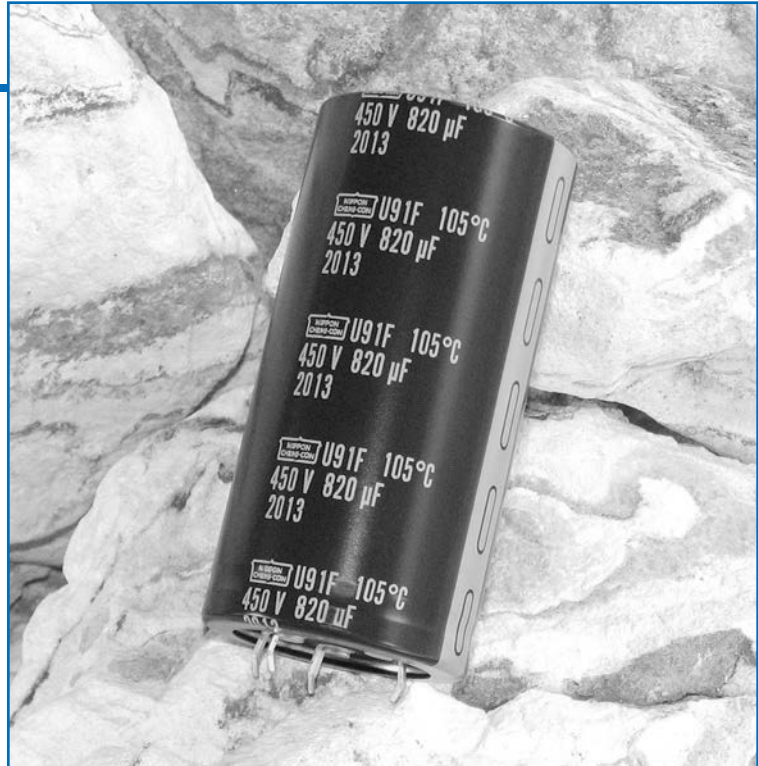


U91F Series NEW



- 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 available in a variety of sizes, with or without an end disk, and encased in a standard Pb-free PVC sleeve or an optional PET 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 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: -25°C to +105°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: 5,000 hours at +105°C with the rated ripple current applied.

U91F Series

U91F Specifications - Snap Mount

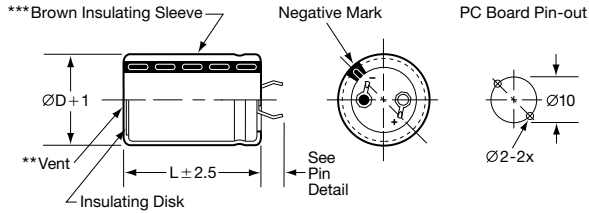
| Item | Characteristics | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------------------|--|-------------------|---------|---------------------|-----------------|--------|------|------------------|------|-------|-------|------|-------|--------|----------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Category Temperature Range | -25 to +105°C | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rated Voltage Range | 350 to 500VDC | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Capacitance Range | 120 to 2,700μF | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 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>+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 +20°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: ≤ ±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 +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 | | | | | | | | | | | | | | | | | | | | | | | | | | | |

U91F Series

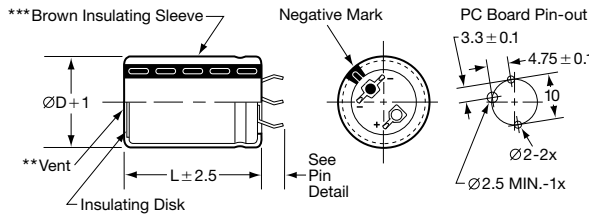
Diagram of Dimensions - Snap Mount

Snap Mount

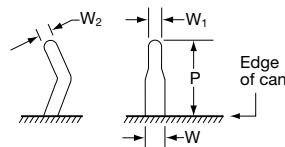
VSN Snap-in $\varnothing 30$ and $\varnothing 35$ standard
VNN Snap-in $\varnothing 30$ and $\varnothing 35$ optional



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



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 | | | |

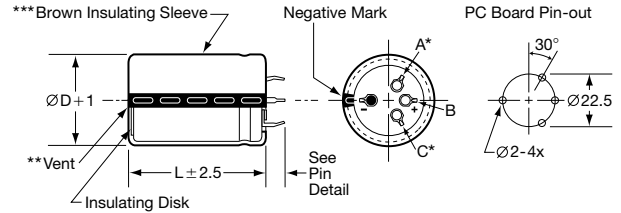
CAUTION:

- * 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.

