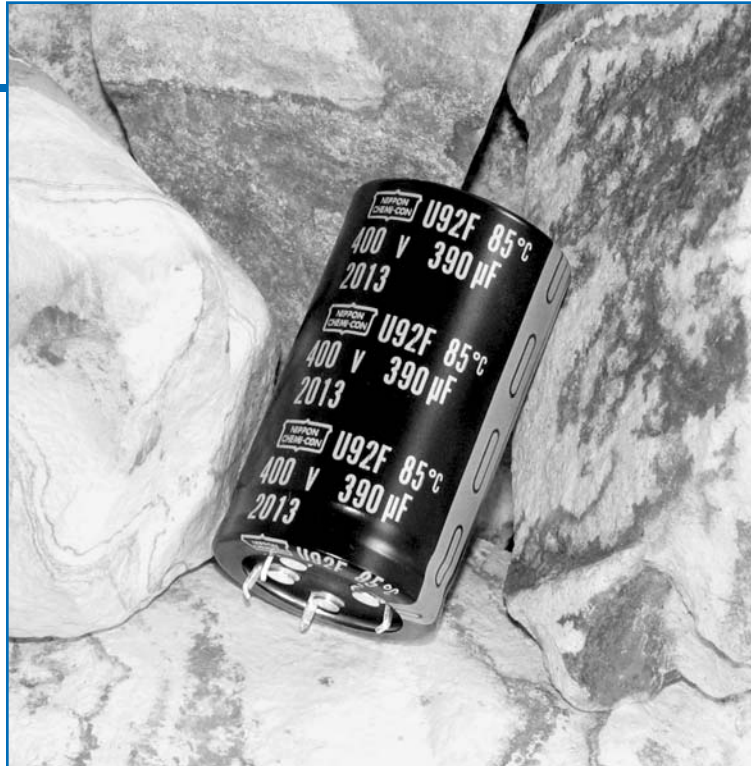


U92F Series



- Snap Mount
- Specific Design For Higher Ripple Current
- 350 to 500VDC Voltage Range
- RoHS Compliant
- +85°C Maximum Temperature
- 5,000 Hours Lifetime at +85°C



The U92F series is a specifically designed series for higher ripple current capability. The U92F capacitors have an endurance rating of 5,000 hours at +85°C with the rated ripple current applied. All U92F series capacitors are RoHS compliant and offered in a variety of sizes, with or without a PPE end disk, and encased in a standard PVC sleeve or an optional PET sleeve. UL746C compliant exterior insulation material for sleeve and end disk is also available. Snap-in terminals (2, 4 or 5-pin configurations) are available as standard or optional styles depending on case size. Straight standoff terminals (5-pin configuration) are an option for 40, 45 and 50mm can diameters.

Summary of Specifications

- PC board snap-in or straight standoff terminals available as standard or optional styles depending on pin styles and case size.
- Capacitance range: 180 to 3,300µF.
- Voltage range: 350 to 500VDC.
- Category temperature range: -40°C to +85°C.
- Leakage current: $3\sqrt{CV}$ (µA) or 3mA, whichever is smaller, after 5 minutes at +25°C.
- Standard capacitance tolerance: ±20%
- Nominal case size (D × L): 30 × 40mm to 50 × 105mm.
- Rated lifetime: 5,000 hours at +85°C with the rated ripple current applied.

