

# U92L Series



- Snap Mount
- Specific Design For Higher Ripple Current
- 350 to 500VDC Voltage Range
- RoHS Compliant
- +85°C Maximum Temperature
- 10,000 Hours Lifetime at +85°C



The U92L series is a longer life series specifically designed for higher ripple current capability. The U92L capacitors have an endurance rating of 10,000 hours at +85°C with the rated ripple current applied. All U92L series capacitors are RoHS compliant and available in a variety of sizes, with or without an end disk, and encased in a PET sleeve or standard Pb-free PVC sleeve. 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: 150 to 3,300µF.
- Voltage range: 350 to 500VDC.
- Category temperature range: -25°C to +85°C.
- Leakage current:  $3\sqrt{CV}$  (µA) or 3mA, whichever is smaller, after 5 minutes at +20°C.
- Standard capacitance tolerance: ±20%
- Nominal case size (D × L): 30 × 40mm to 50 × 105mm.
- Rated lifetime: 10,000 hours at +85°C with the rated ripple current applied.

## U92L Specifications - Snap Mount

Item	Characteristics																											
Category Temperature Range	-25 to +85°C																											
Rated Voltage Range	350 to 500VDC																											
Capacitance Range	150 to 3,300μF																											
Capacitance Tolerance	±20% (M) at +20°C, 120Hz																											
Leakage Current	$I = 3\sqrt{CV}$ (μA) or 3mA, whichever is smaller, after 5 minutes at +20°C. Where I = Max. leakage current (μA), C = Nominal capacitance (μF) and V = Rated voltage (V)																											
Dissipation Factor (Tan δ)	At +20°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 -25°C value and +20°C value shall not exceed the values given below. <table border="1"> <tr> <td>Rated Voltage (V)</td> <td>350-500</td> </tr> <tr> <td>Z(-25°C)/Z(+20°C)</td> <td>8</td> </tr> </table>	Rated Voltage (V)	350-500	Z(-25°C)/Z(+20°C)	8																							
Rated Voltage (V)	350-500																											
Z(-25°C)/Z(+20°C)	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 +20°C after subjecting them to DC voltage for 10,000 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 +20°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																											

Product specifications are subject to change without notice.

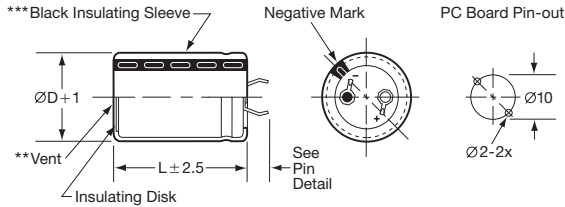
Ask for UCC product bulletins and review specifications before purchase and/or use. Please use our products based on parameters specified in our bulletins.

## Diagram of Dimensions - Snap Mount

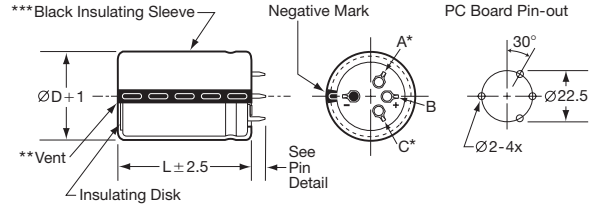
### Snap Mount

Unit: mm

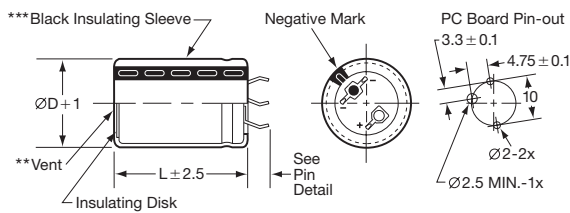
#### VSN Snap-in $\varnothing 30$ and $\varnothing 35$ standard VNN Snap-in $\varnothing 30$ and $\varnothing 35$ optional