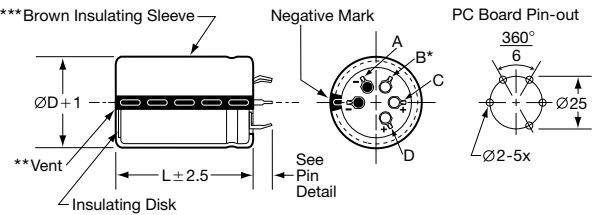
Snap Mount

Unit: mm

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

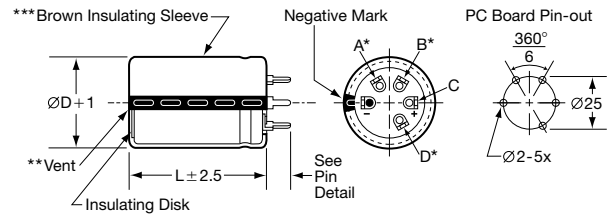


VNT Snap-in $\varnothing 45$ and $\varnothing 50$ standard

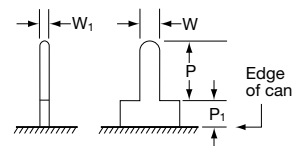


Straight Pin Mount

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



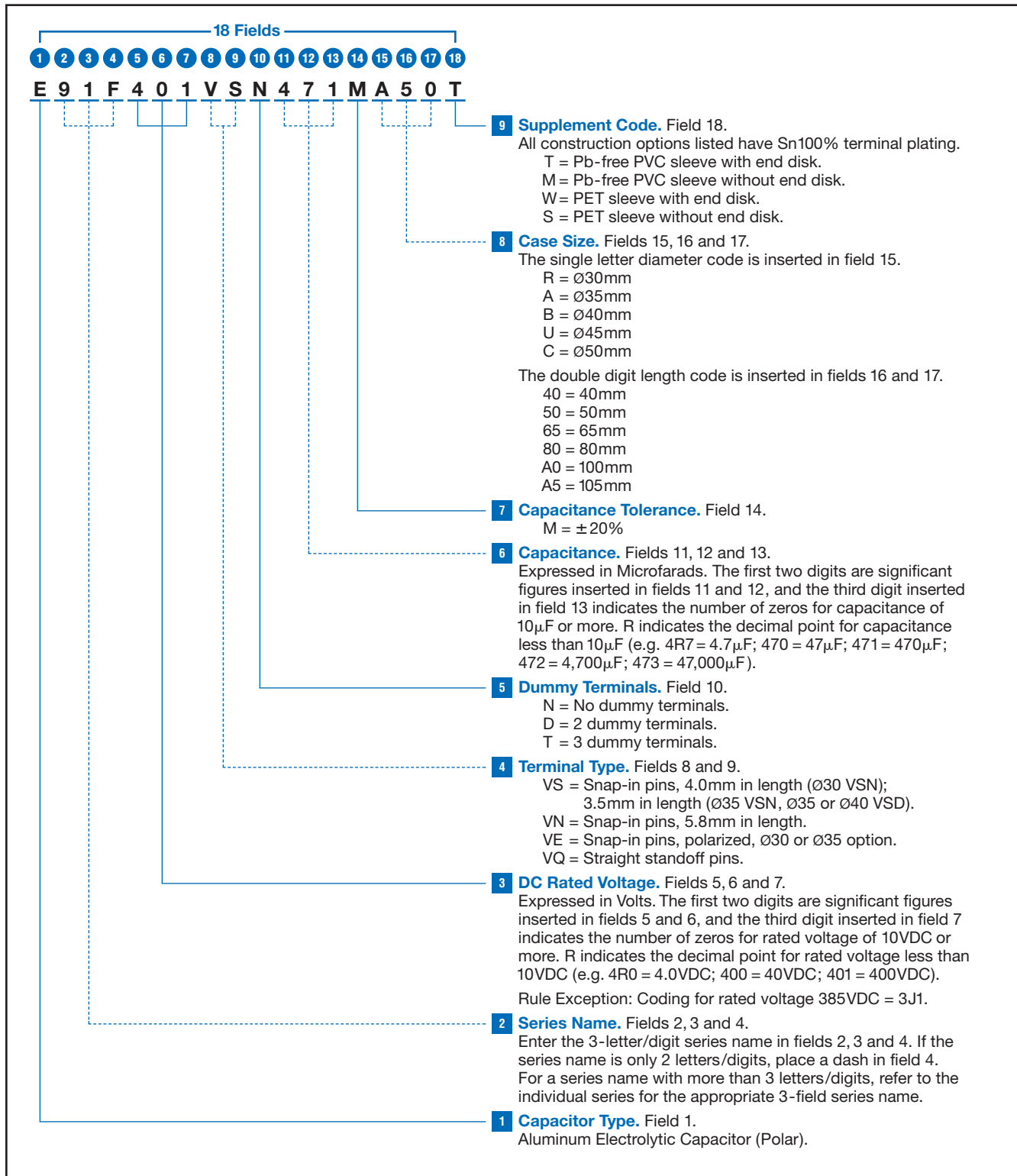
VQ Straight Standoff Pin Dimensions



| 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 |

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 +20°C, 120Hz | Rated Ripple Current (A rms) at +105°C, 120Hz |
|-------------------------------------|--------------------|---------------------|-------------------------------|----------------|---------------------------------|---|
| 350 Volts 400 Volts Surge | 270 | E91F351VSN271MR40T | 30 × 40 | R40 | 0.324 | 1.5 |
| | 390 | E91F351VSN391MR50T | 30 × 50 | R50 | 0.225 | 2.0 |
| | 560 | E91F351VSN561MR65T | 30 × 65 | R65 | 0.156 | 2.6 |
| | 390 | E91F351VSN391MA40T | 35 × 40 | A40 | 0.235 | 2.0 |
| | 560 | E91F351VSN561MA50T | 35 × 50 | A50 | 0.164 | 2.7 |
| | 820 | E91F351VND821MA65T | 35 × 65 | A65 | 0.112 | 3.5 |
| | 1,000 | E91F351VND102MA80T | 35 × 80 | A80 | 0.092 | 4.1 |
| | 1,200 | E91F351VND122MAA0T | 35 × 100 | AA0 | 0.076 | 5.0 |
| | 820 | E91F351VND821MB50T | 40 × 50 | B50 | 0.121 | 3.3 |
| | 1,200 | E91F351VND122MB65T | 40 × 65 | B65 | 0.083 | 4.3 |
| | 1,500 | E91F351VND152MB80T | 40 × 80 | B80 | 0.066 | 5.1 |
| | 1,800 | E91F351VND182MBA0T | 40 × 100 | BA0 | 0.055 | 6.1 |
| | 820 | E91F351VNT821MU50T | 45 × 50 | U50 | 0.131 | 3.3 |
| | 1,200 | E91F351VNT122MU65T | 45 × 65 | U65 | 0.090 | 4.4 |
| | 1,800 | E91F351VNT182MU80T | 45 × 80 | U80 | 0.060 | 5.8 |
| | 2,200 | E91F351VNT222MUA5T | 45 × 105 | UA5 | 0.049 | 7.1 |
