



# Aluminum Electrolytic Capacitors

Snap Mount ♦ Screw Mount



Manufactured in Lansing,  
North Carolina, USA  
Nestled in the Blue Ridge  
Mountain Range

UNITED CHEMI-CON, INC.

ALUMINUM ELECTROLYTIC CAPACITORS

SNAP MOUNT ♦ SCREW MOUNT



United Chemi-Con is publishing the second edition of this catalog for our aluminum electrolytic capacitors series manufactured in our U.S. facility located in Lansing, North Carolina. As a result of our continuous technological development and expanded product lines, this catalog promotes both updated and new series. These series include 6 snap mount series (2 updates, 4 new), 6 screw mount series (2 updates, 4 new), and an update for the screw mount special toroidal capacitor design that offers cooling alternatives. All the capacitor products in this catalog are RoHS compliant and reflect our commitment to meet environmental standards.

This catalog emphasizes the global part numbering system for the capacitor products, but it should be noted that some of the part numbering codes are exclusive to the products made in the U.S. or are variations of the general guidelines published by our parent company, Nippon Chemi-Con. *Please carefully review the part numbering system specified for each series.*

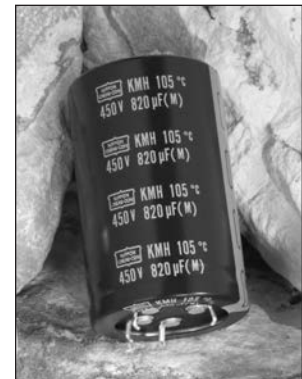
Our U.S manufacturing facility also offers consultation and custom designs. Please contact United Chemi-Con for help with your specific requirements.

With the distribution of this updated catalog and/or the advantage of a downloadable copy in PDF format on our website, the specifications for products made in the U.S will continue to be available worldwide.

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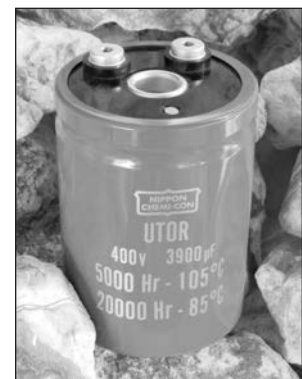
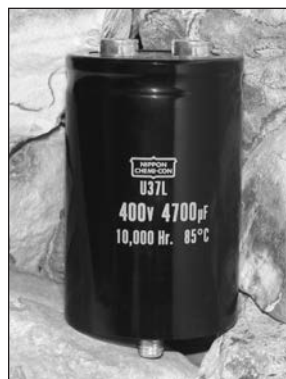
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In the construction of the components described, the full intent of the specification will be met. United Chemi-Con, however, reserves the right to make, from time to time, such departures from the detail specifications as may be required to permit improvements in the design of its products. Components made under military approvals will be in accordance with the approval requirements. The information included herein is believed to be accurate and reliable. However, United Chemi-Con assumes no responsibility for its use, nor for any infringements of patents or other rights of third parties which may result from its use.

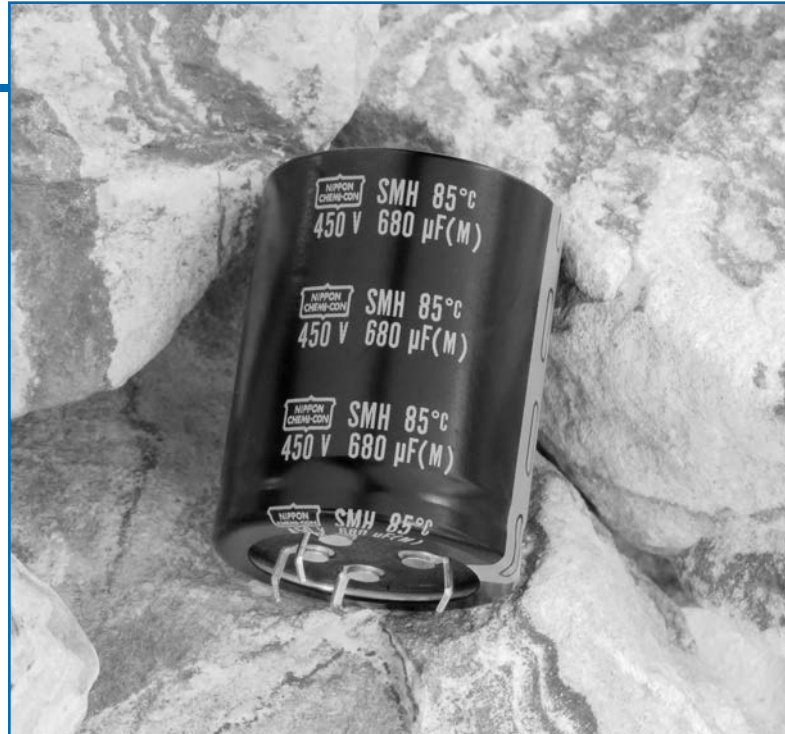
# Specifications Guide

Series	Page No.	Series Features	RoHS Compliant	Terminal Type	Maximum Temperature (C°)	Voltage Range (V)	Capacitance Range (μF)	Endurance (Hours + R*)
SMH	3	Ideal for Power Supply Filter Circuits, High CV, High Ripple, Large Capacitance, Pin Options, PVC or PET Sleeve with or without End Disk	○	Snap-in, Straight Standoff	+85°C	6.3~450	56~270,000	2,000 + R
KMH	18	Ideal for Power Supply Filter Circuits, High CV, High Ripple, Large Capacitance, Pin Options, PVC or PET Sleeve with or without End Disk	○	Snap-in, Straight Standoff	+105°C	6.3~450	47~220,000	2,000 + R
U92F	33	Specific High Ripple Design, Long Life of 5,000 Hours at +85°C, Pin Options, PVC or PET Sleeve with or without End Disk	○	Snap-in, Straight Standoff	+85°C	350~500	180~3,300	5,000 + R
U92L	40	Specific High Ripple Design, Long Life of 10,000 Hours at +85°C, Pin Options, PVC or PET Sleeve with or without End Disk	○	Snap-in, Straight Standoff	+85°C	350~500	150~3,300	10,000 + R
U92X	47	Specific High Ripple Design, Long Life of 15,000 Hours at +85°C, Pin Options, PVC or PET Sleeve with or without End Disk	○	Snap-in, Straight Standoff	+85°C	350~500	150~3,300	15,000 + R
U91F	54	Specific High Ripple Design, Long Life, High Temperature, Pin Options, PVC or PET Sleeve with or without End Disk	○	Snap-in, Straight Standoff	+105°C	350~500	120~2,700	5,000 + R
U36D	61	Ideal Design for Inverter Applications, High Ripple, Variety of Thread Terminals Available, PVC or PET Sleeve with or without End Disk	○	Screw Mount	+85°C	6.3~550	68μF~2.2F	2,000 + R
U32D	74	Ideal Design for Inverter Applications, High Ripple, Variety of Thread Terminals Available, PVC or PET Sleeve with or without End Disk	○	Screw Mount	+105°C	6.3~400	180μF~2.2F	2,000 + R
U37F	86	Specific High Ripple Design, Long Life of 5,000 Hours at +85°C, PVC or PET Sleeve with or without End Disk	○	Screw Mount	+85°C	350~500	1,500~22,000	5,000 + R
U37L	93	Specific High Ripple Design, Longer Life of 10,000 Hours at +85°C, PVC or PET Sleeve with or without End Disk	○	Screw Mount	+85°C	350~500	1,500~18,000	10,000 + R
U37X	100	Specific High Ripple Design, Longest Life of 15,000 Hours at +85°C, PVC or PET Sleeve with or without End Disk	○	Screw Mount	+85°C	350~500	1,200~18,000	15,000 + R
U33F	107	Specific High Ripple Design, Long Life of 5,000 Hours at +105°C, High Temperature, PVC or PET Sleeve with or without End Disk	○	Screw Mount	+105°C	350~500	1,200~15,000	5,000 + R
UTOR	114	Toroidal Design, Low Thermal Resistance, Forced Air or Heat Sink Cooling, Insulating PVC or PET Sleeve with or without End Disk	○	Screw Mount	+105°C	350~500	680~10,000	5,000 + R

\* +R = With rated ripple current applied.



- Snap Mount
- Large Capacitance
- High CV
- High Ripple
- RoHS Compliant
- +85°C Maximum Temperature



The SMH series capacitors are the standard +85°C large capacitance, snap-in capacitors that offer a wide voltage range of 6.3 to 450VDC. The endurance for the SMH series is 2,000 hours at +85°C with the rated ripple current applied. With very high CV values and high ripple current capabilities these capacitors are ideal for use in power supply filter circuits.

All SMH 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. The SMH capacitors are available with snap-in terminals (2 or 4-pin) depending on can diameter. Straight standoff terminals (5 pin) are optional for the 40mm can diameter.

## Summary of Specifications

- PC board 2 or 4-pin snap-in; optional 5-pin (Ø40 only) straight standoff terminals.
- Capacitance range: 56 to 270,000 $\mu$ F.
- Voltage range: 6.3 to 450VDC.
- Category temperature range: -40°C to +85°C for 6.3 to 100V; -25°C to +85°C for 160 to 450V.
- Leakage current: 0.02CV( $\mu$ A) or 3mA, whichever is smaller, after 5 minutes at +20°C.
- Standard capacitance tolerance:  $\pm$ 20%
- Nominal case size (D  $\times$  L): 22  $\times$  20mm to 40  $\times$  80mm.
- Rated lifetime: 2,000 hours at +85°C with the rated ripple current applied.

# SMH Series

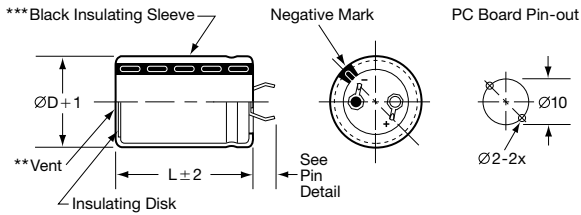
## SMH Specifications - Snap Mount

Item	Characteristics																																											
Category Temperature Range	- 40 to +85°C for 6.3 to 100VDC; - 25 to +85°C for 160 to 450VDC																																											
Rated Voltage Range	6.3 to 450VDC																																											
Capacitance Range	56 to 270,000 $\mu$ F																																											
Capacitance Tolerance	$\pm$ 20% (M) at +20°C, 120Hz																																											
Leakage Current	I = 0.02CV ( $\mu$ A) or 3mA, whichever is smaller, after 5 minutes at +20°C. Where I = Max. leakage current ( $\mu$ A), C = Nominal capacitance ( $\mu$ F) and V = Rated voltage (V)																																											
Dissipation Factor (Tan $\delta$ )	At +20°C, 120Hz <table border="1"> <thead> <tr> <th>Rated Voltage (V)</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63-100</th> <th>160-250</th> <th>315-450</th> </tr> </thead> <tbody> <tr> <td>Tan <math>\delta</math> (DF) Max.†</td> <td>0.60</td> <td>0.50</td> <td>0.40</td> <td>0.30</td> <td>0.25</td> <td>0.20</td> <td>0.15</td> <td>0.10*</td> <td>0.15</td> </tr> </tbody> </table> <p>*0.15 maximum for 35mm and 40mm diameter. † For rated voltages <math>\leq</math> 63V, values are not valid for case sizes &gt;35mm in diameter or &gt;50mm in length.</p>	Rated Voltage (V)	6.3	10	16	25	35	50	63-100	160-250	315-450	Tan $\delta$ (DF) Max.†	0.60	0.50	0.40	0.30	0.25	0.20	0.15	0.10*	0.15																							
Rated Voltage (V)	6.3	10	16	25	35	50	63-100	160-250	315-450																																			
Tan $\delta$ (DF) Max.†	0.60	0.50	0.40	0.30	0.25	0.20	0.15	0.10*	0.15																																			
Low Temperature Characteristics	At 120Hz, impedance (Z) ratio between the -25°C or -40°C value and +20°C value shall not exceed the values given below. <table border="1"> <thead> <tr> <th>Rated Voltage (V)</th> <th>6.3-16</th> <th>25</th> <th>35</th> <th>50, 63</th> <th>80, 100</th> <th>160-400</th> <th>450</th> </tr> </thead> <tbody> <tr> <td>Z(-25°C)/Z(+20°C)</td> <td>4</td> <td>3</td> <td>3</td> <td>2</td> <td>2</td> <td>4</td> <td>8</td> </tr> <tr> <td>Z(-40°C)/Z(+20°C)</td> <td>15</td> <td>10</td> <td>8</td> <td>6</td> <td>5</td> <td>—</td> <td>—</td> </tr> </tbody> </table>	Rated Voltage (V)	6.3-16	25	35	50, 63	80, 100	160-400	450	Z(-25°C)/Z(+20°C)	4	3	3	2	2	4	8	Z(-40°C)/Z(+20°C)	15	10	8	6	5	—	—																			
Rated Voltage (V)	6.3-16	25	35	50, 63	80, 100	160-400	450																																					
Z(-25°C)/Z(+20°C)	4	3	3	2	2	4	8																																					
Z(-40°C)/Z(+20°C)	15	10	8	6	5	—	—																																					
Rated Ripple Current Multipliers	Ambient Temperature (°C) <table border="1"> <thead> <tr> <th>+45°C</th> <th>+60°C</th> <th>+70°C</th> <th>+85°C</th> </tr> </thead> <tbody> <tr> <td>1.73</td> <td>1.50</td> <td>1.32</td> <td>1.00</td> </tr> </tbody> </table> Frequency (Hz) <table border="1"> <thead> <tr> <th>DC Rated Voltage</th> <th>50Hz</th> <th>120Hz</th> <th>300Hz</th> <th>1kHz</th> <th>10kHz</th> <th>100kHz</th> </tr> </thead> <tbody> <tr> <td>6.3-50V</td> <td>0.95</td> <td>1.00</td> <td>1.03</td> <td>1.05</td> <td>1.08</td> <td>1.08</td> </tr> <tr> <td>63-100V</td> <td>0.92</td> <td>1.00</td> <td>1.07</td> <td>1.13</td> <td>1.19</td> <td>1.20</td> </tr> <tr> <td>160-250V</td> <td>0.81</td> <td>1.00</td> <td>1.17</td> <td>1.32</td> <td>1.45</td> <td>1.50</td> </tr> <tr> <td>315-450V</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> </tbody> </table>	+45°C	+60°C	+70°C	+85°C	1.73	1.50	1.32	1.00	DC Rated Voltage	50Hz	120Hz	300Hz	1kHz	10kHz	100kHz	6.3-50V	0.95	1.00	1.03	1.05	1.08	1.08	63-100V	0.92	1.00	1.07	1.13	1.19	1.20	160-250V	0.81	1.00	1.17	1.32	1.45	1.50	315-450V	0.77	1.00	1.16	1.30	1.41	1.43
+45°C	+60°C	+70°C	+85°C																																									
1.73	1.50	1.32	1.00																																									
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63-100V	0.92	1.00	1.07	1.13	1.19	1.20																																						
160-250V	0.81	1.00	1.17	1.32	1.45	1.50																																						
315-450V	0.77	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 2,000 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: $\leq \pm$ 20% of initial measured value Tan $\delta$ (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 +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: $\leq \pm$ 20% of initial measured value Tan $\delta$ (DF) : $\leq$ 150% of initial specified value Leakage current : $\leq$ initial specified value																																											

## Diagram of Dimensions - Snap Mount

### Snap Mount

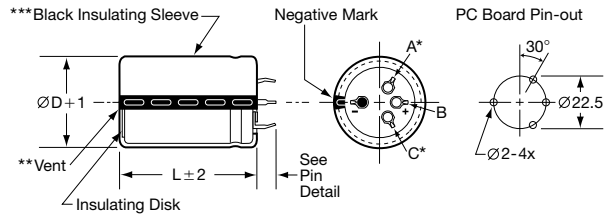
VSN Snap-in  $\varnothing 22$  and  $\varnothing 35$  standard  
VNN Snap-in  $\varnothing 22$  and  $\varnothing 35$  optional



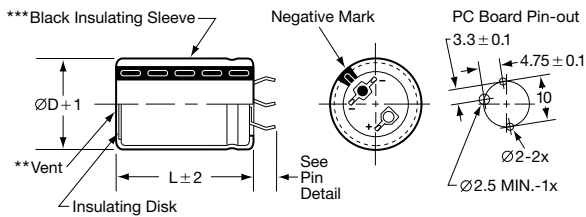
### Snap Mount

Unit: mm

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

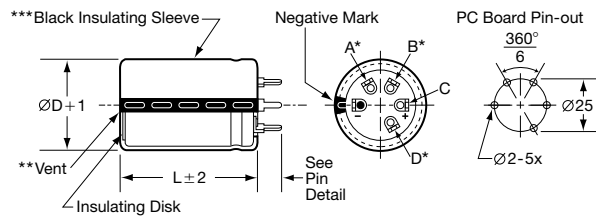


VEN Snap-in  $\varnothing 30$  and  $\varnothing 35$  optional

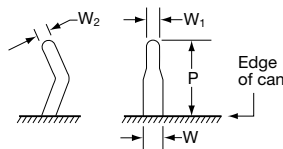


### Straight Pin Mount

VQT Straight Standoff  $\varnothing 40$  optional

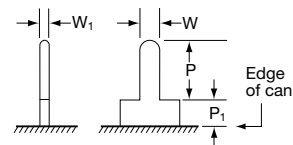


VS, VE & VN Snap-in Pin Dimensions



Type	P	W	W <sub>1</sub>	W <sub>2</sub>
VSN $\varnothing 22-\varnothing 30$	$4.0 \pm 0.5$			
VSN $\varnothing 35$	$3.5 \pm 0.5$			
VNN $\varnothing 22-\varnothing 35$	$5.8 \pm 1.0$	$1.5 \pm 0.2$	$0.8 \pm 0.1$	$0.8 \pm 0.1$
VEN $\varnothing 30-\varnothing 35$	$4.0 \pm 0.5$			
VSD $\varnothing 35-\varnothing 40$	$3.5 \pm 1.0$			
VND $\varnothing 35-\varnothing 40$	$5.8 \pm 1.0$			

VQ Straight Standoff Pin Dimensions



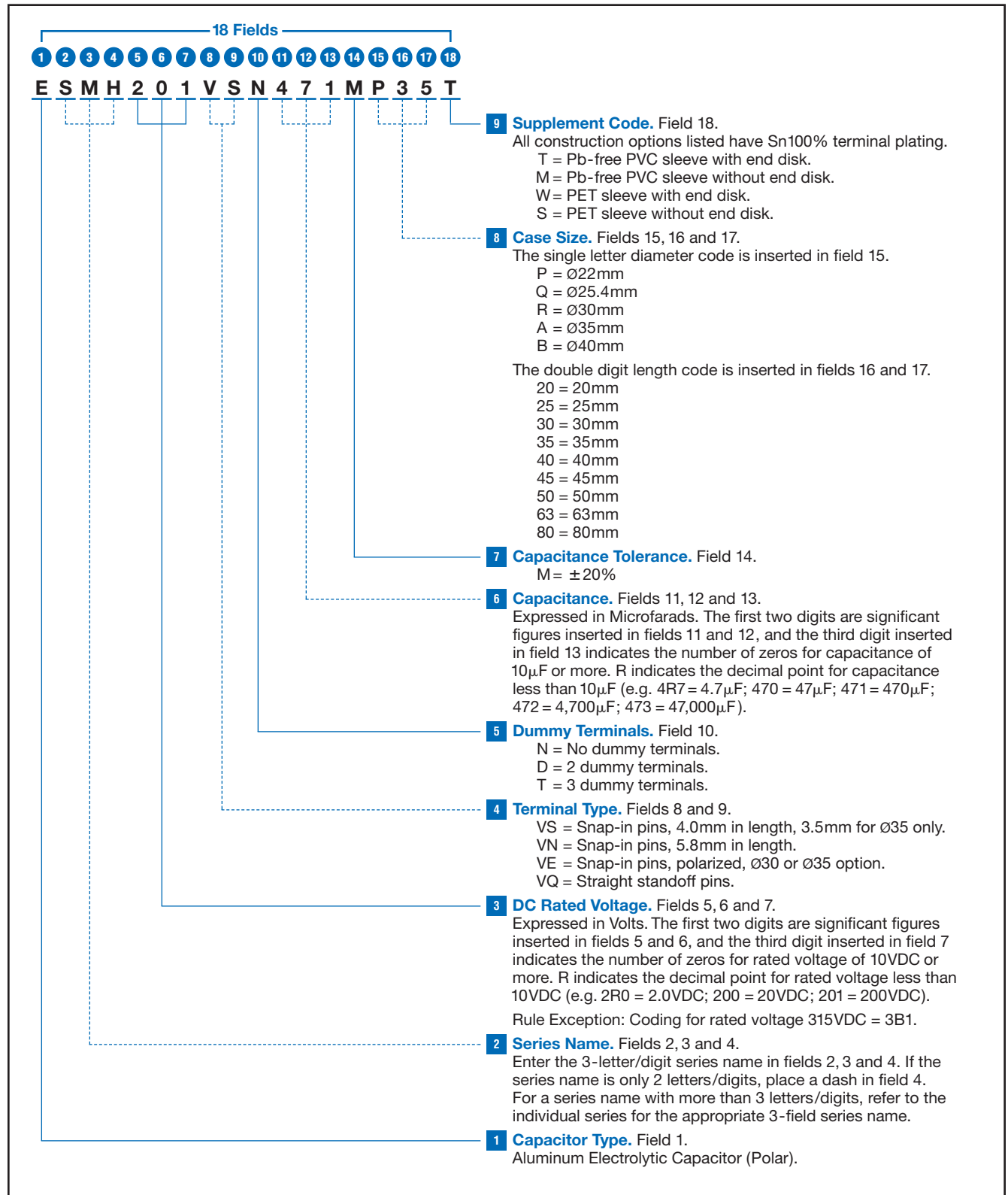
Type	P	P <sub>1</sub>	W	W <sub>1</sub>
Standoff Pin (VQ)	$3.75 \pm 1.0$	2.0 max.	$1.5 \pm 0.1$	$0.7 \pm 0.2$

### 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.

# SMH Series

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



**SMH**  
SNAP MOUNT 85°C



# SMH 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 +85°C, 120Hz
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<b>6.3 Volts 8 Volts Surge</b>	15,000	ESMH6R3VSN153MP25T	22 × 25	P25	0.066	2.44
	18,000	ESMH6R3VSN183MP30T	22 × 30	P30	0.055	2.67
	22,000	ESMH6R3VSN223MP30T	22 × 30	P30	0.045	3.06
	27,000	ESMH6R3VSN273MP35T	22 × 35	P35	0.037	3.49
	33,000	ESMH6R3VSN333MP40T	22 × 40	P40	0.03	3.97
	39,000	ESMH6R3VSN393MP50T	22 × 50	P50	0.026	4.55
	18,000	ESMH6R3VSN183MQ25T	25.4 × 25	Q25	0.055	2.7
	22,000	ESMH6R3VSN223MQ25T	25.4 × 25	Q25	0.045	3.07
	27,000	ESMH6R3VSN273MQ30T	25.4 × 30	Q30	0.037	3.52
	33,000	ESMH6R3VSN333MQ35T	25.4 × 35	Q35	0.03	4.02
	39,000	ESMH6R3VSN393MQ40T	25.4 × 40	Q40	0.026	4.5
	47,000	ESMH6R3VSN473MQ45T	25.4 × 45	Q45	0.021	5.09
	56,000	ESMH6R3VSN563MQ50T	25.4 × 50	Q50	0.018	5.71
	27,000	ESMH6R3VSN273MR25T	30 × 25	R25	0.037	3.57
	33,000	ESMH6R3VSN333MR25T	30 × 25	R25	0.03	3.95
	39,000	ESMH6R3VSN393MR30T	30 × 30	R30	0.026	4.45
	47,000	ESMH6R3VSN473MR35T	30 × 35	R35	0.021	5.06
	56,000	ESMH6R3VSN563MR40T	30 × 40	R40	0.018	5.7
	68,000	ESMH6R3VSN683MR45T	30 × 45	R45	0.015	6.48
	82,000	ESMH6R3VSN823MR50T	30 × 50	R50	0.012	7.32
	39,000	ESMH6R3VSN393MA25T	35 × 25	A25	0.026	4.51
	47,000	ESMH6R3VSN473MA30T	35 × 30	A30	0.021	5.01
	56,000	ESMH6R3VSN563MA30T	35 × 30	A30	0.018	5.77
	68,000	ESMH6R3VSN683MA35T	35 × 35	A35	0.015	6.42
	82,000	ESMH6R3VSN823MA40T	35 × 40	A40	0.012	7.29
	100,000	ESMH6R3VSN104MA45T	35 × 45	A45	0.01	8.31
	150,000	ESMH6R3VND154MA63T	35 × 63	A63	0.01	10.91
	180,000	ESMH6R3VND184MA80T	35 × 80	A80	0.009	12.78
	56,000	ESMH6R3VND563MB25T	40 × 25	B25	0.027	5.48
	82,000	ESMH6R3VND823MB30T	40 × 30	B30	0.02	6.94
100,000	ESMH6R3VND104MB35T	40 × 35	B35	0.017	7.95	
120,000	ESMH6R3VND124MB40T	40 × 40	B40	0.014	8.97	
150,000	ESMH6R3VND154MB50T	40 × 50	B50	0.012	10.66	
220,000	ESMH6R3VND224MB63T	40 × 63	B63	0.009	13.79	
270,000	ESMH6R3VND274MB80T	40 × 80	B80	0.008	16.62	

<b>10 Volts 13 Volts Surge</b>	12,000	ESMH100VSN123MP25T	22 × 25	P25	0.069	2.39
	15,000	ESMH100VSN153MP30T	22 × 30	P30	0.055	2.76
	18,000	ESMH100VSN183MP35T	22 × 35	P35	0.046	3.12
	22,000	ESMH100VSN223MP40T	22 × 40	P40	0.038	3.55
	27,000	ESMH100VSN273MP45T	22 × 45	P45	0.031	4.04
	33,000	ESMH100VSN333MP50T	22 × 50	P50	0.025	4.58
	15,000	ESMH100VSN153MQ25T	25.4 × 25	Q25	0.055	2.77
	18,000	ESMH100VSN183MQ25T	25.4 × 25	Q25	0.046	3.04
	22,000	ESMH100VSN223MQ30T	25.4 × 30	Q30	0.038	3.48
	27,000	ESMH100VSN273MQ35T	25.4 × 35	Q35	0.031	3.98
	33,000	ESMH100VSN333MQ40T	25.4 × 40	Q40	0.025	4.54
	39,000	ESMH100VSN393MQ45T	25.4 × 45	Q45	0.021	5.08
	47,000	ESMH100VSN473MQ50T	25.4 × 50	Q50	0.018	5.73
	22,000	ESMH100VSN223MR25T	30 × 25	R25	0.038	3.53
	27,000	ESMH100VSN273MR30T	30 × 30	R30	0.031	3.73
	33,000	ESMH100VSN333MR30T	30 × 30	R30	0.025	4.13
	39,000	ESMH100VSN393MR35T	30 × 35	R35	0.021	5.05
	47,000	ESMH100VSN473MR40T	30 × 40	R40	0.018	5.72
	56,000	ESMH100VSN563MR45T	30 × 45	R45	0.015	6.44
	27,000	ESMH100VSN273MA25T	35 × 25	A25	0.031	3.73
	33,000	ESMH100VSN333MA25T	35 × 25	A25	0.025	4.13
	39,000	ESMH100VSN393MA30T	35 × 30	A30	0.021	4.8
	47,000	ESMH100VSN473MA30T	35 × 30	A30	0.018	5.27
	56,000	ESMH100VSN563MA35T	35 × 35	A35	0.015	6.38

† 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.