U92F Series

U92F Specifications - Snap Mount

Item	Characteristics																											
Category Temperature Range	- 40 to +85°C																											
Rated Voltage Range	350 to 500VDC																											
Capacitance Range	180 to 3,300µF at +25°C, 120Hz																											
Capacitance Tolerance	±20% (M) at +25°C, 120Hz																											
Leakage Current	$I = 3\sqrt{CV}$ (µA) or 3mA, whichever is smaller, after 5 minutes at +25°C. Where I = Max. leakage current (µA), C = Nominal capacitance (µF) and V = Rated voltage (V)																											
Dissipation Factor (Tan δ)	At +25°C, 120Hz <table border="1"> <tr> <td>Rated Voltage (V)</td> <td>350-400</td> <td>420-500</td> </tr> <tr> <td>Tan δ (DF) Max.</td> <td>0.15</td> <td>0.20</td> </tr> </table>	Rated Voltage (V)	350-400	420-500	Tan δ (DF) Max.	0.15	0.20																					
Rated Voltage (V)	350-400	420-500																										
Tan δ (DF) Max.	0.15	0.20																										
Low Temperature Characteristics	At 120Hz, impedance (Z) ratio between the - 40°C value and +25°C value shall not exceed the values given below. <table border="1"> <tr> <td>Rated Voltage (V)</td> <td>350-400</td> <td>420-500</td> </tr> <tr> <td>Z(-40°C)/Z(+25°C)</td> <td>4</td> <td>8</td> </tr> </table>	Rated Voltage (V)	350-400	420-500	Z(-40°C)/Z(+25°C)	4	8																					
Rated Voltage (V)	350-400	420-500																										
Z(-40°C)/Z(+25°C)	4	8																										
Rated Ripple Current Multipliers	Ambient Temperature (°C) <table border="1"> <tr> <td>+45°C</td> <td>+65°C</td> <td>+85°C</td> </tr> <tr> <td>2.82</td> <td>1.73</td> <td>1.00</td> </tr> </table> Frequency (Hz) <table border="1"> <tr> <td>DC Rated Voltage</td> <td>50Hz</td> <td>120Hz</td> <td>300Hz</td> <td>1kHz</td> <td>10kHz</td> <td>100kHz</td> </tr> <tr> <td>350-450V</td> <td>0.77</td> <td>1.00</td> <td>1.16</td> <td>1.30</td> <td>1.41</td> <td>1.43</td> </tr> <tr> <td>500V</td> <td>0.70</td> <td>1.00</td> <td>1.16</td> <td>1.30</td> <td>1.41</td> <td>1.43</td> </tr> </table>	+45°C	+65°C	+85°C	2.82	1.73	1.00	DC Rated Voltage	50Hz	120Hz	300Hz	1kHz	10kHz	100kHz	350-450V	0.77	1.00	1.16	1.30	1.41	1.43	500V	0.70	1.00	1.16	1.30	1.41	1.43
+45°C	+65°C	+85°C																										
2.82	1.73	1.00																										
DC Rated Voltage	50Hz	120Hz	300Hz	1kHz	10kHz	100kHz																						
350-450V	0.77	1.00	1.16	1.30	1.41	1.43																						
500V	0.70	1.00	1.16	1.30	1.41	1.43																						
Endurance (Load Life)	The following specifications shall be satisfied when the capacitors are restored to +25°C after subjecting them to DC voltage for 5,000 hours at +85°C with the rated ripple current applied. The sum of the DC voltage and peak AC voltage must not exceed the full rated voltage of the capacitors. Capacitance change: ≤ ±20% of initial measured value Tan δ (DF) : ≤ 200% of initial specified value Leakage current : ≤ initial specified value																											
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to +25°C after exposing them for 1,000 hours at +85°C without voltage applied. The rated voltage shall be applied to the capacitors for a minimum of 30 minutes, at least 24 hours and not more than 48 hours before the measurements. Capacitance change: ≤ ±20% of initial measured value Tan δ (DF) : ≤ 150% of initial specified value Leakage current : ≤ initial specified value																											
Custom Designs	Custom CV values per case size and termination type may be available upon request. Contact appropriate representative with specific requirements.																											