| | 1,200 | E91F351VNT122MC50T | 50 × 50 | C50 | 0.092 | 4.1 |
| 1,800 | E91F351VNT182MC65T | 50 × 65 | C65 | 0.066 | 5.2 | |
| 2,200 | E91F351VNT222MC80T | 50 × 80 | C80 | 0.054 | 6.3 | |
| 2,700 | E91F351VNT272MCA5T | 50 × 105 | CA5 | 0.044 | 7.9 | |
| 385 Volts 435 Volts Surge | 220 | E91F3J1VSN221MR40T | 30 × 40 | R40 | 0.336 | 1.5 |
| | 330 | E91F3J1VSN331MR50T | 30 × 50 | R50 | 0.245 | 1.9 |
| | 470 | E91F3J1VSN471MR65T | 30 × 65 | R65 | 0.174 | 2.5 |
| | 330 | E91F3J1VSN331MA40T | 35 × 40 | A40 | 0.237 | 2.0 |
| | 470 | E91F3J1VSN471MA50T | 35 × 50 | A50 | 0.173 | 2.6 |
| | 680 | E91F3J1VND681MA65T | 35 × 65 | A65 | 0.123 | 3.3 |
| | 1,000 | E91F3J1VND102MA80T | 35 × 80 | A80 | 0.095 | 4.0 |
| | 1,200 | E91F3J1VND122MAA0T | 35 × 100 | AA0 | 0.073 | 5.1 |
| | 680 | E91F3J1VND681MB50T | 40 × 50 | B50 | 0.135 | 3.1 |
| | 1,000 | E91F3J1VND102MB65T | 40 × 65 | B65 | 0.096 | 4.0 |
| | 1,200 | E91F3J1VND122MB80T | 40 × 80 | B80 | 0.075 | 4.8 |
| | 1,500 | E91F3J1VND152MBA0T | 40 × 100 | BA0 | 0.058 | 6.0 |
| | 820 | E91F3J1VNT821MU50T | 45 × 50 | U50 | 0.118 | 3.5 |
| | 1,200 | E91F3J1VNT122MU65T | 45 × 65 | U65 | 0.084 | 4.5 |
| | 1,500 | E91F3J1VNT152MU80T | 45 × 80 | U80 | 0.065 | 5.5 |
| | 1,800 | E91F3J1VNT182MUA5T | 45 × 105 | UA5 | 0.047 | 7.2 |
| | 1,000 | E91F3J1VNT102MC50T | 50 × 50 | C50 | 0.094 | 4.1 |
| 1,500 | E91F3J1VNT152MC65T | 50 × 65 | C65 | 0.073 | 5.0 | |
| 1,800 | E91F3J1VNT182MC80T | 50 × 80 | C80 | 0.056 | 6.2 | |
| 2,700 | E91F3J1VNT272MCA5T | 50 × 105 | CA5 | 0.041 | 8.2 | |
| 400 Volts 450 Volts Surge | 220 | E91F401VSN221MR40T | 30 × 40 | R40 | 0.380 | 1.4 |
| | 330 | E91F401VSN331MR50T | 30 × 50 | R50 | 0.253 | 1.8 |
| | 390 | E91F401VSN391MR65T | 30 × 65 | R65 | 0.214 | 2.2 |
| | 330 | E91F401VSN331MA40T | 35 × 40 | A40 | 0.265 | 1.9 |
