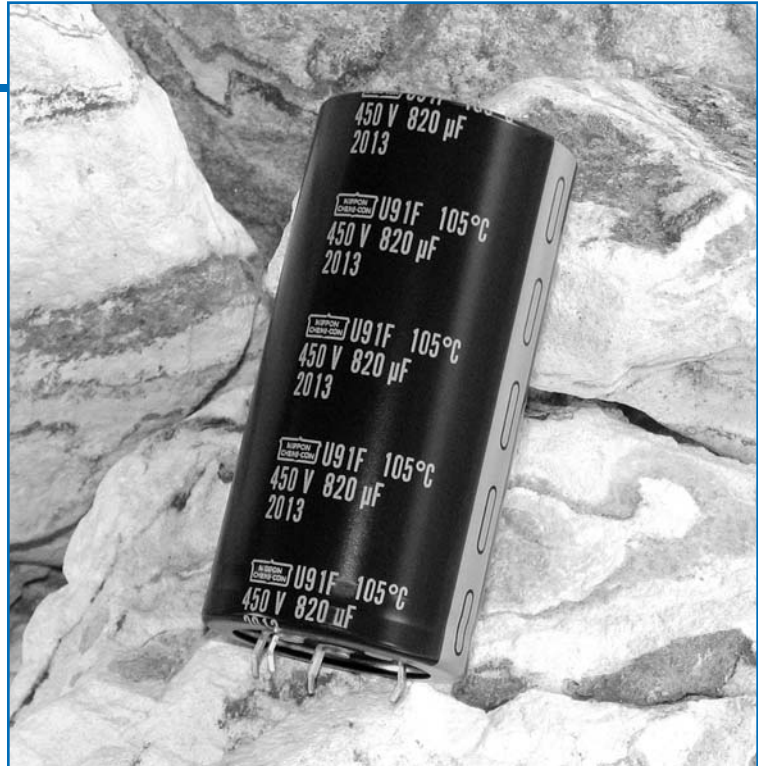


U91F Series



- Snap Mount
- Specific Design For Higher Ripple Current
- 350 to 500VDC Voltage Range
- RoHS Compliant
- +105°C Maximum Temperature
- 5,000 Hours Lifetime at +105°C



The U91F series is a high temperature snap-in series specifically designed for higher ripple current capability. The U91F capacitors have an endurance rating of 5,000 hours at +105°C with the rated ripple current applied. All the U91F 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 the 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: 120 to 2,700µF.
- Voltage range: 350 to 500VDC.
- Category temperature range: -40°C to +105°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 +105°C with the rated ripple current applied.

U91F Series

U91F Specifications - Snap Mount

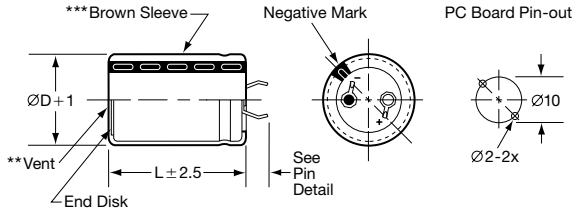
Item	Characteristics																											
Category Temperature Range	- 40 to +105°C																											
Rated Voltage Range	350 to 500VDC																											
Capacitance Range	120 to 2,700 μ F at +25°C, 120Hz																											
Capacitance Tolerance	\pm 20% (M) at +25°C, 120Hz																											
Leakage Current	$I = 3\sqrt{CV}$ (μ A) or 3mA, whichever is smaller, after 5 minutes at +25°C. Where I = Max. leakage current (μ A), C = Nominal capacitance (μ F) 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>+65°C</td> <td>+85°C</td> <td>+105°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>	+65°C	+85°C	+105°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
+65°C	+85°C	+105°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 +105°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: $\leq \pm 20\%$ of initial measured value Tan δ (DF) : $\leq 200\%$ of initial specified value Leakage current : \leq 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 +105°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: $\leq \pm 20\%$ of initial measured value Tan δ (DF) : $\leq 150\%$ of initial specified value Leakage current : \leq 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.																											