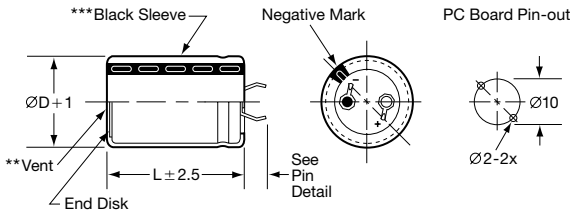
U92F
SNAP MOUNT 85°C

U92F Series

Diagram of Dimensions - Snap Mount

Snap Mount

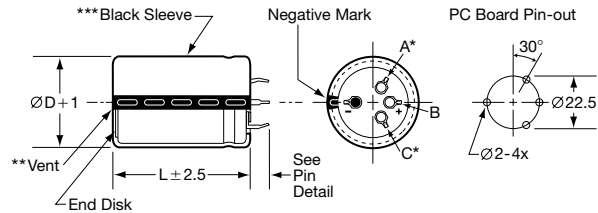
VSN Snap-in $\varnothing 30$ and $\varnothing 35$ standard
VNN Snap-in $\varnothing 30$ and $\varnothing 35$ optional



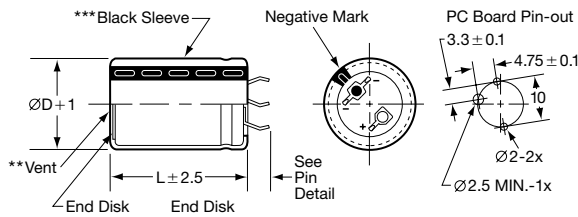
Snap Mount

Unit: mm

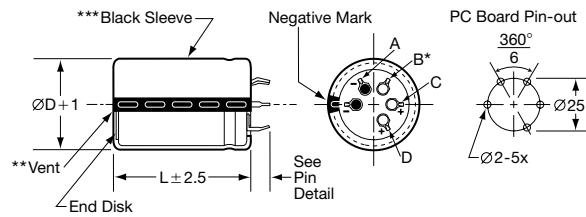
VND Snap-in $\varnothing 35$ and $\varnothing 40$ standard; $\varnothing 45$ optional
VSD Snap-in $\varnothing 35$ and $\varnothing 40$ optional



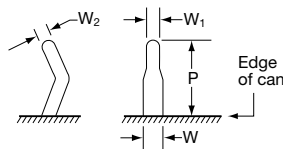
VEN Snap-in $\varnothing 30$ and $\varnothing 35$ optional



VNT Snap-in $\varnothing 45$ and $\varnothing 50$ standard



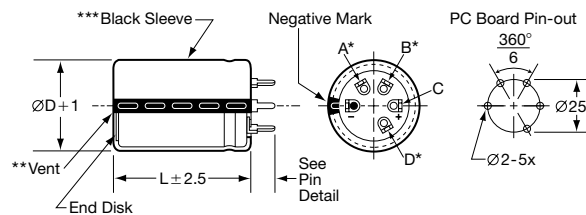
VS, VE & VN Snap-in Pin Dimensions



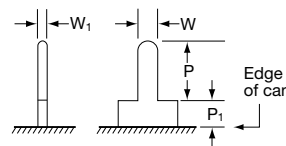
Type	P	W	W ₁	W ₂
VSN $\varnothing 30$	4.0 ± 0.5			
VSN $\varnothing 35$	3.5 ± 0.5			
VNN $\varnothing 30$ - $\varnothing 35$	5.8 ± 1.0			
VEN $\varnothing 30$ - $\varnothing 35$	4.0 ± 0.5	1.5 ± 0.2	0.8 ± 0.1	0.8 ± 0.1
VSD $\varnothing 35$ - $\varnothing 40$	3.5 ± 1.0			
VND $\varnothing 35$ - $\varnothing 45$	5.8 ± 1.0			
VNT $\varnothing 45$ - $\varnothing 50$	5.8 ± 1.0			

Straight Pin Mount

VQT Straight Standoff $\varnothing 40$, $\varnothing 45$ and $\varnothing 50$ optional



VQ Straight Standoff Pin Dimensions



Type	P	P ₁	W	W ₁
Standoff Pin (VQ)	3.75 ± 1.0	2.0 max.	1.5 ± 0.1	0.7 ± 0.2

CAUTION:

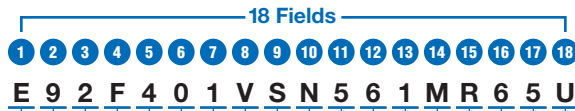
* Use the blank terminals for mechanical support only. The blank terminals must not be connected to a solder trace on the PC board but be electrically isolated from the negative and positive terminals.