| | 470 | E91F401VSN471MA50T | 35 × 50 | A50 | 0.186 | 2.5 |
| | 680 | E91F401VND681MA65T | 35 × 65 | A65 | 0.129 | 3.2 |
| | 820 | E91F401VND821MA80T | 35 × 80 | A80 | 0.107 | 3.8 |
| | 1,000 | E91F401VND102MAA0T | 35 × 100 | AA0 | 0.088 | 4.7 |
| | 560 | E91F401VND561MB50T | 40 × 50 | B50 | 0.164 | 2.8 |
| | 820 | E91F401VND821MB65T | 40 × 65 | B65 | 0.112 | 3.7 |
| | 1,200 | E91F401VND122MB80T | 40 × 80 | B80 | 0.076 | 4.8 |
| | 1,500 | E91F401VND152MBA0T | 40 × 100 | BA0 | 0.061 | 5.8 |
| | 680 | E91F401VNT681MU50T | 45 × 50 | U50 | 0.146 | 3.1 |
| | 1,000 | E91F401VNT102MU65T | 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 +20°C, 120Hz | Rated Ripple Current (A rms) at +105°C, 120Hz |
|-------------------------------------|--------------------|---------------------|-------------------------------|----------------|---------------------------------|---|
| 400 Volts 450 Volts Surge | 1,200 | E91F401VNT122MU80T | 45 × 80 | U80 | 0.083 | 4.9 |
| | 1,800 | E91F401VNT182MUA5T | 45 × 105 | UA5 | 0.055 | 6.7 |
| | 1,000 | E91F401VNT102MC50T | 50 × 50 | C50 | 0.101 | 3.9 |
| | 1,200 | E91F401VNT122MC65T | 50 × 65 | C65 | 0.093 | 4.4 |
| | 1,800 | E91F401VNT182MC80T | 50 × 80 | C80 | 0.062 | 5.9 |
| | 2,200 | E91F401VNT222MCA5T | 50 × 105 | CA5 | 0.051 | 7.4 |
| 420 Volts 470 Volts Surge | 180 | E91F421VSN181MR40T | 30 × 40 | R40 | 0.442 | 1.3 |
| | 270 | E91F421VSN271MR50T | 30 × 50 | R50 | 0.295 | 1.7 |
| | 390 | E91F421VSN391MR65T | 30 × 65 | R65 | 0.204 | 2.3 |
| | 270 | E91F421VSN271MA40T | 35 × 40 | A40 | 0.310 | 1.8 |
| | 390 | E91F421VSN391MA50T | 35 × 50 | A50 | 0.214 | 2.3 |
| | 560 | E91F421VND561MA65T | 35 × 65 | A65 | 0.149 | 3.0 |
| | 680 | E91F421VND681MA80T | 35 × 80 | A80 | 0.123 | 3.5 |
| | 820 | E91F421VND821MAA0T | 35 × 100 | AA0 | 0.102 | 4.3 |