U91F Series

Diagram of Dimensions - Snap Mount

Snap Mount

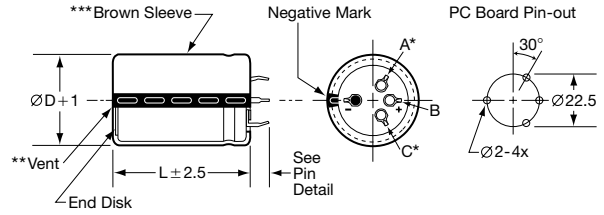
VSN Snap-in $\varnothing 30$ and $\varnothing 35$ standard
VNN Snap-in $\varnothing 30$ and $\varnothing 35$ optional



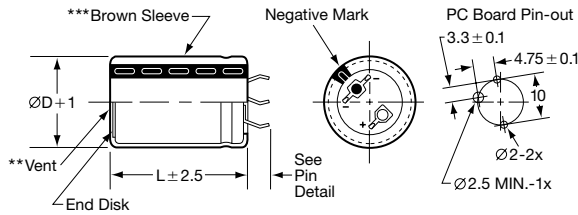
Snap Mount

Unit: mm

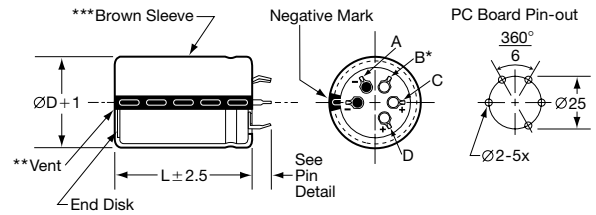
VND Snap-in $\varnothing 35$ and $\varnothing 40$ standard; $\varnothing 45$ optional
VSD Snap-in $\varnothing 35$ and $\varnothing 40$ optional



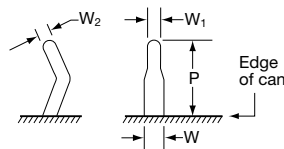
VEN Snap-in $\varnothing 30$ and $\varnothing 35$ optional



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



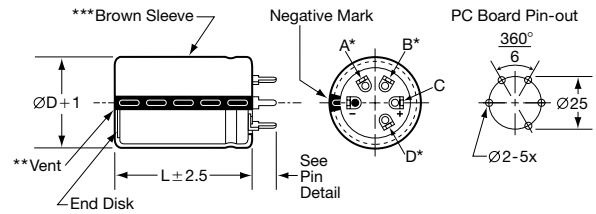
VS, VE & VN Snap-in Pin Dimensions



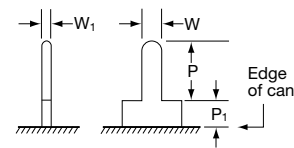
Type	P	W	W ₁	W ₂
VSN $\varnothing 30$	4.0 ± 0.5	1.5 ± 0.2	0.8 ± 0.1	0.8 ± 0.1
VSN $\varnothing 35$	3.5 ± 0.5			
VNN $\varnothing 30-\varnothing 35$	5.8 ± 1.0			
VEN $\varnothing 30-\varnothing 35$	4.0 ± 0.5			
VSD $\varnothing 35-\varnothing 40$	3.5 ± 1.0			
VND $\varnothing 35-\varnothing 45$	5.8 ±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