SMH  
SNAP MOUNT 85°C

# SMH 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 +85°C, 120Hz
<b>10 Volts</b> 13 Volts Surge	68,000	ESMH100VSN683MA40T	35 × 40	A40	0.012	7.27
	82,000	ESMH100VSN823MA50T	35 × 50	A50	0.01	8.49
	100,000	ESMH100VND104MA63T	35 × 63	A63	0.01	8.91
	150,000	ESMH100VND154MA80T	35 × 80	A80	0.009	11.67
	47,000	ESMH100VND473MB25T	40 × 25	B25	0.026	5.02
	56,000	ESMH100VND563MB30T	40 × 30	B30	0.021	5.74
	68,000	ESMH100VND683MB35T	40 × 35	B35	0.018	6.56
	82,000	ESMH100VND823MB40T	40 × 40	B40	0.015	7.42
	120,000	ESMH100VND124MB50T	40 × 50	B50	0.012	9.54
	150,000	ESMH100VND154MB63T	40 × 63	B63	0.01	11.39
220,000	ESMH100VND224MB80T	40 × 80	B80	0.008	15.0	
<b>16 Volts</b> 20 Volts Surge	8,200	ESMH160VSN822MP25T	22 × 25	P25	0.081	2.51
	10,000	ESMH160VSN103MP25T	22 × 25	P25	0.066	2.77
	12,000	ESMH160VSN123MP30T	22 × 30	P30	0.055	2.86
	15,000	ESMH160VSN153MP35T	22 × 35	P35	0.044	3.29
	18,000	ESMH160VSN183MP40T	22 × 40	P40	0.037	3.72
	22,000	ESMH160VSN223MP50T	22 × 50	P50	0.03	4.37
	12,000	ESMH160VSN123MQ25T	25.4 × 25	Q25	0.055	2.95
	15,000	ESMH160VSN153MQ30T	25.4 × 30	Q30	0.044	3.46
	18,000	ESMH160VSN183MQ35T	25.4 × 35	Q35	0.037	3.98
	22,000	ESMH160VSN223MQ40T	25.4 × 40	Q40	0.03	4.26
	27,000	ESMH160VSN273MQ45T	25.4 × 45	Q45	0.025	4.72
	33,000	ESMH160VSN333MQ50T	25.4 × 50	Q50	0.02	5.33
	15,000	ESMH160VSN153MR25T	30 × 25	R25	0.044	3.66
	18,000	ESMH160VSN183MR25T	30 × 25	R25	0.037	4.0
	22,000	ESMH160VSN223MR30T	30 × 30	R30	0.03	4.21
	27,000	ESMH160VSN273MR35T	30 × 35	R35	0.025	4.82
	33,000	ESMH160VSN333MR40T	30 × 40	R40	0.02	5.36
	39,000	ESMH160VSN393MR45T	30 × 45	R45	0.017	6.01
	47,000	ESMH160VSN473MR50T	30 × 50	R50	0.014	6.79
	22,000	ESMH160VSN223MA25T	35 × 25	A25	0.03	4.15
	27,000	ESMH160VSN273MA30T	35 × 30	A30	0.025	4.65
	33,000	ESMH160VSN333MA30T	35 × 30	A30	0.02	5.15
	39,000	ESMH160VSN393MA35T	35 × 35	A35	0.017	5.95
	47,000	ESMH160VSN473MA40T	35 × 40	A40	0.014	6.76
	56,000	ESMH160VSN563MA45T	35 × 45	A45	0.012	7.62
	68,000	ESMH160VSN683MA50T	35 × 50	A50	0.01	8.63
	82,000	ESMH160VND823MA63T	35 × 63	A63	0.011	9.88
	100,000	ESMH160VND104MA80T	35 × 80	A80	0.009	11.67
	33,000	ESMH160VND333MB25T	40 × 25	B25	0.027	5.15
	39,000	ESMH160VND393MB30T	40 × 30	B30	0.022	5.86
	47,000	ESMH160VND473MB35T	40 × 35	B35	0.019	6.68
	68,000	ESMH160VND683MB40T	40 × 40	B40	0.015	8.27
	82,000	ESMH160VND823MB50T	40 × 50	B50	0.012	9.66
100,000	ESMH160VND104MB63T	40 × 63	B63	0.01	11.39	
150,000	ESMH160VND154MB80T	40 × 80	B80	0.008	15.17	
<b>25 Volts</b> 32 Volts Surge	5,600	ESMH250VSN562MP25T	22 × 25	P25	0.089	2.21
	6,800	ESMH250VSN682MP30T	22 × 30	P30	0.073	2.4
	8,200	ESMH250VSN822MP35T	22 × 35	P35	0.061	2.72
	10,000	ESMH250VSN103MP40T	22 × 40	P40	0.05	3.09
	12,000	ESMH250VSN123MP45T	22 × 45	P45	0.041	3.48
	15,000	ESMH250VSN153MP50T	22 × 50	P50	0.033	4.0
	6,800	ESMH250VSN682MQ25T	25.4 × 25	Q25	0.073	2.56
	8,200	ESMH250VSN822MQ25T	25.4 × 25	Q25	0.061	2.8
	10,000	ESMH250VSN103MQ30T	25.4 × 30	Q30	0.05	3.12
	12,000	ESMH250VSN123MQ35T	25.4 × 35	Q35	0.041	3.43
	15,000	ESMH250VSN153MQ40T	25.4 × 40	Q40	0.033	3.95
	18,000	ESMH250VSN183MQ45T	25.4 × 45	Q45	0.028	4.45

†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.

# SMH 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 +85°C, 120Hz
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<b>25 Volts 32 Volts Surge</b>	10,000	ESMH250VSN103MR25T	30 × 25	R25	0.05	3.21
	12,000	ESMH250VSN123MR30T	30 × 30	R30	0.041	3.86
	15,000	ESMH250VSN153MR30T	30 × 30	R30	0.033	4.0
	18,000	ESMH250VSN183MR35T	30 × 35	R35	0.028	4.46
	22,000	ESMH250VSN223MR45T	30 × 45	R45	0.023	5.21
	27,000	ESMH250VSN273MR50T	30 × 50	R50	0.018	5.94
	12,000	ESMH250VSN123MA25T	35 × 25	A25	0.041	3.54
	15,000	ESMH250VSN153MA25T	35 × 25	A25	0.033	3.95
	18,000	ESMH250VSN183MA30T	35 × 30	A30	0.028	4.63
	22,000	ESMH250VSN223MA35T	35 × 35	A35	0.023	5.16
	27,000	ESMH250VSN273MA40T	35 × 40	A40	0.018	5.92
	33,000	ESMH250VSN333MA45T	35 × 45	A45	0.015	6.75
	39,000	ESMH250VSN393MA50T	35 × 50	A50	0.013	7.56
	47,000	ESMH250VND473MA63T	35 × 63	A63	0.012	8.63
	68,000	ESMH250VND683MA80T	35 × 80	A80	0.009	11.11
	22,000	ESMH250VND223MB25T	40 × 25	B25	0.027	4.86
	27,000	ESMH250VND273MB30T	40 × 30	B30	0.021	5.63
	33,000	ESMH250VND333MB35T	40 × 35	B35	0.018	6.46
	39,000	ESMH250VND393MB40T	40 × 40	B40	0.015	7.24
	56,000	ESMH250VND563MB50T	40 × 50	B50	0.012	9.21
68,000	ESMH250VND683MB63T	40 × 63	B63	0.01	10.84	
100,000	ESMH250VND104MB80T	40 × 80	B80	0.008	14.31	

<b>35 Volts 44 Volts Surge</b>	3,900	ESMH350VSN392MP25T	22 × 25	P25	0.106	2.22
	4,700	ESMH350VSN472MP30T	22 × 30	P30	0.088	2.41
	5,600	ESMH350VSN562MP35T	22 × 35	P35	0.074	2.75
	6,800	ESMH350VSN682MP40T	22 × 40	P40	0.061	2.8
	8,200	ESMH350VSN822MP45T	22 × 45	P45	0.051	3.47
	10,000	ESMH350VSN103MP50T	22 × 50	P50	0.041	3.57
	4,700	ESMH350VSN472MQ25T	25.4 × 25	Q25	0.088	2.42
	5,600	ESMH350VSN562MQ25T	25.4 × 25	Q25	0.074	2.64
	6,800	ESMH350VSN682MQ30T	25.4 × 30	Q30	0.061	2.74
	8,200	ESMH350VSN822MQ35T	25.4 × 35	Q35	0.051	3.1
	10,000	ESMH350VSN103MQ40T	25.4 × 40	Q40	0.041	3.53
	12,000	ESMH350VSN123MQ45T	25.4 × 45	Q45	0.035	3.98
	15,000	ESMH350VSN153MQ50T	25.4 × 50	Q50	0.028	4.54
	6,800	ESMH350VSN682MR25T	30 × 25	R25	0.061	2.97
	8,200	ESMH350VSN822MR30T	30 × 30	R30	0.051	3.13
	10,000	ESMH350VSN103MR30T	30 × 30	R30	0.041	3.46
	12,000	ESMH350VSN123MR35T	30 × 35	R35	0.035	4.01
	15,000	ESMH350VSN153MR40T	30 × 40	R40	0.028	4.52
	18,000	ESMH350VSN183MR45T	30 × 45	R45	0.023	4.71
	22,000	ESMH350VSN223MR50T	30 × 50	R50	0.019	5.33
	8,200	ESMH350VSN822MA25T	35 × 25	A25	0.051	2.73
	10,000	ESMH350VSN103MA25T	35 × 25	A25	0.041	3.02
	12,000	ESMH350VSN123MA30T	35 × 30	A30	0.035	4.42
	15,000	ESMH350VSN153MA35T	35 × 35	A35	0.028	5.01
	18,000	ESMH350VSN183MA40T	35 × 40	A40	0.023	5.54
	22,000	ESMH350VSN223MA45T	35 × 45	A45	0.019	6.04
	27,000	ESMH350VSN273MA50T	35 × 50	A50	0.015	6.89
	33,000	ESMH350VND333MA63T	35 × 63	A63	0.012	7.93
	47,000	ESMH350VND473MA80T	35 × 80	A80	0.01	10.12
	15,000	ESMH350VND153MB25T	40 × 25	B25	0.028	4.39
	18,000	ESMH350VND183MB30T	40 × 30	B30	0.023	5.04
	22,000	ESMH350VND223MB35T	40 × 35	B35	0.019	5.78
	27,000	ESMH350VND273MB40T	40 × 40	B40	0.016	6.59
39,000	ESMH350VND393MB50T	40 × 50	B50	0.012	8.42	
47,000	ESMH350VND473MB63T	40 × 63	B63	0.01	9.88	
68,000	ESMH350VND683MB80T	40 × 80	B80	0.008	12.92	

† 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.

# SMH 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 +85°C, 120Hz
<b>50 Volts</b> 63 Volts Surge	2,200	ESMH500VSN222MP25T	22 × 25	P25	0.151	1.91
	3,300	ESMH500VSN332MP30T	22 × 30	P30	0.10	2.37
	3,900	ESMH500VSN392MP35T	22 × 35	P35	0.085	2.65
	4,700	ESMH500VSN472MP40T	22 × 40	P40	0.071	2.99
	5,600	ESMH500VSN562MP45T	22 × 45	P45	0.059	3.36
	6,800	ESMH500VSN682MP50T	22 × 50	P50	0.049	3.81
	3,300	ESMH500VSN332MQ25T	25.4 × 25	Q25	0.10	2.38
	3,900	ESMH500VSN392MQ30T	25.4 × 30	Q30	0.085	2.68
	4,700	ESMH500VSN472MQ35T	25.4 × 35	Q35	0.071	3.03
	5,600	ESMH500VSN562MQ35T	25.4 × 35	Q35	0.059	3.31
	6,800	ESMH500VSN682MQ40T	25.4 × 40	Q40	0.049	3.81
	8,200	ESMH500VSN822MQ50T	25.4 × 50	Q50	0.04	4.37
	3,900	ESMH500VSN392MR25T	30 × 25	R25	0.085	2.55
	4,700	ESMH500VSN472MR25T	30 × 25	R25	0.071	2.81
	5,600	ESMH500VSN562MR30T	30 × 30	R30	0.059	3.37
	6,800	ESMH500VSN682MR35T	30 × 35	R35	0.049	3.85
	8,200	ESMH500VSN822MR40T	30 × 40	R40	0.04	4.36
	10,000	ESMH500VSN103MR45T	30 × 45	R45	0.033	4.97
	12,000	ESMH500VSN123MR50T	30 × 50	R50	0.028	5.6
	5,600	ESMH500VSN562MA25T	35 × 25	A25	0.059	3.42
	6,800	ESMH500VSN682MA30T	35 × 30	A30	0.049	3.85
	8,200	ESMH500VSN822MA30T	35 × 30	A30	0.04	4.41
	10,000	ESMH500VSN103MA35T	35 × 35	A35	0.033	4.92
	12,000	ESMH500VSN123MA40T	35 × 40	A40	0.028	5.58
	15,000	ESMH500VSN153MA45T	35 × 45	A45	0.022	6.44
	18,000	ESMH500VSN183MA50T	35 × 50	A50	0.018	6.71
	22,000	ESMH500VND223MA63T	35 × 63	A63	0.013	7.23
	27,000	ESMH500VND273MA80T	35 × 80	A80	0.011	8.57
	8,200	ESMH500VND822MB25T	40 × 25	B25	0.033	3.63
	12,000	ESMH500VND123MB30T	40 × 30	B30	0.024	4.6
	15,000	ESMH500VND153MB35T	40 × 35	B35	0.02	5.33
	18,000	ESMH500VND183MB40T	40 × 40	B40	0.017	6.02
	22,000	ESMH500VND223MB50T	40 × 50	B50	0.014	7.07
33,000	ESMH500VND333MB63T	40 × 63	B63	0.011	9.25	
39,000	ESMH500VND393MB80T	40 × 80	B80	0.009	10.94	
<b>63 Volts</b> 79 Volts Surge	1,800	ESMH630VSN182MP25T	22 × 25	P25	0.138	1.82
	2,200	ESMH630VSN222MP30T	22 × 30	P30	0.113	2.31
	2,700	ESMH630VSN272MP35T	22 × 35	P35	0.092	2.4
	3,300	ESMH630VSN332MP35T	22 × 35	P35	0.075	2.62
	3,900	ESMH630VSN392MP40T	22 × 40	P40	0.064	2.93
	4,700	ESMH630VSN472MP50T	22 × 50	P50	0.053	3.39
	2,200	ESMH630VSN222MQ25T	25.4 × 25	Q25	0.113	2.3
	2,700	ESMH630VSN272MQ25T	25.4 × 25	Q25	0.092	2.4
	3,300	ESMH630VSN332MQ30T	25.4 × 30	Q30	0.075	2.64
	3,900	ESMH630VSN392MQ35T	25.4 × 35	Q35	0.064	2.97
	4,700	ESMH630VSN472MQ40T	25.4 × 40	Q40	0.053	3.36
	5,600	ESMH630VSN562MQ45T	25.4 × 45	Q45	0.044	3.77
	6,800	ESMH630VSN682MQ50T	25.4 × 50	Q50	0.037	4.27
	3,300	ESMH630VSN332MR25T	30 × 25	R25	0.075	2.78
	3,900	ESMH630VSN392MR30T	30 × 30	R30	0.064	3.0
	4,700	ESMH630VSN472MR30T	30 × 30	R30	0.053	3.32
	5,600	ESMH630VSN562MR35T	30 × 35	R35	0.044	3.75
	6,800	ESMH630VSN682MR40T	30 × 40	R40	0.037	4.27
	8,200	ESMH630VSN822MR45T	30 × 45	R45	0.03	4.83
	10,000	ESMH630VSN103MR50T	30 × 50	R50	0.025	5.49
	3,900	ESMH630VSN392MA25T	35 × 25	A25	0.064	3.0
	4,700	ESMH630VSN472MA25T	35 × 25	A25	0.053	3.36
	5,600	ESMH630VSN562MA30T	35 × 30	A30	0.044	3.76
6,800	ESMH630VSN682MA30T	35 × 30	A30	0.037	4.15	

† 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.

# SMH 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 +85°C, 120Hz
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<b>63 Volts 79 Volts Surge</b>	8,200	ESMH630VSN822MA35T	35 × 35	A35	0.03	4.79
	10,000	ESMH630VSN103MA40T	35 × 40	A40	0.025	5.47
	12,000	ESMH630VSN123MA45T	35 × 45	A45	0.021	6.19
	15,000	ESMH630VND153MA63T	35 × 63	A63	0.015	6.9
	22,000	ESMH630VND223MA80T	35 × 80	A80	0.011	8.94
	6,800	ESMH630VND682MB25T	40 × 25	B25	0.036	3.82
	8,200	ESMH630VND822MB30T	40 × 30	B30	0.029	4.39
	10,000	ESMH630VND103MB35T	40 × 35	B35	0.024	5.03
	12,000	ESMH630VND123MB40T	40 × 40	B40	0.02	5.68
	18,000	ESMH630VND183MB50T	40 × 50	B50	0.015	7.39
22,000	ESMH630VND223MB63T	40 × 63	B63	0.013	8.72	
33,000	ESMH630VND333MB80T	40 × 80	B80	0.01	11.62	

<b>80 Volts 100 Volts Surge</b>	1,200	ESMH800VSN122MP25T	22 × 25	P25	0.207	1.69
	1,500	ESMH800VSN182MP25T	22 × 25	P25	0.138	1.88
	1,800	ESMH800VSN182MP30T	22 × 30	P30	0.138	2.14
	2,200	ESMH800VSN222MP35T	22 × 35	P35	0.113	2.44
	2,700	ESMH800VSN272MP40T	22 × 40	P40	0.092	2.78
	3,300	ESMH800VSN332MP45T	22 × 45	P45	0.075	3.16
	3,900	ESMH800VSN392MP50T	22 × 50	P50	0.064	3.52
	1,800	ESMH800VSN182MQ25T	25.4 × 25	Q25	0.138	2.26
	2,200	ESMH800VSN222MQ30T	25.4 × 30	Q30	0.113	2.46
	2,700	ESMH800VSN272MQ35T	25.4 × 35	Q35	0.092	2.81
	3,300	ESMH800VSN332MQ40T	25.4 × 40	Q40	0.075	3.21
	3,900	ESMH800VSN392MQ45T	25.4 × 45	Q45	0.064	3.59
	4,700	ESMH800VSN472MQ50T	25.4 × 50	Q50	0.053	4.05
	2,200	ESMH800VSN222MR25T	30 × 25	R25	0.113	2.49
	2,700	ESMH800VSN272MR25T	30 × 25	R25	0.092	2.75
	3,300	ESMH800VSN332MR30T	30 × 30	R30	0.075	3.17
	3,900	ESMH800VSN392MR35T	30 × 35	R35	0.064	3.57
	4,700	ESMH800VSN472MR40T	30 × 40	R40	0.053	4.05
	5,600	ESMH800VSN562MR45T	30 × 45	R45	0.044	4.55
	6,800	ESMH800VSN682MR50T	30 × 50	R50	0.037	5.16
	3,300	ESMH800VSN332MA25T	35 × 25	A25	0.075	3.21
	3,900	ESMH800VSN392MA25T	35 × 25	A25	0.064	3.5
	4,700	ESMH800VSN472MA30T	35 × 30	A30	0.053	4.09
	5,600	ESMH800VSN562MA35T	35 × 35	A35	0.044	4.51
	6,800	ESMH800VSN682MA40T	35 × 40	A40	0.037	5.14
	8,200	ESMH800VSN822MA45T	35 × 45	A45	0.03	5.83
	10,000	ESMH800VSN103MA50T	35 × 50	A50	0.025	6.63
	12,000	ESMH800VND123MA63T	35 × 63	A63	0.021	6.9
	15,000	ESMH800VND153MA80T	35 × 80	A80	0.017	9.04
	4,700	ESMH800VND472MB25T	40 × 25	B25	0.053	3.89
	5,600	ESMH800VND562MB30T	40 × 30	B30	0.044	4.44
	6,800	ESMH800VND682MB35T	40 × 35	B35	0.037	5.08
8,200	ESMH800VND822MB40T	40 × 40	B40	0.03	5.75	
12,000	ESMH800VND123MB50T	40 × 50	B50	0.021	7.39	
15,000	ESMH800VND153MB63T	40 × 63	B63	0.017	8.82	
22,000	ESMH800VND223MB80T	40 × 80	B80	0.011	11.62	

<b>100 Volts 125 Volts Surge</b>	820	ESMH101VSN821MP25T	22 × 25	P25	0.303	1.86
	1,200	ESMH101VSN122MP30T	22 × 30	P30	0.207	2.09
	1,500	ESMH101VSN152MP35T	22 × 35	P35	0.166	2.41
	1,800	ESMH101VSN182MP40T	22 × 40	P40	0.138	2.71
	2,200	ESMH101VSN222MP45T	22 × 45	P45	0.113	3.08
	2,700	ESMH101VSN272MP50T	22 × 50	P50	0.092	3.53
	1,200	ESMH101VSN122MQ25T	25.4 × 25	Q25	0.207	2.1
	1,500	ESMH101VSN152MQ30T	25.4 × 30	Q30	0.166	2.43
	1,800	ESMH101VSN182MQ35T	25.4 × 35	Q35	0.138	2.75
	2,200	ESMH101VSN222MQ40T	25.4 × 40	Q40	0.113	3.13

† 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.



# SMH 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 +85°C, 120Hz
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<b>100 Volts 125 Volts Surge</b>	2,700	ESMH101VSN272MQ45T	25.4 × 45	Q45	0.092	3.57
	3,300	ESMH101VSN332MQ50T	25.4 × 50	Q50	0.075	4.06
	1,500	ESMH101VSN152MR25T	30 × 25	R25	0.166	2.46
	1,800	ESMH101VSN182MR25T	30 × 25	R25	0.138	2.72
	2,200	ESMH101VSN222MR30T	30 × 30	R30	0.113	3.09
	2,700	ESMH101VSN272MR35T	30 × 35	R35	0.092	3.55
	3,300	ESMH101VSN332MR40T	30 × 40	R40	0.075	4.05
	3,900	ESMH101VSN392MR45T	30 × 45	R45	0.064	4.54
	4,700	ESMH101VSN472MR50T	30 × 50	R50	0.053	5.13
	2,200	ESMH101VSN222MA25T	35 × 25	A25	0.113	3.14
	2,700	ESMH101VSN272MA30T	35 × 30	A30	0.092	3.71
	3,300	ESMH101VSN332MA30T	35 × 30	A30	0.075	4.05
	3,900	ESMH101VSN392MA35T	35 × 35	A35	0.064	4.49
	4,700	ESMH101VSN472MA40T	35 × 40	A40	0.053	5.11
	5,600	ESMH101VSN562MA45T	35 × 45	A45	0.044	5.75
	6,800	ESMH101VSN682MA50T	35 × 50	A50	0.037	6.50
	8,200	ESMH101VND822MA80T	35 × 80	A80	0.03	7.47
	2,700	ESMH101VND272MB25T	40 × 25	B25	0.092	3.29
	3,300	ESMH101VND332MB30T	40 × 30	B30	0.075	3.81
	3,900	ESMH101VND392MB35T	40 × 35	B35	0.064	4.3
4,700	ESMH101VND472MB40T	40 × 40	B40	0.053	4.86	
6,800	ESMH101VND682MB50T	40 × 50	B50	0.037	6.22	
8,200	ESMH101VND822MB63T	40 × 63	B63	0.03	7.29	
12,000	ESMH101VND123MB80T	40 × 80	B80	0.021	9.6	

<b>160 Volts 200 Volts Surge</b>	270	ESMH161VSN271MP20T	22 × 20	P20	0.614	1.18
	330	ESMH161VSN331MP25T	22 × 25	P25	0.502	1.4
	470	ESMH161VSN471MP30T	22 × 30	P30	0.353	1.73
	560	ESMH161VSN561MP35T	22 × 35	P35	0.296	1.95
	680	ESMH161VSN681MP40T	22 × 40	P40	0.244	2.21
	820	ESMH161VSN821MP45T	22 × 45	P45	0.202	2.49
	1,000	ESMH161VSN102MP50T	22 × 50	P50	0.166	2.82
	330	ESMH161VSN331MQ20T	25.4 × 20	Q20	0.502	1.35
	470	ESMH161VSN471MQ25T	25.4 × 25	Q25	0.353	1.74
	560	ESMH161VSN561MQ25T	25.4 × 25	Q25	0.296	1.95
	680	ESMH161VSN681MQ30T	25.4 × 30	Q30	0.244	2.16
	820	ESMH161VSN821MQ35T	25.4 × 35	Q35	0.202	2.45
	1,000	ESMH161VSN102MQ40T	25.4 × 40	Q40	0.166	2.79
	1,200	ESMH161VSN122MQ45T	25.4 × 45	Q45	0.138	3.15
	1,500	ESMH161VSN152MQ50T	25.4 × 50	Q50	0.111	3.72
	470	ESMH161VSN471MR20T	30 × 20	R20	0.353	1.7
	680	ESMH161VSN681MR25T	30 × 25	R25	0.244	2.19
	820	ESMH161VSN821MR30T	30 × 30	R30	0.202	2.5
	1,000	ESMH161VSN102MR30T	30 × 30	R30	0.166	2.8
	1,200	ESMH161VSN122MR35T	30 × 35	R35	0.138	3.13
	1,500	ESMH161VSN152MR45T	30 × 45	R45	0.111	3.73
	1,800	ESMH161VSN182MR50T	30 × 50	R50	0.092	4.2
	680	ESMH161VSN681MA20T	35 × 20	A20	0.366	2.14
	820	ESMH161VSN821MA25T	35 × 25	A25	0.303	2.5
	1,000	ESMH161VSN102MA25T	35 × 25	A25	0.249	2.8
	1,200	ESMH161VSN122MA30T	35 × 30	A30	0.207	3.27
	1,500	ESMH161VSN152MA35T	35 × 35	A35	0.166	3.69
	1,800	ESMH161VSN182MA40T	35 × 40	A40	0.138	4.18
	2,200	ESMH161VSN222MA45T	35 × 45	A45	0.113	4.78
	2,700	ESMH161VSN272MA50T	35 × 50	A50	0.092	5.45
	3,300	ESMH161VND332MA63T	35 × 63	A63	0.075	5.6
	4,700	ESMH161VND472MA80T	35 × 80	A80	0.053	7.15
	1,500	ESMH161VND152MB25T	40 × 25	B25	0.166	3.11
	1,800	ESMH161VND182MB30T	40 × 30	B30	0.138	3.56

†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.

# SMH 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 +85°C, 120Hz
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<b>160 Volts</b> 200 Volts Surge	2,200	ESMH161VND222MB35T	40 × 35	B35	0.113	4.09
	2,700	ESMH161VND272MB40T	40 × 40	B40	0.092	4.66
	3,900	ESMH161VND392MB50T	40 × 50	B50	0.064	5.96
	4,700	ESMH161VND472MB63T	40 × 63	B63	0.053	6.98
	6,800	ESMH161VND682MB80T	40 × 80	B80	0.037	9.14

<b>180 Volts</b> 225 Volts Surge	220	ESMH181VSN221MP20T	22 × 20	P20	0.753	1.06
	270	ESMH181VSN221MP25T	22 × 25	P25	0.614	1.27
	390	ESMH181VSN221MP30T	22 × 30	P30	0.425	1.58
	470	ESMH181VSN221MP35T	22 × 35	P35	0.353	1.79
	560	ESMH181VSN221MP40T	22 × 40	P40	0.296	2.0
	680	ESMH181VSN221MP45T	22 × 45	P45	0.244	2.27
	820	ESMH181VSN221MP50T	22 × 50	P50	0.202	2.55
	270	ESMH181VSN271MQ20T	25.4 × 20	Q20	0.614	1.22
	390	ESMH181VSN391MQ25T	25.4 × 25	Q25	0.425	1.58
	560	ESMH181VSN561MQ30T	25.4 × 30	Q30	0.296	1.96
	680	ESMH181VSN681MQ35T	25.4 × 35	Q35	0.244	2.23
	820	ESMH181VSN821MQ40T	25.4 × 40	Q40	0.202	2.53
	1,000	ESMH181VSN102MQ45T	25.4 × 45	Q45	0.166	2.87
	390	ESMH181VSN391MR20T	30 × 20	R20	0.425	1.55
	560	ESMH181VSN561MR25T	30 × 25	R25	0.296	1.99
	820	ESMH181VSN821MR30T	30 × 30	R30	0.202	2.7
	1,000	ESMH181VSN102MR35T	30 × 35	R35	0.166	2.86
	1,200	ESMH181VSN122MR40T	30 × 40	R40	0.138	3.23
	1,500	ESMH181VSN152MR50T	30 × 50	R50	0.111	3.83
	560	ESMH181VSN561MA20T	35 × 20	A20	0.444	1.94
	820	ESMH181VSN821MA25T	35 × 25	A25	0.303	2.53
	1,000	ESMH181VSN102MA30T	35 × 30	A30	0.249	2.99
	1,200	ESMH181VSN122MA35T	35 × 35	A35	0.207	3.31
	1,500	ESMH181VSN152MA40T	35 × 40	A40	0.166	3.82
	1,800	ESMH181VSN182MA45T	35 × 45	A45	0.138	4.32
	2,200	ESMH181VSN222MA50T	35 × 50	A50	0.113	4.92
	2,700	ESMH181VND272MA63T	35 × 63	A63	0.092	5.67
	3,900	ESMH181VND392MA80T	35 × 80	A80	0.064	7.29
	1,200	ESMH181VND122MB25T	40 × 25	B25	0.207	3.11
	1,500	ESMH181VND152MB30T	40 × 30	B30	0.166	3.64
	1,800	ESMH181VND182MB35T	40 × 35	B35	0.138	4.13
	2,200	ESMH181VND222MB40T	40 × 40	B40	0.113	4.71
	3,300	ESMH181VND332MB50T	40 × 50	B50	0.075	6.13
3,900	ESMH181VND392MB63T	40 × 63	B63	0.064	7.11	
5,600	ESMH181VND562MB80T	40 × 80	B80	0.044	9.27	

<b>200 Volts</b> 250 Volts Surge	180	ESMH201VSN181MP20T	22 × 20	P20	0.921	0.96
	270	ESMH201VSN271MP25T	22 × 25	P25	0.614	1.27
	330	ESMH201VSN331MP30T	22 × 30	P30	0.502	1.45
	390	ESMH201VSN391MP30T	22 × 30	P30	0.425	1.58
	470	ESMH201VSN471MP35T	22 × 35	P35	0.353	1.78
	560	ESMH201VSN561MP40T	22 × 40	P40	0.296	2.0
	680	ESMH201VSN681MP50T	22 × 50	P50	0.244	2.33
	270	ESMH201VSN271MQ20T	25.4 × 20	Q20	0.614	1.22
	330	ESMH201VSN331MQ25T	25.4 × 25	Q25	0.502	1.45
	390	ESMH201VSN391MQ25T	25.4 × 25	Q25	0.425	1.58
	470	ESMH201VSN471MQ30T	25.4 × 30	Q30	0.353	1.8
	560	ESMH201VSN561MQ35T	25.4 × 35	Q35	0.296	2.03
	680	ESMH201VSN681MQ40T	25.4 × 40	Q40	0.244	2.3
	820	ESMH201VSN821MQ45T	25.4 × 45	Q45	0.202	2.6
	1,000	ESMH201VSN102MQ50T	25.4 × 50	Q50	0.166	2.95
	390	ESMH201VSN391MR20T	30 × 20	R20	0.425	1.55
	470	ESMH201VSN471MR25T	30 × 25	R25	0.353	1.8
	560	ESMH201VSN561MR25T	30 × 25	R25	0.296	2.0

† 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.

