Type 761M
Axial Lead
Pressed/Oval Profile
Metallized Polypropylene
Film Capacitors

Specifications

Capacitance Range:
0.012 to 65.0 µF

Capacitance Tolerance:
±5% and ±10%, standard
(tolerances as close as ±3% available)

Voltage Rating:
160 to 630 VDC
100 to 250 VAC

Operating Temperature
Units may be operated at full rated voltage from -55°C to +85°C.

Voltage De-rating above +85°C:
Units may be operated up to a maximum of +105°C provided the voltage is de-rated linearly to 50% of the +85°C rating.

***Dissipation Factor:**
Varies with capacitance and frequency, please contact us for specific details.

Insulation Resistance (measured at 100 VDC):

At +25°C:	400,000 MΩ for C ≤ 0.5 µF
	200,000 MΩ-µF for C > 0.5 µF
At +85°C:	20,000 MΩ for C ≤ 0.5 µF
	10,000 MΩ-µF for C > 0.5 µF

These are minimum ratings, call us if you have a more demanding requirement.

Encapsulation:
Wrapped with flame retardant polyester tape (meets UL510 specifications) and potted with flame retardant epoxy (meets UL94V-0 specifications).

Lead Wire:
Tinned Copper-Clad Steel for wire sizes:
0.020 (0.5) diameter (#24 AWG)

Tinned Copper for wire sizes:
0.025 (0.6) diameter (#22 AWG)
0.032 (0.8) diameter (#20 AWG)
0.040 (1.0) diameter (#18 AWG)

Dielectric/Construction:
Metallized Polypropylene film, single section design. Non-Inductively wound.

* Although polypropylene film capacitors have a very low dissipation factor, as noted above it is dependent upon capacitance and operating frequency. Please refer to the application notes on pages 14 and 15 for additional details on thermal management issues. In addition we encourage you to contact us to further discuss your specific application.

In addition to the information provided here, SBE also offers complete design and manufacturing of specific capacitance values, custom form factors, special lead terminations, etc.

Dimensions are in inches, millimeters are in parenthesis.

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Introduction to SBE

Who Are We

SB Electronics, Inc. ***Designs*** and ***Manufactures*** the most reliable film capacitor products for use in today's demanding applications. SBE, a former Sprague Electric company, was founded in 1986 following a management buyout. We manufacture the ubiquitous Orange Drop® and 192P Pacer® film capacitor lines, both of which have reliably served the industry since 1959!

SBE's expanding product offerings also include a wide range of Metallized and Film/Foil capacitors in both Radial and Axial leaded styles. We also bolstered our axial leaded product portfolio by purchasing several lines from Industrial/Midwec in 1999. You can find additional details regarding our purchase of Industrial/Midwec on our web site at: www.SBElectronics.com

Why choose SBE?

Our focus is on film capacitor products. SBE has the experience, technical expertise and supporting staff to design and deliver the film capacitor you need, when you need it.

High voltage, tight tolerance, demanding peak currents, high frequency; whatever your application, SBE can help you specify the *right* part. Our products are designed for life and reliably manufactured to provide the best electrical performance for your application.

Located in the pristine Green Mountains of Vermont, SBE benefits from a traditional "Vermont work ethic", which is comprised of hard work, pride in craftsmanship, dedication and attention to detail. Put our team to the test!

Our Company Philosophy

SBE's Mission, Vision and Core Operating Values center around our critical success factors; which include comprehensive technical support, proven reliability, short manufacturing lead times, and dependable customer service that is second-to-none. SBE takes great pride in providing customer service that answers your questions completely and timely by friendly people that are pleasant to work with!

SBE, providing you with the ultimate in Performance, from Design to Delivery.

General Specifications

The 761M series is designed and manufactured for use in many demanding power applications. They are non-inductively wound using the most reliable metallized polypropylene film available. A wide range of capacitance values, voltage ratings, lead terminations and sizes offer the designer an array of options to best meet the form, fit and function requirements specified.

With complete design and manufacturing operations located at our Barre, Vermont facility, SBE's staff can provide the expertise needed to support your application, be it with a standard product found here, or a tailor designed part specific for your requirement. Regardless, SBE designs and manufactures film capacitors to outlast the products they are installed in. If you are in need of any further technical specifications or require any application assistance we will be pleased to assist you.

Operating Temperature Range:

Standard operating temperature range is –55°C to +85°C. Units may be operated at the full rated voltage within this temperature range.

The 761M series may be operated up to a maximum temperature of +105°C, however the voltage must be linearly de-rated to 50% of the full rated voltage at +105°C.

Dielectric Withstanding Voltage:

Units shall withstand a DC potential of 200% of rated voltage applied between terminals for not more than 2 minutes.

Lead Bend Test:

After 3 consecutive 180° bends. No damage.

Lead Pull Test:

5 pounds (2.3 Kg) for one minute on lead axis. No damage.

Humidity Testing:

Units subjected to 95% relative humidity for 250 hours with no voltage applied at +40°C. After 4 hours of drying, minimum product of insulation resistance and capacitance shall be 40,000 MΩ-μF, but need not exceed 80,000 MΩ at +25°C.

DC Voltage Life Test:

1000 hours at +85°C at 150% of rated voltage. After test; capacitance shall not have changed by more than ±2% of initial value, insulation resistance shall not have decreased by more than 50% of initial value and dissipation factor shall not have increased to more than 0.12%. In addition, there shall be no open or short circuits, and no sign of visible damage.

AC Voltage Life Test:

Minimum of 1000 hours at +85°C at 60 Hz. AC test voltage applied at 110% of rated AC 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 initial value and dissipation factor shall not have changed by more than 0.03%. In addition, there shall be no open or short circuits, and no sign of visible damage. All measurements made at 1 KHz.

Dielectric Material/Construction:

The 761M series is manufactured using metallized polypropylene film as the dielectric. The capacitor element is non-inductively wound in a single section design.

Metallized polypropylene film utilizes a base film of polypropylene with a thin layer of aluminum vacuum deposited directly on the film as the electrode.

Metallized film exhibits a characteristic called "self-healing" or "self-clearing", which is the ability to remove a fault or short circuit in the dielectric film by vaporizing (from high current density) the metallization near the defect. The metallization is so thin that negligible film damage occurs during the clearing process. The vaporized metal oxidizes over time, aiding in the isolation of a fault area.

Additional Testing Notes:

Since it is not possible to list every detail of testing we perform we strongly encourage you to contact us with any specific question or requirement you may have. Thank you.

Ordering/Part Number Information

761M 106 5 2 C – XXX

A suffix may be added to denote special construction, packaging, marking, etc. **To specify unit with tinned copper lug terminations add –LUG in this position. Example: 761M10652-LUG.**

Compact design indicator. A letter "C" is added to indicate a compact size form factor. Refer to table of part numbers for specific sizes.

DC Voltage Rating. 1 = 160 VDC 4 = 400 VDC
2 = 250 VDC 6 = 630 VDC

Capacitance Tolerance. 9 = ±10%; 5 = ±5%; 3 = ±3%

Capacitance. Expressed in Picofarads. The first two digits are the significant figures, the third is the number of zeros following (i.e. 106 = 10,000,000 pF = 10.0 µF).

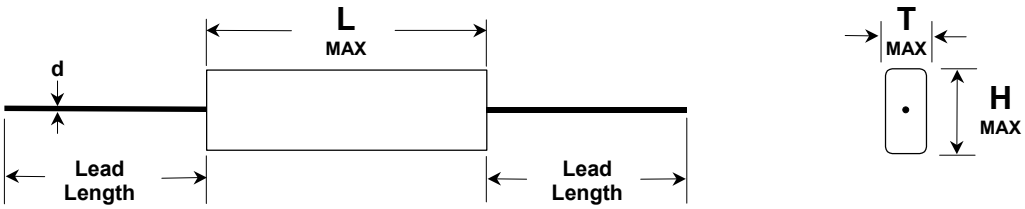
SBE Type Number. Identifies basic capacitor design.

Standard Marking Format

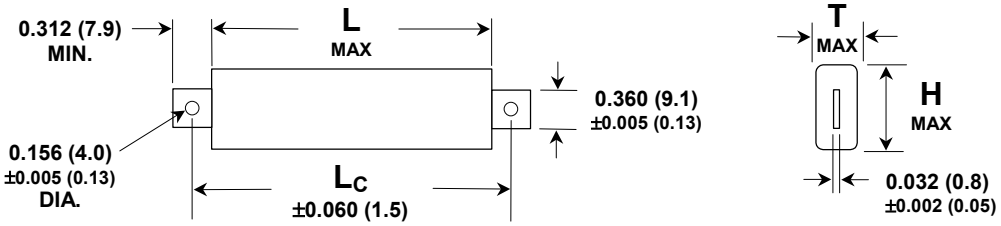
Sample Marking on unit		Description
SBE 761M(C)	SBE -	SB Electronics Identification
106J 250V	761M -	Type Number. 761MC indicates compact design.
0145	250V -	DC Voltage Rating
	106J -	Capacitance and Tolerance Code
	0145 -	Weekly Date Code (i.e. 45th week of 2001)

Tolerance codes per EIA standards	
H	±3%
J	±5%
K	±10%

Dimension Outline



Wire Lead Termination (see lead length table below)



$L_C = L_{MAX} + 0.48\ (12.2)$

Tinned Solid Copper Lug Termination*

***Please note:** Lug terminations are available on units 0.55 (14.0) or greater in Thickness. Please refer to Sizes and Ratings information for available values. If you have a specific requirement other than what you find shown here please contact us.

Lead Length Table

L_{MAX} dimension	Lead Length (Typical)
0.61 (15.5)	2.00 (50.8)
0.79 (20.1)	1.90 (48.3)
0.99 (25.1)	1.80 (45.7)
1.25 (31.8)	1.65 (41.9)
1.74 (44.2)	1.40 (35.6)
2.21 (56.1)	1.25 (31.8)

In all cases a MINIMUM lead length of 1.25 (31.8) will be met.

Lead Wire Size and Additional Termination Options

Standard lead wire sizes utilized in manufacturing range from 0.020 (0.5) diameter [#24 AWG] to 0.040 (1.0) diameter [#18 AWG]. We can also provide a variety of other wire sizes and material (i.e. heavier gauges, insulated wire, etc.). If the wire size or material listed on our standard items doesn't meet your specific requirements please contact us.