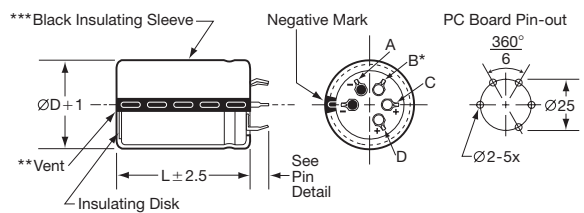
#### VND Snap-in $\varnothing 35$ and $\varnothing 40$ standard; $\varnothing 45$ optional VSD Snap-in $\varnothing 35$ and $\varnothing 40$ optional



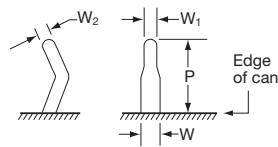
#### VEN Snap-in $\varnothing 30$ and $\varnothing 35$ optional



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



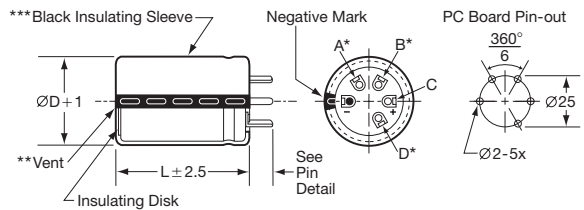
#### VS, VE & VN Snap-in Pin Dimensions



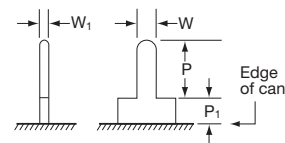
Type	P	W	W <sub>1</sub>	W <sub>2</sub>
VSN $\varnothing 30$	$4.0 \pm 0.5$	$1.5 \pm 0.2$	$0.8 \pm 0.1$	$0.8 \pm 0.1$
VSN $\varnothing 35$	$3.5 \pm 0.5$			
VNN $\varnothing 30 - \varnothing 35$	$5.8 \pm 1.0$			
VEN $\varnothing 30 - \varnothing 35$	$4.0 \pm 0.5$			
VSD $\varnothing 35 - \varnothing 40$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

### Straight Pin Mount

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



#### VQ Standoff Pin Dimensions



Type	P	P <sub>1</sub>	W	W <sub>1</sub>
Standoff Pin (VQ)	$3.75 \pm 1.0$	2.0 max.	$1.5 \pm 0.1$	$0.7 \pm 0.2$

#### 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.

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## Part Numbering System for U92L Series

When ordering, always specify complete 18-field global part number.

**18 Fields**

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

**E 9 2 L 4 5 1 V S N 4 7 1 M A 5 0 T**

- Capacitor Type.** Field 1.  
Aluminum Electrolytic Capacitor (Polar).
- 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.
- 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. 4R5 = 4.5VDC; 450 = 45VDC; 451 = 450VDC).  
Rule Exception: Coding for rated voltage 385VDC = 3J1.
- Terminal Type.** Fields 8 and 9.  
VS = Snap-in pins, 4.0mm in length (Ø30 VSN);  
3.5mm in length (Ø35 VSN, Ø35 or Ø40 VSD).  
VN = Snap-in pins, 5.8mm in length.  
VE = Snap-in pins, polarized, Ø30 or Ø35 option.  
VQ = Straight standoff pins.
- Dummy Terminals.** Field 10.  
N = No dummy terminals.  
D = 2 dummy terminals.  
T = 3 dummy terminals.
- 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 10µF or more. R indicates the decimal point for capacitance less than 10µF (e.g. 4R7 = 4.7µF; 470 = 47µF; 471 = 470µF; 472 = 4,700µF; 473 = 47,000µF).
- Capacitance Tolerance.** Field 14.  
M = ±20%
- Case Size.** Fields 15, 16 and 17.  
The single letter diameter code is inserted in field 15.  
R = Ø30mm  
A = Ø35mm  
B = Ø40mm  
U = Ø45mm  
C = Ø50mm  
The double digit length code is inserted in fields 16 and 17.  
40 = 40mm  
50 = 50mm  
65 = 65mm  
80 = 80mm  
A0 = 100mm  
A5 = 105mm
- Supplement Code.** Field 18.  
All construction options listed have Sn100% terminal plating.  
T = Pb-free PVC sleeve with end disk.  
M = Pb-free PVC sleeve without end disk.  
W = PET sleeve with end disk.  
S = PET sleeve without end disk.