# SMH 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 +85°C, 120Hz
<b>200 Volts</b> 250 Volts Surge	680	ESMH201VSN681MR30T	30 × 30	R30	0.244	2.28
	820	ESMH201VSN821MR35T	30 × 35	R35	0.202	2.59
	1,000	ESMH201VSN102MR40T	30 × 40	R40	0.166	2.95
	1,200	ESMH201VSN122MR45T	30 × 45	R45	0.138	3.31
	1,500	ESMH201VSN152MR50T	30 × 50	R50	0.111	3.82
	560	ESMH201VSN561MA20T	35 × 20	A20	0.444	1.94
	680	ESMH201VSN681MA25T	35 × 25	A25	0.366	2.31
	820	ESMH201VSN821MA25T	35 × 25	A25	0.303	2.6
	1,000	ESMH201VSN102MA30T	35 × 30	A30	0.249	2.95
	1,200	ESMH201VSN122MA35T	35 × 35	A35	0.207	3.31
	1,500	ESMH201VSN152MA40T	35 × 40	A40	0.166	3.82
	1,800	ESMH201VSN182MA45T	35 × 45	A45	0.138	4.32
	2,200	ESMH201VSN222MA50T	35 × 50	A50	0.113	4.92
	2,700	ESMH201VND272MA63T	35 × 63	A63	0.092	5.67
	3,300	ESMH201VND332MA80T	35 × 80	A80	0.075	6.7
	1,000	ESMH201VND102MB25T	40 × 25	B25	0.249	2.84
	1,500	ESMH201VND152MB30T	40 × 30	B30	0.166	3.64
	1,800	ESMH201VND182MB35T	40 × 35	B35	0.138	4.13
	2,200	ESMH201VND222MB40T	40 × 40	B40	0.113	4.71
	2,700	ESMH201VND272MB50T	40 × 50	B50	0.092	5.54
3,900	ESMH201VND392MB63T	40 × 63	B63	0.064	7.11	
4,700	ESMH201VND472MB80T	40 × 80	B80	0.053	8.49	

<b>250 Volts</b> 300 Volts Surge	120	ESMH251VSN121MP20T	22 × 20	P20	1.381	0.78
	180	ESMH251VSN181MP25T	22 × 25	P25	0.921	1.04
	220	ESMH251VSN221MP25T	22 × 25	P25	0.753	1.15
	270	ESMH251VSN271MP30T	22 × 30	P30	0.614	1.31
	330	ESMH251VSN331MP35T	22 × 35	P35	0.502	1.49
	390	ESMH251VSN391MP40T	22 × 40	P40	0.425	1.67
	470	ESMH251VSN471MP45T	22 × 45	P45	0.353	1.88
	560	ESMH251VSN561MP50T	22 × 50	P50	0.296	2.1
	180	ESMH251VSN181MQ20T	25.4 × 20	Q20	0.921	1.0
	270	ESMH251VSN271MQ25T	25.4 × 25	Q25	0.614	1.32
	330	ESMH251VSN331MQ30T	25.4 × 30	Q30	0.502	1.51
	390	ESMH251VSN391MQ30T	25.4 × 30	Q30	0.425	1.66
	470	ESMH251VSN471MQ35T	25.4 × 35	Q35	0.353	1.86
	560	ESMH251VSN561MQ40T	25.4 × 40	Q40	0.296	2.09
	680	ESMH251VSN681MQ50T	25.4 × 50	Q50	0.244	2.44
	270	ESMH251VSN271MR20T	30 × 20	R20	0.614	1.29
	330	ESMH251VSN331MR25T	30 × 25	R25	0.502	1.52
	390	ESMH251VSN391MR25T	30 × 25	R25	0.425	1.66
	470	ESMH251VSN471MR30T	30 × 30	R30	0.353	1.89
	560	ESMH251VSN561MR35T	30 × 35	R35	0.296	2.14
	680	ESMH251VSN681MR40T	30 × 40	R40	0.244	2.43
	820	ESMH251VSN821MR45T	30 × 45	R45	0.202	2.75
	1,000	ESMH251VSN102MR50T	30 × 50	R50	0.166	3.31
	390	ESMH251VSN391MA20T	35 × 20	A20	0.638	1.62
	470	ESMH251VSN471MA25T	35 × 25	A25	0.529	1.88
	560	ESMH251VSN561MA25T	35 × 25	A25	0.444	2.06
	680	ESMH251VSN681MA30T	35 × 30	A30	0.366	2.46
	820	ESMH251VSN821MA35T	35 × 35	A35	0.303	2.77
	1,000	ESMH251VSN102MA40T	35 × 40	A40	0.249	3.32
	1,200	ESMH251VSN122MA45T	35 × 45	A45	0.207	3.53
	1,500	ESMH251VSN152MA50T	35 × 50	A50	0.166	4.04
	1,800	ESMH251VND182MA63T	35 × 63	A63	0.138	4.63
	2,200	ESMH251VND222MA80T	35 × 80	A80	0.113	5.47
	680	ESMH251VND681MB25T	40 × 25	B25	0.366	2.34
	1,000	ESMH251VND102MB30T	40 × 30	B30	0.249	2.97
	1,200	ESMH251VND122MB35T	40 × 35	B35	0.207	3.37

† 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.

# SMH 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 +85°C, 120Hz
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<b>250 Volts</b> 300 Volts Surge	1,500	ESMH251VND152MB40T	40 × 40	B40	0.166	3.89
	1,800	ESMH251VND182MB50T	40 × 50	B50	0.138	4.52
	2,200	ESMH251VND222MB63T	40 × 63	B63	0.113	5.34
	3,300	ESMH251VND332MB80T	40 × 80	B80	0.075	7.12

<b>315 Volts</b> 365 Volts Surge	82	ESMH3B1VSN820MP20T	22 × 20	P20	3.032	0.65
	120	ESMH3B1VSN121MP25T	22 × 25	P25	2.072	0.94
	150	ESMH3B1VSN151MP30T	22 × 30	P30	1.658	1.11
	180	ESMH3B1VSN181MP35T	22 × 35	P35	1.381	1.2
	220	ESMH3B1VSN221MP40T	22 × 40	P40	1.13	1.41
	270	ESMH3B1VSN271MP45T	22 × 45	P45	0.921	1.6
	330	ESMH3B1VSN331MP50T	22 × 50	P50	0.753	1.82
	100	ESMH3B1VSN101MQ20T	25.4 × 20	Q20	2.486	0.74
	150	ESMH3B1VSN151MQ25T	25.4 × 25	Q25	1.658	1.1
	180	ESMH3B1VSN181MQ25T	25.4 × 25	Q25	1.381	1.2
	220	ESMH3B1VSN221MQ30T	25.4 × 30	Q30	1.13	1.38
	270	ESMH3B1VSN271MQ35T	25.4 × 35	Q35	0.921	1.59
	330	ESMH3B1VSN331MQ40T	25.4 × 40	Q40	0.753	1.8
	390	ESMH3B1VSN391MQ45T	25.4 × 45	Q45	0.638	2.01
	470	ESMH3B1VSN471MQ45T	25.4 × 45	Q45	0.529	2.2
	150	ESMH3B1VSN151MR20T	30 × 20	R20	1.658	0.96
	220	ESMH3B1VSN221MR25T	30 × 25	R25	1.13	1.4
	270	ESMH3B1VSN271MR30T	30 × 30	R30	0.921	1.59
	330	ESMH3B1VSN331MR30T	30 × 30	R30	0.753	1.8
	390	ESMH3B1VSN391MR35T	30 × 35	R35	0.638	1.99
	470	ESMH3B1VSN471MR40T	30 × 40	R40	0.529	2.27
	560	ESMH3B1VSN561MR45T	30 × 45	R45	0.444	2.56
	680	ESMH3B1VSN681MR50T	30 × 50	R50	0.366	2.88
	220	ESMH3B1VSN221MA20T	35 × 20	A20	1.13	1.22
	270	ESMH3B1VSN271MA25T	35 × 25	A25	0.921	1.59
	330	ESMH3B1VSN331MA25T	35 × 25	A25	0.753	1.8
	390	ESMH3B1VSN391MA30T	35 × 30	A30	0.638	2.0
	470	ESMH3B1VSN471MA30T	35 × 30	A30	0.529	2.23
	560	ESMH3B1VSN561MA35T	35 × 35	A35	0.444	2.49
	680	ESMH3B1VSN681MA40T	35 × 40	A40	0.366	2.87
	820	ESMH3B1VSN821MA45T	35 × 45	A45	0.303	3.25
	1,000	ESMH3B1VSN102MA50T	35 × 50	A50	0.249	3.69
	1,200	ESMH3B1VND122MA63T	35 × 63	A63	0.207	4.36
	1,500	ESMH3B1VND152MA80T	35 × 80	A80	0.166	5.22
	390	ESMH3B1VND391MB25T	40 × 25	B25	0.638	2.04
	560	ESMH3B1VND561MB30T	40 × 30	B30	0.444	2.57
	680	ESMH3B1VND681MB35T	40 × 35	B35	0.366	2.93
	820	ESMH3B1VND821MB40T	40 × 40	B40	0.303	3.32
	1,200	ESMH3B1VND122MB50T	40 × 50	B50	0.207	4.27
	1,500	ESMH3B1VND152MB63T	40 × 63	B63	0.166	5.09
2,200	ESMH3B1VND222MB80T	40 × 80	B80	0.113	6.71	

<b>350 Volts</b> 400 Volts Surge	68	ESMH351VSN680MP20T	22 × 20	P20	3.656	0.59
	100	ESMH351VSN101MP25T	22 × 25	P25	2.486	0.86
	120	ESMH351VSN121MP30T	22 × 30	P30	2.072	0.99
	150	ESMH351VSN151MP35T	22 × 35	P35	1.658	1.14
	180	ESMH351VSN181MP40T	22 × 40	P40	1.381	1.28
	220	ESMH351VSN221MP45T	22 × 45	P45	1.13	1.44
	270	ESMH351VSN271MP50T	22 × 50	P50	0.921	1.64
	82	ESMH351VSN820MQ20T	25.4 × 20	Q20	3.032	0.67
	120	ESMH351VSN121MQ25T	25.4 × 25	Q25	2.072	0.99
	150	ESMH351VSN151MQ25T	25.4 × 25	Q25	1.658	1.1
	180	ESMH351VSN181MQ30T	25.4 × 30	Q30	1.381	1.24
	220	ESMH351VSN221MQ35T	25.4 × 35	Q35	1.13	1.44

† 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.

# SMH 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 +85°C, 120Hz
<b>350 Volts</b> 400 Volts Surge	270	ESMH351VSN271MQ40T	25.4 × 40	Q40	0.921	1.63
	330	ESMH351VSN331MQ50T	25.4 × 50	Q50	0.753	1.88
	120	ESMH351VSN121MR20T	30 × 20	R20	2.072	0.86
	180	ESMH351VSN181MR25T	30 × 25	R25	1.381	1.27
	220	ESMH351VSN221MR30T	30 × 30	R30	1.13	1.44
	270	ESMH351VSN271MR35T	30 × 35	R35	0.921	1.66
	330	ESMH351VSN331MR35T	30 × 35	R35	0.753	1.83
	390	ESMH351VSN391MR40T	30 × 40	R40	0.638	2.06
	470	ESMH351VSN471MR50T	30 × 50	R50	0.529	2.4
	180	ESMH351VSN181MA20T	35 × 20	A20	1.381	1.1
	220	ESMH351VSN221MA25T	35 × 25	A25	1.13	1.44
	270	ESMH351VSN271MA25T	35 × 25	A25	0.921	1.63
	330	ESMH351VSN331MA30T	35 × 30	A30	0.753	1.87
	390	ESMH351VSN391MA30T	35 × 30	A30	0.638	2.03
	470	ESMH351VSN471MA35T	35 × 35	A35	0.529	2.33
	560	ESMH351VSN561MA40T	35 × 40	A40	0.444	2.6
	680	ESMH351VSN681MA45T	35 × 45	A45	0.366	2.96
	820	ESMH351VSN821MA50T	35 × 50	A50	0.303	3.04
	1,000	ESMH351VND102MA63T	35 × 63	A63	0.249	3.98
	1,200	ESMH351VND122MA80T	35 × 80	A80	0.207	4.67
	330	ESMH351VND331MB25T	40 × 25	B25	0.753	1.88
	470	ESMH351VND471MB30T	40 × 30	B30	0.529	2.35
	560	ESMH351VND561MB35T	40 × 35	B35	0.444	2.66
	680	ESMH351VND681MB40T	40 × 40	B40	0.366	3.02
	1,000	ESMH351VND102MB50T	40 × 50	B50	0.249	3.89
	1,500	ESMH351VND152MB63T	40 × 63	B63	0.166	5.09
	1,800	ESMH351VND182MB80T	40 × 80	B80	0.138	6.07
	<b>400 Volts</b> 450 Volts Surge	56	ESMH401VSN560MP20T	22 × 20	P20	4.44
82		ESMH401VSN820MP25T	22 × 25	P25	3.032	0.78
100		ESMH401VSN101MP30T	22 × 30	P30	2.486	0.9
120		ESMH401VSN121MP35T	22 × 35	P35	2.072	1.02
150		ESMH401VSN151MP40T	22 × 40	P40	1.658	1.16
180		ESMH401VSN181MP45T	22 × 45	P45	1.381	1.31
220		ESMH401VSN221MP50T	22 × 50	P50	1.13	1.49
270		ESMH401VSN271MP50T	22 × 50	P50	0.921	1.64
68		ESMH401VSN680MQ20T	25.4 × 20	Q20	3.656	0.61
100		ESMH401VSN101MQ25T	25.4 × 25	Q25	2.486	0.9
120		ESMH401VSN121MQ25T	25.4 × 25	Q25	2.072	0.98
150		ESMH401VSN151MQ30T	25.4 × 30	Q30	1.658	1.14
180		ESMH401VSN181MQ35T	25.4 × 35	Q35	1.381	1.30
220		ESMH401VSN221MQ40T	25.4 × 40	Q40	1.13	1.47
270		ESMH401VSN271MQ45T	25.4 × 45	Q45	0.921	1.67
330		ESMH401VSN331MQ50T	25.4 × 50	Q50	0.753	1.88
100		ESMH401VSN101MR20T	30 × 20	R20	2.486	0.78
150		ESMH401VSN151MR25T	30 × 25	R25	1.658	1.16
180		ESMH401VSN181MR30T	30 × 30	R30	1.381	1.44
220		ESMH401VSN221MR30T	30 × 30	R30	1.13	1.47
270		ESMH401VSN271MR35T	30 × 35	R35	0.921	1.66
330		ESMH401VSN331MR40T	30 × 40	R40	0.753	1.9
390		ESMH401VSN391MR45T	30 × 45	R45	0.638	2.13
470		ESMH401VSN471MR50T	30 × 50	R50	0.529	2.4
150		ESMH401VSN151MA20T	35 × 20	A20	1.658	1.0
180		ESMH401VSN181MA25T	35 × 25	A25	1.381	1.32
220		ESMH401VSN221MA25T	35 × 25	A25	1.13	1.47
270		ESMH401VSN271MA30T	35 × 30	A30	0.921	1.69
330		ESMH401VSN331MA30T	35 × 30	A30	0.753	1.87
390		ESMH401VSN391MA35T	35 × 35	A35	0.638	2.08
470		ESMH401VSN471MA40T	35 × 40	A40	0.529	2.39
560		ESMH401VSN561MA45T	35 × 45	A45	0.444	2.69

† 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.



# SMH Series

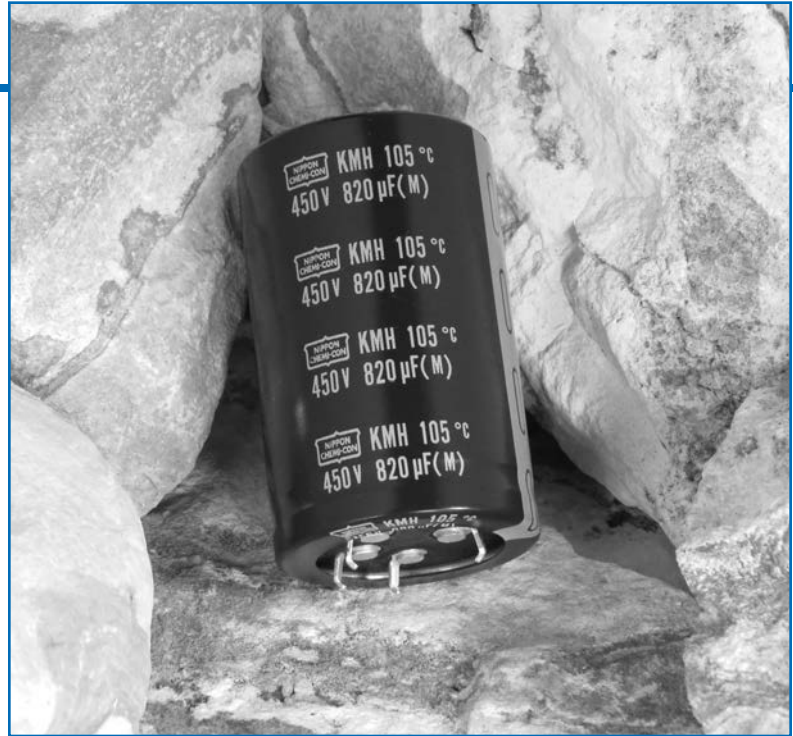
## Standard Voltage Ratings - Snap Mount

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 +85°C, 120Hz
400 Volts 450 Volts Surge	680	ESMH401VSN681MA50T	35 × 50	A50	0.366	3.04
	820	ESMH401VND821MA63T	35 × 63	A63	0.303	3.61
	1,200	ESMH401VND122MA80T	35 × 80	A80	0.207	4.67
	270	ESMH401VND271MB25T	40 × 25	B25	0.921	1.7
	390	ESMH401VND391MB30T	40 × 30	B30	0.638	2.14
	560	ESMH401VND561MB35T	40 × 35	B35	0.444	2.66
	680	ESMH401VND681MB40T	40 × 40	B40	0.366	3.02
	820	ESMH401VND821MB50T	40 × 50	B50	0.303	3.53
	1,200	ESMH401VND122MB63T	40 × 63	B63	0.207	4.56
1,500	ESMH401VND152MB80T	40 × 80	B80	0.166	5.54	
450 Volts 500 Volts Surge	56	ESMH451VSN560MP25T	22 × 25	P25	4.44	0.65
	68	ESMH451VSN680MP25T	22 × 25	P25	3.656	0.71
	82	ESMH451VSN820MP30T	22 × 30	P30	3.032	0.82
	100	ESMH451VSN101MP35T	22 × 35	P35	2.486	0.93
	120	ESMH451VSN121MP40T	22 × 40	P40	2.072	1.04
	150	ESMH451VSN151MP45T	22 × 45	P45	1.658	1.19
	180	ESMH451VSN181MP50T	22 × 50	P50	1.381	1.34
	82	ESMH451VSN820MQ25T	25.4 × 25	Q25	3.032	0.82
	100	ESMH451VSN101MQ25T	25.4 × 25	Q25	2.486	0.9
	120	ESMH451VSN121MQ30T	25.4 × 30	Q30	2.072	1.02
	150	ESMH451VSN151MQ35T	25.4 × 35	Q35	1.658	1.19
	180	ESMH451VSN181MQ40T	25.4 × 40	Q40	1.381	1.33
	220	ESMH451VSN221MQ50T	25.4 × 50	Q50	1.13	1.54
	120	ESMH451VSN121MR25T	30 × 25	R25	2.072	1.03
	150	ESMH451VSN151MR30T	30 × 30	R30	1.658	1.19
	180	ESMH451VSN181MR35T	30 × 35	R35	1.381	1.35
	220	ESMH451VSN221MR40T	30 × 40	R40	1.13	1.55
	270	ESMH451VSN271MR45T	30 × 45	R45	0.921	1.78
	330	ESMH451VSN331MR50T	30 × 50	R50	0.753	2.01
	150	ESMH451VSN151MA25T	35 × 25	A25	1.658	1.19
	180	ESMH451VSN181MA25T	35 × 25	A25	1.381	1.33
	220	ESMH451VSN221MA30T	35 × 30	A30	1.13	1.53
	270	ESMH451VSN271MA35T	35 × 35	A35	0.921	1.73
	330	ESMH451VSN331MA40T	35 × 40	A40	0.753	2.0
	390	ESMH451VSN391MA45T	35 × 45	A45	0.638	2.24
	470	ESMH451VSN471MA50T	35 × 50	A50	0.529	2.53
	560	ESMH451VND561MA63T	35 × 63	A63	0.444	2.98
	820	ESMH451VND821MA80T	35 × 80	A80	0.303	3.86
	220	ESMH451VND221MB25T	40 × 25	B25	1.13	1.54
	270	ESMH451VND271MB30T	40 × 30	B30	0.921	1.78
	390	ESMH451VND391MB35T	40 × 35	B35	0.638	2.22
	470	ESMH451VND471MB40T	40 × 40	B40	0.529	2.51
	680	ESMH451VND681MB50T	40 × 50	B50	0.366	3.21
820	ESMH451VND821MB63T	40 × 63	B63	0.303	3.77	
1,200	ESMH451VND122MB80T	40 × 80	B80	0.207	4.96	

† 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.

- Snap Mount
- Large Capacitance
- High CV
- High Ripple
- RoHS Compliant
- +105°C Maximum Temperature



The KMH series capacitors are the standard +105°C high temperature, large capacitance snap-in capacitors that offer a wide voltage range of 6.3 to 450VDC. The endurance for the KMH series is 2,000 hours at +105°C with the rated ripple current applied. With very high CV values and high ripple current capabilities these capacitors are ideal for use in power supply filter circuits.

All KMH 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. The KMH capacitors are available with snap-in terminals (2 or 4-pin) depending on can diameter. Straight standoff terminals (5 pin) are optional for the 40mm can diameter.

## Summary of Specifications

- PC board 2 or 4-pin snap-in; optional 5-pin (Ø40 only) straight standoff terminals.
- Capacitance range: 47 to 220,000µF.
- Voltage range: 6.3 to 450VDC.
- Category temperature range: -40°C to +105°C for 6.3 to 100V; -25°C to +105°C for 160 to 450V.
- Leakage current: 0.02CV(µA) or 3mA, whichever is smaller, after 5 minutes at +20°C.
- Standard capacitance tolerance: ±20%
- Nominal case size (D×L): 22×20mm to 40×80mm.
- Rated lifetime: 2,000 hours at +105°C with the rated ripple current applied.

# KMH Series

## KMH Specifications - Snap Mount

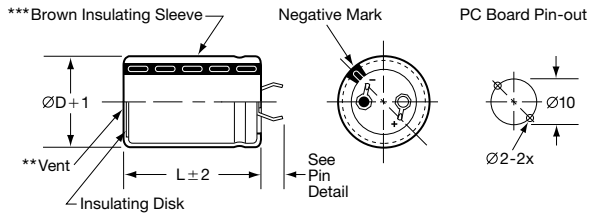
Item	Characteristics																																													
Category Temperature Range	- 40 to +105°C for 6.3 to 100VDC; - 25 to +105°C for 160 to 450VDC																																													
Rated Voltage Range	6.3 to 450VDC																																													
Capacitance Range	47 to 220,000 $\mu$ F																																													
Capacitance Tolerance	$\pm$ 20% (M) at +20°C, 120Hz																																													
Leakage Current	I = 0.02CV ( $\mu$ A) or 3mA, whichever is smaller, after 5 minutes at +20°C. Where I = Max. leakage current ( $\mu$ A), C = Nominal capacitance ( $\mu$ F) and V = Rated voltage (V)																																													
Dissipation Factor (Tan $\delta$ )	At +20°C, 120Hz <table border="1"> <thead> <tr> <th>Rated Voltage (V)</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63-100</th> <th>160-250</th> <th>315-450</th> </tr> </thead> <tbody> <tr> <td>Tan <math>\delta</math> (DF) Max.†</td> <td>0.60</td> <td>0.50</td> <td>0.40</td> <td>0.30</td> <td>0.25</td> <td>0.20</td> <td>0.15</td> <td>0.10*</td> <td>0.15</td> </tr> </tbody> </table> <p>*0.15 maximum for 35mm and 40mm diameter or 20mm in length. † For rated voltages <math>\leq</math> 63V, values are not valid for case sizes &gt;35mm in diameter or &gt;50mm in length.</p>	Rated Voltage (V)	6.3	10	16	25	35	50	63-100	160-250	315-450	Tan $\delta$ (DF) Max.†	0.60	0.50	0.40	0.30	0.25	0.20	0.15	0.10*	0.15																									
Rated Voltage (V)	6.3	10	16	25	35	50	63-100	160-250	315-450																																					
Tan $\delta$ (DF) Max.†	0.60	0.50	0.40	0.30	0.25	0.20	0.15	0.10*	0.15																																					
Low Temperature Characteristics	At 120Hz, impedance (Z) ratio between the -25°C or -40°C value and +20°C value shall not exceed the values given below. <table border="1"> <thead> <tr> <th>Rated Voltage (V)</th> <th>6.3-16</th> <th>25</th> <th>35</th> <th>50, 63</th> <th>80, 100</th> <th>160-400</th> <th>450</th> </tr> </thead> <tbody> <tr> <td>Z(-25°C) / Z(+20°C)</td> <td>4</td> <td>3</td> <td>3</td> <td>2</td> <td>2</td> <td>4</td> <td>8</td> </tr> <tr> <td>Z(-40°C) / Z(+20°C)</td> <td>15</td> <td>10</td> <td>8</td> <td>6</td> <td>5</td> <td>—</td> <td>—</td> </tr> </tbody> </table>	Rated Voltage (V)	6.3-16	25	35	50, 63	80, 100	160-400	450	Z(-25°C) / Z(+20°C)	4	3	3	2	2	4	8	Z(-40°C) / Z(+20°C)	15	10	8	6	5	—	—																					
Rated Voltage (V)	6.3-16	25	35	50, 63	80, 100	160-400	450																																							
Z(-25°C) / Z(+20°C)	4	3	3	2	2	4	8																																							
Z(-40°C) / Z(+20°C)	15	10	8	6	5	—	—																																							
Rated Ripple Current Multipliers	Ambient Temperature (°C) <table border="1"> <thead> <tr> <th>+45°C</th> <th>+60°C</th> <th>+70°C</th> <th>+85°C</th> <th>+105°C</th> </tr> </thead> <tbody> <tr> <td>2.64</td> <td>2.23</td> <td>2.12</td> <td>1.73</td> <td>1.00</td> </tr> </tbody> </table> Frequency (Hz) <table border="1"> <thead> <tr> <th>DC Rated Voltage</th> <th>50Hz</th> <th>120Hz</th> <th>300Hz</th> <th>1kHz</th> <th>10kHz</th> <th>100kHz</th> </tr> </thead> <tbody> <tr> <td>6.3-50V</td> <td>0.95</td> <td>1.00</td> <td>1.03</td> <td>1.05</td> <td>1.08</td> <td>1.08</td> </tr> <tr> <td>63-100V</td> <td>0.92</td> <td>1.00</td> <td>1.07</td> <td>1.13</td> <td>1.19</td> <td>1.20</td> </tr> <tr> <td>160-250V</td> <td>0.81</td> <td>1.00</td> <td>1.17</td> <td>1.32</td> <td>1.45</td> <td>1.50</td> </tr> <tr> <td>315-450V</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> </tbody> </table>	+45°C	+60°C	+70°C	+85°C	+105°C	2.64	2.23	2.12	1.73	1.00	DC Rated Voltage	50Hz	120Hz	300Hz	1kHz	10kHz	100kHz	6.3-50V	0.95	1.00	1.03	1.05	1.08	1.08	63-100V	0.92	1.00	1.07	1.13	1.19	1.20	160-250V	0.81	1.00	1.17	1.32	1.45	1.50	315-450V	0.77	1.00	1.16	1.30	1.41	1.43
+45°C	+60°C	+70°C	+85°C	+105°C																																										
2.64	2.23	2.12	1.73	1.00																																										
DC Rated Voltage	50Hz	120Hz	300Hz	1kHz	10kHz	100kHz																																								
6.3-50V	0.95	1.00	1.03	1.05	1.08	1.08																																								
63-100V	0.92	1.00	1.07	1.13	1.19	1.20																																								
160-250V	0.81	1.00	1.17	1.32	1.45	1.50																																								
315-450V	0.77	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 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: $\leq \pm$ 20% of initial measured value Tan $\delta$ (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 +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: $\leq \pm$ 20% of initial measured value Tan $\delta$ (DF) : $\leq$ 150% of initial specified value Leakage current : $\leq$ initial specified value																																													

# KMH Series

## Diagram of Dimensions - Snap Mount

### Snap Mount

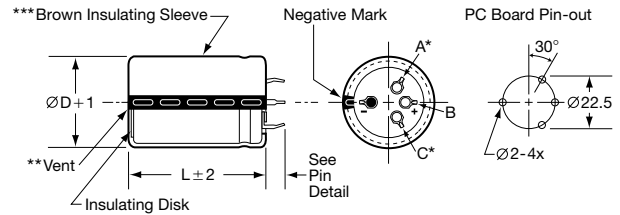
VSN Snap-in  $\varnothing 22$  and  $\varnothing 35$  standard  
VNN Snap-in  $\varnothing 22$  and  $\varnothing 35$  optional