Type 761M Sizes and Ratings – 160 VDC/100 VAC

Cap	Base	Standard Dimensions/Ratings[1]				dV/dt	[2]ESR-mΩ	Compact Dimensions/Ratings[1]				dV/dt	[2]ESR-mΩ
(µF)	Part #	L MAX	T MAX	H MAX	Wire (d)	V/µsec	@100KHz	L MAX	T MAX	H MAX	Wire (d)	V/µsec	@100KHz
0.15	761M15451	0.61 (15.5)	0.17 (4.3)	0.27 (6.9)	0.020 (0.5)	6	20.9						
0.18	761M18451	0.61 (15.5)	0.19 (4.8)	0.29 (7.4)	0.020 (0.5)	6	18.1						
0.2	761M20451	0.61 (15.5)	0.20 (5.1)	0.30 (7.6)	0.020 (0.5)	6	16.7						
0.22	761M22451	0.79 (20.1)	0.16 (4.1)	0.26 (6.6)	0.020 (0.5)	3	33.1	0.61 (15.5)	0.21 (0.5)	0.31 (7.9)	0.020 (0.5)	9	15.6
0.25	761M25451	0.79 (20.1)	0.17 (4.3)	0.27 (6.9)	0.020 (0.5)	3	29.6	0.61 (15.5)	0.23 (5.8)	0.33 (8.4)	0.020 (0.5)	12	14.3
0.27	761M27451	0.79 (20.1)	0.18 (4.6)	0.28 (7.1)	0.020 (0.5)	3	27.7	0.61 (15.5)	0.24 (6.1)	0.34 (8.6)	0.020 (0.5)	15	13.6
0.3	761M30451	0.79 (20.1)	0.18 (4.6)	0.30 (7.6)	0.020 (0.5)	3	25.5	0.61 (15.5)	0.25 (6.4)	0.35 (8.9)	0.020 (0.5)	17	12.8
0.33	761M33451	0.79 (20.1)	0.19 (4.8)	0.31 (7.9)	0.020 (0.5)	3	23.6	0.61 (15.5)	0.27 (6.9)	0.37 (9.4)	0.020 (0.5)	19	12.1
0.39	761M39451	0.79 (20.1)	0.19 (4.8)	0.37 (9.4)	0.020 (0.5)	6	21.2	0.61 (15.5)	0.26 (6.6)	0.44 (11.2)	0.020 (0.5)	32	11.7
0.43	761M43451	0.99 (25.1)	0.18 (4.6)	0.31 (7.9)	0.020 (0.5)	2	34.4	0.79 (20.1)	0.22 (5.6)	0.34 (8.6)	0.025 (0.6)	8	16.3
0.47	761M47451	0.99 (25.1)	0.18 (4.6)	0.33 (8.4)	0.020 (0.5)	2	32.1	0.79 (20.1)	0.22 (5.6)	0.37 (9.4)	0.025 (0.6)	9	15.0
0.5	761M50451	0.99 (25.1)	0.19 (4.8)	0.34 (8.6)	0.020 (0.5)	3	30.5	0.79 (20.1)	0.23 (5.8)	0.38 (9.7)	0.025 (0.6)	10	14.2
0.56	761M56451	0.99 (25.1)	0.20 (5.1)	0.35 (8.9)	0.025 (0.6)	4	24.7	0.79 (20.1)	0.24 (6.1)	0.40 (10.2)	0.025 (0.6)	11	12.8
0.6	761M60451	0.99 (25.1)	0.21 (5.3)	0.36 (9.1)	0.025 (0.6)	5	23.1	0.79 (20.1)	0.25 (6.4)	0.41 (10.4)	0.025 (0.6)	12	12.0
0.68	761M68451	0.99 (25.1)	0.22 (5.6)	0.38 (9.7)	0.025 (0.6)	6	20.5	0.79 (20.1)	0.27 (6.9)	0.43 (10.9)	0.032 (0.8)	19	10.4
0.75	761M75451	0.99 (25.1)	0.24 (6.1)	0.39 (9.9)	0.025 (0.6)	7	18.7	0.79 (20.1)	0.29 (7.4)	0.44 (11.2)	0.032 (0.8)	19	9.5
0.82	761M82451	0.99 (25.1)	0.25 (6.4)	0.40 (10.2)	0.025 (0.6)	8	17.2	0.79 (20.1)	0.30 (7.6)	0.46 (11.7)	0.032 (0.8)	20	8.8
0.9	761M90451	0.99 (25.1)	0.25 (6.4)	0.43 (10.9)	0.025 (0.6)	13	15.8	0.79 (20.1)	0.32 (8.1)	0.48 (12.2)	0.032 (0.8)	20	8.1
1.0	761M10551	0.99 (25.1)	0.27 (6.9)	0.45 (11.4)	0.032 (0.8)	13	14.0	0.79 (20.1)	0.34 (8.6)	0.50 (12.7)	0.032 (0.8)	20	7.4
1.2	761M12551	1.25 (31.8)	0.25 (6.4)	0.43 (10.9)	0.025 (0.6)	9	20.6	0.99 (25.1)	0.30 (7.6)	0.48 (12.2)	0.032 (0.8)	14	11.8
1.5	761M15551	1.25 (31.8)	0.28 (7.1)	0.47 (11.9)	0.032 (0.8)	10	16.3	0.99 (25.1)	0.34 (8.6)	0.52 (13.2)	0.032 (0.8)	14	9.7
1.8	761M18551	1.25 (31.8)	0.29 (7.4)	0.54 (13.7)	0.032 (0.8)	10	13.8	0.99 (25.1)	0.35 (8.9)	0.59 (15.0)	0.032 (0.8)	14	8.3
2.0	761M20551	1.25 (31.8)	0.31 (7.9)	0.56 (14.2)	0.032 (0.8)	10	12.5	0.99 (25.1)	0.37 (9.4)	0.62 (15.7)	0.032 (0.8)	15	7.6
2.2	761M22551	1.25 (31.8)	0.33 (8.4)	0.57 (14.5)	0.032 (0.8)	11	11.5	0.99 (25.1)	0.39 (9.9)	0.64 (16.3)	0.032 (0.8)	15	7.0
2.5	761M25551	1.25 (31.8)	0.35 (8.9)	0.60 (15.2)	0.032 (0.8)	11	10.3	0.99 (25.1)	0.42 (10.7)	0.67 (17.0)	0.032 (0.8)	15	6.3
2.7	761M27551	1.74 (44.2)	0.28 (7.1)	0.53 (13.5)	0.032 (0.8)	7	21.4	1.25 (31.8)	0.37 (9.4)	0.62 (15.7)	0.032 (0.8)	11	9.6
3.0	761M30551	1.74 (44.2)	0.30 (7.6)	0.55 (14.0)	0.032 (0.8)	7	19.3	1.25 (31.8)	0.39 (9.9)	0.64 (16.3)	0.032 (0.8)	11	8.8
3.3	761M33551	1.74 (44.2)	0.32 (8.1)	0.57 (14.5)	0.032 (0.8)	7	17.7	1.25 (31.8)	0.42 (10.7)	0.67 (17.0)	0.032 (0.8)	11	8.1
3.6	761M36551	1.74 (44.2)	0.34 (8.6)	0.59 (15.0)	0.032 (0.8)	7	16.3	1.25 (31.8)	0.44 (11.2)	0.69 (17.5)	0.032 (0.8)	11	7.5
3.9	761M39551	1.74 (44.2)	0.35 (8.9)	0.60 (15.2)	0.032 (0.8)	7	15.1	1.25 (31.8)	0.46 (11.7)	0.71 (18.0)	0.032 (0.8)	11	7.0
4.7	761M47551	1.74 (44.2)	0.40 (10.2)	0.64 (16.3)	0.032 (0.8)	7	12.8	1.25 (31.8)	0.52 (13.2)	0.76 (19.3)	0.032 (0.8)	11	6.1
5.0	761M50551	1.74 (44.2)	0.41 (10.4)	0.66 (16.8)	0.032 (0.8)	7	12.1	1.25 (31.8)	0.53 (13.5)	0.78 (19.8)	0.032 (0.8)	11	5.8
5.6	761M56551	2.21 (56.1)	0.34 (8.6)	0.65 (16.5)	0.032 (0.8)	5	19.1	1.74 (44.2)	0.39 (9.9)	0.76 (19.3)	0.032 (0.8)	7	11.0
6.0	761M60551	2.21 (56.1)	0.36 (9.1)	0.67 (17.0)	0.032 (0.8)	5	17.9	1.74 (44.2)	0.41 (10.4)	0.78 (19.8)	0.032 (0.8)	7	10.4
6.8	761M68551	2.21 (56.1)	0.39 (9.9)	0.69 (17.5)	0.032 (0.8)	5	15.9	1.74 (44.2)	0.44 (11.2)	0.81 (20.6)	0.032 (0.8)	7	9.4
7.0	761M70551	2.21 (56.1)	0.39 (9.9)	0.70 (17.8)	0.032 (0.8)	5	15.5	1.74 (44.2)	0.45 (11.4)	0.82 (20.8)	0.032 (0.8)	7	9.1
7.5	761M75551	2.21 (56.1)	0.41 (10.4)	0.72 (18.3)	0.032 (0.8)	5	14.6	1.74 (44.2)	0.47 (11.9)	0.84 (21.3)	0.032 (0.8)	7	8.6
8.0	761M80551	2.21 (56.1)	0.43 (10.9)	0.74 (18.8)	0.032 (0.8)	5	13.8	1.74 (44.2)	0.49 (12.4)	0.86 (21.8)	0.032 (0.8)	7	8.2
9.0	761M90551	2.21 (56.1)	0.46 (11.7)	0.77 (19.6)	0.032 (0.8)	5	12.4	1.74 (44.2)	0.52 (13.2)	0.90 (22.9)	0.032 (0.8)	7	7.5
10.0	761M10651	2.21 (56.1)	0.49 (12.4)	0.80 (20.3)	0.032 (0.8)	5	11.3	1.74 (44.2)	0.56 (14.2)	0.93 (23.6)	0.032 (0.8)	7	6.9
12.0	761M12651	2.21 (56.1)	0.55 (14.0)	0.86 (21.8)	0.040 (1.0)	5	9.2	1.74 (44.2)	0.63 (16.0)	1.00 (25.4)	0.040 (1.0)	7	5.5
15.0	761M15651	2.21 (56.1)	0.60 (15.2)	0.97 (24.6)	0.040 (1.0)	5	7.6	1.74 (44.2)	0.72 (18.3)	1.09 (27.7)	0.040 (1.0)	7	4.7
18.0	761M18651	2.21 (56.1)	0.67 (17.0)	1.04 (26.4)	0.040 (1.0)	5	6.6	1.74 (44.2)	0.80 (20.3)	1.17 (29.7)	0.040 (1.0)	7	4.1
20.0	761M20651	2.21 (56.1)	0.71 (18.0)	1.08 (27.4)	0.040 (1.0)	5	6.0	1.74 (44.2)	0.85 (21.6)	1.22 (31.0)	0.040 (1.0)	8	3.9
22.0	761M22651	2.21 (56.1)	0.75 (19.1)	1.12 (28.4)	0.040 (1.0)	6	5.6	1.74 (44.2)	0.90 (22.9)	1.27 (32.3)	0.040 (1.0)	8	3.7
25.0	761M25651	2.21 (56.1)	0.81 (20.6)	1.18 (30.0)	0.040 (1.0)	6	5.1	1.74 (44.2)	0.97 (24.6)	1.34 (34.0)	0.040 (1.0)	8	3.4
30.0	761M30651	2.21 (56.1)	0.90 (22.9)	1.28 (32.5)	0.040 (1.0)	6	4.5	1.74 (44.2)	1.08 (27.4)	1.45 (36.8)	0.040 (1.0)	8	3.2
35.0	761M35651	2.21 (56.1)	0.99 (25.1)	1.36 (34.5)	0.040 (1.0)	6	4.1	1.74 (44.2)	1.18 (30.0)	1.55 (39.4)	0.040 (1.0)	8	3.0
40.0	761M40651	2.21 (56.1)	1.07 (27.2)	1.44 (36.6)	0.040 (1.0)	6	3.8	1.74 (44.2)	1.27 (32.3)	1.65 (41.9)	0.040 (1.0)	8	2.9
45.0	761M45651	2.21 (56.1)	1.14 (29.0)	1.52 (38.6)	0.040 (1.0)	6	3.6	1.74 (44.2)	1.36 (34.5)	1.73 (43.9)	0.040 (1.0)	8	2.8
50.0	761M50651	2.21 (56.1)	1.22 (31.0)	1.59 (40.4)	0.040 (1.0)	6	3.5						
55.0	761M55651	2.21 (56.1)	1.28 (32.5)	1.65 (41.9)	0.040 (1.0)	6	3.3						
60.0	761M60651	2.21 (56.1)	1.35 (34.3)	1.72 (43.7)	0.040 (1.0)	6	3.2						
65.0	761M65651	2.21 (56.1)	1.41 (35.8)	1.78 (45.2)	0.040 (1.0)	6	3.2						

[1] Please refer to Ordering/Part Number page for specific part numbering details.

[2] ESR ratings listed are Maximum. Please contact us for additional ESR data.