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## 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 +20°C, 120Hz	Rated Ripple Current (A rms) at +85°C, 120Hz
<b>350 Volts 400 Volts Surge</b>	330	E92L351VSN331MR40T	30 × 40	R40	0.314	2.1
	470	E92L351VSN471MR50T	30 × 50	R50	0.220	2.7
	680	E92L351VSN681MR65T	30 × 65	R65	0.152	3.7
	470	E92L351VSN471MA40T	35 × 40	A40	0.212	3.0
	680	E92L351VSN681MA50T	35 × 50	A50	0.146	4.0
	1,000	E92L351VND102MA65T	35 × 65	A65	0.100	5.2
	1,200	E92L351VND122MA80T	35 × 80	A80	0.083	6.1
	1,500	E92L351VND152MAA0T	35 × 100	AA0	0.066	7.6
	820	E92L351VND821MB50T	40 × 50	B50	0.126	4.5
	1,200	E92L351VND122MB65T	40 × 65	B65	0.086	5.9
	1,500	E92L351VND152MB80T	40 × 80	B80	0.069	7.1
	2,200	E92L351VND222MBA0T	40 × 100	BA0	0.047	9.4
	1,200	E92L351VNT122MU50T	45 × 50	U50	0.096	5.5
	1,500	E92L351VNT152MU65T	45 × 65	U65	0.077	6.7
	2,200	E92L351VNT222MU80T	45 × 80	U80	0.052	8.7
	2,700	E92L351VNT272MUA5T	45 × 105	UA5	0.043	10.7
	1,500	E92L351VNT152MC50T	50 × 50	C50	0.088	5.8
	2,200	E92L351VNT222MC65T	50 × 65	C65	0.060	7.8
2,700	E92L351VNT272MC80T	50 × 80	C80	0.049	9.5	
3,300	E92L351VNT332MCA5T	50 × 105	CA5	0.040	11.8	
<b>385 Volts 435 Volts Surge</b>	270	E92L3J1VSN271MR40T	30 × 40	R40	0.369	1.9
	390	E92L3J1VSN391MR50T	30 × 50	R50	0.255	2.5
	560	E92L3J1VSN561MR65T	30 × 65	R65	0.178	3.4
	470	E92L3J1VSN471MA40T	35 × 40	A40	0.203	3.1
	560	E92L3J1VSN561MA50T	35 × 50	A50	0.171	3.7
	820	E92L3J1VND821MA65T	35 × 65	A65	0.117	4.8
	1,200	E92L3J1VND122MA80T	35 × 80	A80	0.080	6.2
	1,500	E92L3J1VND152MAA0T	35 × 100	AA0	0.064	7.7
	820	E92L3J1VND821MB50T	40 × 50	B50	0.121	4.6
	1,200	E92L3J1VND122MB65T	40 × 65	B65	0.083	6.0
	1,500	E92L3J1VND152MB80T	40 × 80	B80	0.066	7.3
	1,800	E92L3J1VND182MBA0T	40 × 100	BA0	0.055	8.7
	1,000	E92L3J1VNT102MU50T	45 × 50	U50	0.107	5.2
	1,200	E92L3J1VNT122MU65T	45 × 65	U65	0.090	6.2
	1,800	E92L3J1VNT182MU80T	45 × 80	U80	0.060	8.2
	2,200	E92L3J1VNT222MUA5T	45 × 105	UA5	0.049	10.0
	1,200	E92L3J1VNT122MC50T	50 × 50	C50	0.103	5.5
	1,800	E92L3J1VNT182MC65T	50 × 65	C65	0.069	7.3
2,200	E92L3J1VNT222MC80T	50 × 80	C80	0.056	8.8	
2,700	E92L3J1VNT272MCA5T	50 × 105	CA5	0.046	11.0	
<b>400 Volts 450 Volts Surge</b>	270	E92L401VSN271MR40T	30 × 40	R40	0.354	1.9
	390	E92L401VSN391MR50T	30 × 50	R50	0.245	2.6
	560	E92L401VSN561MR65T	30 × 65	R65	0.171	3.5
	390	E92L401VSN391MA40T	35 × 40	A40	0.235	2.9
	560	E92L401VSN561MA50T	35 × 50	A50	0.164	3.8
	820	E92L401VND821MA65T	35 × 65	A65	0.112	4.9
	1,000	E92L401VND102MA80T	35 × 80	A80	0.092	5.8
	1,200	E92L401VND122MAA0T	35 × 100	AA0	0.076	7.0
	680	E92L401VND681MB50T	40 × 50	B50	0.146	4.2
	1,000	E92L401VND102MB65T	40 × 65	B65	0.100	5.5
	1,200	E92L401VND122MB80T	40 × 80	B80	0.083	6.5
	1,800	E92L401VND182MBA0T	40 × 100	BA0	0.055	8.7
	1,000	E92L401VNT102MU50T	45 × 50	U50	0.107	5.2
	1,200	E92L401VNT122MU65T	45 × 65	U65	0.090	6.2