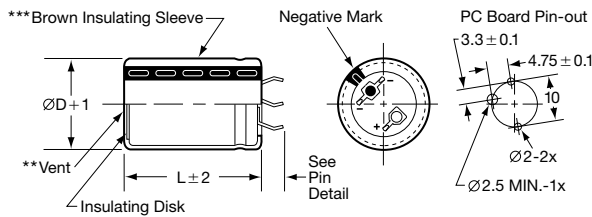
### Snap Mount

Unit: mm

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

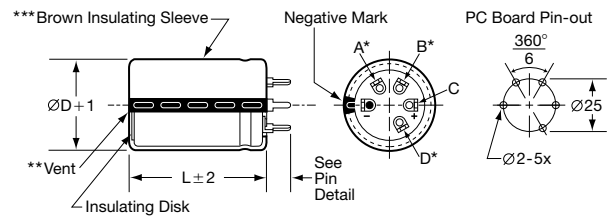


VEN Snap-in  $\varnothing 30$  and  $\varnothing 35$  optional

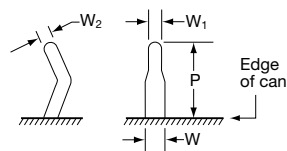


### Straight Pin Mount

VQT Straight Standoff  $\varnothing 40$  optional

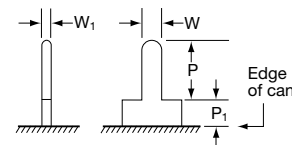


VS, VE & VN Snap-in Pin Dimensions



Type	P	W	W <sub>1</sub>	W <sub>2</sub>
VSN $\varnothing 22$ - $\varnothing 30$	$4.0 \pm 0.5$	$1.5 \pm 0.2$	$0.8 \pm 0.1$	$0.8 \pm 0.1$
VSN $\varnothing 35$	$3.5 \pm 0.5$			
VNN $\varnothing 22$ - $\varnothing 35$	$5.8 \pm 1.0$			
VEN $\varnothing 30$ - $\varnothing 35$	$4.0 \pm 0.5$			
VSD $\varnothing 35$ - $\varnothing 40$	$3.5 \pm 1.0$			
VND $\varnothing 35$ - $\varnothing 40$	$5.8 \pm 1.0$			

VQ Straight Standoff Pin Dimensions



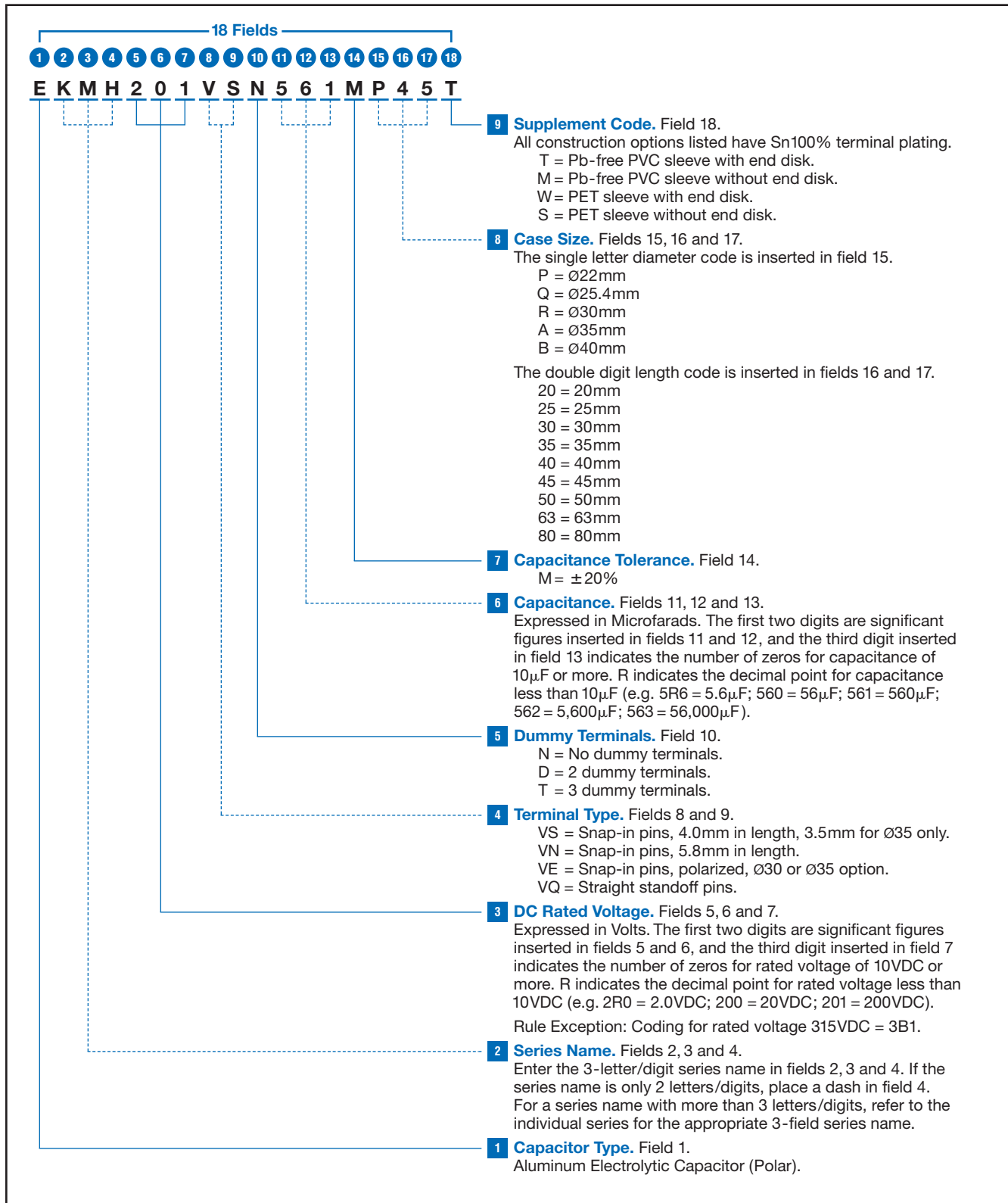
Type	P	P <sub>1</sub>	W	W <sub>1</sub>
Standoff Pin (VQ)	$3.75 \pm 1.0$	2.0 max.	$1.5 \pm 0.1$	$0.7 \pm 0.2$

### 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 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.

# KMH Series

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





# KMH 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
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<b>6.3 Volts 8 Volts Surge</b>	12,000	EKM6R3VSN123MP25T	22 × 25	P25	0.083	1.54
	15,000	EKM6R3VSN153MP25T	22 × 25	P25	0.066	1.72
	18,000	EKM6R3VSN183MP30T	22 × 30	P30	0.055	1.95
	22,000	EKM6R3VSN223MP35T	22 × 35	P35	0.045	2.23
	27,000	EKM6R3VSN273MP40T	22 × 40	P40	0.037	2.54
	33,000	EKM6R3VSN333MP45T	22 × 45	P45	0.03	2.88
	18,000	EKM6R3VSN183MQ25T	25.4 × 25	Q25	0.055	1.96
	22,000	EKM6R3VSN223MQ30T	25.4 × 30	Q30	0.045	2.25
	27,000	EKM6R3VSN273MQ35T	25.4 × 35	Q35	0.037	2.57
	33,000	EKM6R3VSN333MQ40T	25.4 × 40	Q40	0.03	2.93
	39,000	EKM6R3VSN393MQ40T	25.4 × 40	Q40	0.026	3.18
	47,000	EKM6R3VSN473MQ50T	25.4 × 50	Q50	0.021	3.69
	22,000	EKM6R3VSN223MR25T	30 × 25	R25	0.045	2.28
	27,000	EKM6R3VSN273MR25T	30 × 25	R25	0.037	2.52
	33,000	EKM6R3VSN333MR30T	30 × 30	R30	0.03	2.89
	39,000	EKM6R3VSN393MR35T	30 × 35	R35	0.026	3.26
	47,000	EKM6R3VSN473MR40T	30 × 40	R40	0.021	3.69
	56,000	EKM6R3VSN563MR45T	30 × 45	R45	0.018	4.16
	68,000	EKM6R3VSN683MR50T	30 × 50	R50	0.015	4.71
	33,000	EKM6R3VSN333MA25T	35 × 25	A25	0.03	2.93
	39,000	EKM6R3VSN393MA30T	35 × 30	A30	0.026	3.4
	47,000	EKM6R3VSN473MA30T	35 × 30	A30	0.021	3.73
	56,000	EKM6R3VSN563MA35T	35 × 35	A35	0.018	4.12
	68,000	EKM6R3VSN683MA40T	35 × 40	A40	0.015	4.69
	82,000	EKM6R3VSN823MA45T	35 × 45	A45	0.012	5.32
	120,000	EKM6R3VND124MA63T	35 × 63	A63	0.011	6.9
	180,000	EKM6R3VND184MA80T	35 × 80	A80	0.008	9.04
	56,000	EKM6R3VND563MB25T	40 × 25	B25	0.026	3.87
	68,000	EKM6R3VND683MB30T	40 × 30	B30	0.02	4.47
	82,000	EKM6R3VND823MB35T	40 × 35	B35	0.018	5.09
	100,000	EKM6R3VND104MB40T	40 × 40	B40	0.014	5.79
	150,000	EKM6R3VND154MB50T	40 × 50	B50	0.011	7.54
180,000	EKM6R3VND184MB63T	40 × 63	B63	0.009	8.82	
220,000	EKM6R3VND224MB80T	40 × 80	B80	0.008	10.61	

<b>10 Volts 13 Volts Surge</b>	10,000	EKM100VSN103MP25T	22 × 25	P25	0.083	1.55
	12,000	EKM100VSN123MP30T	22 × 30	P30	0.069	1.77
	15,000	EKM100VSN153MP30T	22 × 30	P30	0.055	1.97
	18,000	EKM100VSN183MP35T	22 × 35	P35	0.046	2.21
	22,000	EKM100VSN223MP40T	22 × 40	P40	0.038	2.51
	27,000	EKM100VSN273MP50T	22 × 50	P50	0.031	2.93
	15,000	EKM100VSN153MQ25T	25.4 × 25	Q25	0.055	1.96
	18,000	EKM100VSN183MQ30T	25.4 × 30	Q30	0.046	2.23
	22,000	EKM100VSN223MQ35T	25.4 × 35	Q35	0.038	2.54
	27,000	EKM100VSN273MQ40T	25.4 × 40	Q40	0.031	2.9
	33,000	EKM100VSN333MQ45T	25.4 × 45	Q45	0.025	3.3
	39,000	EKM100VSN393MQ50T	25.4 × 50	Q50	0.021	3.68
	22,000	EKM100VSN223MR25T	30 × 25	R25	0.038	2.4
	27,000	EKM100VSN273MR30T	30 × 30	R30	0.031	2.87
	33,000	EKM100VSN333MR35T	30 × 35	R35	0.025	3.28
	39,000	EKM100VSN393MR40T	30 × 40	R40	0.021	3.69
	47,000	EKM100VSN473MR45T	30 × 45	R45	0.018	4.17
	56,000	EKM100VSN563MR50T	30 × 50	R50	0.015	4.68
	27,000	EKM100VSN273MA25T	35 × 25	A25	0.031	2.73
	33,000	EKM100VSN333MA30T	35 × 30	A30	0.025	3.16
	39,000	EKM100VSN393MA30T	35 × 30	A30	0.021	3.43
	47,000	EKM100VSN473MA35T	35 × 35	A35	0.018	3.76
	56,000	EKM100VSN563MA40T	35 × 40	A40	0.015	4.67
	68,000	EKM100VSN683MA50T	35 × 50	A50	0.012	5.46

† 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.

# KMH 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
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<b>10 Volts 13 Volts Surge</b>	100,000	EKMH100VND104MA63T	35 × 63	A63	0.011	6.9
	120,000	EKMH100VND124MA80T	35 × 80	A80	0.009	8.08
	39,000	EKMH100VND393MB25T	40 × 25	B25	0.027	3.54
	56,000	EKMH100VND563MB30T	40 × 30	B30	0.021	4.44
	68,000	EKMH100VND683MB35T	40 × 35	B35	0.018	5.08
	82,000	EKMH100VND823MB40T	40 × 40	B40	0.015	5.75
	120,000	EKMH100VND124MB50T	40 × 50	B50	0.012	7.39
	150,000	EKMH100VND154MB63T	40 × 63	B63	0.009	8.82
180,000	EKMH100VND184MB80T	40 × 80	B80	0.008	10.51	

<b>16 Volts 20 Volts Surge</b>	6,800	EKMH160VSN682MP25T	22 × 25	P25	0.098	1.57
	10,000	EKMH160VSN103MP30T	22 × 30	P30	0.066	1.97
	12,000	EKMH160VSN123MP35T	22 × 35	P35	0.055	2.22
	15,000	EKMH160VSN153MP40T	22 × 40	P40	0.044	2.55
	18,000	EKMH160VSN183MP45T	22 × 45	P45	0.037	2.87
	10,000	EKMH160VSN103MQ25T	25.4 × 25	Q25	0.066	1.97
	12,000	EKMH160VSN123MQ30T	25.4 × 30	Q30	0.055	2.24
	15,000	EKMH160VSN153MQ35T	25.4 × 35	Q35	0.044	2.58
	18,000	EKMH160VSN183MQ40T	25.4 × 40	Q40	0.037	2.92
	22,000	EKMH160VSN223MQ45T	25.4 × 45	Q45	0.03	3.32
	27,000	EKMH160VSN273MQ50T	25.4 × 50	Q50	0.025	3.78
	12,000	EKMH160VSN123MR25T	30 × 25	R25	0.055	2.45
	15,000	EKMH160VSN153MR25T	30 × 25	R25	0.044	2.52
	18,000	EKMH160VSN183MR30T	30 × 30	R30	0.037	2.88
	22,000	EKMH160VSN223MR35T	30 × 35	R35	0.03	3.29
	27,000	EKMH160VSN273MR40T	30 × 40	R40	0.025	3.77
	33,000	EKMH160VSN333MR45T	30 × 45	R45	0.02	4.3
	39,000	EKMH160VSN393MR50T	30 × 50	R50	0.017	4.81
	18,000	EKMH160VSN183MA25T	35 × 25	A25	0.037	2.92
	22,000	EKMH160VSN223MA25T	35 × 25	A25	0.03	3.23
	27,000	EKMH160VSN273MA30T	35 × 30	A30	0.025	3.45
	33,000	EKMH160VSN333MA35T	35 × 35	A35	0.02	4.26
	39,000	EKMH160VSN393MA40T	35 × 40	A40	0.017	4.79
	47,000	EKMH160VSN473MA45T	35 × 45	A45	0.014	5.43
	68,000	EKMH160VND683MA63T	35 × 63	A63	0.012	6.36
	100,000	EKMH160VND104MA80T	35 × 80	A80	0.009	8.25
	33,000	EKMH160VND333MB25T	40 × 25	B25	0.027	3.64
	39,000	EKMH160VND333MB30T	40 × 30	B30	0.021	4.15
	47,000	EKMH160VND333MB35T	40 × 35	B35	0.018	4.72
	56,000	EKMH160VND333MB40T	40 × 40	B40	0.015	5.31
82,000	EKMH160VND333MB50T	40 × 50	B50	0.012	6.83	
100,000	EKMH160VND333MB63T	40 × 63	B63	0.010	8.05	
150,000	EKMH160VND333MB80T	40 × 80	B80	0.008	10.73	

<b>25 Volts 32 Volts Surge</b>	4,700	EKMH250VSN472MP25T	22 × 25	P25	0.106	1.5
	5,600	EKMH250VSN562MP25T	22 × 25	P25	0.089	1.63
	6,800	EKMH250VSN682MP30T	22 × 30	P30	0.073	1.86
	8,200	EKMH250VSN822MP35T	22 × 35	P35	0.061	2.11
	10,000	EKMH250VSN103MP40T	22 × 40	P40	0.05	2.39
	12,000	EKMH250VSN123MP45T	22 × 45	P45	0.041	2.69
	6,800	EKMH250VSN682MQ25T	25.4 × 25	Q25	0.073	1.87
	8,200	EKMH250VSN822MQ30T	25.4 × 30	Q30	0.061	2.12
	10,000	EKMH250VSN103MQ35T	25.4 × 35	Q35	0.05	2.42
	12,000	EKMH250VSN123MQ40T	25.4 × 40	Q40	0.041	2.74
	15,000	EKMH250VSN153MQ45T	25.4 × 45	Q45	0.033	3.15
	18,000	EKMH250VSN183MQ50T	25.4 × 50	Q50	0.028	3.54
	8,200	EKMH250VSN822MR25T	30 × 25	R25	0.061	2.15
	10,000	EKMH250VSN103MR25T	30 × 25	R25	0.05	2.37
	12,000	EKMH250VSN123MR30T	30 × 30	R30	0.041	2.7
	15,000	EKMH250VSN153MR35T	30 × 35	R35	0.033	3.13

† 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.

# KMH 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
<b>25 Volts 32 Volts Surge</b>	18,000	EKMH250VSN183MR40T	30 × 40	R40	0.028	3.54
	22,000	EKMH250VSN223MR45T	30 × 45	R45	0.023	4.04
	12,000	EKMH250VSN123MA25T	35 × 25	A25	0.041	2.74
	15,000	EKMH250VSN153MA30T	35 × 30	A30	0.033	3.27
	18,000	EKMH250VSN183MA30T	35 × 30	A30	0.028	3.58
	22,000	EKMH250VSN223MA35T	35 × 35	A35	0.023	3.64
	27,000	EKMH250VSN273MA45T	35 × 45	A45	0.018	4.73
	33,000	EKMH250VSN333MA50T	35 × 50	A50	0.015	5.39
	47,000	EKMH250VND473MA63T	35 × 63	A63	0.012	6.11
	68,000	EKMH250VND683MA80T	35 × 80	A80	0.009	7.86
	18,000	EKMH250VND183MB25T	40 × 25	B25	0.029	3.11
	27,000	EKMH250VND273MB30T	40 × 30	B30	0.021	3.98
	33,000	EKMH250VND333MB35T	40 × 35	B35	0.018	4.57
	39,000	EKMH250VND393MB40T	40 × 40	B40	0.015	5.12
	47,000	EKMH250VND473MB50T	40 × 50	B50	0.013	5.97
	68,000	EKMH250VND683MB63T	40 × 63	B63	0.010	7.67
82,000	EKMH250VND823MB80T	40 × 80	B80	0.008	9.16	
<b>35 Volts 44 Volts Surge</b>	3,300	EKMH350VSN332MP25T	22 × 25	P25	0.126	1.4
	3,900	EKMH350VSN392MP30T	22 × 30	P30	0.106	1.57
	4,700	EKMH350VSN472MP30T	22 × 30	P30	0.088	1.72
	5,600	EKMH350VSN562MP35T	22 × 35	P35	0.074	1.95
	6,800	EKMH350VSN682MP40T	22 × 40	P40	0.061	2.2
	8,200	EKMH350VSN822MP50T	22 × 50	P50	0.051	2.55
	4,700	EKMH350VSN472MQ25T	25.4 × 25	Q25	0.088	1.8
	5,600	EKMH350VSN562MQ30T	25.4 × 30	Q30	0.074	1.96
	6,800	EKMH350VSN682MQ35T	25.4 × 35	Q35	0.061	2.23
	8,200	EKMH350VSN822MQ40T	25.4 × 40	Q40	0.051	2.53
	10,000	EKMH350VSN103MQ45T	25.4 × 45	Q45	0.041	2.87
	12,000	EKMH350VSN123MQ50T	25.4 × 50	Q50	0.035	3.24
	5,600	EKMH350VSN562MR25T	30 × 25	R25	0.074	1.99
	6,800	EKMH350VSN682MR25T	30 × 25	R25	0.061	2.19
	8,200	EKMH350VSN822MR30T	30 × 30	R30	0.051	2.75
	10,000	EKMH350VSN103MR35T	30 × 35	R35	0.041	2.9
	12,000	EKMH350VSN123MR40T	30 × 40	R40	0.035	3.23
	15,000	EKMH350VSN153MR45T	30 × 45	R45	0.028	3.72
	8,200	EKMH350VSN822MA25T	35 × 25	A25	0.051	2.75
	10,000	EKMH350VSN103MA30T	35 × 30	A30	0.041	2.91
	12,000	EKMH350VSN123MA30T	35 × 30	A30	0.035	2.99
	15,000	EKMH350VSN153MA35T	35 × 35	A35	0.028	3.67
	18,000	EKMH350VSN183MA40T	35 × 40	A40	0.023	4.37
	22,000	EKMH350VSN223MA50T	35 × 50	A50	0.019	4.92
	33,000	EKMH350VND333MA63T	35 × 63	A63	0.012	5.60
	39,000	EKMH350VND393MA80T	35 × 80	A80	0.010	6.52
	12,000	EKMH350VND123MB25T	40 × 25	B25	0.030	2.78
	18,000	EKMH350VND183MB30T	40 × 30	B30	0.022	3.56
	22,000	EKMH350VND223MB35T	40 × 35	B35	0.019	4.09
	27,000	EKMH350VND273MB40T	40 × 40	B40	0.016	4.66
33,000	EKMH350VND333MB50T	40 × 50	B50	0.013	5.48	
47,000	EKMH350VND473MB63T	40 × 63	B63	0.010	6.98	
56,000	EKMH350VND563MB80T	40 × 80	B80	0.008	8.29	
<b>50 Volts 63 Volts Surge</b>	1,800	EKMH500VSN182MP25T	22 × 25	P25	0.184	1.33
	2,700	EKMH500VSN272MP30T	22 × 30	P30	0.123	1.69
	3,300	EKMH500VSN332MP35T	22 × 35	P35	0.10	1.93
	3,900	EKMH500VSN392MP40T	22 × 40	P40	0.085	2.16
	4,700	EKMH500VSN472MP45T	22 × 45	P45	0.071	2.43
	5,600	EKMH500VSN562MP50T	22 × 50	P50	0.059	2.75
	2,700	EKMH500VSN272MQ25T	25.4 × 25	Q25	0.123	1.7
	3,300	EKMH500VSN332MQ30T	25.4 × 30	Q30	0.10	1.85

†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.

# KMH 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
<b>50 Volts</b> 63 Volts Surge	3,900	EKM500VSN392MQ35T	25.4 × 35	Q35	0.085	2.18
	4,700	EKM500VSN472MQ35T	25.4 × 35	Q35	0.071	2.39
	5,600	EKM500VSN562MQ40T	25.4 × 40	Q40	0.059	2.7
	6,800	EKM500VSN682MQ50T	25.4 × 50	Q50	0.049	3.3
	3,900	EKM500VSN392MR25T	30 × 25	R25	0.085	1.95
	4,700	EKM500VSN472MR30T	30 × 30	R30	0.071	2.25
	5,600	EKM500VSN562MR35T	30 × 35	R35	0.059	2.76
	6,800	EKM500VSN682MR40T	30 × 40	R40	0.049	3.3
	8,200	EKM500VSN822MR45T	30 × 45	R45	0.04	3.6
	10,000	EKM500VSN103MR50T	30 × 50	R50	0.033	4.04
	4,700	EKM500VSN472MA25T	35 × 25	A25	0.071	2.48
	5,600	EKM500VSN562MA25T	35 × 25	A25	0.059	2.7
	6,800	EKM500VSN682MA30T	35 × 30	A30	0.049	3.25
	8,200	EKM500VSN822MA35T	35 × 35	A35	0.04	3.55
	10,000	EKM500VSN103MA40T	35 × 40	A40	0.033	4.03
	12,000	EKM500VSN123MA45T	35 × 45	A45	0.028	4.55
	18,000	EKM500VND183MA63T	35 × 63	A63	0.014	4.63
	27,000	EKM500VND273MA80T	35 × 80	A80	0.011	6.06
	8,200	EKM500VND822MB25T	40 × 25	B25	0.035	2.57
	10,000	EKM500VND103MB30T	40 × 30	B30	0.027	2.97
12,000	EKM500VND123MB35T	40 × 35	B35	0.023	3.37	
15,000	EKM500VND153MB40T	40 × 40	B40	0.019	3.89	
22,000	EKM500VND223MB50T	40 × 50	B50	0.015	5.0	
27,000	EKM500VND273MB63T	40 × 63	B63	0.012	5.92	
39,000	EKM500VND393MB80T	40 × 80	B80	0.009	7.74	
<b>63 Volts</b> 79 Volts Surge	1,200	EKM630VSN122MP25T	22 × 25	P25	0.207	1.19
	1,500	EKM630VSN152MP25T	22 × 25	P25	0.166	1.33
	1,800	EKM630VSN182MP30T	22 × 30	P30	0.138	1.51
	2,200	EKM630VSN222MP35T	22 × 35	P35	0.113	1.73
	2,700	EKM630VSN272MP40T	22 × 40	P40	0.092	1.97
	3,300	EKM630VSN332MP50T	22 × 50	P50	0.075	2.29
	1,800	EKM630VSN182MQ25T	25.4 × 25	Q25	0.138	1.52
	2,200	EKM630VSN222MQ30T	25.4 × 30	Q30	0.113	1.74
	2,700	EKM630VSN272MQ35T	25.4 × 35	Q35	0.092	1.99
	3,300	EKM630VSN332MQ40T	25.4 × 40	Q40	0.075	2.27
	3,900	EKM630VSN392MQ45T	25.4 × 45	Q45	0.064	2.54
	4,700	EKM630VSN472MQ50T	25.4 × 50	Q50	0.053	2.86
	2,700	EKM630VSN272MR25T	30 × 25	R25	0.092	1.76
	3,300	EKM630VSN332MR30T	30 × 30	R30	0.075	2.24
	3,900	EKM630VSN392MR35T	30 × 35	R35	0.064	2.55
	4,700	EKM630VSN472MR40T	30 × 40	R40	0.053	2.86
	5,600	EKM630VSN562MR45T	30 × 45	R45	0.044	3.22
	6,800	EKM630VSN682MR50T	30 × 50	R50	0.037	3.65
	3,300	EKM630VSN332MA25T	35 × 25	A25	0.075	2.06
	3,900	EKM630VSN392MA25T	35 × 25	A25	0.064	2.24
	4,700	EKM630VSN472MA30T	35 × 30	A30	0.053	2.79
	5,600	EKM630VSN562MA35T	35 × 35	A35	0.044	3.19
	6,800	EKM630VSN682MA40T	35 × 40	A40	0.037	3.64
	8,200	EKM630VSN822MA45T	35 × 45	A45	0.03	3.9
	10,000	EKM630VSN103MA50T	35 × 50	A50	0.025	4.4
	15,000	EKM630VND153MA63T	35 × 63	A63	0.014	4.88
	18,000	EKM630VND183MA80T	35 × 80	A80	0.012	5.72
	5,600	EKM630VND562MB25T	40 × 25	B25	0.038	2.45
	8,200	EKM630VND822MB30T	40 × 30	B30	0.028	3.1
	10,000	EKM630VND103MB35T	40 × 35	B35	0.026	3.56
12,000	EKM630VND123MB40T	40 × 40	B40	0.02	4.01	
15,000	EKM630VND153MB50T	40 × 50	B50	0.016	4.77	
18,000	EKM630VND183MB63T	40 × 63	B63	0.013	5.58	
27,000	EKM630VND273MB80T	40 × 80	B80	0.010	7.43	

† 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.

KMH  
SNAP MOUNT 105°C

# KMH 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
<b>80 Volts</b> 100 Volts Surge	820	EKMH800VSN821MP25T	22 × 25	P25	0.303	1.11
	1,000	EKMH800VSN102MP25T	22 × 25	P25	0.249	1.22
	1,200	EKMH800VSN122MP30T	22 × 30	P30	0.207	1.38
	1,500	EKMH800VSN152MP35T	22 × 35	P35	0.166	1.59
	1,800	EKMH800VSN182MP40T	22 × 40	P40	0.138	1.8
	2,200	EKMH800VSN222MP45T	22 × 45	P45	0.113	2.04
	1,200	EKMH800VSN122MQ25T	25.4 × 25	Q25	0.207	1.39
	1,500	EKMH800VSN152MQ30T	25.4 × 30	Q30	0.166	1.61
	1,800	EKMH800VSN182MQ30T	25.4 × 30	Q30	0.138	1.76
	2,200	EKMH800VSN222MQ35T	25.4 × 35	Q35	0.113	2.01
	2,700	EKMH800VSN272MQ45T	25.4 × 45	Q45	0.092	2.36
	3,300	EKMH800VSN332MQ50T	25.4 × 50	Q50	0.075	2.68
	1,800	EKMH800VSN182MR25T	30 × 25	R25	0.138	1.65
	2,200	EKMH800VSN222MR30T	30 × 30	R30	0.113	2.05
	2,700	EKMH800VSN272MR35T	30 × 35	R35	0.092	2.35
	3,300	EKMH800VSN332MR40T	30 × 40	R40	0.075	2.68
	3,900	EKMH800VSN392MR45T	30 × 45	R45	0.064	3.0
	4,700	EKMH800VSN472MR50T	30 × 50	R50	0.053	3.39
	2,200	EKMH800VSN222MA25T	35 × 25	A25	0.113	2.07
	2,700	EKMH800VSN272MA25T	35 × 25	A25	0.092	2.29
	3,300	EKMH800VSN332MA30T	35 × 30	A30	0.075	2.45
	3,900	EKMH800VSN392MA35T	35 × 35	A35	0.064	2.98
	4,700	EKMH800VSN472MA40T	35 × 40	A40	0.053	3.38
	5,600	EKMH800VSN562MA45T	35 × 45	A45	0.044	3.8
	6,800	EKMH800VSN682MA50T	35 × 50	A50	0.037	3.9
	8,200	EKMH800VND822MA63T	35 × 63	A63	0.03	4.42
	12,000	EKMH800VND103MA80T	35 × 80	A80	0.021	5.72
	3,900	EKMH800VND392MB25T	40 × 25	B25	0.064	2.5
	4,700	EKMH800VND472MB30T	40 × 30	B30	0.053	2.88
	5,600	EKMH800VND562MB35T	40 × 35	B35	0.044	3.26
6,800	EKMH800VND682MB40T	40 × 40	B40	0.037	3.7	
10,000	EKMH800VND103MB50T	40 × 50	B50	0.025	4.77	
12,000	EKMH800VND123MB63T	40 × 63	B63	0.021	5.58	
18,000	EKMH800VND183MB80T	40 × 80	B80	0.014	7.43	
<b>100 Volts</b> 125 Volts Surge	560	EKMH101VSN561MP25T	22 × 25	P25	0.444	1.05
	820	EKMH101VSN821MP30T	22 × 30	P30	0.303	1.32
	1,000	EKMH101VSN102MP35T	22 × 35	P35	0.249	1.5
	1,200	EKMH101VSN122MP40T	22 × 40	P40	0.207	1.69
	1,500	EKMH101VSN152MP45T	22 × 45	P45	0.166	1.94
	820	EKMH101VSN821MQ25T	25.4 × 25	Q25	0.303	1.33
	1,000	EKMH101VSN102MQ30T	25.4 × 30	Q30	0.249	1.51
	1,200	EKMH101VSN122MQ35T	25.4 × 35	Q35	0.207	1.71
	1,500	EKMH101VSN152MQ40T	25.4 × 40	Q40	0.166	1.98
	1,800	EKMH101VSN182MQ45T	25.4 × 45	Q45	0.138	2.23
	2,200	EKMH101VSN222MQ50T	25.4 × 50	Q50	0.113	2.53
	1,200	EKMH101VSN122MR25T	30 × 25	R25	0.207	1.68
	1,500	EKMH101VSN152MR30T	30 × 30	R30	0.166	1.95
	1,800	EKMH101VSN182MR35T	30 × 35	R35	0.138	2.5
	2,200	EKMH101VSN222MR40T	30 × 40	R40	0.113	2.7
	2,700	EKMH101VSN272MR45T	30 × 45	R45	0.092	2.88
	3,300	EKMH101VSN332MR50T	30 × 50	R50	0.075	3.28
	1,500	EKMH101VSN152MA25T	35 × 25	A25	0.166	1.98
	1,800	EKMH101VSN182MA25T	35 × 25	A25	0.138	2.17
	2,200	EKMH101VSN222MA30T	35 × 30	A30	0.113	2.5
	2,700	EKMH101VSN272MA35T	35 × 35	A35	0.092	2.86
	3,300	EKMH101VSN332MA40T	35 × 40	A40	0.075	3.27
	3,900	EKMH101VSN392MA45T	35 × 45	A45	0.064	3.67
4,700	EKMH101VSN472MA50T	35 × 50	A50	0.053	3.8	

† 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.

