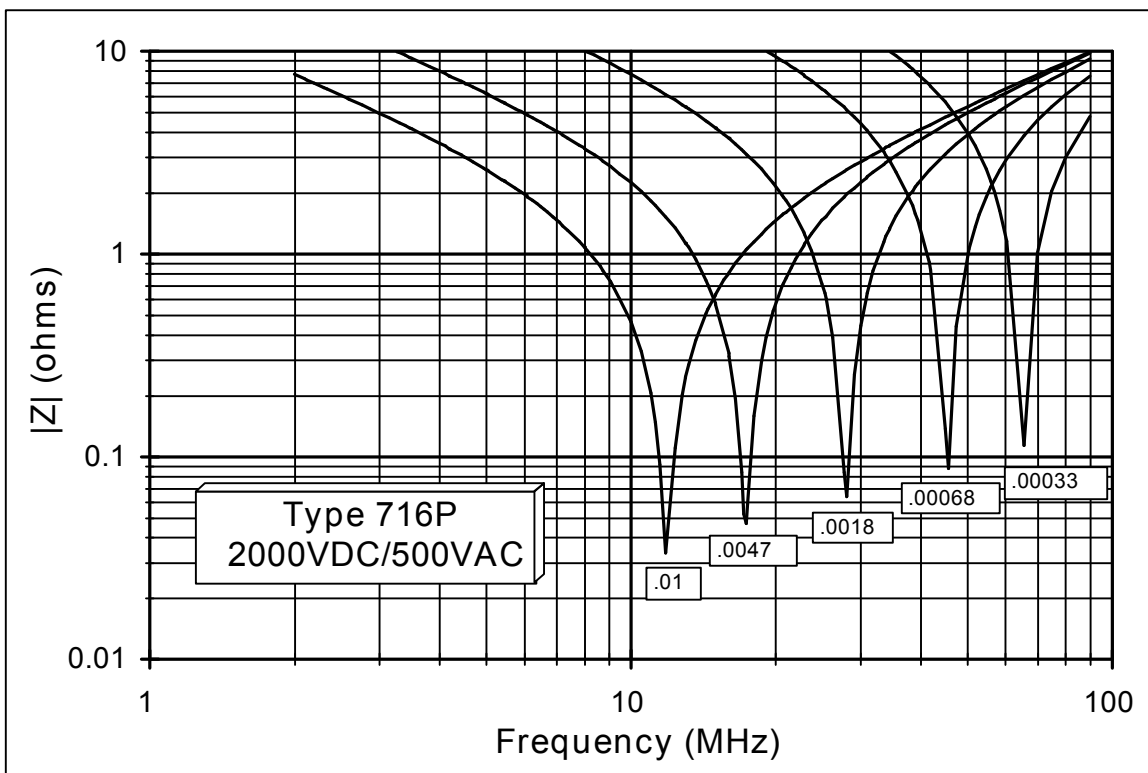
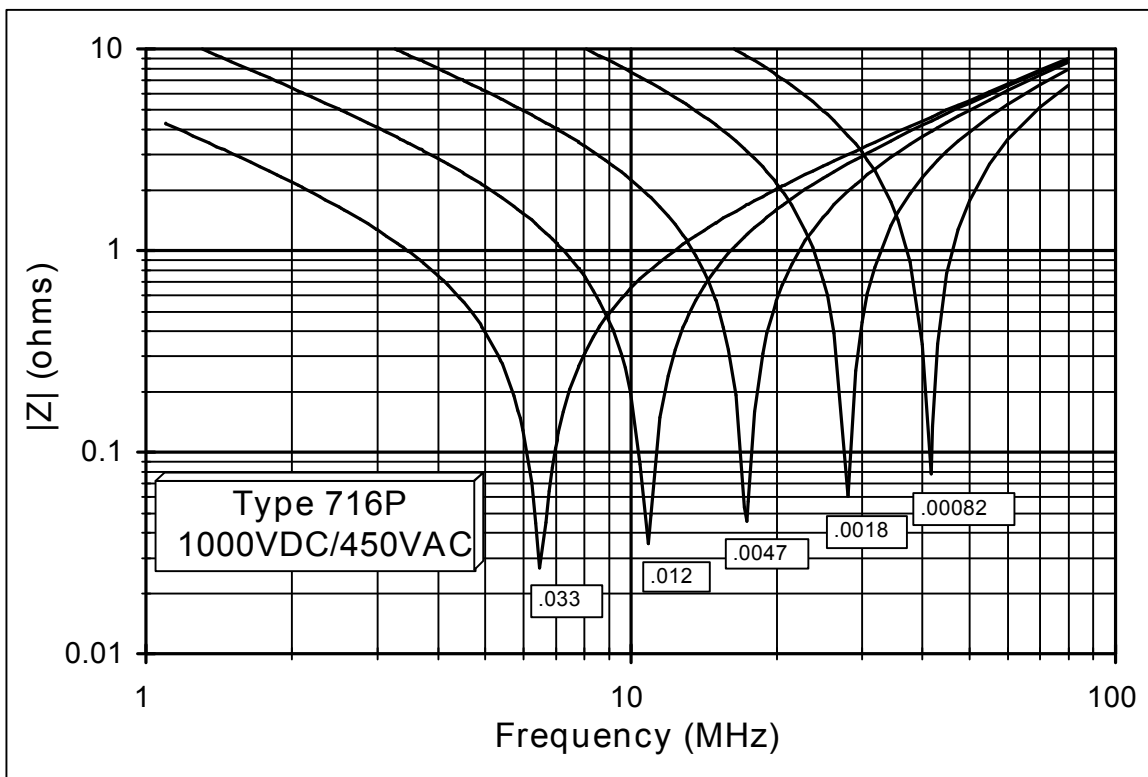


Typical Dissipation Factor vs. Frequency @ 85°C





Typical Impedance vs. Frequency



Please note: Capacitance values above are in μ F. The resonant frequency and impedance shown above apply to units with a 0.250" lead length and are typical values only. Please contact us for additional data. Thank you.



RMS Voltage vs. Frequency @ 85°C

