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U91D Series

NEW

UNITED CHEMI-CON

- Snap Mount
- Specific Design For Higher Ripple Current
- 25 to 550VDC Voltage Range
- RoHS Compliant
- +105°C Maximum Temperature
- 2,000 Hours Lifetime at +105°C

The U91D series is a high temperature snap-in series specifically designed for higher ripple current capability. The U91D capacitors have an endurance rating of 2,000 hours at +105°C with the rated ripple current applied. All the U91D 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: 220 to 120,000μF.**
- **Voltage range: 25 to 550VDC.**
- **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): 35×50mm to 50×105mm.**
- **Rated lifetime: 2,000 hours at +105°C with the rated ripple current applied.**

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U91D Series

U91D Specifications - Snap Mount

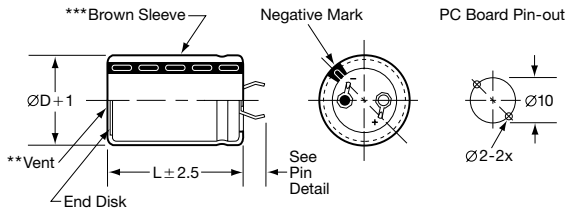
Category Temperature Range	−40 to +105°C
Rated Voltage Range	25 to 550VDC
Capacitance Range	220 to 120,000μF at +25°C, 120Hz
Capacitance Tolerance	±20% (M) at +25°C, 120Hz
Leakage Current	I = $3\sqrt{CV}$ (μA) or 3mA, whichever is smaller, after 5 minutes at +25°C. Where I = Max. leakage current (μA), C = Nominal capacitance (μF) and V = Rated voltage (V)
Dissipation Factor (Tan δ)	At +25°C, 120Hz Rated Voltage (V): 25-400 | 450-550 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. Rated Voltage (V): 25 | 50 | 100 | 200-400 | 450-550 Z(−40°C)/Z(+25°C): 10 | 6 | 5 | 4 | 8
Rated Ripple Current Multipliers	Ambient Temperature (°C) +65°C: 2.82 | +85°C: 1.73 | +105°C: 1.00 Frequency (Hz) DC Rated Voltage: 50Hz: 120Hz: 300Hz: 1kHz: 10kHz: 100kHz 25-50V: 0.95: 1.00: 1.03: 1.05: 1.08: 1.08 100-300V: 0.81: 1.00: 1.17: 1.32: 1.45: 1.50 350-450V: 0.77: 1.00: 1.16: 1.30: 1.41: 1.43 500-550V: 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 2,000 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: ≤ ±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 +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: ≤ ±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.

U91D Series

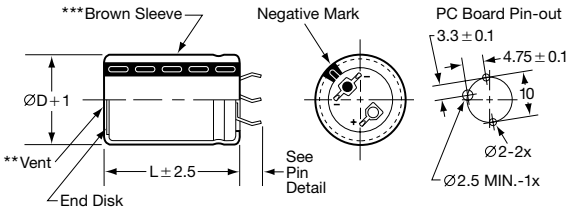
Diagram of Dimensions - Snap Mount

Snap Mount

VSN Snap-in Ø35 standard
VNN Snap-in Ø35 optional



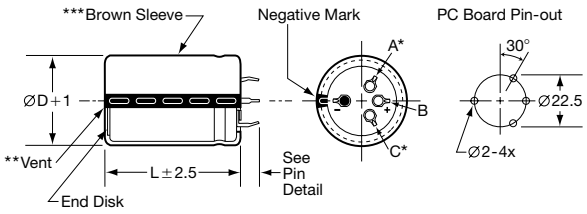
VEN Snap-in Ø35 optional



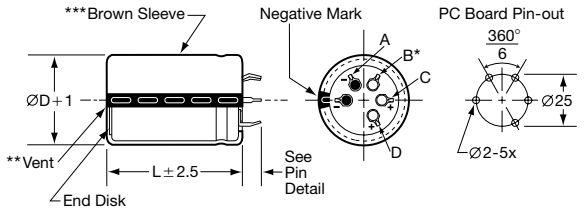
Snap Mount

Unit: mm

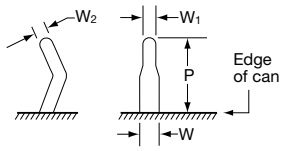
VND Snap-in Ø35 and Ø40 standard; Ø45 optional
VSD Snap-in Ø35 and Ø40 optional