# KMH 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
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<b>100 Volts</b> 125 Volts Surge	5,600	EKM101VND562MA63T	35 × 63	A63	0.044	4.08
	6,800	EKM101VND682MA80T	35 × 80	A80	0.037	4.81
	2,200	EKM101VND222MB25T	40 × 25	B25	0.113	2.1
	2,700	EKM101VND272MB30T	40 × 30	B30	0.092	2.44
	3,300	EKM101VND332MB35T	40 × 35	B35	0.075	2.8
	4,700	EKM101VND472MB40T	40 × 40	B40	0.053	3.44
	5,600	EKM101VND562MB50T	40 × 50	B50	0.044	3.99
	8,200	EKM101VND822MB63T	40 × 63	B63	0.03	5.16
10,000	EKM101VND103MB80T	40 × 80	B80	0.025	6.19	

<b>160 Volts</b> 200 Volts Surge	220	EKM161VSN221MP20T	22 × 20	P20	1.13	0.8
	270	EKM161VSN271MP25T	22 × 25	P25	0.614	1.09
	330	EKM161VSN331MP25T	22 × 25	P25	0.502	1.2
	390	EKM161VSN391MP30T	22 × 30	P30	0.425	1.3
	470	EKM161VSN471MP35T	22 × 35	P35	0.353	1.4
	560	EKM161VSN561MP40T	22 × 40	P40	0.296	1.5
	680	EKM161VSN681MP45T	22 × 45	P45	0.244	1.71
	820	EKM161VSN821MP50T	22 × 50	P50	0.202	1.93
	330	EKM161VSN331MQ20T	25.4 × 20	Q20	0.753	1.02
	390	EKM161VSN391MQ25T	25.4 × 25	Q25	0.425	1.28
	470	EKM161VSN471MQ25T	25.4 × 25	Q25	0.353	1.41
	560	EKM161VSN561MQ30T	25.4 × 30	Q30	0.296	1.51
	680	EKM161VSN681MQ35T	25.4 × 35	Q35	0.244	1.7
	820	EKM161VSN821MQ40T	25.4 × 40	Q40	0.202	2.01
	1,000	EKM161VSN102MQ45T	25.4 × 45	Q45	0.166	2.2
	1,200	EKM161VSN122MQ50T	25.4 × 50	Q50	0.138	2.45
	390	EKM161VSN391MR20T	30 × 20	R20	0.638	1.17
	470	EKM161VSN471MR20T	30 × 20	R20	0.529	1.28
	560	EKM161VSN561MR25T	30 × 25	R25	0.296	1.56
	680	EKM161VSN681MR25T	30 × 25	R25	0.244	1.72
	820	EKM161VSN821MR30T	30 × 30	R30	0.202	2.0
	1,000	EKM161VSN102MR35T	30 × 35	R35	0.166	2.22
	1,200	EKM161VSN122MR40T	30 × 40	R40	0.138	2.44
	1,500	EKM161VSN152MR45T	30 × 45	R45	0.111	2.82
	1,800	EKM161VSN182MR50T	30 × 50	R50	0.092	3.31
	560	EKM161VSN561MA20T	35 × 20	A20	0.444	1.54
	680	EKM161VSN681MA20T	35 × 20	A20	0.366	1.7
	820	EKM161VSN821MA25T	35 × 25	A25	0.303	1.91
	1,000	EKM161VSN102MA25T	35 × 25	A25	0.249	2.11
	1,200	EKM161VSN122MA30T	35 × 30	A30	0.207	2.44
	1,500	EKM161VSN152MA35T	35 × 35	A35	0.166	2.5
	1,800	EKM161VSN182MA45T	35 × 45	A45	0.138	3.31
	2,200	EKM161VSN222MA50T	35 × 50	A50	0.113	3.77
	3,300	EKM161VND332MA63T	35 × 63	A63	0.075	3.96
	3,900	EKM161VND392MA80T	35 × 80	A80	0.064	4.61
	1,200	EKM161VND122MB25T	40 × 25	B25	0.207	1.96
	1,800	EKM161VND182MB30T	40 × 30	B30	0.138	2.52
	2,200	EKM161VND222MB35T	40 × 35	B35	0.113	2.89
	2,700	EKM161VND272MB40T	40 × 40	B40	0.092	3.3
	3,300	EKM161VND332MB50T	40 × 50	B50	0.075	3.87
4,700	EKM161VND472MB63T	40 × 63	B63	0.053	4.94	
5,600	EKM161VND562MB80T	40 × 80	B80	0.044	5.86	

<b>180 Volts</b> 225 Volts Surge	180	EKM181VSN181MP20T	22 × 20	P20	1.381	0.73
	220	EKM181VSN221MP20T	22 × 20	P20	1.13	0.8
	270	EKM181VSN271MP25T	22 × 25	P25	0.614	0.96
	330	EKM181VSN331MP25T	22 × 25	P25	0.502	1.06
	390	EKM181VSN391MP30T	22 × 30	P30	0.425	1.3
	470	EKM181VSN471MP35T	22 × 35	P35	0.353	1.35

† 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.

KMH  
SNAP MOUNT 105°C



# KMH 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
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<b>180 Volts 225 Volts Surge</b>	560	EKMH181VSN561MP40T	22 × 40	P40	0.296	1.51
	680	EKMH181VSN681MP45T	22 × 45	P45	0.244	1.71
	820	EKMH181VSN821MP50T	22 × 50	P50	0.202	1.97
	270	EKMH181VSN271MQ20T	25.4 × 20	Q20	0.921	0.92
	330	EKMH181VSN331MQ25T	25.4 × 25	Q25	0.502	1.2
	390	EKMH181VSN391MQ25T	25.4 × 25	Q25	0.425	1.3
	470	EKMH181VSN471MQ30T	25.4 × 30	Q30	0.353	1.4
	560	EKMH181VSN561MQ35T	25.4 × 35	Q35	0.296	1.53
	680	EKMH181VSN681MQ40T	25.4 × 40	Q40	0.244	1.74
	820	EKMH181VSN821MQ45T	25.4 × 45	Q45	0.202	1.97
	1,000	EKMH181VSN102MQ50T	25.4 × 50	Q50	0.166	2.23
	390	EKMH181VSN391MR20T	30 × 20	R20	0.638	1.17
	470	EKMH181VSN471MR25T	30 × 25	R25	0.353	1.38
	560	EKMH181VSN561MR25T	30 × 25	R25	0.296	1.51
	680	EKMH181VSN681MR30T	30 × 30	R30	0.244	1.72
	820	EKMH181VSN821MR35T	30 × 35	R35	0.202	2.0
	1,000	EKMH181VSN102MR40T	30 × 40	R40	0.166	2.24
	1,200	EKMH181VSN122MR45T	30 × 45	R45	0.138	2.52
	1,500	EKMH181VSN152MR50T	30 × 50	R50	0.111	2.89
	470	EKMH181VSN471MA20T	35 × 20	A20	0.529	1.41
	560	EKMH181VSN561MA20T	35 × 20	A20	0.444	1.53
	680	EKMH181VSN681MA25T	35 × 25	A25	0.366	1.74
	820	EKMH181VSN821MA25T	35 × 25	A25	0.303	1.91
	1,000	EKMH181VSN102MA30T	35 × 30	A30	0.249	2.26
	1,200	EKMH181VSN122MA35T	35 × 35	A35	0.207	2.5
	1,500	EKMH181VSN152MA40T	35 × 40	A40	0.166	2.89
	1,800	EKMH181VSN182MA40T	35 × 40	A40	0.138	3.17
	2,200	EKMH181VSN222MA50T	35 × 50	A50	0.113	3.6
	2,700	EKMH181VND272MA63T	35 × 63	A63	0.092	4.01
	3,300	EKMH181VND332MA80T	35 × 80	A80	0.075	4.74
	1,000	EKMH181VND102MB25T	40 × 25	B25	0.249	2.01
	1,500	EKMH181VND152MB30T	40 × 30	B30	0.166	2.57
	1,800	EKMH181VND182MB35T	40 × 35	B35	0.138	2.92
2,200	EKMH181VND222MB40T	40 × 40	B40	0.113	3.33	
2,700	EKMH181VND272MB50T	40 × 50	B50	0.092	3.92	
3,900	EKMH181VND392MB63T	40 × 63	B63	0.064	5.03	
4,700	EKMH181VND472MB80T	40 × 80	B80	0.053	6.01	

<b>200 Volts 250 Volts Surge</b>	150	EKMH201VSN151MP20T	22 × 20	P20	1.658	0.66
	180	EKMH201VSN181MP20T	22 × 20	P20	1.381	0.72
	220	EKMH201VSN221MP25T	22 × 25	P25	0.753	0.79
	270	EKMH201VSN271MP25T	22 × 25	P25	0.614	0.87
	330	EKMH201VSN331MP30T	22 × 30	P30	0.502	1.2
	390	EKMH201VSN391MP35T	22 × 35	P35	0.425	1.31
	470	EKMH201VSN471MP40T	22 × 40	P40	0.353	1.4
	560	EKMH201VSN561MP45T	22 × 45	P45	0.296	1.56
	680	EKMH201VSN681MP50T	22 × 50	P50	0.244	1.74
	220	EKMH201VSN221MQ20T	25.4 × 20	Q20	1.13	0.83
	270	EKMH201VSN271MQ25T	25.4 × 25	Q25	0.614	1.09
	330	EKMH201VSN331MQ25T	25.4 × 25	Q25	0.502	1.21
	390	EKMH201VSN391MQ25T	25.4 × 25	Q25	0.425	1.31
	470	EKMH201VSN471MQ30T	25.4 × 30	Q30	0.353	1.41
	560	EKMH201VSN561MQ35T	25.4 × 35	Q35	0.296	1.53
	680	EKMH201VSN681MQ40T	25.4 × 40	Q40	0.244	1.74
	820	EKMH201VSN821MQ50T	25.4 × 50	Q50	0.202	2.04
	330	EKMH201VSN331MR20T	30 × 20	R20	0.753	1.08
	390	EKMH201VSN391MR25T	30 × 25	R25	0.425	1.37
	470	EKMH201VSN471MR25T	30 × 25	R25	0.353	1.5
	560	EKMH201VSN561MR25T	30 × 25	R25	0.296	1.63

† 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.

# KMH 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
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<b>200 Volts 250 Volts Surge</b>	680	EKM201VSN681MR30T	30 × 30	R30	0.244	1.74
	820	EKM201VSN821MR35T	30 × 35	R35	0.202	2.0
	1,000	EKM201VSN102MR45T	30 × 45	R45	0.166	2.3
	1,200	EKM201VSN122MR50T	30 × 50	R50	0.138	2.6
	470	EKM201VSN471MA20T	35 × 20	A20	0.529	1.41
	560	EKM201VSN561MA25T	35 × 25	A25	0.444	1.56
	680	EKM201VSN681MA25T	35 × 25	A25	0.366	1.72
	820	EKM201VSN821MA30T	35 × 30	A30	0.303	2.04
	1,000	EKM201VSN102MA35T	35 × 35	A35	0.249	2.3
	1,200	EKM201VSN122MA40T	35 × 40	A40	0.207	2.65
	1,500	EKM201VSN152MA45T	35 × 45	A45	0.166	3.08
	1,800	EKM201VSN182MA50T	35 × 50	A50	0.138	3.47
	2,200	EKM201VND222MA63T	35 × 63	A63	0.113	3.62
	3,300	EKM201VND332MA80T	35 × 80	A80	0.075	4.74
	1,000	EKM201VND102MB25T	40 × 25	B25	0.249	2.01
	1,200	EKM201VND122MB30T	40 × 30	B30	0.207	2.3
	1,500	EKM201VND152MB35T	40 × 35	B35	0.166	2.67
	1,800	EKM201VND182MB40T	40 × 40	B40	0.138	3.01
	2,700	EKM201VND272MB50T	40 × 50	B50	0.092	3.92
	3,300	EKM201VND332MB63T	40 × 63	B63	0.075	4.63
4,700	EKM201VND472MB80T	40 × 80	B80	0.053	6.01	

<b>250 Volts 300 Volts Surge</b>	120	EKM251VSN121MP20T	22 × 20	P20	2.072	0.59
	150	EKM251VSN151MP25T	22 × 25	P25	1.105	0.71
	180	EKM251VSN181MP25T	22 × 25	P25	0.921	0.78
	220	EKM251VSN221MP30T	22 × 30	P30	0.753	0.95
	270	EKM251VSN271MP35T	22 × 35	P35	0.614	1.14
	330	EKM251VSN331MP40T	22 × 40	P40	0.502	1.26
	390	EKM251VSN391MP45T	22 × 45	P45	0.425	1.49
	470	EKM251VSN471MP50T	22 × 50	P50	0.353	1.57
	180	EKM251VSN181MQ20T	25.4 × 20	Q20	1.381	0.75
	220	EKM251VSN221MQ25T	25.4 × 25	Q25	0.753	0.95
	270	EKM251VSN271MQ25T	25.4 × 25	Q25	0.614	1.05
	330	EKM251VSN331MQ30T	25.4 × 30	Q30	0.502	1.2
	390	EKM251VSN391MQ35T	25.4 × 35	Q35	0.425	1.49
	470	EKM251VSN471MQ40T	25.4 × 40	Q40	0.353	1.57
	560	EKM251VSN561MQ45T	25.4 × 45	Q45	0.296	1.79
	680	EKM251VSN681MQ50T	25.4 × 50	Q50	0.244	1.84
	220	EKM251VSN221MR20T	30 × 20	R20	1.13	0.88
	270	EKM251VSN271MR20T	30 × 20	R20	0.921	0.97
	330	EKM251VSN331MR25T	30 × 25	R25	0.502	1.26
	390	EKM251VSN391MR25T	30 × 25	R25	0.425	1.37
	470	EKM251VSN471MR30T	30 × 30	R30	0.353	1.57
	560	EKM251VSN561MR35T	30 × 35	R35	0.296	1.79
	680	EKM251VSN681MR40T	30 × 40	R40	0.244	2.0
	820	EKM251VSN821MR45T	30 × 45	R45	0.202	2.16
	330	EKM251VSN331MA20T	35 × 20	A20	0.753	1.18
	390	EKM251VSN391MA25T	35 × 25	A25	0.638	1.43
	470	EKM251VSN471MA25T	35 × 25	A25	0.529	1.57
	560	EKM251VSN561MA30T	35 × 30	A30	0.444	1.79
	680	EKM251VSN681MA30T	35 × 30	A30	0.366	1.97
	820	EKM251VSN821MA35T	35 × 35	A35	0.303	1.98
	1,000	EKM251VSN102MA40T	35 × 40	A40	0.249	2.3
	1,200	EKM251VSN122MA45T	35 × 45	A45	0.207	2.43
	1,800	EKM251VND182MA63T	35 × 63	A63	0.138	3.27
	2,200	EKM251VND222MA80T	35 × 80	A80	0.113	3.87
	680	EKM251VND681MB25T	40 × 25	B25	0.366	1.65
	1,000	EKM251VND102MB30T	40 × 30	B30	0.249	2.1
	1,200	EKM251VND122MB35T	40 × 35	B35	0.207	2.39

† 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.

KMH  
SNAP MOUNT 105°C

# KMH 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
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<b>250 Volts</b> 300 Volts Surge	1,500	EKMH251VND152MB40T	40 × 40	B40	0.166	2.75
	1,800	EKMH251VND182MB50T	40 × 50	B50	0.138	3.2
	2,200	EKMH251VND222MB63T	40 × 63	B63	0.113	3.78
	3,300	EKMH251VND332MB80T	40 × 80	B80	0.075	5.03

<b>315 Volts</b> 365 Volts Surge	68	EKMH3B1VSN680MP20T	22 × 20	P20	3.656	0.44
	82	EKMH3B1VSN820MP25T	22 × 25	P25	3.032	0.64
	100	EKMH3B1VSN101MP30T	22 × 30	P30	2.486	0.68
	120	EKMH3B1VSN121MP30T	22 × 30	P30	2.072	0.75
	150	EKMH3B1VSN151MP35T	22 × 35	P35	1.658	0.82
	180	EKMH3B1VSN181MP40T	22 × 40	P40	1.381	0.91
	220	EKMH3B1VSN221MP45T	22 × 45	P45	1.13	1.02
	270	EKMH3B1VSN271MP50T	22 × 50	P50	0.921	1.16
	100	EKMH3B1VSN101MQ20T	25.4 × 20	Q20	2.486	0.56
	120	EKMH3B1VSN121MQ25T	25.4 × 25	Q25	2.072	0.76
	150	EKMH3B1VSN151MQ30T	25.4 × 30	Q30	1.658	0.8
	180	EKMH3B1VSN181MQ30T	25.4 × 30	Q30	1.381	0.88
	220	EKMH3B1VSN221MQ35T	25.4 × 35	Q35	1.13	1.02
	270	EKMH3B1VSN271MQ40T	25.4 × 40	Q40	0.921	1.15
	330	EKMH3B1VSN331MQ50T	25.4 × 50	Q50	0.753	1.33
	120	EKMH3B1VSN121MR20T	30 × 20	R20	2.072	0.65
	150	EKMH3B1VSN151MR25T	30 × 25	R25	1.658	0.82
	180	EKMH3B1VSN181MR25T	30 × 25	R25	1.381	0.9
	220	EKMH3B1VSN221MR30T	30 × 30	R30	1.13	1.02
	270	EKMH3B1VSN271MR35T	30 × 35	R35	0.921	1.17
	330	EKMH3B1VSN331MR35T	30 × 35	R35	0.753	1.3
	390	EKMH3B1VSN391MR40T	30 × 40	R40	0.638	1.46
	470	EKMH3B1VSN471MR50T	30 × 50	R50	0.529	1.7
	180	EKMH3B1VSN181MA20T	35 × 20	A20	1.381	0.83
	220	EKMH3B1VSN221MA25T	35 × 25	A25	1.13	1.03
	270	EKMH3B1VSN271MA25T	35 × 25	A25	0.921	1.15
	330	EKMH3B1VSN331MA30T	35 × 30	A30	0.753	1.32
	390	EKMH3B1VSN391MA35T	35 × 35	A35	0.638	1.47
	470	EKMH3B1VSN471MA40T	35 × 40	A40	0.529	1.69
	560	EKMH3B1VSN561MA45T	35 × 45	A45	0.444	1.9
	680	EKMH3B1VSN681MA50T	35 × 50	A50	0.366	2.15
	1,000	EKMH3B1VND102MA63T	35 × 63	A63	0.249	2.82
	1,200	EKMH3B1VND122MA80T	35 × 80	A80	0.207	3.3
	330	EKMH3B1VND331MB25T	40 × 25	B25	0.753	1.33
	470	EKMH3B1VND471MB30T	40 × 30	B30	0.529	1.66
	560	EKMH3B1VND561MB35T	40 × 35	B35	0.444	1.88
680	EKMH3B1VND681MB40T	40 × 40	B40	0.366	2.14	
1,000	EKMH3B1VND102MB50T	40 × 50	B50	0.249	2.75	
1,500	EKMH3B1VND152MB63T	40 × 63	B63	0.166	3.6	
1,800	EKMH3B1VND182MB80T	40 × 80	B80	0.138	4.29	

<b>350 Volts</b> 400 Volts Surge	56	EKMH351VSN560MP20T	22 × 20	P20	4.44	0.4
	68	EKMH351VSN680MP25T	22 × 25	P25	3.656	0.51
	82	EKMH351VSN820MP25T	22 × 25	P25	3.032	0.56
	100	EKMH351VSN101MP30T	22 × 30	P30	2.486	0.69
	120	EKMH351VSN121MP35T	22 × 35	P35	2.072	0.75
	150	EKMH351VSN151MP40T	22 × 40	P40	1.658	0.82
	180	EKMH351VSN181MP45T	22 × 45	P45	1.381	0.92
	220	EKMH351VSN221MP50T	22 × 50	P50	1.13	1.05
	82	EKMH351VSN820MQ20T	25.4 × 20	Q20	3.032	0.51
	100	EKMH351VSN101MQ25T	25.4 × 25	Q25	2.486	0.69
	120	EKMH351VSN121MQ25T	25.4 × 25	Q25	2.072	0.75
	150	EKMH351VSN151MQ30T	25.4 × 30	Q30	1.658	0.83
	180	EKMH351VSN181MQ35T	25.4 × 35	Q35	1.381	0.92

† 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.

# KMH 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
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<b>350 Volts 400 Volts Surge</b>	220	EKM351VSN221MQ40T	25.4 × 40	Q40	1.13	1.04
	270	EKM351VSN271MQ45T	25.4 × 45	Q45	0.921	1.18
	100	EKM351VSN101MR20T	30 × 20	R20	2.486	0.59
	120	EKM351VSN121MR20T	30 × 20	R20	2.072	0.64
	150	EKM351VSN151MR25T	30 × 25	R25	1.658	0.83
	180	EKM351VSN181MR25T	30 × 25	R25	1.381	0.91
	220	EKM351VSN221MR30T	30 × 30	R30	1.13	1.02
	270	EKM351VSN271MR35T	30 × 35	R35	0.921	1.17
	330	EKM351VSN331MR40T	30 × 40	R40	0.753	1.34
	390	EKM351VSN391MR45T	30 × 45	R45	0.638	1.51
	150	EKM351VSN151MA20T	35 × 20	A20	1.658	0.76
	180	EKM351VSN181MA25T	35 × 25	A25	1.381	0.94
	220	EKM351VSN221MA25T	35 × 25	A25	1.13	1.04
	270	EKM351VSN271MA30T	35 × 30	A30	0.921	1.2
	330	EKM351VSN331MA30T	35 × 30	A30	0.753	1.33
	390	EKM351VSN391MA35T	35 × 35	A35	0.638	1.47
	470	EKM351VSN471MA40T	35 × 40	A40	0.529	1.69
	560	EKM351VSN561MA45T	35 × 45	A45	0.444	1.9
	1,000	EKM351VND102MA63T	35 × 63	A63	0.249	2.82
	1,200	EKM351VND122MA80T	35 × 80	A80	0.207	3.3
	330	EKM351VND331MB25T	40 × 25	B25	0.753	1.33
	470	EKM351VND471MB30T	40 × 30	B30	0.529	1.66
	560	EKM351VND561MB35T	40 × 35	B35	0.444	1.88
	680	EKM351VND681MB40T	40 × 40	B40	0.366	2.14
1,000	EKM351VND102MB50T	40 × 50	B50	0.249	2.75	
1,200	EKM351VND122MB63T	40 × 63	B63	0.207	3.22	
1,800	EKM351VND182MB80T	40 × 80	B80	0.138	4.29	

<b>400 Volts 450 Volts Surge</b>	47	EKM401VSN470MP20T	22 × 20	P20	5.29	0.37
	56	EKM401VSN560MP20T	22 × 20	P20	4.44	0.4
	68	EKM401VSN680MP25T	22 × 25	P25	3.656	0.51
	82	EKM401VSN820MP30T	22 × 30	P30	3.032	0.58
	100	EKM401VSN101MP30T	22 × 30	P30	2.486	0.64
	120	EKM401VSN121MP35T	22 × 35	P35	2.072	0.72
	150	EKM401VSN151MP40T	22 × 40	P40	1.658	0.82
	180	EKM401VSN181MP50T	22 × 50	P50	1.381	0.95
	68	EKM401VSN680MQ20T	25.4 × 20	Q20	3.656	0.46
	82	EKM401VSN820MQ25T	25.4 × 25	Q25	3.032	0.64
	100	EKM401VSN101MQ25T	25.4 × 25	Q25	2.486	0.67
	120	EKM401VSN121MQ30T	25.4 × 30	Q30	2.072	0.72
	150	EKM401VSN151MQ35T	25.4 × 35	Q35	1.658	0.84
	180	EKM401VSN181MQ40T	25.4 × 40	Q40	1.381	0.94
	220	EKM401VSN221MQ45T	25.4 × 45	Q45	1.13	1.07
	270	EKM401VSN271MQ50T	25.4 × 50	Q50	0.921	1.21
	100	EKM401VSN101MR20T	30 × 20	R20	2.486	0.59
	120	EKM401VSN121MR25T	30 × 25	R25	2.072	0.76
	150	EKM401VSN151MR25T	30 × 25	R25	1.658	0.84
	180	EKM401VSN181MR30T	30 × 30	R30	1.381	0.92
	220	EKM401VSN221MR35T	30 × 35	R35	1.13	1.06
	270	EKM401VSN271MR40T	30 × 40	R40	0.921	1.21
	330	EKM401VSN331MR45T	30 × 45	R45	0.753	1.39
	390	EKM401VSN391MR50T	30 × 50	R50	0.638	1.55
	150	EKM401VSN151MA20T	35 × 20	A20	1.658	0.76
	180	EKM401VSN181MA25T	35 × 25	A25	1.381	0.94
	220	EKM401VSN221MA30T	35 × 30	A30	1.13	1.08
	270	EKM401VSN271MA30T	35 × 30	A30	0.921	1.2
	330	EKM401VSN331MA35T	35 × 35	A35	0.753	1.35
	390	EKM401VSN391MA40T	35 × 40	A40	0.638	1.54
	470	EKM401VSN471MA45T	35 × 45	A45	0.529	1.74

† 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.