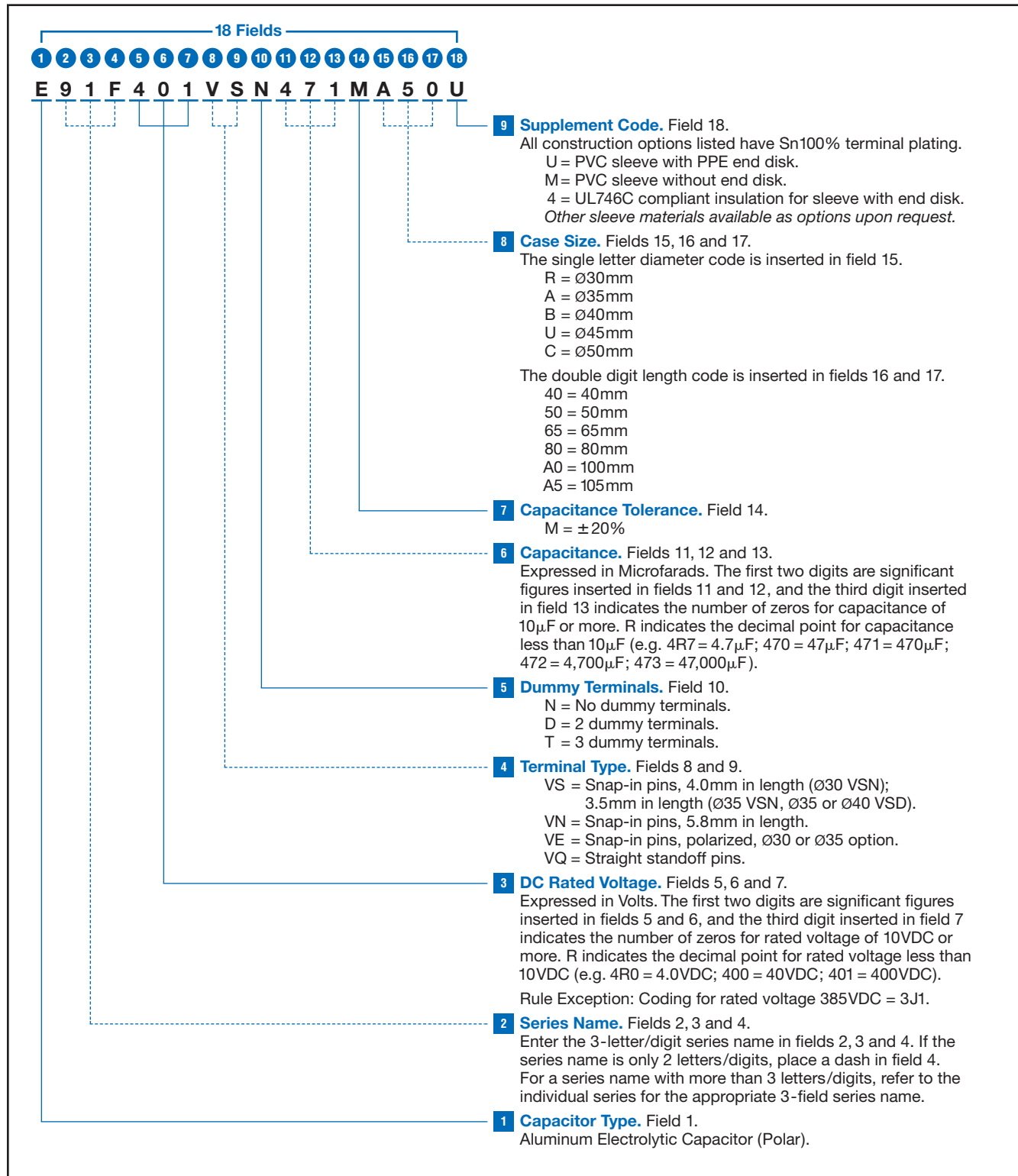
* Use the blank terminals for mechanical support only. The blank terminals must not be connected to a solder trace on the PC board but be electrically isolated from the negative and positive terminals.

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

*** The brown 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.

U91F Series

Part Numbering System for U91F Series When ordering, always specify complete 18-field global part number.