†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.

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## 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 +20°C, 120Hz	Rated Ripple Current (A rms) at +85°C, 120Hz
400 Volts 450 Volts Surge	1,500	E92L401VNT152MU80T	45 × 80	U80	0.072	7.5
	2,200	E92L401VNT222MUA5T	45 × 105	UA5	0.049	10.0
	1,200	E92L401VNT122MC50T	50 × 50	C50	0.100	5.4
	1,500	E92L401VNT152MC65T	50 × 65	C65	0.080	6.8
	2,200	E92L401VNT222MC80T	50 × 80	C80	0.054	9.0
	2,700	E92L401VNT272MCA5T	50 × 105	CA5	0.044	11.2
420 Volts 470 Volts Surge	220	E92L421VSN221MR40T	30 × 40	R40	0.408	1.8
	330	E92L421VSN331MR50T	30 × 50	R50	0.298	2.3
	470	E92L421VSN471MR65T	30 × 65	R65	0.212	3.1
	390	E92L421VSN391MA40T	35 × 40	A40	0.264	2.7
	560	E92L421VSN561MA50T	35 × 50	A50	0.193	3.5
	680	E92L421VND681MA65T	35 × 65	A65	0.137	4.4
	820	E92L421VND821MA80T	35 × 80	A80	0.106	5.4
	1,200	E92L421VND122MAA0T	35 × 100	AA0	0.082	6.8
	680	E92L421VND681MB50T	40 × 50	B50	0.150	4.2
	820	E92L421VND821MB65T	40 × 65	B65	0.107	5.3
	1,200	E92L421VND122MB80T	40 × 80	B80	0.084	6.5
	1,500	E92L421VND152MBA0T	40 × 100	BA0	0.065	8.0
	820	E92L421VNT821MU50T	45 × 50	U50	0.130	4.7
	1,200	E92L421VNT122MU65T	45 × 65	U65	0.093	6.1
	1,500	E92L421VNT152MU80T	45 × 80	U80	0.073	7.4
	1,800	E92L421VNT182MUA5T	45 × 105	UA5	0.053	9.6
	1,000	E92L421VNT102MC50T	50 × 50	C50	0.113	5.1
	1,500	E92L421VNT152MC65T	50 × 65	C65	0.081	6.7
1,800	E92L421VNT182MC80T	50 × 80	C80	0.063	8.3	
2,200	E92L421VNT222MCA5T	50 × 105	CA5	0.046	10.9	
450 Volts 500 Volts Surge	220	E92L451VSN221MR40T	30 × 40	R40	0.428	1.8
	330	E92L451VSN331MR50T	30 × 50	R50	0.312	2.3
	390	E92L451VSN391MR65T	30 × 65	R65	0.222	3.0
	330	E92L451VSN331MA40T	35 × 40	A40	0.318	2.5
	470	E92L451VSN471MA50T	35 × 50	A50	0.202	3.4
	680	E92L451VND681MA65T	35 × 65	A65	0.143	4.3
	820	E92L451VND821MA80T	35 × 80	A80	0.111	5.3
	1,000	E92L451VND102MAA0T	35 × 100	AA0	0.086	6.6