** The vent may be located either on the bottom or side of the can.

*** The black sleeve with gray stripe negative pin indicator is standard. Also note in some cases, the sleeve color may change slightly due to the operating conditions, however, the discoloration will not impair capacitor function.

U92F Series

Part Numbering System for U92F Series When ordering, always specify complete 18-field global part number.



- 9 Supplement Code.** Field 18.
All construction options listed have Sn100% terminal plating.
U = PVC sleeve with PPE end disk.
M = PVC sleeve without end disk.
4 = UL746C compliant insulation for sleeve with end disk.
Other sleeve materials available as options upon request.
- 8 Case Size.** Fields 15, 16 and 17.
The single letter diameter code is inserted in field 15.
R = \varnothing 30mm
A = \varnothing 35mm
B = \varnothing 40mm
U = \varnothing 45mm
C = \varnothing 50mm
The double digit length code is inserted in fields 16 and 17.
40 = 40mm
50 = 50mm
65 = 65mm
80 = 80mm
A0 = 100mm
A5 = 105mm
- 7 Capacitance Tolerance.** Field 14.
M = \pm 20%
- 6 Capacitance.** Fields 11, 12 and 13.
Expressed in Microfarads. The first two digits are significant figures inserted in fields 11 and 12, and the third digit inserted in field 13 indicates the number of zeros for capacitance of 10 μ F or more. R indicates the decimal point for capacitance less than 10 μ F (e.g. 5R6 = 5.6 μ F; 560 = 56 μ F; 561 = 560 μ F; 562 = 5,600 μ F; 563 = 56,000 μ F).
- 5 Dummy Terminals.** Field 10.
N = No dummy terminals.
D = 2 dummy terminals.
T = 3 dummy terminals.
- 4 Terminal Type.** Fields 8 and 9.
VS = Snap-in pins, 4.0mm in length (\varnothing 30 VSN);
3.5mm in length (\varnothing 35 VSN, \varnothing 35 or \varnothing 40 VSD).
VN = Snap-in pins, 5.8mm in length.
VE = Snap-in pins, polarized, \varnothing 30 or \varnothing 35 option.
VQ = Straight standoff pins.
- 3 DC Rated Voltage.** Fields 5, 6 and 7.
Expressed in Volts. The first two digits are significant figures inserted in fields 5 and 6, and the third digit inserted in field 7 indicates the number of zeros for rated voltage of 10VDC or more. R indicates the decimal point for rated voltage less than 10VDC (e.g. 4R0 = 4.0VDC; 400 = 40VDC; 401 = 400VDC).
Rule Exception: Coding for rated voltage 385VDC = 3J1.
- 2 Series Name.** Fields 2, 3 and 4.
Enter the 3-letter/digit series name in fields 2, 3 and 4. If the series name is only 2 letters/digits, place a dash in field 4. For a series name with more than 3 letters/digits, refer to the individual series for the appropriate 3-field series name.
- 1 Capacitor Type.** Field 1.
Aluminum Electrolytic Capacitor (Polar).