U91F 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 +105°C, 120Hz
350 Volts 400 Volts Surge	270	E91F351VSN271MR40U	30 × 40	R40	0.324	1.5
	390	E91F351VSN391MR50U	30 × 50	R50	0.225	2.0
	560	E91F351VSN561MR65U	30 × 65	R65	0.156	2.6
	390	E91F351VSN391MA40U	35 × 40	A40	0.235	2.0
	560	E91F351VSN561MA50U	35 × 50	A50	0.164	2.7
	820	E91F351VSN821MA65U	35 × 65	A65	0.112	3.5
	1,000	E91F351VND102MA80U	35 × 80	A80	0.092	4.1
	1,200	E91F351VND122MAA0U	35 × 100	AA0	0.076	5.0
	820	E91F351VND821MB50U	40 × 50	B50	0.121	3.3
	1,200	E91F351VND122MB65U	40 × 65	B65	0.083	4.3
	1,500	E91F351VND152MB80U	40 × 80	B80	0.066	5.1
	1,800	E91F351VND182MBA0U	40 × 100	BA0	0.055	6.1
	820	E91F351VNT821MU50U	45 × 50	U50	0.131	3.3
	1,200	E91F351VNT122MU65U	45 × 65	U65	0.090	4.4
	1,800	E91F351VNT182MU80U	45 × 80	U80	0.060	5.8
	2,200	E91F351VNT222MUA5U	45 × 105	UA5	0.049	7.1
	1,200	E91F351VNT122MC50U	50 × 50	C50	0.092	4.1
	1,800	E91F351VNT182MC65U	50 × 65	C65	0.066	5.2
2,200	E91F351VNT222MC80U	50 × 80	C80	0.054	6.3	
2,700	E91F351VNT272MCA5U	50 × 105	CA5	0.044	7.9	
385 Volts 435 Volts Surge	220	E91F3J1VSN221MR40U	30 × 40	R40	0.336	1.5
	330	E91F3J1VSN331MR50U	30 × 50	R50	0.245	1.9
	470	E91F3J1VSN471MR65U	30 × 65	R65	0.174	2.5
	330	E91F3J1VSN331MA40U	35 × 40	A40	0.237	2.0
	470	E91F3J1VSN471MA50U	35 × 50	A50	0.173	2.6
	680	E91F3J1VSN681MA65U	35 × 65	A65	0.123	3.3
	1,000	E91F3J1VND102MA80U	35 × 80	A80	0.095	4.0
	1,200	E91F3J1VND122MAA0U	35 × 100	AA0	0.073	5.1
	680	E91F3J1VND681MB50U	40 × 50	B50	0.135	3.1
	1,000	E91F3J1VND102MB65U	40 × 65	B65	0.096	4.0
	1,200	E91F3J1VND122MB80U	40 × 80	B80	0.075	4.8
	1,500	E91F3J1VND152MBA0U	40 × 100	BA0	0.058	6.0
	820	E91F3J1VNT821MU50U	45 × 50	U50	0.118	3.5
	1,200	E91F3J1VNT122MU65U	45 × 65	U65	0.084	4.5
	1,500	E91F3J1VNT152MU80U	45 × 80	U80	0.065	5.5
	1,800	E91F3J1VNT182MUA5U	45 × 105	UA5	0.047	7.2
	1,000	E91F3J1VNT102MC50U	50 × 50	C50	0.094	4.1
	1,500	E91F3J1VNT152MC65U	50 × 65	C65	0.073	5.0
1,800	E91F3J1VNT182MC80U	50 × 80	C80	0.056	6.2	
2,700	E91F3J1VNT272MCA5U	50 × 105	CA5	0.041	8.2	
400 Volts 450 Volts Surge	220	E91F401VSN221MR40U	30 × 40	R40	0.380	1.4
	330	E91F401VSN331MR50U	30 × 50	R50	0.253	1.8
	390	E91F401VSN391MR65U	30 × 65	R65	0.214	2.2
	330	E91F401VSN331MA40U	35 × 40	A40	0.265	1.9
	470	E91F401VSN471MA50U	35 × 50	A50	0.186	2.5
	680	E91F401VSN681MA65U	35 × 65	A65	0.129	3.2
	820	E91F401VND821MA80U	35 × 80	A80	0.107	3.8
	1,000	E91F401VND102MAA0U	35 × 100	AA0	0.088	4.7
	560	E91F401VND561MB50U	40 × 50	B50	0.164	2.8
	820	E91F401VND821MB65U	40 × 65	B65	0.112	3.7
	1,200	E91F401VND122MB80U	40 × 80	B80	0.076	4.8
	1,500	E91F401VND152MBA0U	40 × 100	BA0	0.061	5.8
	680	E91F401VNT681MU50U	45 × 50	U50	0.146	3.1
	1,000	E91F401VNT102MU65U	45 × 65	U65	0.100	4.1

†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.