Type 761M Sizes and Ratings – 250 VDC/175 VAC

Cap (µF)	Base Part #	Standard Dimensions/Ratings[1] L MAX	T MAX	H MAX	Wire (d)	dV/dt V/µsec	[2]ESR-mΩ @100KHz	Compact Dimensions/Ratings[1] L MAX	T MAX	H MAX	Wire (d)	dV/dt V/µsec	[2]ESR-mΩ @100KHz
0.068	761M68352	0.61 (15.5)	0.17 (4.3)	0.27 (6.9)	0.020 (0.5)	9	31.0						
0.075	761M75352	0.61 (15.5)	0.18 (4.6)	0.27 (6.9)	0.020 (0.5)	9	28.5						
0.082	761M82352	0.61 (15.5)	0.19 (4.8)	0.29 (7.4)	0.020 (0.5)	9	26.5						
0.1	761M10452	0.79 (20.1)	0.16 (4.1)	0.26 (6.6)	0.020 (0.5)	5	48.5	0.61 (15.5)	0.21 (5.3)	0.31 (7.9)	0.020 (0.5)	13	22.5
0.12	761M12452	0.79 (20.1)	0.18 (4.6)	0.28 (7.1)	0.020 (0.5)	5	41.0	0.61 (15.5)	0.24 (6.1)	0.34 (8.6)	0.020 (0.5)	21	19.6
0.15	761M15452	0.79 (20.1)	0.20 (5.1)	0.30 (7.6)	0.025 (0.6)	5	31.1	0.61 (15.5)	0.27 (6.9)	0.37 (9.4)	0.020 (0.5)	29	16.7
0.18	761M18452	0.79 (20.1)	0.21 (5.3)	0.34 (8.6)	0.025 (0.6)	9	26.1	0.61 (15.5)	0.26 (6.6)	0.45 (11.4)	0.020 (0.5)	48	15.5
0.2	761M20452	0.99 (25.1)	0.20 (5.1)	0.30 (7.6)	0.025 (0.6)	4	45.8	0.79 (20.1)	0.23 (5.8)	0.33 (8.4)	0.025 (0.6)	12	23.6
0.22	761M22452	0.99 (25.1)	0.20 (5.1)	0.32 (8.1)	0.025 (0.6)	4	41.8	0.79 (20.1)	0.24 (6.1)	0.36 (9.1)	0.025 (0.6)	14	21.6
0.25	761M25452	0.99 (25.1)	0.21 (5.3)	0.34 (8.6)	0.025 (0.6)	7	36.9	0.79 (20.1)	0.26 (6.6)	0.38 (9.7)	0.032 (0.8)	17	18.8
0.27	761M27452	0.99 (25.1)	0.22 (5.6)	0.35 (8.9)	0.025 (0.6)	8	34.2	0.79 (20.1)	0.27 (6.9)	0.39 (9.9)	0.032 (0.8)	18	17.5
0.3	761M30452	0.99 (25.1)	0.24 (6.1)	0.36 (9.1)	0.025 (0.6)	10	30.9	0.79 (20.1)	0.28 (7.1)	0.41 (10.4)	0.032 (0.8)	20	15.8
0.33	761M33452	0.99 (25.1)	0.25 (6.4)	0.37 (9.4)	0.025 (0.6)	11	28.2	0.79 (20.1)	0.30 (7.6)	0.42 (10.7)	0.032 (0.8)	21	14.4
0.39	761M39452	0.99 (25.1)	0.26 (6.6)	0.41 (10.4)	0.032 (0.8)	13	23.7	0.79 (20.1)	0.31 (7.9)	0.47 (11.9)	0.032 (0.8)	30	12.4
0.43	761M43452	0.99 (25.1)	0.27 (6.9)	0.43 (10.9)	0.032 (0.8)	20	21.6	0.79 (20.1)	0.33 (8.4)	0.49 (12.4)	0.032 (0.8)	30	11.3
0.47	761M47452	0.99 (25.1)	0.29 (7.4)	0.44 (11.2)	0.032 (0.8)	20	19.8	0.79 (20.1)	0.35 (8.9)	0.50 (12.7)	0.032 (0.8)	31	10.4
0.5	761M50452	1.25 (31.8)	0.27 (6.9)	0.39 (9.9)	0.032 (0.8)	9	32.1	0.99 (25.1)	0.30 (7.6)	0.45 (11.4)	0.032 (0.8)	20	18.7
0.56	761M56452	1.25 (31.8)	0.27 (6.9)	0.42 (10.7)	0.032 (0.8)	10	28.8	0.99 (25.1)	0.32 (8.1)	0.47 (11.9)	0.032 (0.8)	21	16.8
0.6	761M60452	1.25 (31.8)	0.28 (7.1)	0.43 (10.9)	0.032 (0.8)	15	26.9	0.99 (25.1)	0.33 (8.4)	0.49 (12.4)	0.032 (0.8)	21	15.7
0.68	761M68452	1.25 (31.8)	0.29 (7.4)	0.47 (11.9)	0.032 (0.8)	15	23.9	0.99 (25.1)	0.34 (8.6)	0.53 (13.5)	0.032 (0.8)	21	14.0
0.75	761M75452	1.25 (31.8)	0.30 (7.6)	0.49 (12.4)	0.032 (0.8)	15	21.7	0.99 (25.1)	0.36 (9.1)	0.55 (14.0)	0.032 (0.8)	21	12.8
0.82	761M82452	1.25 (31.8)	0.32 (8.1)	0.51 (13.0)	0.032 (0.8)	16	20.0	0.99 (25.1)	0.38 (9.7)	0.57 (14.5)	0.032 (0.8)	22	11.8
0.9	761M90452	1.25 (31.8)	0.34 (8.6)	0.52 (13.2)	0.032 (0.8)	16	18.3	0.99 (25.1)	0.40 (10.2)	0.59 (15.0)	0.032 (0.8)	22	10.9
1.0	761M10552	1.25 (31.8)	0.33 (8.4)	0.58 (14.7)	0.032 (0.8)	16	16.6	0.99 (25.1)	0.43 (10.9)	0.61 (15.5)	0.032 (0.8)	22	9.9
1.2	761M12552	1.74 (44.2)	0.28 (7.1)	0.53 (13.5)	0.032 (0.8)	10	31.8	1.25 (31.8)	0.37 (9.4)	0.62 (15.7)	0.032 (0.8)	16	14.0
1.5	761M15552	1.74 (44.2)	0.33 (8.4)	0.57 (14.5)	0.032 (0.8)	10	25.6	1.25 (31.8)	0.42 (10.7)	0.67 (17.0)	0.032 (0.8)	17	11.5
1.8	761M18552	1.74 (44.2)	0.36 (9.1)	0.61 (15.5)	0.032 (0.8)	10	21.6	1.25 (31.8)	0.47 (11.9)	0.72 (18.3)	0.032 (0.8)	17	9.8
2.0	761M20552	1.74 (44.2)	0.39 (9.9)	0.63 (16.0)	0.032 (0.8)	11	19.5	1.25 (31.8)	0.50 (12.7)	0.75 (19.1)	0.032 (0.8)	17	9.0
2.2	761M22552	2.21 (56.1)	0.34 (8.6)	0.59 (15.0)	0.032 (0.8)	8	31.7	1.74 (44.2)	0.36 (9.1)	0.73 (18.5)	0.032 (0.8)	11	18.0
2.5	761M25552	2.21 (56.1)	0.37 (9.4)	0.62 (15.7)	0.032 (0.8)	8	28.0	1.74 (44.2)	0.39 (9.9)	0.76 (19.3)	0.032 (0.8)	11	16.0
2.7	761M27552	2.21 (56.1)	0.39 (9.9)	0.63 (16.0)	0.032 (0.8)	8	26.0	1.74 (44.2)	0.41 (10.4)	0.78 (19.8)	0.032 (0.8)	11	14.9
3.0	761M30552	2.21 (56.1)	0.38 (9.7)	0.69 (17.5)	0.032 (0.8)	8	23.6	1.74 (44.2)	0.44 (11.2)	0.81 (20.6)	0.032 (0.8)	11	13.6
3.3	761M33552	2.21 (56.1)	0.41 (10.4)	0.72 (18.3)	0.032 (0.8)	8	21.6	1.74 (44.2)	0.47 (11.9)	0.84 (21.3)	0.032 (0.8)	11	12.5
3.6	761M36552	2.21 (56.1)	0.43 (10.9)	0.74 (18.8)	0.032 (0.8)	8	19.9	1.74 (44.2)	0.49 (12.4)	0.86 (21.8)	0.032 (0.8)	11	11.6
3.9	761M39552	2.21 (56.1)	0.45 (11.4)	0.76 (19.3)	0.032 (0.8)	8	18.5	1.74 (44.2)	0.52 (13.2)	0.89 (22.6)	0.032 (0.8)	11	10.8
4.7	761M47552	2.21 (56.1)	0.51 (13.0)	0.82 (20.8)	0.040 (1.0)	8	15.2	1.74 (44.2)	0.58 (14.7)	0.95 (24.1)	0.040 (1.0)	11	8.8
5.0	761M50552	2.21 (56.1)	0.53 (13.5)	0.84 (21.3)	0.040 (1.0)	8	14.3	1.74 (44.2)	0.60 (15.2)	0.97 (24.6)	0.040 (1.0)	11	8.3
5.6	761M56552	2.21 (56.1)	0.56 (14.2)	0.87 (22.1)	0.040 (1.0)	8	12.9	1.74 (44.2)	0.65 (16.5)	1.02 (25.9)	0.040 (1.0)	11	7.6
6.0	761M60552	2.21 (56.1)	0.59 (15.0)	0.90 (22.9)	0.040 (1.0)	8	12.1	1.74 (44.2)	0.67 (17.0)	1.04 (26.4)	0.040 (1.0)	11	7.1
6.8	761M68552	2.21 (56.1)	0.60 (15.2)	0.97 (24.6)	0.040 (1.0)	8	10.8	1.74 (44.2)	0.73 (18.5)	1.10 (27.9)	0.040 (1.0)	11	6.5
7.0	761M70552	2.21 (56.1)	0.61 (15.5)	0.99 (25.1)	0.040 (1.0)	8	10.6	1.74 (44.2)	0.74 (18.8)	1.11 (28.2)	0.040 (1.0)	11	6.3
7.5	761M75552	2.21 (56.1)	0.64 (16.3)	1.01 (25.7)	0.040 (1.0)	8	10.0	1.74 (44.2)	0.71 (18.0)	1.21 (30.7)	0.040 (1.0)	11	6.0
8.0	761M80552	2.21 (56.1)	0.67 (17.0)	1.04 (26.4)	0.040 (1.0)	8	9.4	1.74 (44.2)	0.74 (18.8)	1.24 (31.5)	0.040 (1.0)	11	5.8
9.0	761M90552	2.21 (56.1)	0.72 (18.3)	1.09 (27.7)	0.040 (1.0)	8	8.5	1.74 (44.2)	0.80 (20.3)	1.29 (32.8)	0.040 (1.0)	11	5.3
10.0	761M10652	2.21 (56.1)	0.76 (19.3)	1.13 (28.7)	0.040 (1.0)	8	7.8	1.74 (44.2)	0.85 (21.6)	1.35 (34.3)	0.040 (1.0)	11	4.9
12.0	761M12652	2.21 (56.1)	0.85 (21.6)	1.22 (31.0)	0.040 (1.0)	8	6.7	1.74 (44.2)	0.95 (24.1)	1.45 (36.8)	0.040 (1.0)	11	4.4
15.0	761M15652	2.21 (56.1)	0.97 (24.6)	1.34 (34.0)	0.040 (1.0)	8	5.7	1.74 (44.2)	1.09 (27.7)	1.59 (40.4)	0.040 (1.0)	11	3.9
18.0	761M18652	2.21 (56.1)	1.08 (27.4)	1.45 (36.8)	0.040 (1.0)	8	5.1	1.74 (44.2)	1.22 (31.0)	1.71 (43.4)	0.040 (1.0)	11	3.6
20.0	761M20652	2.21 (56.1)	1.14 (29.0)	1.52 (38.6)	0.040 (1.0)	8	4.8	1.74 (44.2)	1.30 (33.0)	1.79 (45.5)	0.040 (1.0)	11	3.5
22.0	761M22652	2.21 (56.1)	1.21 (30.7)	1.58 (40.1)	0.040 (1.0)	8	4.5						
25.0	761M25652	2.21 (56.1)	1.30 (33.0.)	1.67 (42.4)	0.040 (1.0)	8	4.2						

[1] Please refer to Ordering/Part Number page for specific part numbering details.

[2] ESR ratings listed are Maximum. Please contact us for additional ESR data.