U92F Series

Standard Voltage Ratings - Snap Mount

Rated Voltage (WVDC)	Capacitance (µF)	Global Part Number†	Nominal Case Size* D × L (mm)	Case Size Code	Maximum ESR (Ω) at +25°C, 120Hz	Rated Ripple Current (A rms) at +85°C, 120Hz
350 Volts 400 Volts Surge	330	E92F351VSN331MR40U	30 × 40	R40	0.338	2.0
	470	E92F351VSN471MR50U	30 × 50	R50	0.237	2.6
	680	E92F351VSN681MR65U	30 × 65	R65	0.164	3.5
	560	E92F351VSN561MA40U	35 × 40	A40	0.192	3.2
	680	E92F351VSN681MA50U	35 × 50	A50	0.158	3.8
	1,000	E92F351VSN102MA65U	35 × 65	A65	0.107	5.0
	1,200	E92F351VND122MA80U	35 × 80	A80	0.090	5.9
	1,800	E92F351VND182MAA0U	35 × 100	AA0	0.060	8.0
	820	E92F351VND821MB50U	40 × 50	B50	0.126	4.5
	1,200	E92F351VND122MB65U	40 × 65	B65	0.086	5.9
	1,500	E92F351VND152MB80U	40 × 80	B80	0.069	7.1
	2,200	E92F351VND222MBA0U	40 × 100	BA0	0.047	9.4
	1,200	E92F351VNT122MU50U	45 × 50	U50	0.093	5.6
	1,500	E92F351VNT152MU65U	45 × 65	U65	0.074	6.8
	2,200	E92F351VNT222MU80U	45 × 80	U80	0.051	8.9
	2,700	E92F351VNT272MUA5U	45 × 105	UA5	0.041	10.9
	1,500	E92F351VNT152MC50U	50 × 50	C50	0.082	6.2
	2,200	E92F351VNT222MC65U	50 × 65	C65	0.056	8.1
2,700	E92F351VNT272MC80U	50 × 80	C80	0.046	9.8	
3,300	E92F351VNT332MCA5U	50 × 105	CA5	0.037	12.2	
385 Volts 435 Volts Surge	330	E92F3J1VSN331MR40U	30 × 40	R40	0.302	2.1
	390	E92F3J1VSN391MR50U	30 × 50	R50	0.255	2.5
	560	E92F3J1VSN561MR65U	30 × 65	R65	0.178	3.4
	470	E92F3J1VSN471MA40U	35 × 40	A40	0.195	3.1
	560	E92F3J1VSN561MA50U	35 × 50	A50	0.164	3.8
	820	E92F3J1VSN821MA65U	35 × 65	A65	0.112	4.9
	1,200	E92F3J1VND122MA80U	35 × 80	A80	0.076	6.4
	1,500	E92F3J1VND152MAA0U	35 × 100	AA0	0.061	7.9
	820	E92F3J1VND821MB50U	40 × 50	B50	0.121	4.6
	1,200	E92F3J1VND122MB65U	40 × 65	B65	0.083	6.0
	1,500	E92F3J1VND152MB80U	40 × 80	B80	0.066	7.3
	1,800	E92F3J1VND182MBA0U	40 × 100	BA0	0.055	8.7
	1,000	E92F3J1VNT102MU50U	45 × 50	U50	0.111	5.1
	1,500	E92F3J1VNT152MU65U	45 × 65	U65	0.074	6.8
	1,800	E92F3J1VNT182MU80U	45 × 80	U80	0.062	8.0
	2,200	E92F3J1VNT222MUA5U	45 × 105	UA5	0.051	9.9
	1,200	E92F3J1VNT122MC50U	50 × 50	C50	0.103	5.5
	1,800	E92F3J1VNT182MC65U	50 × 65	C65	0.069	7.3
2,200	E92F3J1VNT222MC80U	50 × 80	C80	0.056	8.8	
3,300	E92F3J1VNT332MCA5U	50 × 105	CA5	0.037	12.2	
400 Volts 450 Volts Surge	270	E92F401VSN271MR40U	30 × 40	R40	0.339	2.0
	390	E92F401VSN391MR50U	30 × 50	R50	0.235	2.6
	560	E92F401VSN561MR65U	30 × 65	R65	0.164	3.5
	390	E92F401VSN391MA40U	35 × 40	A40	0.225	2.9
	560	E92F401VSN561MA50U	35 × 50	A50	0.156	3.9
	820	E92F401VSN821MA65U	35 × 65	A65	0.107	5.0
	1,000	E92F401VND102MA80U	35 × 80	A80	0.088	5.9
	1,200	E92F401VND122MAA0U	35 × 100	AA0	0.073	7.2
	680	E92F401VND681MB50U	40 × 50	B50	0.141	4.3
	1,000	E92F401VND102MB65U	40 × 65	B65	0.096	5.6
	1,200	E92F401VND122MB80U	40 × 80	B80	0.080	6.6
	1,800	E92F401VND182MBA0U	40 × 100	BA0	0.053	8.8
	1,000	E92F401VNT102MU50U	45 × 50	U50	0.100	5.4
	1,200	E92F401VNT122MU65U	45 × 65	U65	0.083	6.4