# KMH 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	820	EKMH401VND821MA63T	35 × 63	A63	0.303	2.55
	1,000	EKMH401VND102MA80T	35 × 80	A80	0.249	3.01
	270	EKMH401VND271MB25T	40 × 25	B25	0.921	1.2
	390	EKMH401VND391MB30T	40 × 30	B30	0.638	1.51
	470	EKMH401VND471MB35T	40 × 35	B35	0.529	1.72
	560	EKMH401VND561MB40T	40 × 40	B40	0.444	1.94
	820	EKMH401VND821MB50T	40 × 50	B50	0.303	2.49
	1,200	EKMH401VND122MB63T	40 × 63	B63	0.207	3.22
1,500	EKMH401VND152MB80T	40 × 80	B80	0.166	3.92	
450 Volts 500 Volts Surge	56	EKMH451VSN560MP25T	22 × 25	P25	4.44	0.4
	68	EKMH451VSN680MP30T	22 × 30	P30	3.656	0.5
	82	EKMH451VSN820MP35T	22 × 35	P35	3.032	0.56
	100	EKMH451VSN101MP40T	22 × 40	P40	2.486	0.64
	120	EKMH451VSN121MP45T	22 × 45	P45	2.072	0.72
	150	EKMH451VSN151MP50T	22 × 50	P50	1.658	0.79
	68	EKMH451VSN680MQ25T	25.4 × 25	Q25	3.656	0.5
	82	EKMH451VSN820MQ25T	25.4 × 25	Q25	3.032	0.55
	100	EKMH451VSN101MQ30T	25.4 × 30	Q30	2.486	0.57
	120	EKMH451VSN121MQ35T	25.4 × 35	Q35	2.072	0.71
	150	EKMH451VSN151MQ40T	25.4 × 40	Q40	1.658	0.75
	180	EKMH451VSN181MQ45T	25.4 × 45	Q45	1.381	0.84
	220	EKMH451VSN221MQ50T	25.4 × 50	Q50	1.13	0.98
	100	EKMH451VSN101MR25T	30 × 25	R25	2.486	0.64
	120	EKMH451VSN121MR25T	30 × 25	R25	2.072	0.7
	150	EKMH451VSN151MR30T	30 × 30	R30	1.658	0.74
	180	EKMH451VSN181MR35T	30 × 35	R35	1.381	0.87
	220	EKMH451VSN221MR40T	30 × 40	R40	1.13	0.98
	270	EKMH451VSN271MR45T	30 × 45	R45	0.921	1.15
	330	EKMH451VSN331MR50T	30 × 50	R50	0.753	1.38
	150	EKMH451VSN151MA25T	35 × 25	A25	1.658	0.75
	180	EKMH451VSN181MA30T	35 × 30	A30	1.381	0.9
	220	EKMH451VSN221MA30T	35 × 30	A30	1.13	1.0
	270	EKMH451VSN271MA35T	35 × 35	A35	0.921	1.17
	330	EKMH451VSN331MA40T	35 × 40	A40	0.753	1.38
	390	EKMH451VSN391MA45T	35 × 45	A45	0.638	1.55
	470	EKMH451VSN471MA50T	35 × 50	A50	0.529	1.72
	560	EKMH451VND561MA63T	35 × 63	A63	0.444	2.11
	820	EKMH451VND821MA80T	35 × 80	A80	0.303	2.73
	220	EKMH451VND221MB25T	40 × 25	B25	1.13	1.09
	270	EKMH451VND271MB30T	40 × 30	B30	0.921	1.26
	390	EKMH451VND391MB35T	40 × 35	B35	0.638	1.57
	470	EKMH451VND471MB40T	40 × 40	B40	0.529	1.78
	560	EKMH451VND561MB50T	40 × 50	B50	0.444	2.06
820	EKMH451VND821MB63T	40 × 63	B63	0.303	2.66	
1,200	EKMH451VND122MB80T	40 × 80	B80	0.207	3.5	

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

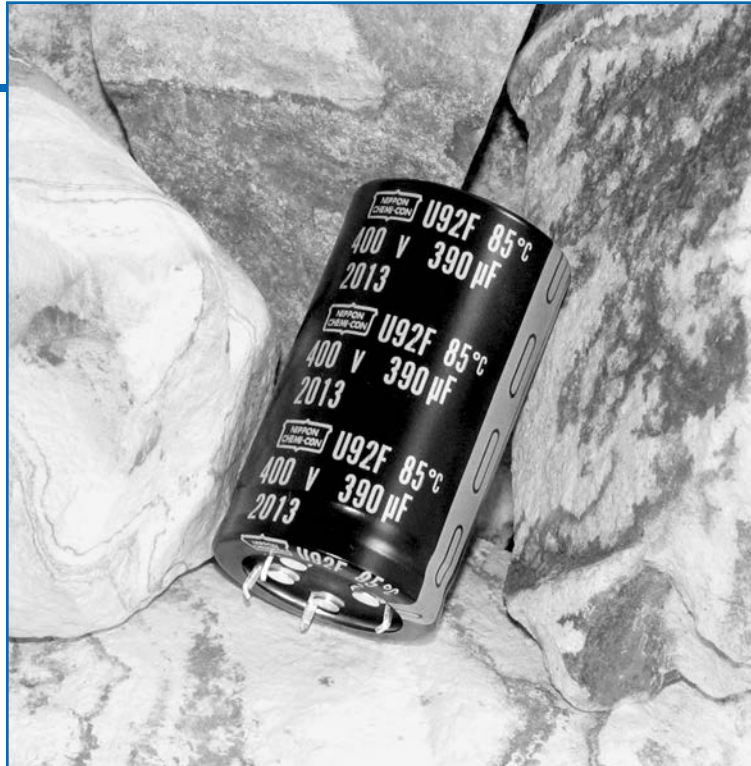
\* Refer to diagram of dimensions for detailed case size specifications.

# U92F Series NEW



U92F  
SNAP MOUNT 85°C

- 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 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: 180 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: 5,000 hours at +85°C with the rated ripple current applied.



# U92F Series

## U92F Specifications - Snap Mount

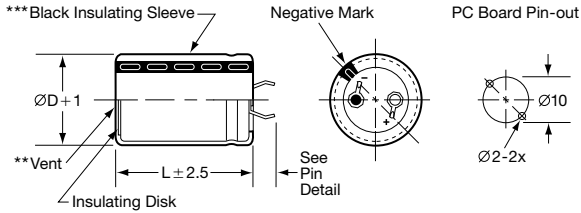
Item	Characteristics																											
Category Temperature Range	-25 to +85°C																											
Rated Voltage Range	350 to 500VDC																											
Capacitance Range	180 to 3,300μF																											
Capacitance Tolerance	±20% (M) at +20°C, 120Hz																											
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" style="margin-left: 20px;"> <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" style="margin-left: 20px;"> <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" style="margin-left: 20px;"> <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" style="margin-left: 20px;"> <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 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 +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																											

# U92F Series

## Diagram of Dimensions - Snap Mount

### Snap Mount

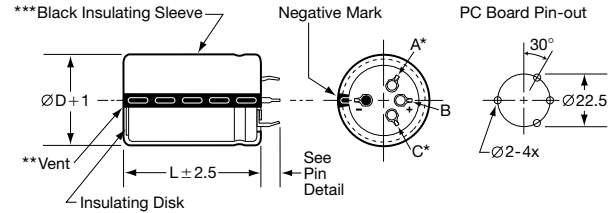
VSN Snap-in  $\varnothing 30$  and  $\varnothing 35$  standard  
VNN Snap-in  $\varnothing 30$  and  $\varnothing 35$  optional



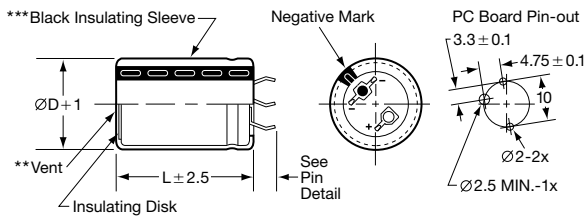
### Snap Mount

Unit: mm

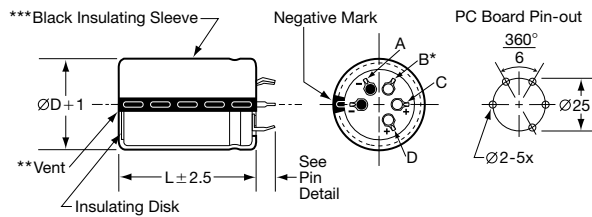
VND Snap-in  $\varnothing 35$  and  $\varnothing 40$  standard;  $\varnothing 45$  optional  
VSD Snap-in  $\varnothing 35$  and  $\varnothing 40$  optional



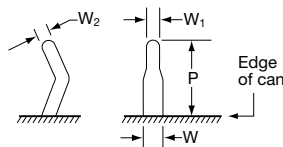
VEN Snap-in  $\varnothing 30$  and  $\varnothing 35$  optional



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



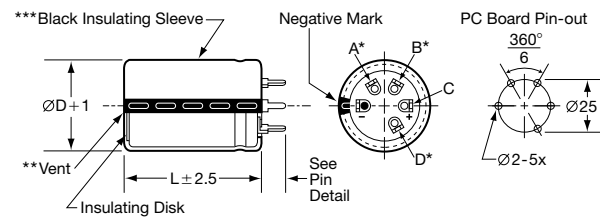
### VS, VE & VN Snap-in Pin Dimensions



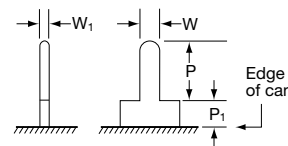
Type	P	W	W <sub>1</sub>	W <sub>2</sub>
VSN $\varnothing 30$	$4.0 \pm 0.5$			
VSN $\varnothing 35$	$3.5 \pm 0.5$			
VNN $\varnothing 30-\varnothing 35$	$5.8 \pm 1.0$			
VEN $\varnothing 30-\varnothing 35$	$4.0 \pm 0.5$	$1.5 \pm 0.2$	$0.8 \pm 0.1$	$0.8 \pm 0.1$
VSD $\varnothing 35-\varnothing 40$	$3.5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

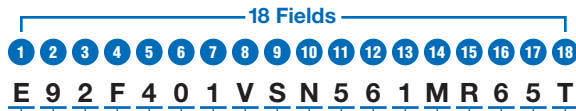
\* Use the blank terminals for mechanical support only. The blank terminals must not be connected to a solder trace on the PC board but be electrically isolated from the negative and positive terminals.

\*\* 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.

# U92F Series

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



E 9 2 F 4 0 1 V S N 5 6 1 M R 6 5 T

- 9 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.
- 8 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
- 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. 5R6 = 5.6µF; 560 = 56µF; 561 = 560µF; 562 = 5,600µF; 563 = 56,000µF).
- 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, 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.
- 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 +20°C, 120Hz	Rated Ripple Current (A rms) at +85°C, 120Hz
<b>350 Volts</b> 400 Volts Surge	330	E92F351VSN331MR40T	30 × 40	R40	0.338	2.0
	470	E92F351VSN471MR50T	30 × 50	R50	0.237	2.6
	680	E92F351VSN681MR65T	30 × 65	R65	0.164	3.5
	560	E92F351VSN561MA40T	35 × 40	A40	0.192	3.2
	680	E92F351VSN681MA50T	35 × 50	A50	0.158	3.8
	1,000	E92F351VND102MA65T	35 × 65	A65	0.107	5.0
	1,200	E92F351VND122MA80T	35 × 80	A80	0.090	5.9
	1,800	E92F351VND182MAA0T	35 × 100	AA0	0.060	8.0
	820	E92F351VND821MB50T	40 × 50	B50	0.126	4.5
	1,200	E92F351VND122MB65T	40 × 65	B65	0.086	5.9
	1,500	E92F351VND152MB80T	40 × 80	B80	0.069	7.1
	2,200	E92F351VND222MBA0T	40 × 100	BA0	0.047	9.4
	1,200	E92F351VNT122MU50T	45 × 50	U50	0.093	5.6
	1,500	E92F351VNT152MU65T	45 × 65	U65	0.074	6.8
	2,200	E92F351VNT222MU80T	45 × 80	U80	0.051	8.9
	2,700	E92F351VNT272MUA5T	45 × 105	UA5	0.041	10.9
	1,500	E92F351VNT152MC50T	50 × 50	C50	0.082	6.2
	2,200	E92F351VNT222MC65T	50 × 65	C65	0.056	8.1
2,700	E92F351VNT272MC80T	50 × 80	C80	0.046	9.8	
3,300	E92F351VNT332MCA5T	50 × 105	CA5	0.037	12.2	
<b>385 Volts</b> 435 Volts Surge	330	E92F3J1VSN331MR40T	30 × 40	R40	0.302	2.1
	390	E92F3J1VSN391MR50T	30 × 50	R50	0.255	2.5
	560	E92F3J1VSN561MR65T	30 × 65	R65	0.178	3.4
	470	E92F3J1VSN471MA40T	35 × 40	A40	0.195	3.1
	560	E92F3J1VSN561MA50T	35 × 50	A50	0.164	3.8
	820	E92F3J1VND821MA65T	35 × 65	A65	0.112	4.9
	1,200	E92F3J1VND122MA80T	35 × 80	A80	0.076	6.4
	1,500	E92F3J1VND152MAA0T	35 × 100	AA0	0.061	7.9
	820	E92F3J1VND821MB50T	40 × 50	B50	0.121	4.6
	1,200	E92F3J1VND122MB65T	40 × 65	B65	0.083	6.0
	1,500	E92F3J1VND152MB80T	40 × 80	B80	0.066	7.3
	1,800	E92F3J1VND182MBA0T	40 × 100	BA0	0.055	8.7
	1,000	E92F3J1VNT102MU50T	45 × 50	U50	0.111	5.1
	1,500	E92F3J1VNT152MU65T	45 × 65	U65	0.074	6.8
	1,800	E92F3J1VNT182MU80T	45 × 80	U80	0.062	8.0
	2,200	E92F3J1VNT222MUA5T	45 × 105	UA5	0.051	9.9
	1,200	E92F3J1VNT122MC50T	50 × 50	C50	0.103	5.5
	1,800	E92F3J1VNT182MC65T	50 × 65	C65	0.069	7.3
2,200	E92F3J1VNT222MC80T	50 × 80	C80	0.056	8.8	
3,300	E92F3J1VNT332MCA5T	50 × 105	CA5	0.037	12.2	
<b>400 Volts</b> 450 Volts Surge	270	E92F401VSN271MR40T	30 × 40	R40	0.339	2.0
	390	E92F401VSN391MR50T	30 × 50	R50	0.235	2.6
	560	E92F401VSN561MR65T	30 × 65	R65	0.164	3.5
	390	E92F401VSN391MA40T	35 × 40	A40	0.225	2.9
	560	E92F401VSN561MA50T	35 × 50	A50	0.156	3.9
	820	E92F401VND821MA65T	35 × 65	A65	0.107	5.0
	1,000	E92F401VND102MA80T	35 × 80	A80	0.088	5.9
	1,200	E92F401VND122MAA0T	35 × 100	AA0	0.073	7.2
	680	E92F401VND681MB50T	40 × 50	B50	0.141	4.3
	1,000	E92F401VND102MB65T	40 × 65	B65	0.096	5.6
	1,200	E92F401VND122MB80T	40 × 80	B80	0.080	6.6
	1,800	E92F401VND182MBA0T	40 × 100	BA0	0.053	8.8
	1,000	E92F401VNT102MU50T	45 × 50	U50	0.100	5.4
	1,200	E92F401VNT122MU65T	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  
SNAP MOUNT 85°C

# 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 +20°C, 120Hz	Rated Ripple Current (A rms) at +85°C, 120Hz
<b>400 Volts</b> 450 Volts Surge	1,800	E92F401VNT182MU80T	45 × 80	U80	0.055	8.5
	2,200	E92F401VNT222MUA5T	45 × 105	UA5	0.045	10.4
	1,200	E92F401VNT122MC50T	50 × 50	C50	0.093	5.6
	1,800	E92F401VNT182MC65T	50 × 65	C65	0.062	7.7
	2,200	E92F401VNT222MC80T	50 × 80	C80	0.051	9.3
	2,700	E92F401VNT272MCA5T	50 × 105	CA5	0.041	11.6
<b>420 Volts</b> 470 Volts Surge	220	E92F421VSN221MR40T	30 × 40	R40	0.331	2.0
	330	E92F421VSN331MR50T	30 × 50	R50	0.241	2.6
	470	E92F421VSN471MR65T	30 × 65	R65	0.172	3.5
	390	E92F421VSN391MA40T	35 × 40	A40	0.213	3.0
	560	E92F421VSN561MA50T	35 × 50	A50	0.155	3.9
	680	E92F421VND681MA65T	35 × 65	A65	0.110	5.0
	1,000	E92F421VND102MA80T	35 × 80	A80	0.086	6.0
	1,200	E92F421VND122MAA0T	35 × 100	AA0	0.066	7.6
	560	E92F421VND561MB50T	40 × 50	B50	0.131	4.4
	820	E92F421VND821MB65T	40 × 65	B65	0.094	5.7
	1,200	E92F421VND122MB80T	40 × 80	B80	0.073	6.9
	1,500	E92F421VND152MBA0T	40 × 100	BA0	0.057	8.6
	820	E92F421VNT821MU50T	45 × 50	U50	0.110	5.1
	1,200	E92F421VNT122MU65T	45 × 65	U65	0.079	6.6
	1,500	E92F421VNT152MU80T	45 × 80	U80	0.062	8.0
	1,800	E92F421VNT182MUA5T	45 × 105	UA5	0.045	10.5
	1,000	E92F421VNT102MC50T	50 × 50	C50	0.093	5.6
	1,500	E92F421VNT152MC65T	50 × 65	C65	0.067	7.4
	1,800	E92F421VNT182MC80T	50 × 80	C80	0.052	9.1
	2,700	E92F421VNT272MCA5T	50 × 105	CA5	0.038	12.1
<b>450 Volts</b> 500 Volts Surge	220	E92F451VSN221MR40T	30 × 40	R40	0.340	2.0
	330	E92F451VSN331MR50T	30 × 50	R50	0.248	2.6
	390	E92F451VSN391MR65T	30 × 65	R65	0.177	3.4
	390	E92F451VSN391MA40T	35 × 40	A40	0.249	2.8
	470	E92F451VSN471MA50T	35 × 50	A50	0.159	3.8
	680	E92F451VND681MA65T	35 × 65	A65	0.113	4.9
	820	E92F451VND821MA80T	35 × 80	A80	0.088	5.9
	1,000	E92F451VND102MAA0T	35 × 100	AA0	0.068	7.5
	560	E92F451VND561MB50T	40 × 50	B50	0.135	4.4
	820	E92F451VND821MB65T	40 × 65	B65	0.097	5.6
	1,000	E92F451VND102MB80T	40 × 80	B80	0.075	6.8
	1,200	E92F451VND122MBA0T	40 × 100	BA0	0.058	8.4
	680	E92F451VNT681MU50T	45 × 50	U50	0.114	5.0
	1,000	E92F451VNT102MU65T	45 × 65	U65	0.081	6.5
	1,200	E92F451VNT122MU80T	45 × 80	U80	0.063	7.9
	1,800	E92F451VNT182MUA5T	45 × 105	UA5	0.046	10.3
	820	E92F451VNT821MC50T	50 × 50	C50	0.093	5.6
	1,200	E92F451VNT122MC65T	50 × 65	C65	0.066	7.4
	1,500	E92F451VNT152MC80T	50 × 80	C80	0.052	9.2
	2,200	E92F451VNT222MCA5T	50 × 105	CA5	0.038	12.1
<b>500 Volts</b> 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	E92F501VND471MA65T	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 +20°C, 120Hz	Rated Ripple Current (A rms) at +85°C, 120Hz
<b>500 Volts 550 Volts Surge</b>	560	E92F501VND561MA80T	35 × 80	A80	0.142	4.7
	820	E92F501VND821MAA0T	35 × 100	AA0	0.097	6.2
	470	E92F501VND471MB50T	40 × 50	B50	0.178	3.8
	680	E92F501VND681MB65T	40 × 65	B65	0.123	5.0
	820	E92F501VND821MB80T	40 × 80	B80	0.102	5.8
	1,200	E92F501VND122MBA0T	40 × 100	BA0	0.070	7.7
	560	E92F501VNT561MU50T	45 × 50	U50	0.164	4.2
	820	E92F501VNT821MU65T	45 × 65	U65	0.112	5.5
	1,200	E92F501VNT122MU80T	45 × 80	U80	0.076	7.2
	1,500	E92F501VNT152MUA5T	45 × 105	UA5	0.061	9.0
	820	E92F501VNT821MC50T	50 × 50	C50	0.121	4.9
	1,200	E92F501VNT122MC65T	50 × 65	C65	0.083	6.6
	1,500	E92F501VNT152MC80T	50 × 80	C80	0.066	8.1
	1,800	E92F501VNT182MCA5T	50 × 105	CA5	0.055	10.0

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

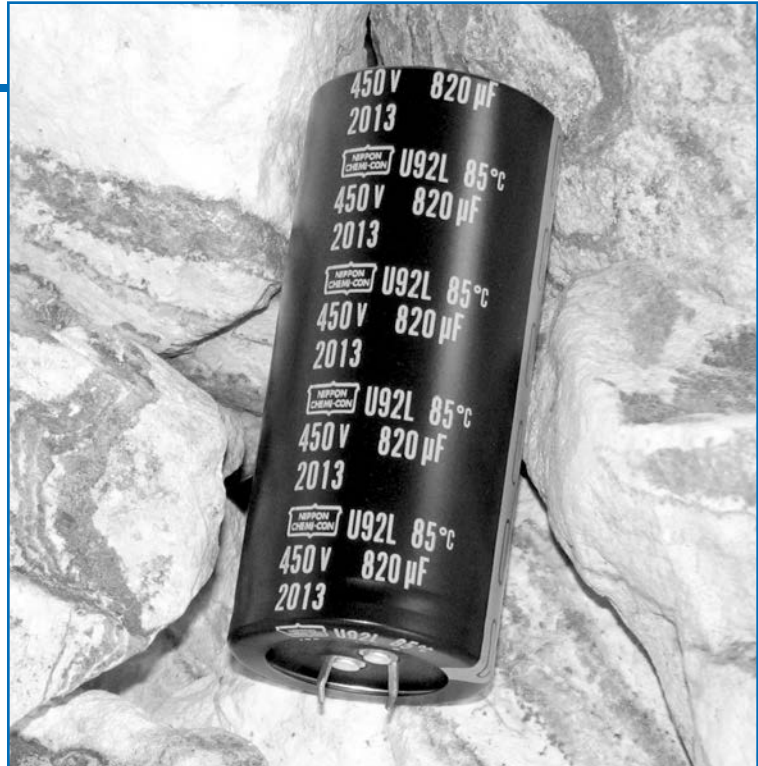
\* Refer to diagram of dimensions for detailed case size specifications.



# U92L Series NEW



- 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 Series

## U92L Specifications - Snap Mount

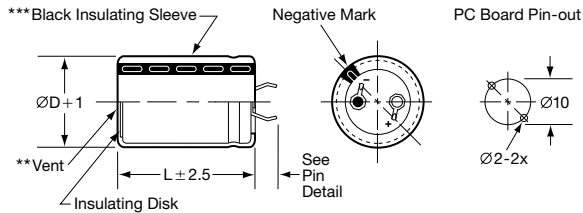
Item	Characteristics																											
Category Temperature Range	-25 to +85°C																											
Rated Voltage Range	350 to 500VDC																											
Capacitance Range	150 to 3,300μF																											
Capacitance Tolerance	±20% (M) at +20°C, 120Hz																											
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																											

# U92L Series

## Diagram of Dimensions - Snap Mount

### Snap Mount

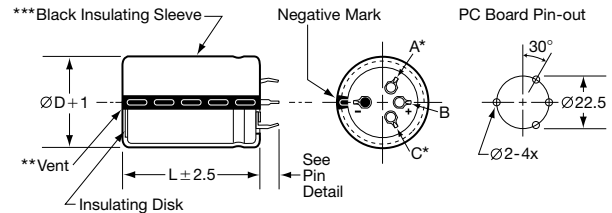
VSN Snap-in  $\varnothing 30$  and  $\varnothing 35$  standard  
VNN Snap-in  $\varnothing 30$  and  $\varnothing 35$  optional



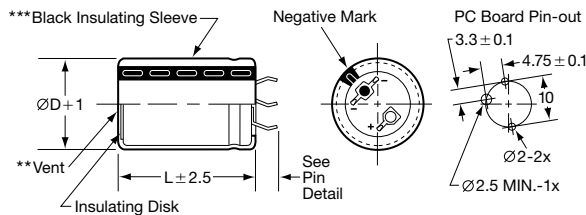
### Snap Mount

Unit: mm

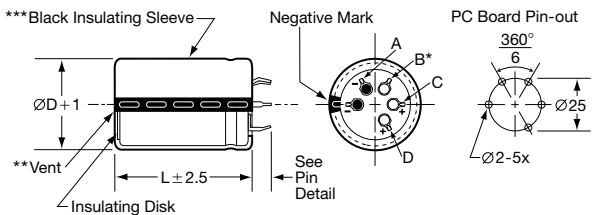
VND Snap-in  $\varnothing 35$  and  $\varnothing 40$  standard;  $\varnothing 45$  optional  
VSD Snap-in  $\varnothing 35$  and  $\varnothing 40$  optional



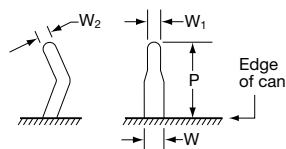
VEN Snap-in  $\varnothing 30$  and  $\varnothing 35$  optional



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



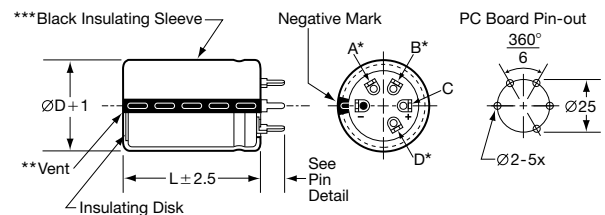
VS, VE & VN Snap-in Pin Dimensions



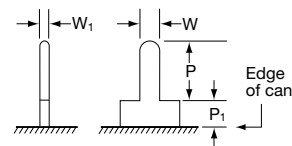
Type	P	W	W <sub>1</sub>	W <sub>2</sub>
VSN $\varnothing 30$	4.0 ± 0.5	1.5 ± 0.2	0.8 ± 0.1	0.8 ± 0.1
VSN $\varnothing 35$	3.5 ± 0.5			
VNN $\varnothing 30$ - $\varnothing 35$	5.8 ± 1.0			
VEN $\varnothing 30$ - $\varnothing 35$	4.0 ± 0.5			
VSD $\varnothing 35$ - $\varnothing 40$	3.5 ± 1.0			
VND $\varnothing 35$ - $\varnothing 45$	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 <sub>1</sub>	W	W <sub>1</sub>
Standoff Pin (VQ)	3.75 ± 1.0	2.0 max.	1.5 ± 0.1	0.7 ± 0.2

### CAUTION:

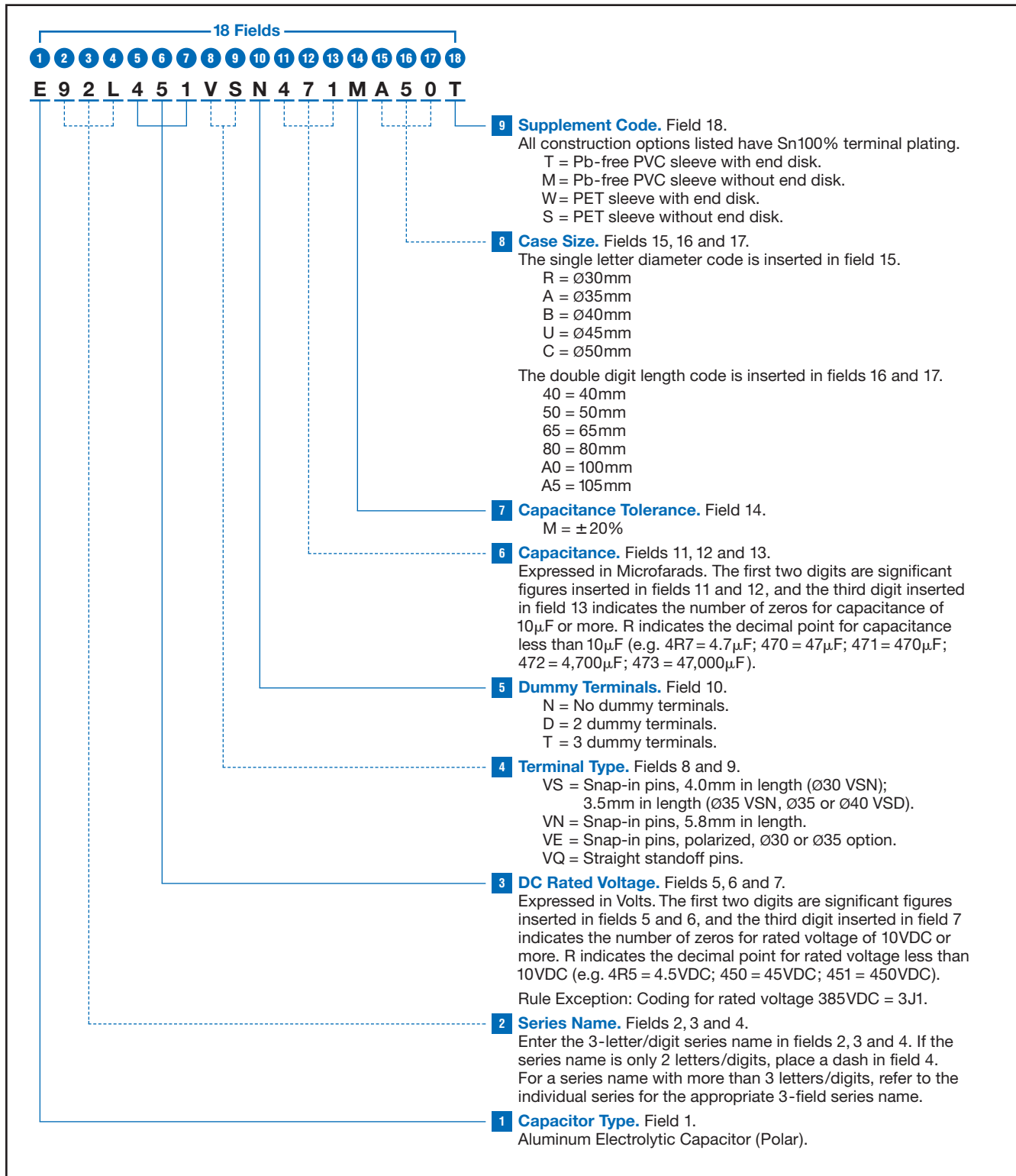
\* Use the blank terminals for mechanical support only. The blank terminals must not be connected to a solder trace on the PC board but be electrically isolated from the negative and positive terminals.

\*\* 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.

# U92L Series

**Part Numbering System for U92L Series** When ordering, always specify complete 18-field global part number.



# U92L 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 +85°C, 120Hz
<b>350 Volts</b> 400 Volts Surge	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</b> 435 Volts Surge	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</b> 450 Volts Surge	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.

# U92L 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 +85°C, 120Hz
<b>400 Volts</b> 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
<b>420 Volts</b> 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	
<b>450 Volts</b> 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	
<b>500 Volts</b> 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.



# U92L 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 +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

†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.