Type 761M Sizes and Ratings – 400 VDC/220 VAC

Cap	Base	Standard Dimensions/Ratings[1]				dV/dt	[2]ESR-mΩ	Compact Dimensions/Ratings[1]				dV/dt	[2]ESR-mΩ
(µF)	Part #	L MAX	T MAX	H MAX	Wire (d)	V/µsec	@100KHz	L MAX	T MAX	H MAX	Wire (d)	V/µsec	@100KHz
0.033	761M33354	0.61 (15.5)	0.17 (4.3)	0.27 (6.9)	0.020 (0.5)	14	42.3						
0.036	761M36354	0.61 (15.5)	0.18 (4.6)	0.28 (7.1)	0.020 (0.5)	14	39.1						
0.039	761M39354	0.61 (15.5)	0.19 (4.8)	0.29 (7.4)	0.020 (0.5)	14	36.5						
0.043	761M43354	0.61 (15.5)	0.20 (5.1)	0.30 (7.6)	0.020 (0.5)	14	33.5						
0.047	761M47354	0.79 (20.1)	0.15 (3.8)	0.25 (6.4)	0.020 (0.5)	8	70.3	0.61 (15.5)	0.21 (5.3)	0.31 (7.9)	0.020 (0.5)	16	31.0
0.05	761M50354	0.79 (20.1)	0.16 (4.1)	0.25 (6.4)	0.020 (0.5)	8	66.3	0.61 (15.5)	0.22 (5.6)	0.31 (7.9)	0.020 (0.5)	21	29.4
0.056	761M56354	0.79 (20.1)	0.16 (4.1)	0.26 (6.6)	0.020 (0.5)	8	59.6	0.61 (15.5)	0.23 (5.8)	0.33 (8.4)	0.020 (0.5)	29	26.8
0.062	761M62354	0.79 (20.1)	0.17 (4.3)	0.27 (6.9)	0.020 (0.5)	8	54.2	0.61 (15.5)	0.24 (6.1)	0.34 (8.6)	0.020 (0.5)	35	24.7
0.068	761M68354	0.79 (20.1)	0.18 (4.6)	0.28 (7.1)	0.020 (0.5)	8	49.8	0.61 (15.5)	0.26 (6.6)	0.35 (8.9)	0.020 (0.5)	40	23.0
0.075	761M75354	0.99 (25.1)	0.17 (4.3)	0.26 (6.6)	0.020 (0.5)	5	88.5	0.79 (20.1)	0.19 (4.8)	0.29 (7.4)	0.025 (0.6)	8	43.0
0.082	761M82354	0.99 (25.1)	0.16 (4.1)	0.29 (7.4)	0.020 (0.5)	5	81.4	0.79 (20.1)	0.19 (4.8)	0.32 (8.1)	0.025 (0.6)	8	39.4
0.1	761M10454	0.99 (25.1)	0.18 (4.6)	0.31 (7.9)	0.020 (0.5)	5	67.6	0.79 (20.1)	0.22 (5.6)	0.34 (8.6)	0.025 (0.6)	15	32.5
0.12	761M12454	0.99 (25.1)	0.20 (5.1)	0.32 (8.1)	0.025 (0.6)	7	54.3	0.79 (20.1)	0.24 (6.1)	0.37 (9.4)	0.025 (0.6)	21	27.3
0.15	761M15454	0.99 (25.1)	0.21 (5.3)	0.37 (9.4)	0.025 (0.6)	12	43.6	0.79 (20.1)	0.27 (6.9)	0.40 (10.2)	0.032 (0.8)	27	21.7
0.18	761M18454	0.99 (25.1)	0.24 (6.1)	0.39 (9.9)	0.025 (0.6)	15	36.6	0.79 (20.1)	0.28 (7.1)	0.46 (11.7)	0.032 (0.8)	42	18.3
0.2	761M20454	0.99 (25.1)	0.25 (6.4)	0.41 (10.4)	0.025 (0.6)	17	33.0	0.79 (20.1)	0.30 (7.6)	0.48 (12.2)	0.032 (0.8)	43	16.6
0.22	761M22454	0.99 (25.1)	0.25 (6.4)	0.44 (11.2)	0.025 (0.6)	27	30.2	0.79 (20.1)	0.31 (7.9)	0.50 (12.7)	0.032 (0.8)	43	15.1
0.25	761M25454	1.25 (31.8)	0.23 (5.8)	0.41 (10.4)	0.025 (0.6)	11	46.6	0.99 (25.1)	0.27 (6.9)	0.46 (11.7)	0.032 (0.8)	28	26.3
0.27	761M27454	1.25 (31.8)	0.24 (6.1)	0.42 (10.7)	0.025 (0.6)	12	43.2	0.99 (25.1)	0.26 (6.6)	0.51 (13.0)	0.032 (0.8)	28	24.5
0.3	761M30454	1.25 (31.8)	0.25 (6.4)	0.44 (11.2)	0.025 (0.6)	20	39.0	0.99 (25.1)	0.28 (7.1)	0.53 (13.5)	0.032 (0.8)	28	22.2
0.33	761M33454	1.25 (31.8)	0.27 (6.9)	0.45 (11.4)	0.032 (0.8)	20	35.2	0.99 (25.1)	0.29 (7.4)	0.54 (13.7)	0.032 (0.8)	29	20.2
0.39	761M39454	1.25 (31.8)	0.27 (6.9)	0.52 (13.2)	0.032 (0.8)	21	30.0	0.99 (25.1)	0.33 (8.4)	0.57 (14.5)	0.032 (0.8)	30	17.3
0.43	761M43454	1.25 (31.8)	0.29 (7.4)	0.53 (13.5)	0.032 (0.8)	21	27.3	0.99 (25.1)	0.35 (8.9)	0.59 (15.0)	0.032 (0.8)	30	15.8
0.47	761M47454	1.25 (31.8)	0.30 (7.6)	0.55 (14.0)	0.032 (0.8)	21	25.1	0.99 (25.1)	0.37 (9.4)	0.61 (15.5)	0.032 (0.8)	30	14.5
0.5	761M50454	1.25 (31.8)	0.31 (7.9)	0.56 (14.2)	0.032 (0.8)	21	23.6	0.99 (25.1)	0.38 (9.7)	0.63 (16.0)	0.032 (0.8)	30	13.7
0.56	761M56454	1.25 (31.8)	0.34 (8.6)	0.58 (14.7)	0.032 (0.8)	22	21.2	0.99 (25.1)	0.41 (10.4)	0.65 (16.5)	0.032 (0.8)	31	12.4
0.6	761M60454	1.74 (44.2)	0.27 (6.9)	0.52 (13.2)	0.032 (0.8)	13	46.5	1.25 (31.8)	0.35 (8.9)	0.60 (15.2)	0.032 (0.8)	22	19.9
0.68	761M68454	1.74 (44.2)	0.29 (7.4)	0.54 (13.7)	0.032 (0.8)	13	41.1	1.25 (31.8)	0.38 (9.7)	0.63 (16.0)	0.032 (0.8)	22	17.7
0.75	761M75454	1.74 (44.2)	0.31 (7.9)	0.55 (14.0)	0.032 (0.8)	13	37.4	1.25 (31.8)	0.40 (10.2)	0.65 (16.5)	0.032 (0.8)	22	16.1
0.82	761M82454	1.74 (44.2)	0.32 (8.1)	0.57 (14.5)	0.032 (0.8)	14	34.3	1.25 (31.8)	0.42 (10.7)	0.67 (17.0)	0.032 (0.8)	23	14.9
0.9	761M90454	1.74 (44.2)	0.34 (8.6)	0.59 (15.0)	0.032 (0.8)	14	31.3	1.25 (31.8)	0.45 (11.4)	0.69 (17.5)	0.032 (0.8)	23	13.7
1.0	761M10554	1.74 (44.2)	0.36 (9.1)	0.61 (15.5)	0.032 (0.8)	14	28.3	1.25 (31.8)	0.48 (12.2)	0.72 (18.3)	0.032 (0.8)	23	12.5
1.2	761M12554	2.21 (56.1)	0.34 (8.6)	0.58 (14.7)	0.032 (0.8)	10	43.0	1.74 (44.2)	0.38 (9.7)	0.69 (17.5)	0.032 (0.8)	14	23.9
1.5	761M15554	2.21 (56.1)	0.38 (9.7)	0.63 (16.0)	0.032 (0.8)	10	34.6	1.74 (44.2)	0.44 (11.2)	0.74 (18.8)	0.032 (0.8)	14	19.4
1.8	761M18554	2.21 (56.1)	0.43 (10.9)	0.68 (17.3)	0.032 (0.8)	10	29.1	1.74 (44.2)	0.49 (12.4)	0.80 (20.3)	0.032 (0.8)	15	16.4
2.0	761M20554	2.21 (56.1)	0.46 (11.7)	0.70 (17.8)	0.032 (0.8)	11	26.3	1.74 (44.2)	0.52 (13.2)	0.83 (21.1)	0.032 (0.8)	15	14.9
2.2	761M22554	2.21 (56.1)	0.45 (11.4)	0.76 (19.3)	0.032 (0.8)	11	24.1	1.74 (44.2)	0.55 (14.0)	0.86 (21.8)	0.032 (0.8)	15	13.7
2.5	761M25554	2.21 (56.1)	0.49 (12.4)	0.80 (20.3)	0.032 (0.8)	11	21.4	1.74 (44.2)	0.59 (15.0)	0.90 (22.9)	0.032 (0.8)	15	12.3
2.7	761M27554	2.21 (56.1)	0.51 (13.0)	0.82 (20.8)	0.040 (1.0)	11	19.5	1.74 (44.2)	0.62 (15.7)	0.93 (23.6)	0.040 (1.0)	15	11.0
3.0	761M30554	2.21 (56.1)	0.55 (14.0)	0.86 (21.8)	0.040 (1.0)	11	17.6	1.74 (44.2)	0.63 (16.0)	1.00 (25.4)	0.040 (1.0)	15	10.0
3.3	761M33554	2.21 (56.1)	0.58 (14.7)	0.89 (22.6)	0.040 (1.0)	11	16.1	1.74 (44.2)	0.67 (17.0)	1.04 (26.4)	0.040 (1.0)	15	9.2
3.6	761M36554	2.21 (56.1)	0.61 (15.5)	0.92 (23.4)	0.040 (1.0)	11	14.9	1.74 (44.2)	0.70 (17.8)	1.08 (27.4)	0.040 (1.0)	15	8.6
3.9	761M39554	2.21 (56.1)	0.64 (16.3)	0.95 (24.1)	0.040 (1.0)	11	13.8	1.74 (44.2)	0.74 (18.8)	1.11 (28.2)	0.040 (1.0)	15	8.0
4.7	761M47554	2.21 (56.1)	0.68 (17.3)	1.06 (26.9)	0.040 (1.0)	11	11.7	1.74 (44.2)	0.83 (21.1)	1.20 (30.5)	0.040 (1.0)	15	6.9
5.0	761M50554	2.21 (56.1)	0.71 (18.0)	1.08 (27.4)	0.040 (1.0)	11	11.1	1.74 (44.2)	0.86 (21.8)	1.23 (31.2)	0.040 (1.0)	15	6.6
5.6	761M56554	2.21 (56.1)	0.76 (19.3)	1.13 (28.7)	0.040 (1.0)	11	10.0	1.74 (44.2)	0.92 (23.4)	1.29 (32.8)	0.040 (1.0)	15	6.1
6.0	761M60554	2.21 (56.1)	0.79 (20.1)	1.16 (29.5)	0.040 (1.0)	11	9.5	1.74 (44.2)	0.89 (22.6)	1.39 (35.3)	0.040 (1.0)	15	5.8
6.8	761M68554	2.21 (56.1)	0.85 (21.6)	1.22 (31.0)	0.040 (1.0)	11	8.5	1.74 (44.2)	0.96 (24.4)	1.46 (37.1)	0.040 (1.0)	15	5.3
7.0	761M70554	2.21 (56.1)	0.87 (22.1)	1.24 (31.5)	0.040 (1.0)	11	8.3	1.74 (44.2)	0.98 (24.9)	1.48 (37.6)	0.040 (1.0)	15	5.2
7.5	761M75554	2.21 (56.1)	0.90 (22.9)	1.28 (32.5)	0.040 (1.0)	11	7.9	1.74 (44.2)	1.02 (25.9)	1.52 (38.6)	0.040 (1.0)	15	5.0
8.0	761M80554	2.21 (56.1)	0.94 (23.9)	1.31 (33.3)	0.040 (1.0)	11	7.5	1.74 (44.2)	1.06 (26.9)	1.56 (39.6)	0.040 (1.0)	15	4.8
9.0	761M90554	2.21 (56.1)	1.01 (25.7)	1.38 (35.1)	0.040 (1.0)	11	6.9	1.74 (44.2)	1.14 (29.0)	1.64 (41.7)	0.040 (1.0)	15	4.5
10.0	761M10654	2.21 (56.1)	1.07 (27.2)	1.44 (36.6)	0.040 (1.0)	11	6.3	1.74 (44.2)	1.21 (30.7)	1.71 (43.4)	0.040 (1.0)	15	4.3
12.0	761M12654	2.21 (56.1)	1.19 (30.2)	1.56 (39.6)	0.040 (1.0)	11	5.6						
15.0	761M15654	2.21 (56.1)	1.35 (34.3)	1.72 (43.7)	0.040 (1.0)	11	4.9						

[1] Please refer to Ordering/Part Number page for specific part numbering details.