† For construction and terminal options, refer to the part numbering system for descriptions and codes.

* Refer to diagram of dimensions for detailed case size specifications.

U92F Series

Standard Voltage Ratings - Snap Mount

Rated Voltage (WVDC)	Capacitance (µF)	Global Part Number†	Nominal Case Size* D × L (mm)	Case Size Code	Maximum ESR (Ω) at +25°C, 120Hz	Rated Ripple Current (A rms) at +85°C, 120Hz
400 Volts 450 Volts Surge	1,800	E92F401VNT182MU80U	45 × 80	U80	0.055	8.5
	2,200	E92F401VNT222MUA5U	45 × 105	UA5	0.045	10.4
	1,200	E92F401VNT122MC50U	50 × 50	C50	0.093	5.6
	1,800	E92F401VNT182MC65U	50 × 65	C65	0.062	7.7
	2,200	E92F401VNT222MC80U	50 × 80	C80	0.051	9.3
	2,700	E92F401VNT272MCA5U	50 × 105	CA5	0.041	11.6
420 Volts 470 Volts Surge	220	E92F421VSN221MR40U	30 × 40	R40	0.331	2.0
	330	E92F421VSN331MR50U	30 × 50	R50	0.241	2.6
	470	E92F421VSN471MR65U	30 × 65	R65	0.172	3.5
	390	E92F421VSN391MA40U	35 × 40	A40	0.213	3.0
	560	E92F421VSN561MA50U	35 × 50	A50	0.155	3.9
	680	E92F421VSN681MA65U	35 × 65	A65	0.110	5.0
	1,000	E92F421VND102MA80U	35 × 80	A80	0.086	6.0
	1,200	E92F421VND122MAA0U	35 × 100	AA0	0.066	7.6
	560	E92F421VND561MB50U	40 × 50	B50	0.131	4.4
	820	E92F421VND821MB65U	40 × 65	B65	0.094	5.7
	1,200	E92F421VND122MB80U	40 × 80	B80	0.073	6.9
	1,500	E92F421VND152MBA0U	40 × 100	BA0	0.057	8.6
	820	E92F421VNT821MU50U	45 × 50	U50	0.110	5.1
	1,200	E92F421VNT122MU65U	45 × 65	U65	0.079	6.6
	1,500	E92F421VNT152MU80U	45 × 80	U80	0.062	8.0
	1,800	E92F421VNT182MUA5U	45 × 105	UA5	0.045	10.5
	1,000	E92F421VNT102MC50U	50 × 50	C50	0.093	5.6
	1,500	E92F421VNT152MC65U	50 × 65	C65	0.067	7.4
1,800	E92F421VNT182MC80U	50 × 80	C80	0.052	9.1	
2,700	E92F421VNT272MCA5U	50 × 105	CA5	0.038	12.1	
450 Volts 500 Volts Surge	220	E92F451VSN221MR40U	30 × 40	R40	0.340	2.0
	330	E92F451VSN331MR50U	30 × 50	R50	0.248	2.6
	390	E92F451VSN391MR65U	30 × 65	R65	0.177	3.4
	390	E92F451VSN391MA40U	35 × 40	A40	0.249	2.8
	470	E92F451VSN471MA50U	35 × 50	A50	0.159	3.8
	680	E92F451VSN681MA65U	35 × 65	A65	0.113	4.9
	820	E92F451VND821MA80U	35 × 80	A80	0.088	5.9
	1,000	E92F451VND102MAA0U	35 × 100	AA0	0.068	7.5
	560	E92F451VND561MB50U	40 × 50	B50	0.135	4.4
	820	E92F451VND821MB65U	40 × 65	B65	0.097	5.6
	1,000	E92F451VND102MB80U	40 × 80	B80	0.075	6.8
	1,200	E92F451VND122MBA0U	40 × 100	BA0	0.058	8.4
	680	E92F451VNT681MU50U	45 × 50	U50	0.114	5.0
	1,000	E92F451VNT102MU65U	45 × 65	U65	0.081	6.5
	1,200	E92F451VNT122MU80U	45 × 80	U80	0.063	7.9
	1,800	E92F451VNT182MUA5U	45 × 105	UA5	0.046	10.3
	820	E92F451VNT821MC50U	50 × 50	C50	0.093	5.6
	1,200	E92F451VNT122MC65U	50 × 65	C65	0.066	7.4
1,500	E92F451VNT152MC80U	50 × 80	C80	0.052	9.2	
2,200	E92F451VNT222MCA5U	50 × 105	CA5	0.038	12.1	
500 Volts 550 Volts Surge	180	E92F501VSN181MR40T	30 × 40	R40	0.464	1.7
	220	E92F501VSN221MR50T	30 × 50	R50	0.380	2.1
	330	E92F501VSN331MR65T	30 × 65	R65	0.253	2.8
	270	E92F501VSN271MA40T	35 × 40	A40	0.295	2.6
	330	E92F501VSN331MA50T	35 × 50	A50	0.241	3.1
	470	E92F501VSN471MA65T	35 × 65	A65	0.169	4.0