VNT Snap-in Ø45 and Ø50 standard



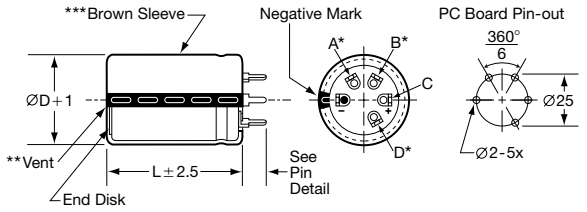
VS, VE & VN Snap-in Pin Dimensions



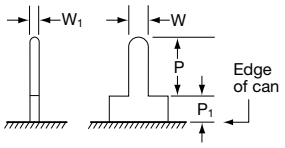
Type	P	W	W1	W2
VSN Ø35	3.5±0.5	1.5±0.2	0.8±0.1	0.8±0.1
VNN Ø35	5.8±1.0			
VEN Ø35	4.0±0.5			
VSD Ø35-Ø40	3.5±1.0			
VND Ø35-Ø45	5.8±1.0			
VNT Ø45-Ø50	5.8±1.0			

Straight Pin Mount

VQT Straight Standoff Ø40, Ø45 and Ø50 optional



VQ Straight Standoff Pin Dimensions



Type	P	P1	W	W1
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.

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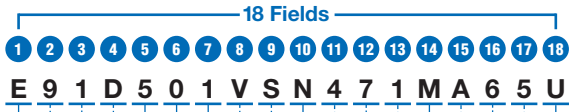
Part Numbering System for U91D Series

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.
A = Ø35mm
B = Ø40mm
U = Ø45mm
C = Ø50mm

The double digit length code is inserted in fields 16 and 17.
50 = 50mm
65 = 65mm
80 = 80mm
A0 = 100mm
A5 = 105mm

7 Capacitance Tolerance. Field 14.
M = ±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 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).

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, 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.

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. 5R0 = 5.0VDC; 500 = 50VDC; 501 = 500VDC).

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).