[2] ESR ratings listed are Maximum. Please contact us for additional ESR data.

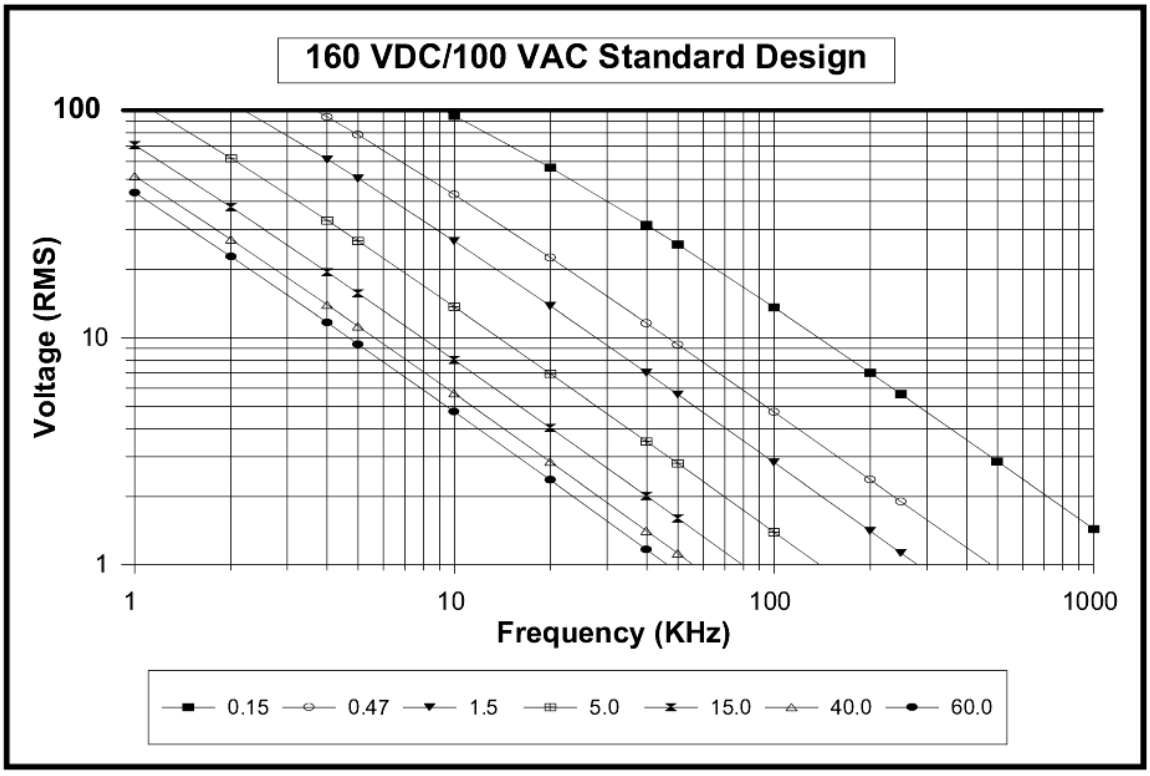
Type 761M Sizes and Ratings – 630 VDC/250 VAC