† For construction and terminal options, refer to the part numbering system for descriptions and codes.

* Refer to diagram of dimensions for detailed case size specifications.

U92F Series

Standard Voltage Ratings - Snap Mount

Rated Voltage (WVDC)	Capacitance (µF)	Global Part Number†	Nominal Case Size* D × L (mm)	Case Size Code	Maximum ESR (Ω) at +25°C, 120Hz	Rated Ripple Current (A rms) at +85°C, 120Hz
500 Volts 550 Volts Surge	560	E92F501VND561MA80U	35 × 80	A80	0.142	4.7
	820	E92F501VND821MAA0U	35 × 100	AA0	0.097	6.2
	470	E92F501VND471MB50U	40 × 50	B50	0.178	3.8
	680	E92F501VND681MB65U	40 × 65	B65	0.123	5.0
	820	E92F501VND821MB80U	40 × 80	B80	0.102	5.8
	1,200	E92F501VND122MBA0U	40 × 100	BA0	0.070	7.7
	560	E92F501VNT561MU50U	45 × 50	U50	0.164	4.2
	820	E92F501VNT821MU65U	45 × 65	U65	0.112	5.5
	1,200	E92F501VNT122MU80U	45 × 80	U80	0.076	7.2
	1,500	E92F501VNT152MUA5U	45 × 105	UA5	0.061	9.0
	820	E92F501VNT821MC50U	50 × 50	C50	0.121	4.9
	1,200	E92F501VNT122MC65U	50 × 65	C65	0.083	6.6
	1,500	E92F501VNT152MC80U	50 × 80	C80	0.066	8.1
	1,800	E92F501VNT182MCA5U	50 × 105	CA5	0.055	10.0

† For construction and terminal options, refer to the part numbering system for descriptions and codes.

* Refer to diagram of dimensions for detailed case size specifications.