- Snap Mount
- Specific Design For Higher Ripple Current
- 350 to 500VDC Voltage Range
- RoHS Compliant
- +85°C Maximum Temperature
- 15,000 Hours Lifetime at +85°C



The U92X series is a longest life series specifically designed for higher ripple current capability. The U92X capacitors have an endurance rating of 15,000 hours at +85°C with the rated ripple current applied. All U92X 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: 15,000 hours at +85°C with the rated ripple current applied.

# U92X Series

## U92X Specifications - Snap Mount

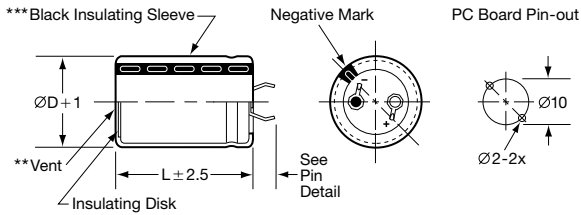
Item	Characteristics																											
Category Temperature Range	-25 to +85°C																											
Rated Voltage Range	350 to 500VDC																											
Capacitance Range	150 to 3,300 $\mu$ F																											
Capacitance Tolerance	$\pm$ 20% (M) at +20°C, 120Hz																											
Leakage Current	$I = 3\sqrt{CV}$ ( $\mu$ A) or 3mA, whichever is smaller, after 5 minutes at +20°C. Where I = Max. leakage current ( $\mu$ A), C = Nominal capacitance ( $\mu$ F) and V = Rated voltage (V)																											
Dissipation Factor (Tan $\delta$ )	At +20°C, 120Hz <table border="1" style="margin-left: 20px;"> <tr> <td>Rated Voltage (V)</td> <td>350-400</td> <td>420-500</td> </tr> <tr> <td>Tan <math>\delta</math> (DF) Max.</td> <td>0.15</td> <td>0.20</td> </tr> </table>	Rated Voltage (V)	350-400	420-500	Tan $\delta$ (DF) Max.	0.15	0.20																					
Rated Voltage (V)	350-400	420-500																										
Tan $\delta$ (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" style="margin-left: 20px;"> <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" style="margin-left: 20px;"> <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" style="margin-left: 20px;"> <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 15,000 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: $\leq \pm 20\%$ of initial measured value Tan $\delta$ (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 +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: $\leq \pm 20\%$ of initial measured value Tan $\delta$ (DF) : $\leq 150\%$ of initial specified value Leakage current : $\leq$ initial specified value																											

# U92X Series

## Diagram of Dimensions - Snap Mount

### Snap Mount

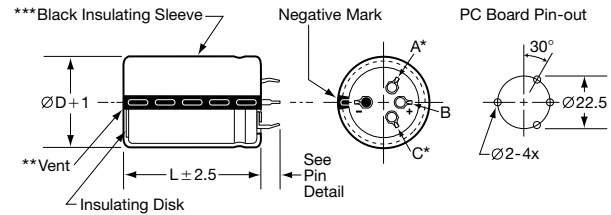
VSN Snap-in  $\varnothing 30$  and  $\varnothing 35$  standard  
VNN Snap-in  $\varnothing 30$  and  $\varnothing 35$  optional



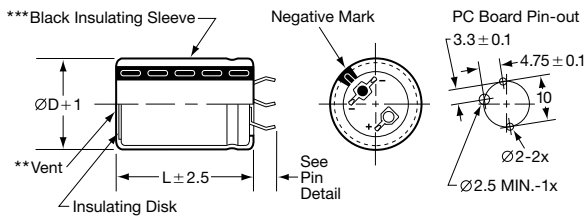
### Snap Mount

Unit: mm

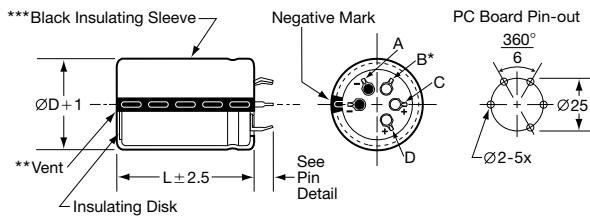
VND Snap-in  $\varnothing 35$  and  $\varnothing 40$  standard;  $\varnothing 45$  optional  
VSD Snap-in  $\varnothing 35$  and  $\varnothing 40$  optional



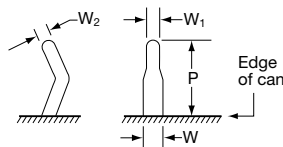
VEN Snap-in  $\varnothing 30$  and  $\varnothing 35$  optional



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



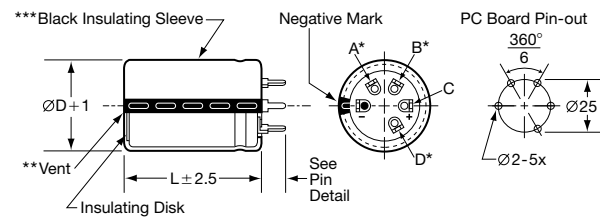
### VS, VE & VN Snap-in Pin Dimensions



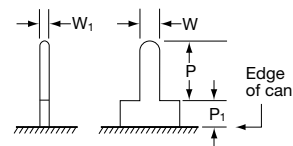
Type	P	W	$W_1$	$W_2$
VSN $\varnothing 30$	$4.0 \pm 0.5$			
VSN $\varnothing 35$	$3.5 \pm 0.5$			
VNN $\varnothing 30-\varnothing 35$	$5.8 \pm 1.0$			
VEN $\varnothing 30-\varnothing 35$	$4.0 \pm 0.5$	$1.5 \pm 0.2$	$0.8 \pm 0.1$	$0.8 \pm 0.1$
VSD $\varnothing 35-\varnothing 40$	$3.5 \pm 1.0$			
VND $\varnothing 35-\varnothing 45$	$5.8 \pm 1.0$			
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 Straight Standoff Pin Dimensions



Type	P	$P_1$	W	$W_1$
Standoff Pin (VQ)	$3.75 \pm 1.0$	2.0 max.	$1.5 \pm 0.1$	$0.7 \pm 0.2$

### CAUTION:

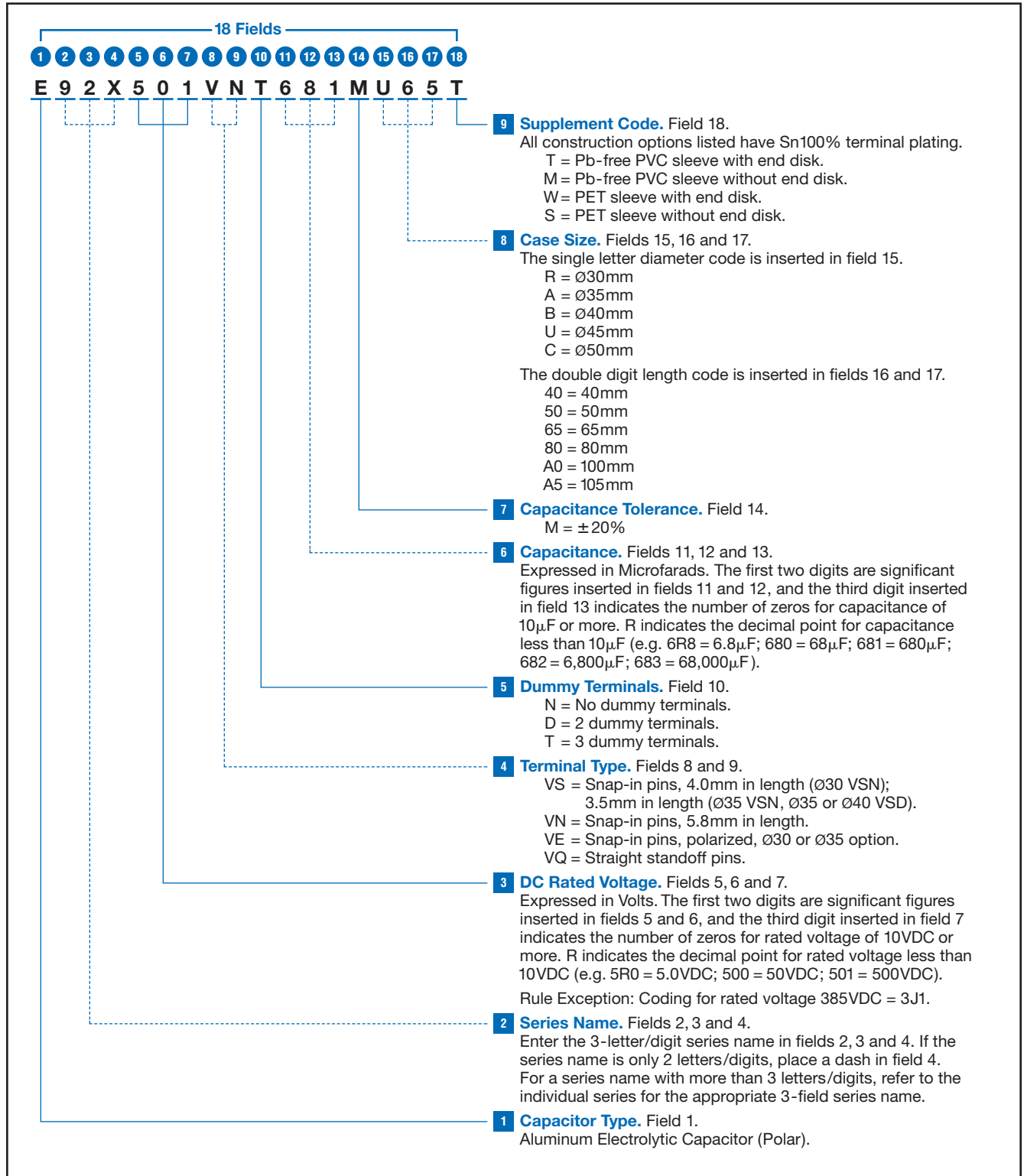
\* Use the blank terminals for mechanical support only. The blank terminals must not be connected to a solder trace on the PC board but be electrically isolated from the negative and positive terminals.

\*\* 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.

# U92X Series

**Part Numbering System for U92X Series** When ordering, always specify complete 18-field global part number.



U92X  
SNAP MOUNT 85°C

# U92X 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 +85°C, 120Hz
<b>350 Volts</b> 400 Volts Surge	330	E92X351VSN331MR40T	30 × 40	R40	0.302	2.1
	470	E92X351VSN471MR50T	30 × 50	R50	0.212	2.8
	680	E92X351VSN681MR65T	30 × 65	R65	0.146	3.7
	470	E92X351VSN471MA40T	35 × 40	A40	0.195	3.1
	680	E92X351VSN681MA50T	35 × 50	A50	0.135	4.2
	1,000	E92X351VND102MA65T	35 × 65	A65	0.092	5.4
	1,200	E92X351VND122MA80T	35 × 80	A80	0.076	6.4
	1,500	E92X351VND152MAA0T	35 × 100	AA0	0.061	7.9
	820	E92X351VND821MB50T	40 × 50	B50	0.121	4.6
	1,200	E92X351VND122MB65T	40 × 65	B65	0.083	6.0
	1,500	E92X351VND152MB80T	40 × 80	B80	0.066	7.3
	1,800	E92X351VND182MBA0T	40 × 100	BA0	0.055	8.7
	1,000	E92X351VNT102MU50T	45 × 50	U50	0.107	5.2
	1,500	E92X351VNT152MU65T	45 × 65	U65	0.072	6.9
	1,800	E92X351VNT182MU80T	45 × 80	U80	0.060	8.2
	2,700	E92X351VNT272MUA5T	45 × 105	UA5	0.040	11.1
	1,200	E92X351VNT122MC50T	50 × 50	C50	0.103	5.4
	1,800	E92X351VNT182MC65T	50 × 65	C65	0.069	7.3
2,200	E92X351VNT222MC80T	50 × 80	C80	0.056	8.8	
3,300	E92X351VNT332MCA5T	50 × 105	CA5	0.037	12.2	
<b>385 Volts</b> 435 Volts Surge	270	E92X3J1VSN271MR40T	30 × 40	R40	0.339	2.0
	390	E92X3J1VSN391MR50T	30 × 50	R50	0.235	2.6
	560	E92X3J1VSN561MR65T	30 × 65	R65	0.164	3.5
	390	E92X3J1VSN391MA40T	35 × 40	A40	0.225	2.9
	560	E92X3J1VSN561MA50T	35 × 50	A50	0.156	3.9
	820	E92X3J1VND821MA65T	35 × 65	A65	0.107	5.0
	1,000	E92X3J1VND102MA80T	35 × 80	A80	0.088	5.9
	1,200	E92X3J1VND122MAA0T	35 × 100	AA0	0.073	7.2
	680	E92X3J1VND681MB50T	40 × 50	B50	0.135	4.4
	1,000	E92X3J1VND102MB65T	40 × 65	B65	0.092	5.8
	1,200	E92X3J1VND122MB80T	40 × 80	B80	0.076	6.8
	1,800	E92X3J1VND182MBA0T	40 × 100	BA0	0.051	9.0
	1,000	E92X3J1VNT102MU50T	45 × 50	U50	0.100	5.4
	1,200	E92X3J1VNT122MU65T	45 × 65	U65	0.083	6.4
	1,500	E92X3J1VNT152MU80T	45 × 80	U80	0.066	7.7
	2,200	E92X3J1VNT222MUA5T	45 × 105	UA5	0.045	10.4
	1,200	E92X3J1VNT122MC50T	50 × 50	C50	0.096	5.7
	1,500	E92X3J1VNT152MC65T	50 × 65	C65	0.077	6.9
2,200	E92X3J1VNT222MC80T	50 × 80	C80	0.052	9.1	
2,700	E92X3J1VNT272MCA5T	50 × 105	CA5	0.043	11.4	
<b>400 Volts</b> 450 Volts Surge	270	E92X401VSN271MR40T	30 × 40	R40	0.339	2.0
	390	E92X401VSN391MR50T	30 × 50	R50	0.235	2.6
	470	E92X401VSN471MR65T	30 × 65	R65	0.195	3.2
	390	E92X401VSN391MA40T	35 × 40	A40	0.225	2.9
	560	E92X401VSN561MA50T	35 × 50	A50	0.156	3.9
	680	E92X401VND681MA65T	35 × 65	A65	0.129	4.6
	1,000	E92X401VND102MA80T	35 × 80	A80	0.088	5.9
	1,200	E92X401VND122MAA0T	35 × 100	AA0	0.073	7.2
	680	E92X401VND681MB50T	40 × 50	B50	0.135	4.4
	1,000	E92X401VND102MB65T	40 × 65	B65	0.092	5.8
	1,200	E92X401VND122MB80T	40 × 80	B80	0.076	6.8
	1,500	E92X401VND152MBA0T	40 × 100	BA0	0.061	8.2
	820	E92X401VNT821MU50T	45 × 50	U50	0.121	4.9
	1,200	E92X401VNT122MU65T	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.



# U92X 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 +85°C, 120Hz
<b>400 Volts</b> 450 Volts Surge	1,500	E92X401VNT152MU80T	45 × 80	U80	0.066	7.7
	2,200	E92X401VNT222MUA5T	45 × 105	UA5	0.045	10.4
	1,200	E92X401VNT122MC50T	50 × 50	C50	0.093	5.6
	1,500	E92X401VNT152MC65T	50 × 65	C65	0.074	7.0
	1,800	E92X401VNT182MC80T	50 × 80	C80	0.062	8.4
	2,700	E92X401VNT272MCA5T	50 × 105	CA5	0.041	11.6
<b>420 Volts</b> 470 Volts Surge	220	E92X421VSN221MR40T	30 × 40	R40	0.389	1.9
	330	E92X421VSN331MR50T	30 × 50	R50	0.284	2.4
	470	E92X421VSN471MR65T	30 × 65	R65	0.202	3.2
	390	E92X421VSN391MA40T	35 × 40	A40	0.251	2.8
	470	E92X421VSN471MA50T	35 × 50	A50	0.183	3.6
	680	E92X421VND681MA65T	35 × 65	A65	0.130	4.6
	820	E92X421VND821MA80T	35 × 80	A80	0.101	5.5
	1,200	E92X421VND122MAA0T	35 × 100	AA0	0.078	7.0
	680	E92X421VND681MB50T	40 × 50	B50	0.142	4.3
	820	E92X421VND821MB65T	40 × 65	B65	0.102	5.5
	1,200	E92X421VND122MB80T	40 × 80	B80	0.079	6.6
	1,500	E92X421VND152MBA0T	40 × 100	BA0	0.061	8.2
	820	E92X421VNT821MU50T	45 × 50	U50	0.124	4.8
	1,000	E92X421VNT102MU65T	45 × 65	U65	0.089	6.2
	1,200	E92X421VNT122MU80T	45 × 80	U80	0.069	7.6
	1,800	E92X421VNT182MUA5T	45 × 105	UA5	0.051	9.9
	1,000	E92X421VNT102MC50T	50 × 50	C50	0.109	5.2
	1,200	E92X421VNT122MC65T	50 × 65	C65	0.078	6.8
1,800	E92X421VNT182MC80T	50 × 80	C80	0.061	8.5	
2,200	E92X421VNT222MCA5T	50 × 105	CA5	0.044	11.2	
<b>450 Volts</b> 500 Volts Surge	220	E92X451VSN221MR40T	30 × 40	R40	0.411	1.8
	330	E92X451VSN331MR50T	30 × 50	R50	0.300	2.3
	390	E92X451VSN391MR65T	30 × 65	R65	0.213	3.1
	330	E92X451VSN331MA40T	35 × 40	A40	0.304	2.5
	470	E92X451VSN471MA50T	35 × 50	A50	0.193	3.5
	560	E92X451VND561MA65T	35 × 65	A65	0.138	4.4
	820	E92X451VND821MA80T	35 × 80	A80	0.107	5.4
	1,000	E92X451VND102MAA0T	35 × 100	AA0	0.082	6.8
	560	E92X451VND561MB50T	40 × 50	B50	0.163	4.0
	820	E92X451VND821MB65T	40 × 65	B65	0.117	5.1
	1,000	E92X451VND102MB80T	40 × 80	B80	0.091	6.2
	1,200	E92X451VND122MBA0T	40 × 100	BA0	0.070	7.7
	680	E92X451VNT681MU50T	45 × 50	U50	0.137	4.6
	1,000	E92X451VNT102MU65T	45 × 65	U65	0.098	5.9
	1,200	E92X451VNT122MU80T	45 × 80	U80	0.076	7.2
	1,800	E92X451VNT182MUA5T	45 × 105	UA5	0.056	9.4
	820	E92X451VNT821MC50T	50 × 50	C50	0.115	5.1
	1,200	E92X451VNT122MC65T	50 × 65	C65	0.083	6.6
1,500	E92X451VNT152MC80T	50 × 80	C80	0.064	8.2	
2,200	E92X451VNT222MCA5T	50 × 105	CA5	0.047	10.8	
<b>500 Volts</b> 550 Volts Surge	150	E92X501VSN151MR40T	30 × 40	R40	0.557	1.6
	180	E92X501VSN181MR50T	30 × 50	R50	0.464	1.9
	270	E92X501VSN271MR65T	30 × 65	R65	0.310	2.6
	220	E92X501VSN221MA40T	35 × 40	A40	0.362	2.3
	270	E92X501VSN271MA50T	35 × 50	A50	0.295	2.8
390	E92X501VND391MA65T	35 × 65	A65	0.204	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.

# U92X 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 +85°C, 120Hz
<b>500 Volts 550 Volts Surge</b>	560	E92X501VND561MA80T	35 × 80	A80	0.142	4.7
	680	E92X501VND681MAA0T	35 × 100	AA0	0.117	5.7
	390	E92X501VND391MB50T	40 × 50	B50	0.204	3.6
	560	E92X501VND561MB65T	40 × 65	B65	0.142	4.6
	680	E92X501VND681MB80T	40 × 80	B80	0.117	5.5
	820	E92X501VND821MBA0T	40 × 100	BA0	0.097	6.5
	560	E92X501VNT561MU50T	45 × 50	U50	0.156	4.3
	680	E92X501VNT681MU65T	45 × 65	U65	0.129	5.2
	1,000	E92X501VNT102MU80T	45 × 80	U80	0.088	6.7
	1,200	E92X501VNT122MUA5T	45 × 105	UA5	0.073	8.2
	680	E92X501VNT681MC50T	50 × 50	C50	0.141	4.6
	1,000	E92X501VNT102MC65T	50 × 65	C65	0.096	6.2
	1,200	E92X501VNT122MC80T	50 × 80	C80	0.080	7.4
	1,800	E92X501VNT182MCA5T	50 × 105	CA5	0.053	10.2

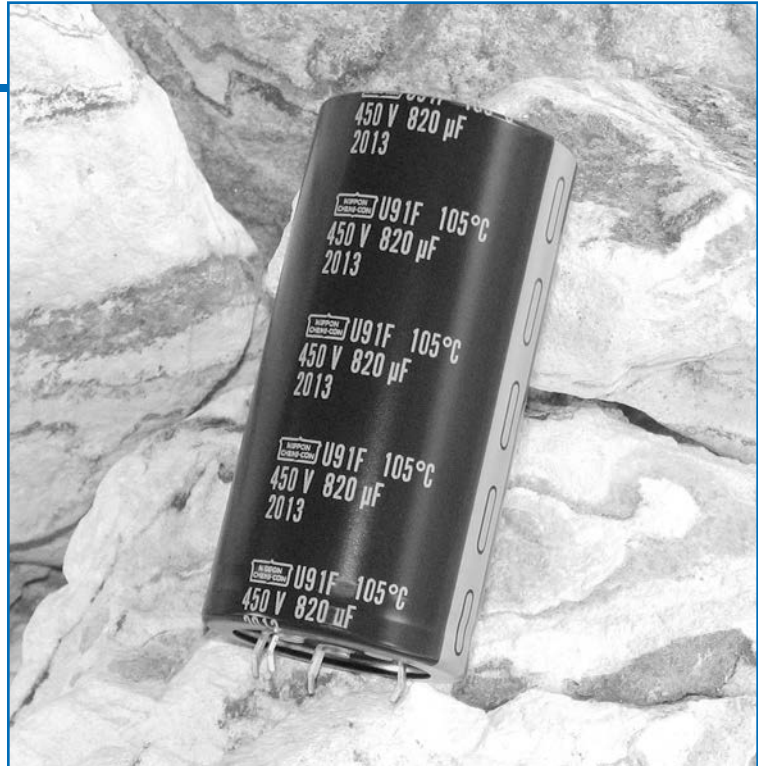
† For construction and terminal options, refer to the part numbering system for descriptions and codes.

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

# 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

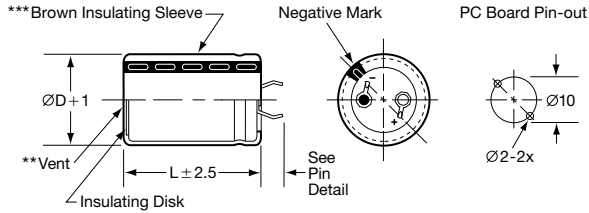
Item	Characteristics																											
Category Temperature Range	-25 to +105°C																											
Rated Voltage Range	350 to 500VDC																											
Capacitance Range	120 to 2,700μF																											
Capacitance Tolerance	±20% (M) at +20°C, 120Hz																											
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

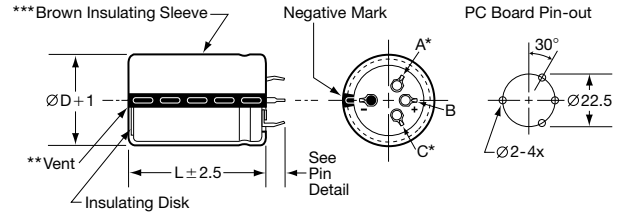
VSN Snap-in  $\varnothing 30$  and  $\varnothing 35$  standard  
VNN Snap-in  $\varnothing 30$  and  $\varnothing 35$  optional



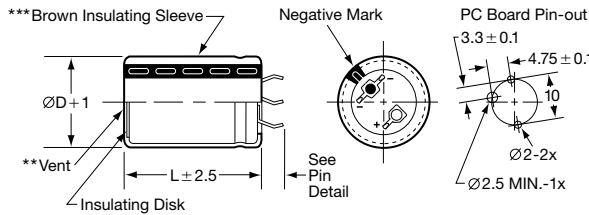
### Snap Mount

Unit: mm

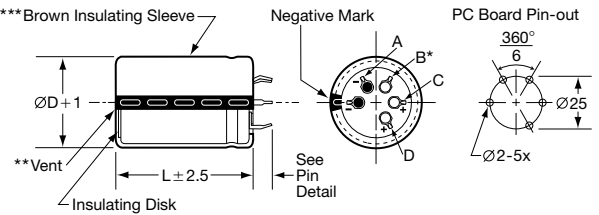
VND Snap-in  $\varnothing 35$  and  $\varnothing 40$  standard;  $\varnothing 45$  optional  
VSD Snap-in  $\varnothing 35$  and  $\varnothing 40$  optional



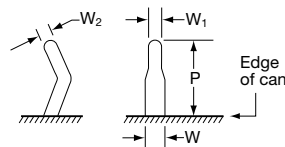
VEN Snap-in  $\varnothing 30$  and  $\varnothing 35$  optional



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



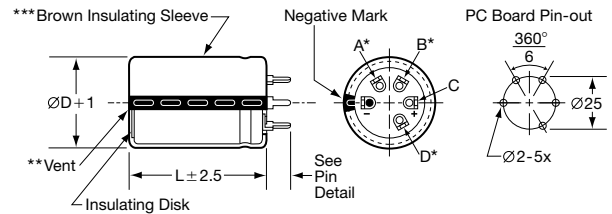
VS, VE & VN Snap-in Pin Dimensions



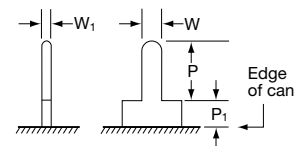
Type	P	W	$W_1$	$W_2$
VSN $\varnothing 30$	$4.0 \pm 0.5$	$1.5 \pm 0.2$	$0.8 \pm 0.1$	$0.8 \pm 0.1$
VSN $\varnothing 35$	$3.5 \pm 0.5$			
VNN $\varnothing 30-\varnothing 35$	$5.8 \pm 1.0$			
VEN $\varnothing 30-\varnothing 35$	$4.0 \pm 0.5$			
VSD $\varnothing 35-\varnothing 40$	$3.5 \pm 1.0$			
VND $\varnothing 35-\varnothing 45$	$5.8 \pm 1.0$			
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 Straight Standoff Pin Dimensions



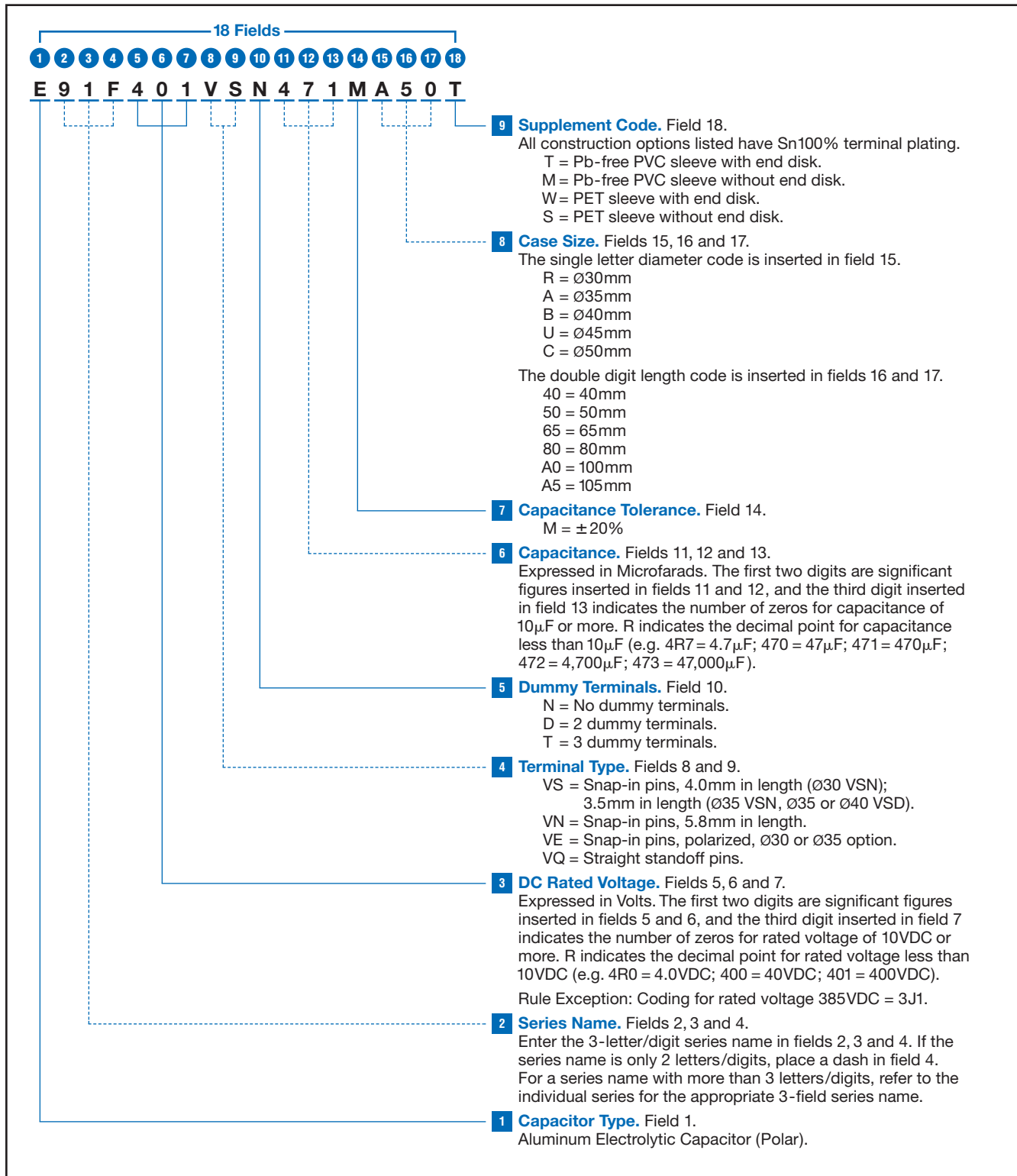
Type	P	$P_1$	W	$W_1$
Standoff Pin (VQ)	$3.75 \pm 1.0$	2.0 max.	$1.5 \pm 0.1$	$0.7 \pm 0.2$

### 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 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 +20°C, 120Hz	Rated Ripple Current (A rms) at +105°C, 120Hz
<b>350 Volts</b> 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	
<b>385 Volts</b> 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	
<b>400 Volts</b> 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
<b>400 Volts</b> 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
<b>420 Volts</b> 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	
<b>450 Volts</b> 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	
<b>500 Volts</b> 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
<b>500 Volts 550 Volts Surge</b>	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.