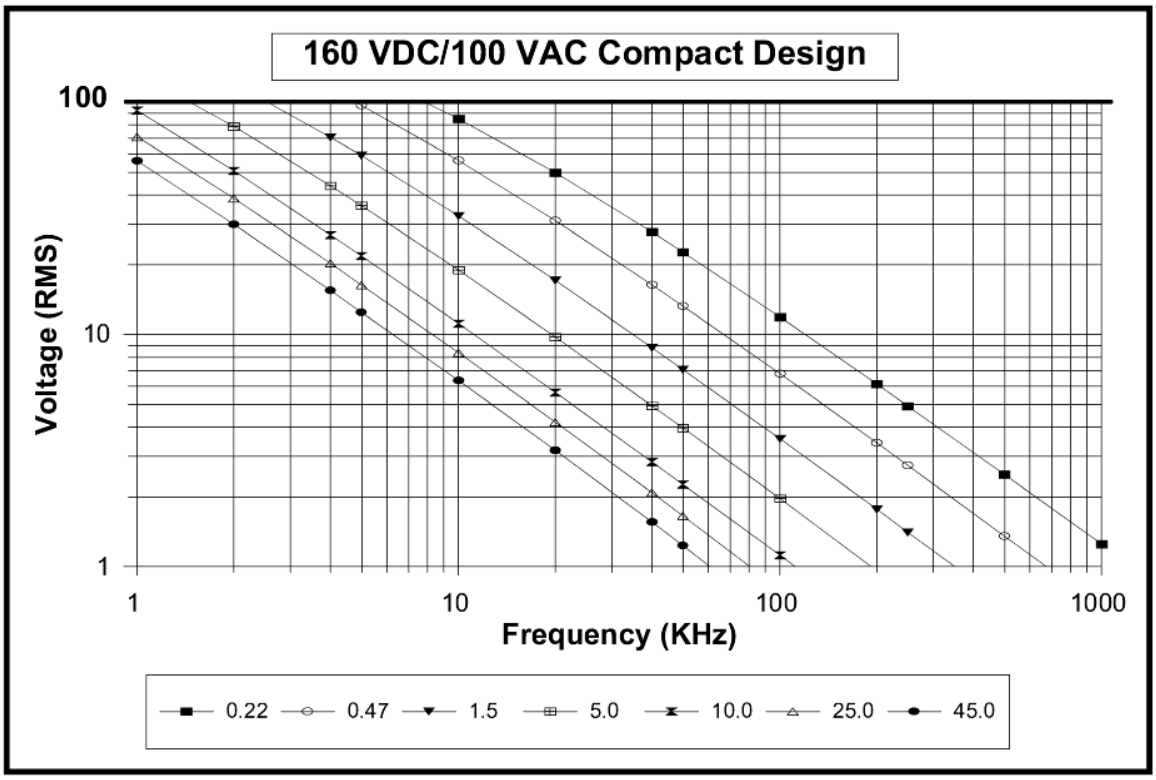
Cap (µF)	Base Part #	Standard Dimensions/Ratings[1] L MAX	T MAX	H MAX	Wire (d)	dV/dt V/µsec	[2]ESR-mΩ @100KHz	Compact Dimensions/Ratings[1] L MAX	T MAX	H MAX	Wire (d)	dV/dt V/µsec	[2]ESR-mΩ @100KHz
0.012	761M12356	0.61 (15.5)	0.17 (4.3)	0.27 (6.9)	0.020 (0.5)	25	72.5						
0.015	761M15356	0.61 (15.5)	0.19 (4.8)	0.29 (7.4)	0.020 (0.5)	25	58.8						
0.018	761M18356	0.61 (15.5)	0.21 (5.3)	0.31 (7.9)	0.020 (0.5)	32	49.8						
0.02	761M20356	0.79 (20.1)	0.15 (3.8)	0.25 (6.4)	0.020 (0.5)	13	101.4	0.61 (15.5)	0.22 (5.6)	0.32 (8.1)	0.020 (0.5)	46	45.3
0.022	761M22356	0.79 (20.1)	0.16 (4.1)	0.26 (6.6)	0.020 (0.5)	13	92.6	0.61 (15.5)	0.23 (5.8)	0.33 (8.4)	0.020 (0.5)	58	41.6
0.025	761M25356	0.79 (20.1)	0.17 (4.3)	0.27 (6.6)	0.020 (0.5)	13	81.9	0.61 (15.5)	0.25 (6.4)	0.35 (8.9)	0.020 (0.5)	71	37.2
0.027	761M27356	0.79 (20.1)	0.18 (4.6)	0.28 (7.1)	0.020 (0.5)	13	76.1	0.61 (15.5)	0.26 (6.6)	0.36 (9.1)	0.020 (0.5)	79	34.9
0.03	761M30356	0.99 (25.1)	0.15 (3.8)	0.28 (7.1)	0.020 (0.5)	8	136.9	0.79 (20.1)	0.18 (4.6)	0.31 (7.9)	0.020 (0.5)	13	69.1
0.033	761M33356	0.99 (25.1)	0.16 (4.1)	0.29 (7.4)	0.020 (0.5)	8	124.8	0.79 (20.1)	0.19 (4.8)	0.32 (8.1)	0.025 (0.6)	13	60.5
0.036	761M36356	0.99 (25.1)	0.17 (4.3)	0.29 (7.4)	0.020 (0.5)	8	114.8	0.79 (20.1)	0.20 (5.1)	0.33 (8.4)	0.025 (0.6)	17	55.6
0.039	761M39356	0.99 (25.1)	0.18 (4.6)	0.30 (7.6)	0.020 (0.5)	8	106.3	0.79 (20.1)	0.21 (5.3)	0.34 (8.6)	0.025 (0.6)	22	51.4
0.043	761M43356	0.99 (25.1)	0.19 (4.8)	0.31 (7.9)	0.020 (0.5)	8	96.8	0.79 (20.1)	0.22 (5.6)	0.35 (8.9)	0.025 (0.6)	28	46.7
0.047	761M47356	0.99 (25.1)	0.18 (4.6)	0.34 (8.6)	0.020 (0.5)	8	89.2	0.79 (20.1)	0.21 (5.3)	0.40 (10.2)	0.025 (0.6)	34	42.9
0.05	761M50356	0.99 (25.1)	0.19 (4.8)	0.34 (8.6)	0.020 (0.5)	11	84.1	0.79 (20.1)	0.22 (5.6)	0.41 (10.4)	0.025 (0.6)	37	40.4
0.056	761M56356	0.99 (25.1)	0.20 (5.1)	0.36 (9.1)	0.025 (0.6)	15	72.5	0.79 (20.1)	0.24 (6.1)	0.42 (10.7)	0.025 (0.6)	42	36.2
0.062	761M62356	0.99 (25.1)	0.20 (5.1)	0.39 (9.9)	0.025 (0.6)	18	65.7	0.79 (20.1)	0.25 (6.4)	0.44 (11.2)	0.025 (0.6)	67	32.8
0.068	761M68356	0.99 (25.1)	0.21 (5.3)	0.40 (10.2)	0.025 (0.6)	21	60.0	0.79 (20.1)	0.27 (6.9)	0.45 (11.4)	0.032 (0.8)	68	29.7
0.075	761M75356	0.99 (25.1)	0.23 (5.8)	0.41 (10.4)	0.025 (0.6)	24	54.5	0.79 (20.1)	0.28 (7.1)	0.47 (11.9)	0.032 (0.8)	70	27.0
0.082	761M82356	0.99 (25.1)	0.24 (6.1)	0.42 (10.7)	0.025 (0.6)	27	49.9	0.79 (20.1)	0.30 (7.6)	0.48 (12.2)	0.032 (0.8)	71	24.8
0.10	761M10456	0.99 (25.1)	0.27 (6.9)	0.45 (11.4)	0.032 (0.8)	44	40.8	0.79 (20.1)	0.34 (8.6)	0.52 (13.2)	0.032 (0.8)	73	20.5
0.12	761M12456	1.25 (31.8)	0.25 (6.4)	0.43 (10.9)	0.025 (0.6)	30	61.0	0.99 (25.1)	0.27 (6.9)	0.52 (13.2)	0.032 (0.8)	45	34.2
0.15	761M15456	1.25 (31.8)	0.26 (6.6)	0.50 (12.7)	0.032 (0.8)	32	48.8	0.99 (25.1)	0.31 (7.9)	0.56 (14.2)	0.032 (0.8)	47	27.6
0.18	761M18456	1.25 (31.8)	0.29 (7.4)	0.53 (13.5)	0.032 (0.8)	33	40.8	0.99 (25.1)	0.35 (8.9)	0.60 (15.2)	0.032 (0.8)	48	23.2
0.2	761M20456	1.25 (31.8)	0.30 (7.6)	0.55 (14.0)	0.032 (0.8)	34	36.8	0.99 (25.1)	0.37 (9.4)	0.62 (15.7)	0.032 (0.8)	49	21.0
0.22	761M22456	1.25 (31.8)	0.32 (8.1)	0.57 (14.5)	0.032 (0.8)	34	33.6	0.99 (25.1)	0.39 (9.9)	0.64 (16.3)	0.032 (0.8)	49	19.2
0.25	761M25456	1.74 (44.2)	0.27 (6.9)	0.51 (13.0)	0.032 (0.8)	20	71.2	1.25 (31.8)	0.33 (8.4)	0.64 (16.3)	0.032 (0.8)	35	29.7
0.27	761M27456	1.74 (44.2)	0.28 (7.1)	0.52 (13.2)	0.032 (0.8)	20	66.0	1.25 (31.8)	0.34 (8.6)	0.65 (16.5)	0.032 (0.8)	35	27.6
0.3	761M30456	1.74 (44.2)	0.30 (7.6)	0.54 (13.7)	0.032 (0.8)	21	59.5	1.25 (31.8)	0.37 (9.4)	0.68 (17.3)	0.032 (0.8)	35	25.0
0.33	761M33456	1.74 (44.2)	0.31 (7.9)	0.56 (14.2)	0.032 (0.8)	21	54.1	1.25 (31.8)	0.39 (9.9)	0.70 (17.8)	0.032 (0.8)	36	22.8
0.39	761M39456	1.74 (44.2)	0.35 (8.9)	0.59 (15.0)	0.032 (0.8)	21	46.0	1.25 (31.8)	0.43 (10.9)	0.74 (18.8)	0.032 (0.8)	36	19.5
0.43	761M43456	1.74 (44.2)	0.34 (8.6)	0.65 (16.5)	0.032 (0.8)	22	41.9	1.25 (31.8)	0.46 (11.7)	0.77 (19.6)	0.032 (0.8)	36	17.9
0.47	761M47456	1.74 (44.2)	0.36 (9.1)	0.67 (17.0)	0.032 (0.8)	22	38.4	1.25 (31.8)	0.48 (12.2)	0.79 (20.1)	0.032 (0.8)	36	16.5
0.5	761M50456	1.74 (44.2)	0.37 (9.4)	0.68 (17.3)	0.032 (0.8)	22	36.2	1.25 (31.8)	0.50 (12.7)	0.81 (20.6)	0.032 (0.8)	37	15.6
0.56	761M56456	1.74 (44.2)	0.40 (10.2)	0.71 (18.0)	0.032 (0.8)	22	32.5	1.25 (31.8)	0.54 (13.7)	0.84 (21.3)	0.032 (0.8)	37	14.1
0.6	761M60456	2.21 (56.1)	0.34 (8.6)	0.65 (16.5)	0.032 (0.8)	16	55.5	1.74 (44.2)	0.39 (9.9)	0.76 (19.3)	0.032 (0.8)	22	30.4
0.68	761M68456	2.21 (56.1)	0.37 (9.4)	0.68 (17.3)	0.032 (0.8)	16	49.1	1.74 (44.2)	0.42 (10.7)	0.80 (20.3)	0.032 (0.8)	22	27.0
0.75	761M75456	2.21 (56.1)	0.39 (9.9)	0.70 (17.8)	0.032 (0.8)	16	44.6	1.74 (44.2)	0.45 (11.4)	0.82 (20.8)	0.032 (0.8)	23	24.7
0.82	761M82456	2.21 (56.1)	0.41 (10.4)	0.72 (18.3)	0.032 (0.8)	16	40.9	1.74 (44.2)	0.48 (12.2)	0.85 (21.6)	0.032 (0.8)	23	22.7
0.9	761M90456	2.21 (56.1)	0.44 (11.2)	0.75 (19.1)	0.032 (0.8)	16	37.4	1.74 (44.2)	0.51 (13.0)	0.88 (22.4)	0.032 (0.8)	23	20.8
1.0	761M10556	2.21 (56.1)	0.44 (11.2)	0.81 (20.6)	0.032 (0.8)	16	33.9	1.74 (44.2)	0.54 (13.7)	0.91 (23.1)	0.032 (0.8)	23	18.9
1.2	761M12556	2.21 (56.1)	0.50 (12.7)	0.87 (22.1)	0.040 (1.0)	16	28.0	1.74 (44.2)	0.60 (15.2)	0.98 (24.9)	0.040 (1.0)	23	15.5
1.5	761M15556	2.21 (56.1)	0.57 (14.5)	0.94 (23.9)	0.040 (1.0)	17	22.6	1.74 (44.2)	0.69 (17.5)	1.06 (26.9)	0.040 (1.0)	23	12.7
1.8	761M18556	2.21 (56.1)	0.64 (16.3)	1.01 (25.7)	0.040 (1.0)	17	19.1	1.74 (44.2)	0.71 (18.0)	1.21 (30.7)	0.040 (1.0)	23	10.9
2.0	761M20556	2.21 (56.1)	0.68 (17.3)	1.05 (26.7)	0.040 (1.0)	17	17.3	1.74 (44.2)	0.76 (19.3)	1.26 (32.0)	0.040 (1.0)	23	9.9
2.2	761M22556	2.21 (56.1)	0.72 (18.3)	1.09 (27.7)	0.040 (1.0)	17	15.8	1.74 (44.2)	0.81 (20.6)	1.30 (33.0)	0.040 (1.0)	23	9.2
2.5	761M25556	2.21 (56.1)	0.77 (19.6)	1.15 (29.2)	0.040 (1.0)	17	14.1	1.74 (44.2)	0.88 (22.4)	1.37 (34.8)	0.040 (1.0)	23	8.3
2.7	761M27556	2.21 (56.1)	0.81 (20.6)	1.18 (30.0)	0.040 (1.0)	17	13.2	1.74 (44.2)	0.92 (23.4)	1.41 (35.8)	0.040 (1.0)	23	7.8
3.0	761M30556	2.21 (56.1)	0.86 (21.8)	1.23 (31.2)	0.040 (1.0)	17	12.0	1.74 (44.2)	0.98 (24.9)	1.47 (37.3)	0.040 (1.0)	24	7.2
3.3	761M33556	2.21 (56.1)	0.91 (23.1)	1.28 (32.5)	0.040 (1.0)	17	11.1	1.74 (44.2)	1.04 (26.4)	1.53 (38.9)	0.040 (1.0)	24	6.7
3.6	761M36556	2.21 (56.1)	0.96 (24.4)	1.33 (33.8)	0.040 (1.0)	17	10.3	1.74 (44.2)	1.09 (27.7)	1.59 (40.4)	0.040 (1.0)	24	6.3
3.9	761M39556	2.21 (56.1)	1.01 (25.7)	1.38 (35.1)	0.040 (1.0)	17	9.6	1.74 (44.2)	1.15 (29.2)	1.64 (41.7)	0.040 (1.0)	24	6.0
4.7	761M47556	2.21 (56.1)	1.12 (28.4)	1.49 (37.8)	0.040 (1.0)	17	8.3	1.74 (44.2)	1.28 (32.5)	1.77 (45.0)	0.040 (1.0)	24	5.3
5.0	761M50556	2.21 (56.1)	1.16 (29.5)	1.53 (38.9)	0.040 (1.0)	17	7.9						
5.6	761M56556	2.21 (56.1)	1.24 (31.5)	1.61 (40.9)	0.040 (1.0)	17	7.3						
6.0	761M60556	2.21 (56.1)	1.29 (32.8)	1.66 (42.2)	0.040 (1.0)	17	6.9						
6.8	761M68556	2.21 (56.1)	1.38 (35.1)	1.75 (44.5)	0.040 (1.0)	17	6.4						
7.0	761M70556	2.21 (56.1)	1.40 (35.6)	1.78 (45.2)	0.040 (1.0)	17	6.3						

[1] Please refer to Ordering/Part Number page for specific part numbering details.

[2] ESR ratings listed are Maximum. Please contact us for additional ESR data.

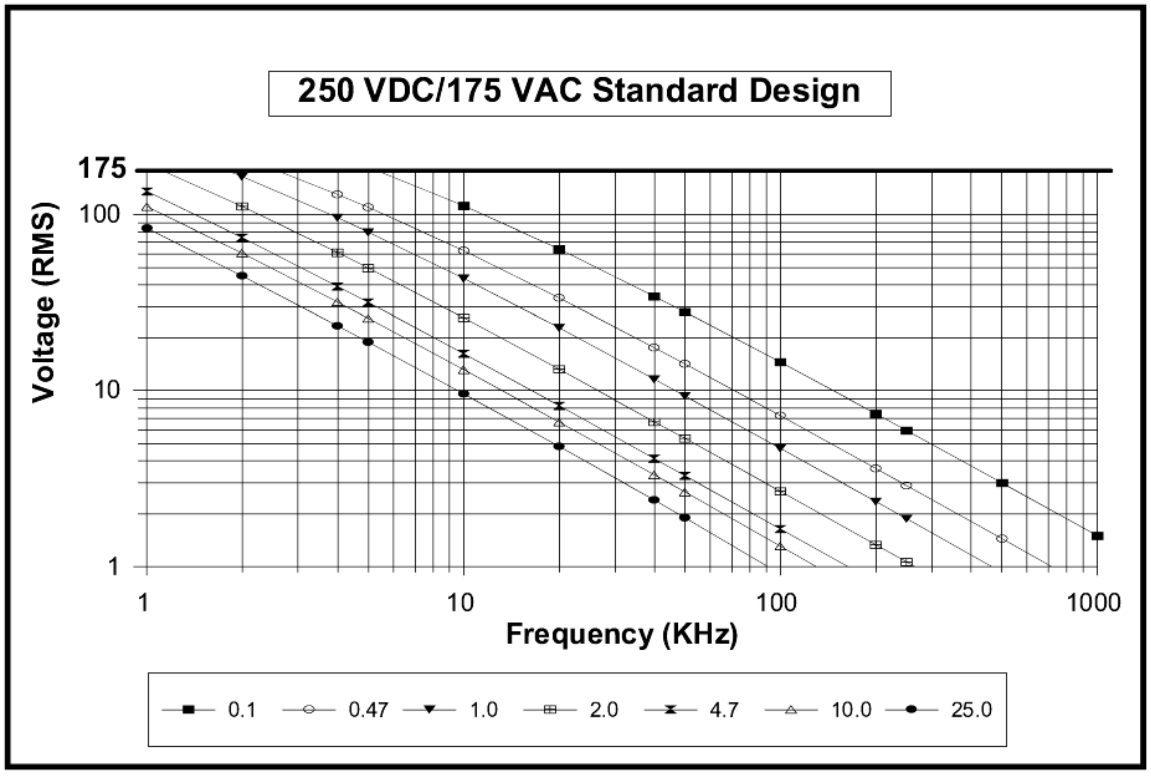
RMS Voltage vs. Frequency @ +85°C, in still air*