	560	E92L451VND561MB50T	40 × 50	B50	0.170	3.9
	820	E92L451VND821MB65T	40 × 65	B65	0.122	5.0
	1,000	E92L451VND102MB80T	40 × 80	B80	0.095	6.1
	1,200	E92L451VND122MBA0T	40 × 100	BA0	0.073	7.5
	680	E92L451VNT681MU50T	45 × 50	U50	0.142	4.5
	1,000	E92L451VNT102MU65T	45 × 65	U65	0.102	5.8
	1,200	E92L451VNT122MU80T	45 × 80	U80	0.079	7.1
	1,800	E92L451VNT182MUA5T	45 × 105	UA5	0.058	9.2
	820	E92L451VNT821MC50T	50 × 50	C50	0.120	5.0
	1,200	E92L451VNT122MC65T	50 × 65	C65	0.086	6.5
1,500	E92L451VNT152MC80T	50 × 80	C80	0.067	8.1	
2,200	E92L451VNT222MCA5T	50 × 105	CA5	0.049	10.6	
500 Volts 550 Volts Surge	150	E92L501VSN151MR40T	30 × 40	R40	0.557	1.6
	220	E92L501VSN221MR50T	30 × 50	R50	0.380	2.1
	270	E92L501VSN271MR65T	30 × 65	R65	0.310	2.6
	220	E92L501VSN221MA40T	35 × 40	A40	0.380	2.3
	330	E92L501VSN331MA50T	35 × 50	A50	0.253	3.0
	390	E92L501VND391MA65T	35 × 65	A65	0.214	3.6

†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.

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Rated Voltage (WVDC)	Capacitance (µF)	Global Part Number†	Nominal Case Size* D × L (mm)	Case Size Code	Maximum ESR (Ω) at +20°C, 120Hz	Rated Ripple Current (A rms) at +85°C, 120Hz
<b>500 Volts 550 Volts Surge</b>	560	E92L501VND561MA80T	35 × 80	A80	0.149	4.6
	680	E92L501VND681MAA0T	35 × 100	AA0	0.123	5.6
	390	E92L501VND391MB50T	40 × 50	B50	0.225	3.4
	560	E92L501VND561MB65T	40 × 65	B65	0.156	4.4
	680	E92L501VND681MB80T	40 × 80	B80	0.129	5.2
	1,000	E92L501VND102MBA0T	40 × 100	BA0	0.088	6.9
	560	E92L501VNT561MU50T	45 × 50	U50	0.164	4.2
	820	E92L501VNT821MU65T	45 × 65	U65	0.112	5.5
	1,000	E92L501VNT102MU80T	45 × 80	U80	0.092	6.6
	1,500	E92L501VNT152MUA5T	45 × 105	UA5	0.061	9.0
	680	E92L501VNT681MC50T	50 × 50	C50	0.146	4.5
	1,000	E92L501VNT102MC65T	50 × 65	C65	0.100	6.1
	1,200	E92L501VNT122MC80T	50 × 80	C80	0.083	7.2
	1,800	E92L501VNT182MCA5T	50 × 105	CA5	0.055	10.0

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