U91F 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 +105°C, 120Hz
400 Volts 450 Volts Surge	1,200	E91F401VNT122MU80U	45 × 80	U80	0.083	4.9
	1,800	E91F401VNT182MUA5U	45 × 105	UA5	0.055	6.7
	1,000	E91F401VNT102MC50U	50 × 50	C50	0.101	3.9
	1,200	E91F401VNT122MC65U	50 × 65	C65	0.093	4.4
	1,800	E91F401VNT182MC80U	50 × 80	C80	0.062	5.9
	2,200	E91F401VNT222MCA5U	50 × 105	CA5	0.051	7.4
420 Volts 470 Volts Surge	180	E91F421VSN181MR40U	30 × 40	R40	0.442	1.3
	270	E91F421VSN271MR50U	30 × 50	R50	0.295	1.7
	390	E91F421VSN391MR65U	30 × 65	R65	0.204	2.3
	270	E91F421VSN271MA40U	35 × 40	A40	0.310	1.8
	390	E91F421VSN391MA50U	35 × 50	A50	0.214	2.3
	560	E91F421VSN561MA65U	35 × 65	A65	0.149	3.0
	680	E91F421VND681MA80U	35 × 80	A80	0.123	3.5
	820	E91F421VND821MAA0U	35 × 100	AA0	0.102	4.3
	560	E91F421VND561MB50U	40 × 50	B50	0.156	2.9
	820	E91F421VND821MB65U	40 × 65	B65	0.107	3.8
	1,000	E91F421VND102MB80U	40 × 80	B80	0.088	4.5
	1,200	E91F421VND122MBA0U	40 × 100	BA0	0.073	5.3
	680	E91F421VNT681MU50U	45 × 50	U50	0.141	3.2
	1,000	E91F421VNT102MU65U	45 × 65	U65	0.096	4.2
	1,200	E91F421VNT122MU80U	45 × 80	U80	0.080	5.0
	1,700	E91F421VNT172MUA5U	45 × 105	UA5	0.056	6.6
	820	E91F421VNT821MC50U	50 × 50	C50	0.126	3.5
	1,200	E91F421VNT122MC65U	50 × 65	C65	0.086	4.6
1,500	E91F421VNT152MC80U	50 × 80	C80	0.069	5.6	
2,200	E91F421VNT222MCA5U	50 × 105	CA5	0.047	7.7	
450 Volts 500 Volts Surge	180	E91F451VSN181MR40U	30 × 40	R40	0.442	1.3
	220	E91F451VSN221MR50U	30 × 50	R50	0.362	1.5
	330	E91F451VSN331MR65U	30 × 65	R65	0.241	2.1
	270	E91F451VSN271MA40U	35 × 40	A40	0.310	1.8
	390	E91F451VSN391MA50U	35 × 50	A50	0.214	2.3
	470	E91F451VSN471MA65U	35 × 65	A65	0.178	2.8
	680	E91F451VND681MA80U	35 × 80	A80	0.123	3.5
	820	E91F451VND821MAA0U	35 × 100	AA0	0.102	4.3
	470	E91F451VND471MB50U	40 × 50	B50	0.178	2.7
	680	E91F451VND681MB65U	40 × 65	B65	0.123	3.5
	820	E91F451VND821MB80U	40 × 80	B80	0.102	4.1
	1,200	E91F451VND122MBA0U	40 × 100	BA0	0.070	5.5
	680	E91F451VNT681MU50U	45 × 50	U50	0.135	3.3
	820	E91F451VNT821MU65U	45 × 65	U65	0.112	3.9
	1,000	E91F451VNT102MU80U	45 × 80	U80	0.092	4.7
	1,500	E91F451VNT152MUA5U	45 × 105	UA5	0.061	6.4
	820	E91F451VNT821MC50U	50 × 50	C50	0.121	3.6
	1,000	E91F451VNT102MC65U	50 × 65	C65	0.100	4.3
1,500	E91F451VNT152MC80U	50 × 80	C80	0.066	5.7	
1,800	E91F451VNT182MCA5U	50 × 105	CA5	0.055	7.1	
500 Volts 550 Volts Surge	120	E91F501VSN121MR40U	30 × 40	R40	0.663	1.0
	180	E91F501VSN181MR50U	30 × 50	R50	0.442	1.4
	270	E91F501VSN271MR65U	30 × 65	R65	0.295	1.9
	180	E91F501VSN181MA40U	35 × 40	A40	0.442	1.5
	270	E91F501VSN271MA50U	35 × 50	A50	0.295	2.0
	390	E91F501VSN391MA65U	35 × 65	A65	0.204	2.6

† 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.

U91F 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 +105°C, 120Hz
500 Volts 550 Volts Surge	470	E91F501VND471MA80U	35 × 80	A80	0.169	3.0
	560	E91F501VND561MAA0U	35 × 100	AA0	0.142	3.7
	330	E91F501VND331MB50U	40 × 50	B50	0.253	2.3
	470	E91F501VND471MB65U	40 × 65	B65	0.178	2.9
	680	E91F501VND681MB80U	40 × 80	B80	0.123	3.8
	820	E91F501VND821MBA0U	40 × 100	BA0	0.102	4.5
	390	E91F501VNT391MU50U	45 × 50	U50	0.225	2.5
	560	E91F501VNT561MU65U	45 × 65	U65	0.156	3.3
	820	E91F501VNT821MU80U	45 × 80	U80	0.107	4.3
	1,000	E91F501VNT102MUA5U	45 × 105	UA5	0.088	5.3
	560	E91F501VNT561MC50U	50 × 50	C50	0.164	3.1
	820	E91F501VNT821MC65U	50 × 65	C65	0.112	4.0
	1,000	E91F501VNT102MC80U	50 × 80	C80	0.092	4.9
	1,200	E91F501VNT122MCA5U	50 × 105	CA5	0.076	6.0

†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.