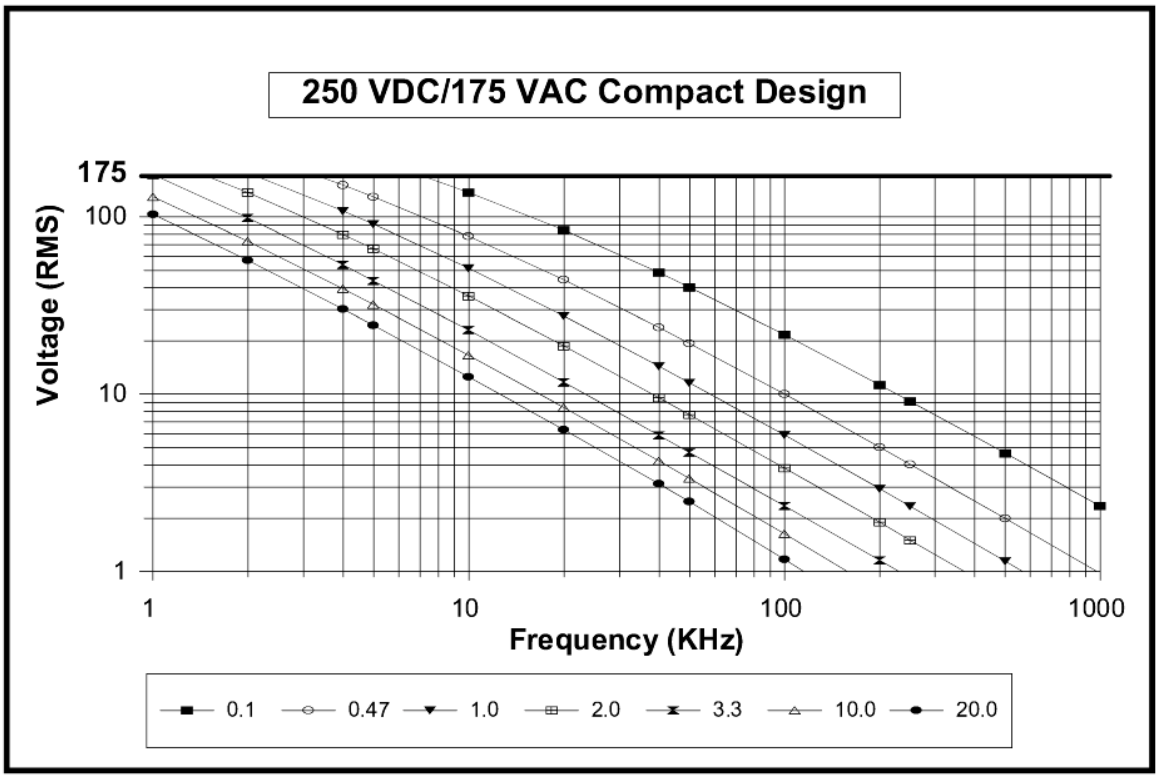




* For additional information regarding these performance curves and their interpretation please refer to our Thermal Management application note on page 14. We also encourage you to contact us for additional application details.

RMS Voltage vs. Frequency @ +85°C, in still air*





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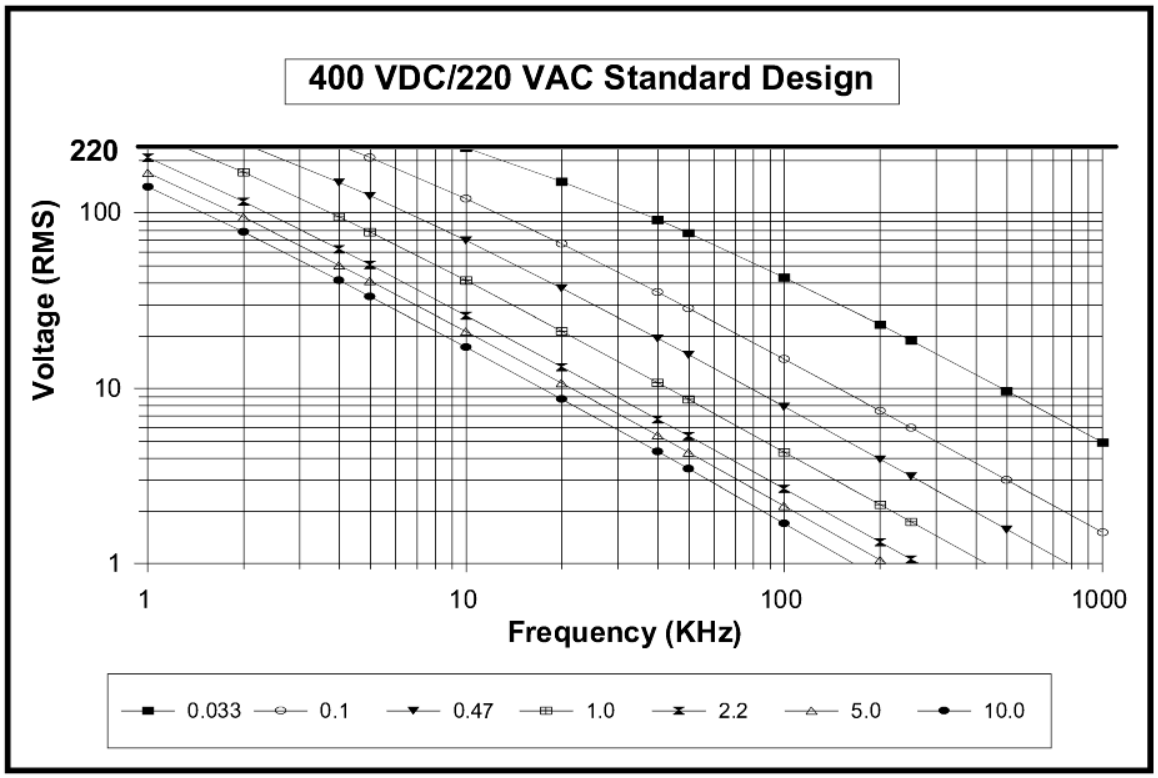
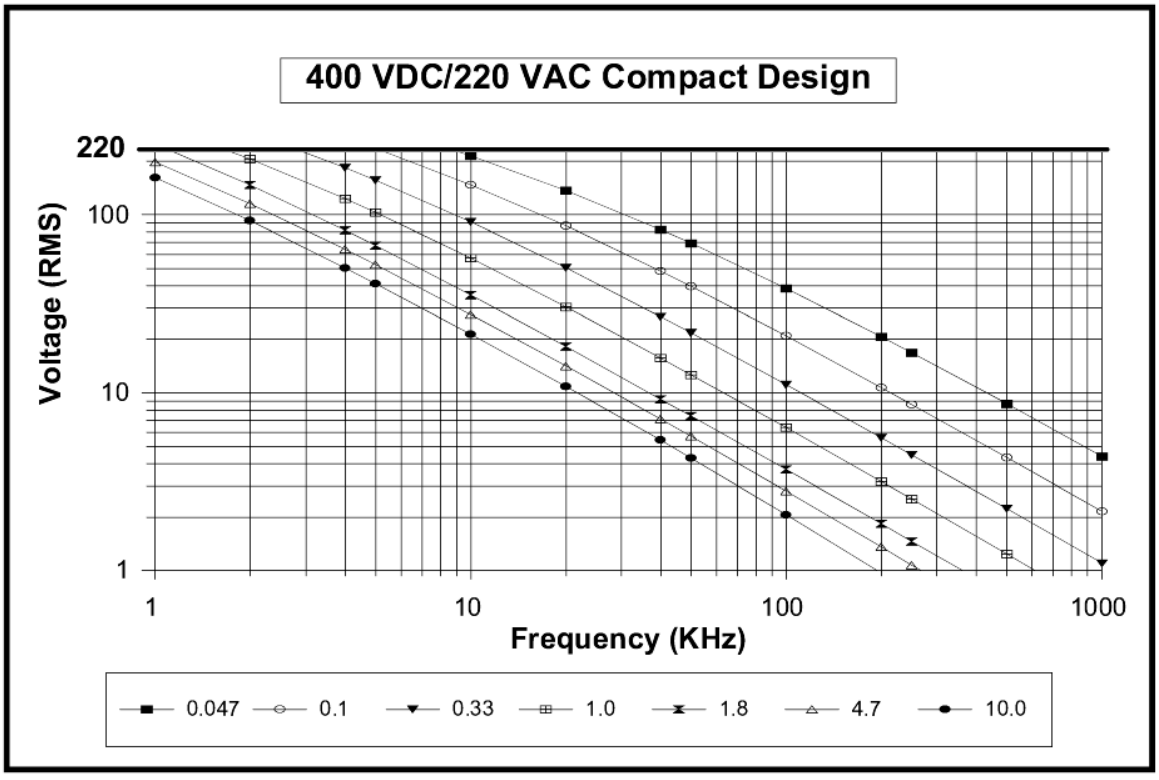
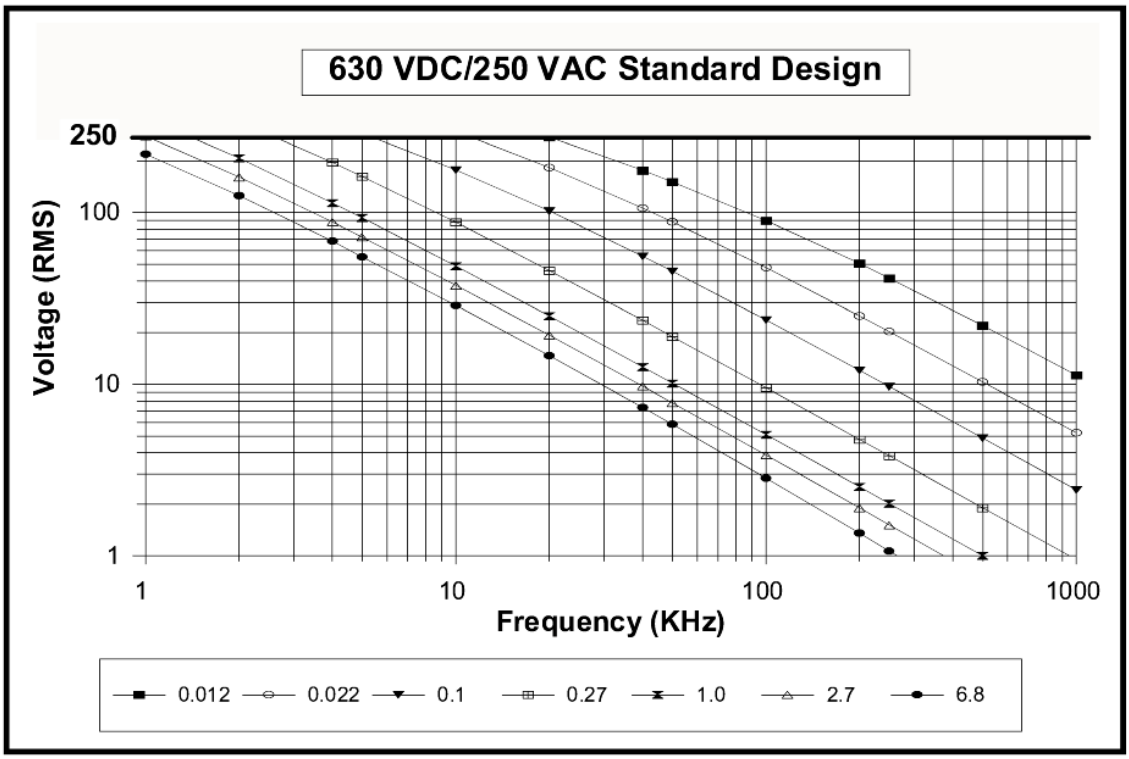
RMS Voltage vs. Frequency @ +85°C, in still air*