| | 560 | E91F421VND561MB50T | 40 × 50 | B50 | 0.156 | 2.9 |
| | 820 | E91F421VND821MB65T | 40 × 65 | B65 | 0.107 | 3.8 |
| | 1,000 | E91F421VND102MB80T | 40 × 80 | B80 | 0.088 | 4.5 |
| | 1,200 | E91F421VND122MBA0T | 40 × 100 | BA0 | 0.073 | 5.3 |
| | 680 | E91F421VNT681MU50T | 45 × 50 | U50 | 0.141 | 3.2 |
| | 1,000 | E91F421VNT102MU65T | 45 × 65 | U65 | 0.096 | 4.2 |
| | 1,200 | E91F421VNT122MU80T | 45 × 80 | U80 | 0.080 | 5.0 |
| | 1,700 | E91F421VNT172MUA5T | 45 × 105 | UA5 | 0.056 | 6.6 |
| | 820 | E91F421VNT821MC50T | 50 × 50 | C50 | 0.126 | 3.5 |
| | 1,200 | E91F421VNT122MC65T | 50 × 65 | C65 | 0.086 | 4.6 |
| 1,500 | E91F421VNT152MC80T | 50 × 80 | C80 | 0.069 | 5.6 | |
| 2,200 | E91F421VNT222MCA5T | 50 × 105 | CA5 | 0.047 | 7.7 | |
| 450 Volts 500 Volts Surge | 180 | E91F451VSN181MR40T | 30 × 40 | R40 | 0.442 | 1.3 |
| | 220 | E91F451VSN221MR50T | 30 × 50 | R50 | 0.362 | 1.5 |
| | 330 | E91F451VSN331MR65T | 30 × 65 | R65 | 0.241 | 2.1 |
| | 270 | E91F451VSN271MA40T | 35 × 40 | A40 | 0.310 | 1.8 |
| | 390 | E91F451VSN391MA50T | 35 × 50 | A50 | 0.214 | 2.3 |
| | 470 | E91F451VND471MA65T | 35 × 65 | A65 | 0.178 | 2.8 |
| | 680 | E91F451VND681MA80T | 35 × 80 | A80 | 0.123 | 3.5 |
| | 820 | E91F451VND821MAA0T | 35 × 100 | AA0 | 0.102 | 4.3 |
| | 470 | E91F451VND471MB50T | 40 × 50 | B50 | 0.178 | 2.7 |
| | 680 | E91F451VND681MB65T | 40 × 65 | B65 | 0.123 | 3.5 |
| | 820 | E91F451VND821MB80T | 40 × 80 | B80 | 0.102 | 4.1 |
| | 1,200 | E91F451VND122MBA0T | 40 × 100 | BA0 | 0.070 | 5.5 |
| | 680 | E91F451VNT681MU50T | 45 × 50 | U50 | 0.135 | 3.3 |
| | 820 | E91F451VNT821MU65T | 45 × 65 | U65 | 0.112 | 3.9 |
| | 1,000 | E91F451VNT102MU80T | 45 × 80 | U80 | 0.092 | 4.7 |
| | 1,500 | E91F451VNT152MUA5T | 45 × 105 | UA5 | 0.061 | 6.4 |