U91D 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
25 Volts 32 Volts Surge	39,000	E91D250VSN393MA50U	35×50	A50	0.019	7.7
	56,000	E91D250VSN563MA65U	35×65	A65	0.015	9.5
	68,000	E91D250VND683MA80U	35×80	A80	0.012	11.2
	82,000	E91D250VND823MAA0U	35×100	AA0	0.011	13.3
	47,000	E91D250VND473MB50U	40×50	B50	0.021	7.8
	68,000	E91D250VND683MB65U	40×65	B65	0.016	9.8
	82,000	E91D250VND823MB80U	40×80	B80	0.013	11.5
	120,000	E91D250VND124MBA0U	40×100	BA0	0.011	13.8
50 Volts 63 Volts Surge	15,000	E91D500VSN153MA50U	35×50	A50	0.027	6.6
	18,000	E91D500VSN183MA65U	35×65	A65	0.022	7.8
	27,000	E91D500VND273MA80U	35×80	A80	0.016	9.8
	33,000	E91D500VND333MAA0U	35×100	AA0	0.013	12.0
	18,000	E91D500VND183MB50U	40×50	B50	0.031	6.5
	27,000	E91D500VND273MB65U	40×65	B65	0.021	8.6
	33,000	E91D500VND333MB80U	40×80	B80	0.017	10.2
	39,000	E91D500VND393MBA0U	40×100	BA0	0.014	12.0
100 Volts 125 Volts Surge	4,700	E91D101VSN472MA50U	35×50	A50	0.042	5.2
	6,800	E91D101VSN682MA65U	35×65	A65	0.029	6.8
	8,200	E91D101VND822MA80U	35×80	A80	0.024	8.0
	10,000	E91D101VND103MAA0U	35×100	AA0	0.020	9.8
	5,600	E91D101VND562MB50U	40×50	B50	0.036	6.0
	8,200	E91D101VND822MB65U	40×65	B65	0.029	7.2
	10,000	E91D101VND103MB80U	40×80	B80	0.024	8.5
	15,000	E91D101VND153MBA0U	40×100	BA0	0.019	10.6
200 Volts 250 Volts Surge	1,800	E91D201VSN182MA50U	35×50	A50	0.066	4.2
	2,200	E91D201VSN222MA65U	35×65	A65	0.054	5.0
	3,300	E91D201VND332MA80U	35×80	A80	0.039	6.3
	3,900	E91D201VND392MAA0U	35×100	AA0	0.033	7.6
	2,200	E91D201VND222MB50U	40×50	B50	0.072	4.2
	3,300	E91D201VND332MB65U	40×65	B65	0.048	5.6
	3,900	E91D201VND392MB80U	40×80	B80	0.041	6.5
	5,600	E91D201VND562MBA0U	40×100	BA0	0.032	8.0
250 Volts 300 Volts Surge	1,000	E91D251VSN102MA40U	35×40	A40	0.092	3.2
	1,200	E91D251VSN122MA50U	35×50	A50	0.076	3.9
	1,800	E91D251VSN182MA65U	35×65	A65	0.051	5.2
	2,200	E91D251VND222MA80U	35×80	A80	0.042	6.1
	1,800	E91D251VND182MB50U	40×50	B50	0.055	4.8
	2,200	E91D251VND222MB65U	40×65	B65	0.045	5.8
	3,300	E91D251VND332MB80U	40×80	B80	0.030	7.6
	3,900	E91D251VND392MBA0U	40×100	BA0	0.026	9.0
350 Volts 400 Volts Surge	820	E91D351VSN821MA50U	35×50	A50	0.112	3.2
	1,200	E91D351VSN122MA65U	35×65	A65	0.076	4.2
	1,500	E91D351VND152MA80U	35×80	A80	0.061	5.0
	1,800	E91D351VND182MAA0U	35×100	AA0	0.051	6.1
	1,000	E91D351VND102MB50U	40×50	B50	0.100	3.6
	1,500	E91D351VND152MB65U	40×65	B65	0.066	4.8
	1,800	E91D351VND182MB80U	40×80	B80	0.055	5.6
	2,200	E91D351VND222MBA0U	40×100	BA0	0.045	6.8
	1,000	E91D351VNT102MU50U	45×50	U50	0.107	3.7
	1,500	E91D351VNT152MU65U	45×65	U65	0.072	4.9
	1,800	E91D351VNT182MU80U	45×80	U80	0.060	5.8
	2,700	E91D351VNT272MUA5U	45×105	UA5	0.040	7.9