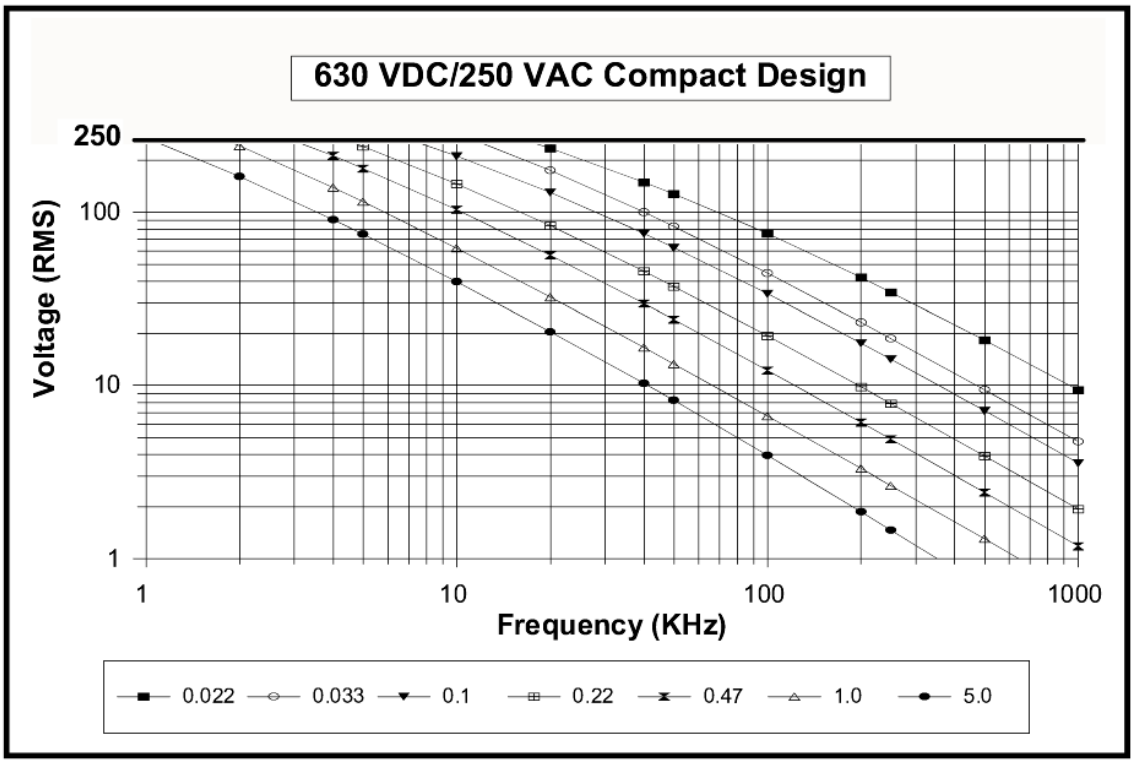




* For additional information regarding these performance curves and their interpretation please refer to our Thermal Management application note on page 14. We also encourage you to contact us for additional application details.

RMS Voltage vs. Frequency @ +85°C, in still air*





* For additional information regarding these performance curves and their interpretation please refer to our Thermal Management application note on page 14. We also encourage you to contact us for additional application details.

Thermal Management Application Notes

This application note primarily addresses thermal issues as they relate to polypropylene film capacitors, however the same concepts apply to other capacitor types as well. Because thermal environments vary considerably our approach is to provide RMS voltage versus frequency performance curves (see pages 10-13) based on the following extreme parameters:

- +85°C ambient temperature.
- Pure convection cooling.
- All heat dissipation from the lead wire is added to the capacitor.
- Increased lead wire dissipation at high frequencies is included [skin effect losses].
- "Worst-case" capacitor material parameters are assumed.

The ambient temperature is the air temperature adjacent to the capacitor within the application enclosure at the highest exterior temperature permitted by the end user. Since the maximum allowable temperature for polypropylene is +105°C, our performance curves are based on a power level that raises the temperature +20°C from ambient to the hot spot.

Warning: Before comparing capacitor performance curves between suppliers it is critical to ensure that they represent similar conditions!

We realize that the environment assumed by our performance curves is highly unlikely to represent that of a real application. We also understand that a "pure convection" environment is also highly improbable. There will almost always be a circuit board and other adjacent components that will impede convection based air circulation, and the capacitor under discussion will not be the only “heat generating” device present! Because of all this "variability" our performance curves are calculated very conservatively. Therefore you can *always* reliably specify a capacitor for your application if:

- The AC voltage across the capacitor is less than that indicated by our published curves.
- There are no adjacent "really hot" parts.
- The **capacitor’s** ambient environment is less than +85°C
- Air can circulate by means of some natural convection.

In MANY cases a capacitor can be operated reliably above the values shown in our performance curves since our performance data is calculated under “worst-case/extreme” thermal conditions. The trick is to remove heat from the capacitor by means other than convective air motion. Most of the following suggestions are relatively easy and inexpensive to implement if considered early on in the design cycle.

- Reduce the ambient temperature (if possible).
- Separate hot(ter) components from the capacitor if electrical/mechanical environment permits. (we understand loop inductance, creepage/clearance requirements, and mechanical "keep away's")
- Minimize the I^2R heat added to the capacitor by the board etch or other connection methods.
- Size the pads around the capacitor vias as large as possible to remove heat from the leads. Add as much extra copper around the capacitor pads as layout and design rules permit.
- Specify larger diameter copper capacitor leads (works even better when copper added at vias)
- Forced air helps, but there are some cautions. Case to hot spot rise is fixed by power level!
- Heat can be removed to a "heat sink", even if by hot glue to a cooler adjacent object or the board.

The application power level can be compared to the performance curves at a given frequency by the following calculation:

$$(\text{Actual VAC}/\text{Rated VAC})^2 = \text{Power level relative to performance curve power}$$

Temperature rise is directly related to power; power is related to the voltage squared.

A final thought. It may be tempting to obtain sample capacitors (from ANY supplier) and make temperature rise measurements; making choices based on the results. The temperature rise measurements are certainly useful information (and highly recommended for tough applications) but this method does not take into account the capacitor material parameter variation over which we (and other capacitor suppliers) have no control.

Please contact us for more detailed information and methods to estimate allowable voltage in your electrical/thermal environment. We always welcome an engineer-to-engineer discussion of your particular situation!

Current Rating Application Notes

Capacitor current ratings provided by many manufacturers need to be carefully evaluated as they can be misleading; not because the information provided is incorrect, but because of the information that may NOT be provided. BOTH frequency and temperature at which these ratings apply need to be factored into the "capacitor choice decision". The application's electrical and thermal parameters are rarely the same as the "environment" specified for the ratings provided. The "expected design life" at the ratings provided is not necessarily the same for all capacitor types!

Some definitions:

Ripple current is the RMS value of the capacitor current in an application where the voltage across the capacitor is small (less than ~5% of DC rating). For switching supplies the voltage change across the capacitor may be much less than this. RMS capacitor current typically is not specified at a particular frequency and thus should be carefully considered. [The term "ripple" originated with vacuum tube capacitor input power supplies, and may not have any meaning in the context of some modern capacitor applications].

ESR (Effective Series Resistance) is a mathematical construct that "lumps" ALL of the capacitor losses together as an appropriate resistance connected in series with the capacitor. It is a valid concept if the current is near sinusoidal OR the ESR is essentially constant over the frequency spectrum of the current (fundamental and significant harmonics). **In general ESR is frequency, temperature, and (in some cases for ceramic capacitors) bias voltage dependent! For aluminum electrolytics there is also an "aging" factor determined by run time, current, and temperature.**

Although the ESR concept is truly valid only for power dissipation calculations at a specific frequency and temperature, ESR can be reasonably constant over some frequency and temperature range. ESR usually begins to rise above 100KHz., reducing allowable capacitor current. For some capacitor types ESR rises with temperature. **Be very careful not to envision a real capacitor as "an ideal capacitor in series with a fixed resistor of 'ESR' ohms"! [Although good polypropylene capacitors may behave nearly this way over a very wide frequency range]**

In spite of the above qualifications, ESR remains a VERY useful construct to estimate dissipation with familiar formulas. Current ratings based on ESR and temperature are easy performance metrics to "digest", but use them with care!

$$\text{ESR (ohms)} = \frac{\text{D.F.}}{(2*\pi*f*C*100)}$$

D.F. = Dissipation Factor expressed as a %
f = Frequency in Hertz
C = Capacitance in Farads

When choosing capacitors consider the enormous difference in expected lifetimes between film and electrolytics when used at or near maximum "rated" current and/or temperature. Verify with a proposed supplier performance parameters at frequencies above 100KHz if that applies.

Our suggested maximum ratings assume a lifetime longer than the useful life of the application. Electrolytic capacitor lifetimes at performance extremes may be only a few thousand hours, and they remain one of the highest failure rate components in an application, especially when carrying high frequency ripple current even at stress levels below their "max rating".

It is our opinion that our published voltage performance curves contain more information than do ripple current versus temperature charts at fixed frequency. Maximum allowed current versus frequency can be estimated from our voltage curves for polypropylene capacitors with +85°C convection environment.

It is a more difficult matter to specify RMS ripple currents for polyester capacitors where ESR is more frequency and temperature dependent. Because of smaller size [for a given voltage and capacitance], and higher temperature ratings they remain a viable solution for some high frequency ripple current applications.

Current versus temperature charts do not take into account ESR variation with frequency nor do they address possible methods [other than "ambient" temperature] to optimize performance!

Please contact us for more information and for specific application notes. We have detailed methods to estimate capacitor current limits for different capacitors and thermal/electrical environments. We always welcome an engineer-to-engineer discussion of your specific application!

SBE designs and manufactures a wide variety of Film Capacitors. Please contact us today for additional details!

Radial Lead Film Capacitors, Orange Drop®

POLYPROPYLENE – FILM/FOIL

Series	Capacitance	DC Voltage	AC Voltage	Features
715P	.001 to .47 µF	100 to 2000	70 to 500	Tolerance to ±1%, excellent Polystyrene sub.
716P	.001 to 1.0 µF	100 to 2000	70 to 500	Solid copper leads, high performance
716P High Volt.	.00022 to .033 µF	1000 to 2000	450 to 500	Compact size, extremely low D.F.
715P/717P	.00047 to .015 µF	1800 to 2000	800 to 1000	dV/dt to 104 KV/µsec, tolerances to ±1%
773P	.001 to .01 µF	1600	700 to 750	Ideal for demanding ballast applications
778P/779P	.00047 to .033 µF	630	400	Peak current over 450 Amps, low ESR

POLYPROPYLENE – METALLIZED

725M	.01 to 4.7 µF	160 to 630	100 to 250	Compact size, low ESR/ESL
727M	.001 to 2.2 µF	400 to 2000	300 to 600	AC applications
757M	.001 to .01 µF	1600	700	High AC voltage for electronic ballast

POLYESTER – FILM/FOIL

225P	.001 to 1.0 µF	100 to 600	70 to 200	Over 40 years of proven reliability
418P	.001 to 1.0 µF	100 to 1000	70 to 200	High peak current, temp rating to +125°C

POLYESTER – METALLIZED

425M	.012 to 12.0 µF	100 to 630	63 to 250	Compact size, various lead spacings
427M	.01 to 2.2 µF	up to 1000	up to 480	AC applications

R-C NETWORKS

Series	Cap/Resistor	DC Voltage	AC Voltage	Features
288P	.1/.22/.47 µF 47/100/470 Ohm	400	250	Metallized Polyester Film Cap. 1/2 watt carbon comp resistor
298P	.047/.1 µF 47/100/470 Ohm	500	330	Polyester Film/Foil Cap. 1/2 watt carbon comp resistor

Axial Lead Film Capacitors

POLYPROPYLENE – METALLIZED

Series	Capacitance	DC Voltage	AC Voltage	Features
760M/761M	.01 to 65.0 µF	160 to 630	100 to 250	High Power
762M/763M	.01 to 2.2 µF	up to 2000	up to 600	AC applications

POLYPROPYLENE – FILM/FOIL

770P	.00047 to .68 µF	100 to 600	70 to 200	Excellent capacitance stability

POLYESTER – METALLIZED

460M/461M	.0047 to 100.0 µF	63 to 1000	40 to 250	Various sizes, wide range of cap values
462M/463M	.01 to 2.2 µF	up to 1000	up to 480	AC applications

POLYESTER – FILM/FOIL

192P Pacer®	.0001 to .39 µF	80 to 600	55 to 200	Small size, available on Tape & Reel