| | 820 | E91F451VNT821MC50T | 50 × 50 | C50 | 0.121 | 3.6 |
| | 1,000 | E91F451VNT102MC65T | 50 × 65 | C65 | 0.100 | 4.3 |
| 1,500 | E91F451VNT152MC80T | 50 × 80 | C80 | 0.066 | 5.7 | |
| 1,800 | E91F451VNT182MCA5T | 50 × 105 | CA5 | 0.055 | 7.1 | |
| 500 Volts 550 Volts Surge | 120 | E91F501VSN121MR40T | 30 × 40 | R40 | 0.663 | 1.0 |
| | 180 | E91F501VSN181MR50T | 30 × 50 | R50 | 0.442 | 1.4 |
| | 270 | E91F501VSN271MR65T | 30 × 65 | R65 | 0.295 | 1.9 |
| | 180 | E91F501VSN181MA40T | 35 × 40 | A40 | 0.442 | 1.5 |
| | 270 | E91F501VSN271MA50T | 35 × 50 | A50 | 0.295 | 2.0 |
| | 390 | E91F501VND391MA65T | 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 +20°C, 120Hz | Rated Ripple Current (A rms) at +105°C, 120Hz |
|--------------------------------------|------------------|---------------------|-------------------------------|----------------|---------------------------------|---|
| 500 Volts 550 Volts Surge | 470 | E91F501VND471MA80T | 35 × 80 | A80 | 0.169 | 3.0 |
| | 560 | E91F501VND561MAA0T | 35 × 100 | AA0 | 0.142 | 3.7 |
| | 330 | E91F501VND331MB50T | 40 × 50 | B50 | 0.253 | 2.3 |
| | 470 | E91F501VND471MB65T | 40 × 65 | B65 | 0.178 | 2.9 |
| | 680 | E91F501VND681MB80T | 40 × 80 | B80 | 0.123 | 3.8 |
| | 820 | E91F501VND821MBA0T | 40 × 100 | BA0 | 0.102 | 4.5 |
| | 390 | E91F501VNT391MU50T | 45 × 50 | U50 | 0.225 | 2.5 |
| | 560 | E91F501VNT561MU65T | 45 × 65 | U65 | 0.156 | 3.3 |
| | 820 | E91F501VNT821MU80T | 45 × 80 | U80 | 0.107 | 4.3 |
| | 1,000 | E91F501VNT102MUA5T | 45 × 105 | UA5 | 0.088 | 5.3 |
| | 560 | E91F501VNT561MC50T | 50 × 50 | C50 | 0.164 | 3.1 |
| | 820 | E91F501VNT821MC65T | 50 × 65 | C65 | 0.112 | 4.0 |
| | 1,000 | E91F501VNT102MC80T | 50 × 80 | C80 | 0.092 | 4.9 |
| | 1,200 | E91F501VNT122MCA5T | 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.