†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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U91D 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	1,200	E91D351VNT122MC50U	50×50	C50	0.092	4.1
	1,800	E91D351VNT182MC65U	50×65	C65	0.066	5.2
	2,200	E91D351VNT222MC80U	50×80	C80	0.054	6.3
	3,300	E91D351VNT332MCA5U	50×105	CA5	0.036	8.7
400 Volts 450 Volts Surge	680	E91D401VSN681MA50U	35×50	A50	0.129	3.0
	1,000	E91D401VSN102MA65U	35×65	A65	0.088	3.9
	1,200	E91D401VND122MA80U	35×80	A80	0.073	4.6
	1,500	E91D401VND152MAA0U	35×100	AA0	0.058	5.7
	820	E91D401VND821MB50U	40×50	B50	0.112	3.4
	1,200	E91D401VND122MB65U	40×65	B65	0.076	4.5
	1,500	E91D401VND152MB80U	40×80	B80	0.061	5.3
	2,200	E91D401VND222MBA0U	40×100	BA0	0.042	7.1
	820	E91D401VNT821MU50U	45×50	U50	0.121	3.5
	1,200	E91D401VNT122MU65U	45×65	U65	0.083	4.5
	1,500	E91D401VNT152MU80U	45×80	U80	0.066	5.5
	2,200	E91D401VNT222MUA5U	45×105	UA5	0.045	7.4
	1,000	E91D401VNT102MC50U	50×50	C50	0.101	3.9
	1,500	E91D401VNT152MC65U	50×65	C65	0.074	5.0
	2,200	E91D401VNT222MC80U	50×80	C80	0.056	6.3
	2,700	E91D401VNT272MCA5U	50×105	CA5	0.041	8.2
450 Volts 500 Volts Surge	560	E91D451VSN561MA50U	35×50	A50	0.149	2.8
	680	E91D451VSN681MA65U	35×65	A65	0.123	3.3
	1,000	E91D451VND102MA80U	35×80	A80	0.084	4.3
	1,200	E91D451VND122MAA0U	35×100	AA0	0.070	5.2
	680	E91D451VND681MB50U	40×50	B50	0.135	3.1
	1,000	E91D451VND102MB65U	40×65	B65	0.092	4.1
	1,200	E91D451VND122MB80U	40×80	B80	0.076	4.8
	1,500	E91D451VND152MBA0U	40×100	BA0	0.061	5.8
	680	E91D451VNT681MU50U	45×50	U50	0.135	3.3
	1,000	E91D451VNT102MU65U	45×65	U65	0.092	4.3
	1,200	E91D451VNT122MU80U	45×80	U80	0.076	5.1
	1,800	E91D451VNT182MUA5U	45×105	UA5	0.051	7.0
	820	E91D451VNT821MC50U	50×50	C50	0.121	3.6
	1,200	E91D451VNT122MC65U	50×65	C65	0.083	4.7
	1,800	E91D451VNT182MC80U	50×80	C80	0.055	6.3
	2,200	E91D451VNT222MCA5U	50×105	CA5	0.045	7.8
500 Volts 550 Volts Surge	330	E91D501VSN331MA50U	35×50	A50	0.241	2.2
	470	E91D501VSN471MA65U	35×65	A65	0.169	2.8
	560	E91D501VND561MA80U	35×80	A80	0.142	3.3
	820	E91D501VND821MAA0U	35×100	AA0	0.097	4.4
	390	E91D501VND391MB50U	40×50	B50	0.214	2.5
	560	E91D501VND561MB65U	40×65	B65	0.149	3.2
	820	E91D501VND821MB80U	40×80	B80	0.102	4.1
	1,000	E91D501VND102MBA0U	40×100	BA0	0.084	5.0
	560	E91D501VNT561MU50U	45×50	U50	0.156	3.0
	680	E91D501VNT681MU65U	45×65	U65	0.129	3.6
	820	E91D501VNT821MU80U	45×80	U80	0.107	4.3
	1,000	E91D501VNT102MUA5U	45×105	UA5	0.088	5.3
	680	E91D501VNT681MC50U	50×50	C50	0.135	3.4
	820	E91D501VNT821MC65U	50×65	C65	0.112	4.0
	1,200	E91D501VNT122MC80U	50×80	C80	0.076	5.3
	1,500	E91D501VNT152MCA5U	50×105	CA5	0.061	6.7

†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.**

U91D 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
550 Volts 600 Volts Surge	220	E91D551VSN221MA50U	35×50	A50	0.362	1.8
	330	E91D551VSN331MA65U	35×65	A65	0.241	2.4
	470	E91D551VND471MA80U	35×80	A80	0.169	3.0
	560	E91D551VND561MAA0U	35×100	AA0	0.142	3.7
	330	E91D551VND331MB50U	40×50	B50	0.253	2.3
	470	E91D551VND471MB65U	40×65	B65	0.178	2.9
	560	E91D551VND561MB80U	40×80	B80	0.149	3.4
	820	E91D551VND821MBA0U	40×100	BA0	0.102	4.5
	390	E91D551VNT391MU50U	45×50	U50	0.225	2.5
	560	E91D551VNT561MU65U	45×65	U65	0.156	3.3
	680	E91D551VNT681MU80U	45×80	U80	0.129	3.9
	820	E91D551VNT821MUA5U	45×105	UA5	0.107	4.8
	470	E91D551VNT471MC50U	50×50	C50	0.195	2.8
	680	E91D551VNT681MC65U	50×65	C65	0.135	3.7
	820	E91D551VNT821MC80U	50×80	C80	0.112	4.4
	1,200	E91D551VNT122MCA5U	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.