- Large Can
- Screw Terminals
- High Ripple
- Up to 550VDC  
Rated Voltage
- High  
Capacitance
- RoHS Compliant
- +85°C  
Maximum  
Temperature



The U36D series is ideal for inverter applications requiring high ripple current capabilities. With a voltage range of 6.3 to 550 volts, the number of capacitors in series can be reduced. The U36D capacitors offer very large capacitance of up to 2.2F and a maximum operating temperature of +85°C. These capacitors are available with a variety of high current English or Metric thread terminals. Mounting options include a three-footed clamp or bottom threaded stud. Custom designs are available upon request.

## Summary of Specifications

- Screw terminals: high and low post, English and Metric thread.
- Capacitance range: 68µF to 2.2F.
- Voltage range: 6.3 to 550VDC.
- Category temperature range: -40°C to +85°C.
- Leakage current: 0.02CV(µA) or 5mA, whichever is smaller, after 5 minutes at +25°C.
- Standard capacitance tolerance: ±20%
- Nominal case size (D×L): D = 35mm (1.375") to 89mm (3.500"); L = 41mm (1.625") to 219mm (8.625").
- Rated lifetime: 2,000 hours at +85°C with rated ripple current applied.

# U36D Series

## U36D Specifications - Screw Terminals

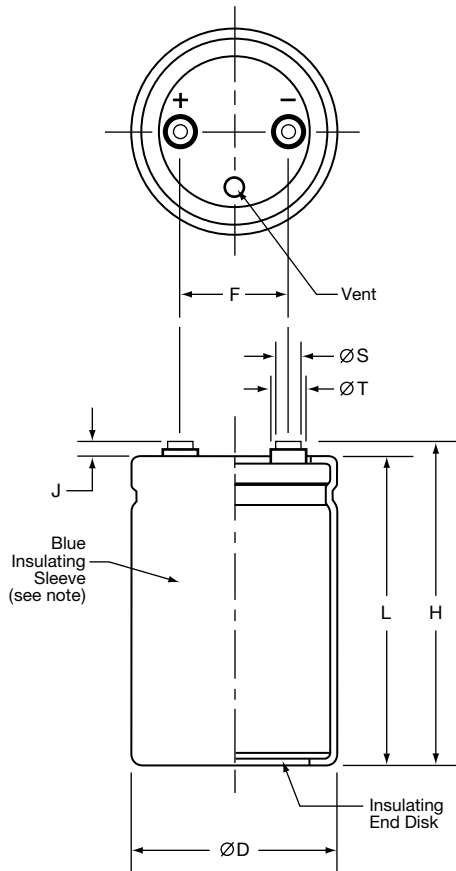
Item	Characteristics																																																							
Category Temperature Range	- 40 to +85°C																																																							
Rated Voltage Range	6.3 to 550VDC																																																							
Capacitance Range	68μF to 2.2F at +25°C, 120Hz																																																							
Capacitance Tolerance	±20% (M) at +25°C, 120Hz																																																							
Leakage Current	I = 0.02CV (μA) or 5mA, whichever is smaller, after 5 minutes at +25°C. Where I = Max. leakage current (μA), C = Nominal capacitance (μF) and V = Rated voltage (V)																																																							
Rated Ripple Current Multipliers	<p>Ambient Temperature (°C)</p> <table border="1"> <tr> <td>≤ +55°C</td> <td>+65°C</td> <td>+75°C</td> <td>+85°C</td> </tr> <tr> <td>2.39</td> <td>2.22</td> <td>1.67</td> <td>1.00</td> </tr> </table> <p>Frequency (Hz)</p> <table border="1"> <tr> <td>50Hz</td> <td>120Hz</td> <td>300Hz</td> <td>1kHz</td> <td>3kHz</td> </tr> <tr> <td>0.8</td> <td>1.0</td> <td>1.1</td> <td>1.3</td> <td>1.4</td> </tr> </table>	≤ +55°C	+65°C	+75°C	+85°C	2.39	2.22	1.67	1.00	50Hz	120Hz	300Hz	1kHz	3kHz	0.8	1.0	1.1	1.3	1.4																																					
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Endurance (Load Life)	<p>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 +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.</p> <p>Capacitance change: ≤ 20% from initial measurement ESR change : ≤ 300% of initial specified limit Leakage current : ≤ initial specified limit</p>																																																							
Shelf Life	<p>The following specifications shall be satisfied when the capacitors are restored to +25°C after exposing them for 500 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.</p> <p>Capacitance change: ≤ 20% from initial measurement ESR change : ≤ 300% of initial specified limit Leakage current : ≤ initial specified limit</p>																																																							
Vibration Rating	10-55Hz, 10g sinusoidal in three axes, 2 hours per axis.																																																							
Maximum Tightening Torque	<table border="1"> <thead> <tr> <th>Terminal Code</th> <th>HP/LP</th> <th>HL/ML</th> <th>CD</th> <th>CP</th> <th>CH</th> <th>CA</th> <th>CS</th> </tr> </thead> <tbody> <tr> <td>Thread Size</td> <td>10-32 NF-2B</td> <td>M5x0.8-6H</td> <td></td> <td>1/4-28 NF-2B</td> <td></td> <td>M6x1-6H</td> <td></td> </tr> <tr> <td>3 Threads Engaged</td> <td colspan="3">2.0 N·m (18.0 in·lb)</td> <td colspan="4">4.0 N·m (35.0 in·lb)</td> </tr> <tr> <td>6 Threads Engaged</td> <td colspan="3">2.8 N·m (25.0 in·lb)</td> <td colspan="4">6.2 N·m (55.0 in·lb)</td> </tr> </tbody> </table>	Terminal Code	HP/LP	HL/ML	CD	CP	CH	CA	CS	Thread Size	10-32 NF-2B	M5x0.8-6H		1/4-28 NF-2B		M6x1-6H		3 Threads Engaged	2.0 N·m (18.0 in·lb)			4.0 N·m (35.0 in·lb)				6 Threads Engaged	2.8 N·m (25.0 in·lb)			6.2 N·m (55.0 in·lb)																										
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Typical Inductance (nH) at 1MHz	<table border="1"> <thead> <tr> <th rowspan="2">Case Diameter (mm)</th> <th colspan="7">Terminal Code</th> </tr> <tr> <th>HP/LP</th> <th>HL/ML</th> <th>CD</th> <th>CP</th> <th>CH</th> <th>CA</th> <th>CS</th> </tr> </thead> <tbody> <tr> <td>ø35.0</td> <td>—</td> <td>—</td> <td>NA</td> <td>NA</td> <td>NA</td> <td>NA</td> <td>NA</td> </tr> <tr> <td>ø50.8</td> <td>—</td> <td>—</td> <td>NA</td> <td>NA</td> <td>NA</td> <td>NA</td> <td>NA</td> </tr> <tr> <td>ø63.5</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> </tr> <tr> <td>ø76.2</td> <td>30</td> <td>30</td> <td>25</td> <td>20</td> <td>25</td> <td>20</td> <td>25</td> </tr> <tr> <td>ø89.0</td> <td>30</td> <td>30</td> <td>25</td> <td>20</td> <td>25</td> <td>20</td> <td>25</td> </tr> </tbody> </table>	Case Diameter (mm)	Terminal Code							HP/LP	HL/ML	CD	CP	CH	CA	CS	ø35.0	—	—	NA	NA	NA	NA	NA	ø50.8	—	—	NA	NA	NA	NA	NA	ø63.5	—	—	—	—	—	—	—	ø76.2	30	30	25	20	25	20	25	ø89.0	30	30	25	20	25	20	25
Case Diameter (mm)	Terminal Code																																																							
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ø35.0	—	—	NA	NA	NA	NA	NA																																																	
ø50.8	—	—	NA	NA	NA	NA	NA																																																	
ø63.5	—	—	—	—	—	—	—																																																	
ø76.2	30	30	25	20	25	20	25																																																	
ø89.0	30	30	25	20	25	20	25																																																	
Custom Designs	Custom CV values per case size and termination type may be available upon request. Contact appropriate representative with specific requirements.																																																							

# U36D Series

## Diagram of Dimensions - Screw Terminals

### Large Can/Screw Terminals

Unit: mm (inches)



### Case Dimensions and Standard Box Quantities

Case Size Code	ØD +2.0 (0.080)	L ±1.0 (0.040)	F ±0.25 (0.010)	Standard Box Quantity
A41 A54 A67 A79 A92 AA5 AB7 AD0 AE3	35.0 (1.375)	41 (1.625) 54 (2.125) 67 (2.625) 79 (3.125) 92 (3.625) 105 (4.125) 117 (4.625) 130 (5.125) 143 (5.625)	12.7 (0.500)	100
C48 C54 C67 C79 C92 CA5 CB7 CD0 CE3	50.8 (2.000)	48 (1.875) 54 (2.125) 67 (2.625) 79 (3.125) 92 (3.625) 105 (4.125) 117 (4.625) 130 (5.125) 143 (5.625)	22.2 (0.875)	49
D79 DA5 DB7 DD0 DE3	63.5 (2.500)	79 (3.125) 105 (4.125) 117 (4.625) 130 (5.125) 143 (5.625)	28.6 (1.125)	20
E79 E92 EA5 EB7 ED0 EE3 EM9	76.2 (3.000)	79 (3.125) 92 (3.625) 105 (4.125) 117 (4.625) 130 (5.125) 143 (5.625) 219 (8.625)	31.8 (1.250)	16 9
FA5 FB7 FD0 FE3	89.0 (3.500)	105 (4.125) 117 (4.625) 130 (5.125) 143 (5.625)	31.8 (1.250)	5

#### Note:

In some cases, the color of the sleeve may change slightly due to the operating conditions, however, the discoloration will not impair capacitor function.

### Terminal Specifications

Terminal Code	Available Case Diameter		Thread Size	Minimum Thread Depth	J ±0.5 (0.020)	H ±2.0 (0.080)	ØS ±0.25 (0.010)	ØT ±0.25 (0.010)
	ØD Code	ØD mm (inches)						
HP	A-E	35.0 – 76.2 (1.375 – 3.000)	10-32 NF-2B	9.5 (0.375)	6.4 (0.250)	L+J	8.0 (0.313)	11.1 (0.438)
LP	A-E	35.0 – 76.2 (1.375 – 3.000)	10-32 NF-2B	5.6 (0.219)	1.6 (0.063)	L+J	8.0 (0.313)	—
HL	A-E	35.0 – 76.2 (1.375 – 3.000)	M5x0.8-6H	9.5 (0.375)	6.4 (0.250)	L+J	8.0 (0.313)	11.1 (0.438)
ML	A-E	35.0 – 76.2 (1.375 – 3.000)	M5x0.8-6H	5.6 (0.219)	1.6 (0.063)	L+J	8.0 (0.313)	11.1 (0.438)
CD	D-E	63.5 – 76.2 (2.500 – 3.000)	M5x0.8-6H	8.5 (0.335)	5.0 (0.200)	L+J	13.0 (0.512)	18.8 (0.740)
CP	D-F	63.5 – 89.0 (2.500 – 3.500)	1/4 - 28 NF-2B	8.7 (0.344)	2.4 (0.093)	L+J	17.5 (0.689)	—
CH	D-F	63.5 – 89.0 (2.500 – 3.500)	1/4 - 28 NF-2B	11.9 (0.468)	6.4 (0.250)	L+J	17.5 (0.689)	—
CA	D-F	63.5 – 89.0 (2.500 – 3.500)	M6x1-6H	8.7 (0.344)	2.4 (0.093)	L+J	17.5 (0.689)	—
CS	D-F	63.5 – 89.0 (2.500 – 3.500)	M6x1-6H	11.9 (0.468)	6.4 (0.250)	L+J	17.5 (0.689)	—

Mounting Hardware is optional. Refer to hardware specifications on the following page.

U36D  
SCREW MOUNT 85°C

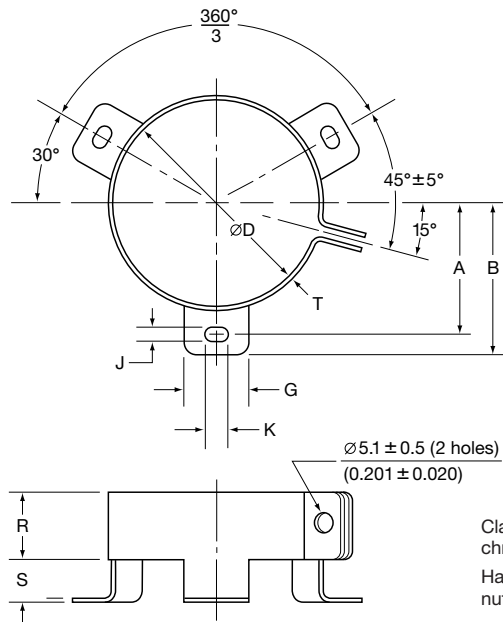


# U36D Series

## Mounting Hardware - Screw Terminals

### Type C: Three-Footed Clamp

Unit: mm (inches)



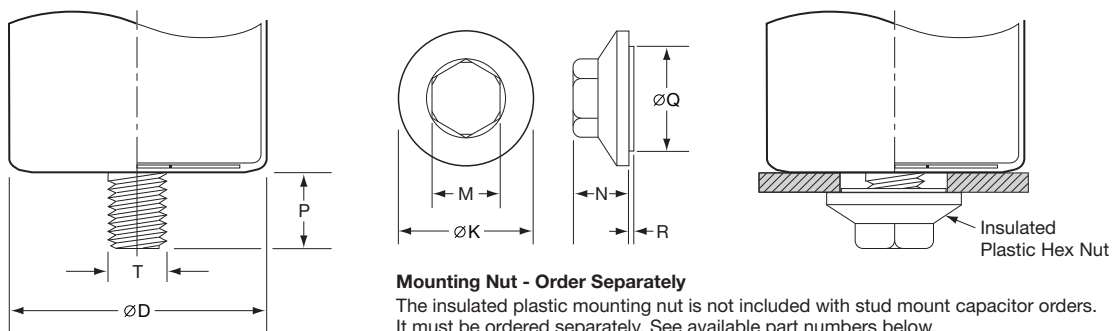
Clamp: Zinc with silver trivalent chromate post treatment.

Hardware: Screw, washer and hexagon nut included with each clamp.

### Type C: Clamp Dimensions

Mounting Code	Case øD	A ±1.0 (0.040)	B ±1.0 (0.040)	G ±1.0 (0.040)	J ±0.5 (0.020)	K ±0.5 (0.020)	R ±1.0 (0.040)	S ±1.0 (0.040)	T ±0.5 (0.020)
C	50.8 (2.000)	31.8 (1.250)	36.5 (1.437)	13.3 (0.524)	4.5 (0.177)	7.1 (0.280)	19.1 (0.751)	9.5 (0.374)	0.8 (0.032)
C	63.5 (2.500)	38.1 (1.500)	42.9 (1.689)	13.3 (0.524)	4.5 (0.177)	7.1 (0.280)	19.1 (0.751)	9.5 (0.374)	0.8 (0.032)
C	76.2 (3.000)	44.5 (1.750)	49.2 (1.937)	13.3 (0.524)	4.5 (0.177)	7.1 (0.280)	19.1 (0.751)	9.5 (0.374)	1.0 (0.040)
C	89.0 (3.500)	50.8 (2.000)	56.5 (2.224)	16.0 (0.630)	4.5 (0.177)	8.0 (0.313)	21.0 (0.827)	9.0 (0.354)	1.0 (0.040)

### Type S: Stud Mounting



#### Mounting Nut - Order Separately

The insulated plastic mounting nut is not included with stud mount capacitor orders. It must be ordered separately. See available part numbers below.

### Type S: Stud Dimensions

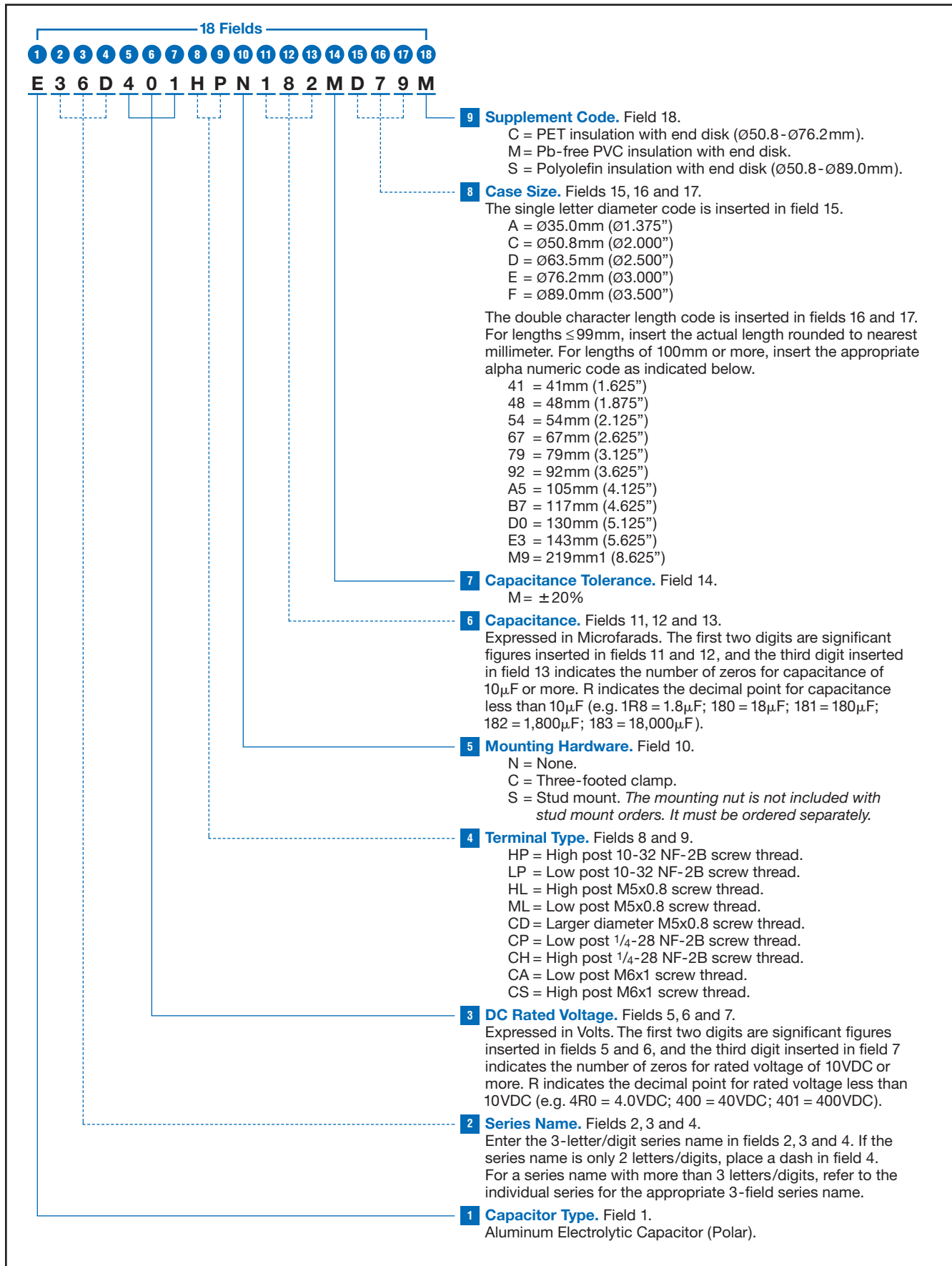
Mounting Code	P ±1.0 (0.040)	T Thread Size
S	16.0 (0.630)	M12

### Mounting Nut Dimensions

Part Number	øK ±2.0 (0.080)	M ±1.0 (0.040)	N ±1.0 (0.040)	øQ ±1.0 (0.040)	R ±1.0 (0.040)
50-8D	30.0 (1.181)	19.0 (0.748)	18.0 (0.709)	22.0 (0.866)	1.40 (0.055)
50-8E	38.0 (1.496)	19.0 (0.748)	18.0 (0.709)	30.0 (1.181)	1.40 (0.055)

# U36D Series

**Part Numbering System for U36D Series** When ordering, always specify complete 18-field global part number.



# U36D Series

## Standard Voltage Ratings - Screw Terminals

Rated Voltage (WVDC)	Capacitance (µF)	Global Part Number†	Nominal Case Size* D × L (mm)	Case Size Code	Maximum ESR (mΩ) at +25°C, 120Hz	Rated Ripple Current (A rms) at +85°C, 120Hz
<b>6.3 Volts</b> 8 Volts Surge	39,000	E36D6R3HPN393MA41M	35 × 41	A41	42.7	4.48
	68,000	E36D6R3HPN683MA54M	35 × 54	A54	25.5	6.35
	120,000	E36D6R3HPN124MA79M	35 × 79	A79	15.4	9.47
	180,000	E36D6R3HPN184MAA5M	35 × 105	AA5	11.2	11.10
	220,000	E36D6R3HPN224MAB7M	35 × 117	AB7	9.8	12.55
	270,000	E36D6R3HPN274MAE3M	35 × 143	AE3	8.4	15.27
	120,000	E36D6R3HPN124MC54M	50.8 × 54	C54	16.9	7.72
	220,000	E36D6R3HPN224MC67M	50.8 × 67	C67	9.1	10.85
	270,000	E36D6R3HPN274MC79M	50.8 × 79	C79	8.8	12.60
	390,000	E36D6R3HPN394MC92M	50.8 × 92	C92	7.5	15.71
	470,000	E36D6R3HPN474MCB7M	50.8 × 117	CB7	5.8	17.95
	560,000	E36D6R3HPN564MCD0M	50.8 × 130	CD0	5.2	19.94
	680,000	E36D6R3HPN684MCE3M	50.8 × 143	CE3	5.0	22.31
	470,000	E36D6R3HPN474MD79M	63.5 × 79	D79	8.9	15.39
	680,000	E36D6R3HPN684MDA5M	63.5 × 105	DA5	6.5	20.69
	820,000	E36D6R3HPN824MDB7M	63.5 × 117	DB7	5.8	21.02
	1,000,000	E36D6R3HPN105MDE3M	63.5 × 143	DE3	4.9	24.55
	680,000	E36D6R3HPN684ME79M	76.2 × 79	E79	10.0	17.32
	820,000	E36D6R3HPN824ME92M	76.2 × 92	E92	8.6	19.55
	1,000,000	E36D6R3HPN105MEA5M	76.2 × 105	EA5	7.5	22.10
1,200,000	E36D6R3HPN125MEB7M	76.2 × 117	EB7	6.8	24.59	
1,500,000	E36D6R3HPN155MEE3M	76.2 × 143	EE3	5.6	29.17	
2,200,000	E36D6R3HPN225MEM9M	76.2 × 219	EM9	3.9	41.67	
<b>10 Volts</b> 13 Volts Surge	33,000	E36D100HPN333MA41M	35 × 41	A41	40.9	3.65
	56,000	E36D100HPN563MA54M	35 × 54	A54	25.0	4.99
	82,000	E36D100HPN823MA67M	35 × 67	A67	18.0	6.44
	100,000	E36D100HPN104MA79M	35 × 79	A79	15.0	7.65
	120,000	E36D100HPN124MA92M	35 × 92	A92	12.9	8.45
	150,000	E36D100HPN154MAA5M	35 × 105	AA5	10.9	10.03
	180,000	E36D100HPN184MAB7M	35 × 117	AB7	10.6	11.24
	220,000	E36D100HPN224MAE3M	35 × 143	AE3	8.3	12.71
	82,000	E36D100HPN823MC48M	50.8 × 48	C48	21.0	6.36
	100,000	E36D100HPN104MC54M	50.8 × 54	C54	16.6	7.37
	150,000	E36D100HPN154MC67M	50.8 × 67	C67	11.5	9.18
	220,000	E36D100HPN224MC79M	50.8 × 79	C79	8.8	11.93
	270,000	E36D100HPN274MC92M	50.8 × 92	C92	7.4	13.07
	330,000	E36D100HPN334MCA5M	50.8 × 105	CA5	6.4	15.32
	390,000	E36D100HPN394MCB7M	50.8 × 117	CB7	5.7	16.35
	470,000	E36D100HPN474MCE3M	50.8 × 143	CE3	4.9	19.08
	330,000	E36D100HPN334MD79M	63.5 × 79	D79	8.7	12.77
	560,000	E36D100HPN564MDA5M	63.5 × 105	DA5	6.3	18.77
	680,000	E36D100HPN684MDB7M	63.5 × 117	DB7	5.7	19.14
	820,000	E36D100HPN824MDE3M	63.5 × 143	DE3	4.9	20.73
680,000	E36D100HPN684ME92M	76.2 × 92	E92	8.9	18.43	
820,000	E36D100HPN824MEA5M	76.2 × 105	EA5	7.7	21.39	
1,000,000	E36D100HPN105MED0M	76.2 × 130	ED0	6.0	23.50	
1,200,000	E36D100HPN125MEE3M	76.2 × 143	EE3	5.7	26.84	
1,800,000	E36D100HPN185MEM9M	76.2 × 219	EM9	4.0	37.69	
<b>16 Volts</b> 20 Volts Surge	22,000	E36D160HPN223MA41M	35 × 41	A41	44.2	3.16
	39,000	E36D160HPN393MA54M	35 × 54	A54	26.1	4.50
	56,000	E36D160HPN563MA67M	35 × 67	A67	19.0	5.63
	68,000	E36D160HPN683MA79M	35 × 79	A79	15.8	6.68
	82,000	E36D160HPN823MA92M	35 × 92	A92	13.5	7.86
	100,000	E36D160HPN104MAA5M	35 × 105	AA5	11.6	9.23
	120,000	E36D160HPN124MAB7M	35 × 117	AB7	10.2	10.33
	150,000	E36D160HPN154MAE3M	35 × 143	AE3	8.7	12.69
	56,000	E36D160HPN563MC48M	50.8 × 48	C48	21.7	5.51
	68,000	E36D160HPN683MC54M	50.8 × 54	C54	17.2	6.37

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

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

# U36D Series

## Standard Voltage Ratings - Screw Terminals

Rated Voltage (WVDC)	Capacitance (µF)	Global Part Number†	Nominal Case Size* D × L (mm)	Case Size Code	Maximum ESR (mΩ) at +25°C, 120Hz	Rated Ripple Current (A rms) at +85°C, 120Hz
16 Volts 20 Volts Surge	120,000	E36D160HPN124MC67M	50.8 × 67	C67	12.2	9.00
	150,000	E36D160HPN154MC79M	50.8 × 79	C79	9.2	10.79
	220,000	E36D160HPN224MC92M	50.8 × 92	C92	6.7	13.19
	270,000	E36D160HPN274MCB7M	50.8 × 117	CB7	5.9	15.71
	330,000	E36D160HPN334MCE3M	50.8 × 143	CE3	5.1	19.03
	220,000	E36D160HPN224MD79M	63.5 × 79	D79	8.7	12.59
	390,000	E36D160HPN394MDA5M	63.5 × 105	DA5	6.3	18.91
	470,000	E36D160HPN474MDB7M	63.5 × 117	DB7	5.7	20.24
	560,000	E36D160HPN564MDE3M	63.5 × 143	DE3	4.9	24.15
	470,000	E36D160HPN474ME92M	76.2 × 92	E92	8.7	19.11
	560,000	E36D160HPN564MEA5M	76.2 × 105	EA5	7.5	22.05
	680,000	E36D160HPN684MEB7M	76.2 × 117	EB7	6.3	22.91
820,000	E36D160HPN824MEE3M	76.2 × 143	EE3	5.6	25.28	
1,200,000	E36D160HPN125MEM9M	76.2 × 219	EM9	3.9	34.52	
25 Volts 32 Volts Surge	15,000	E36D250HPN153MA41M	35 × 41	A41	44.0	3.05
	27,000	E36D250HPN273MA54M	35 × 54	A54	25.7	4.38
	39,000	E36D250HPN393MA67M	35 × 67	A67	18.7	5.50
	47,000	E36D250HPN473MA79M	35 × 79	A79	15.7	6.49
	56,000	E36D250HPN563MA92M	35 × 92	A92	13.5	7.60
	68,000	E36D250HPN683MAA5M	35 × 105	AA5	11.6	8.89
	82,000	E36D250HPN823MAB7M	35 × 117	AB7	10.2	9.99
	100,000	E36D250HPN104MAE3M	35 × 143	AE3	8.8	12.12
	39,000	E36D250HPN393MC48M	50.8 × 48	C48	21.7	5.66
	47,000	E36D250HPN473MC54M	50.8 × 54	C54	17.2	6.52
	82,000	E36D250HPN823MC67M	50.8 × 67	C67	12.2	9.15
	100,000	E36D250HPN104MC79M	50.8 × 79	C79	9.2	10.84
	150,000	E36D250HPN154MCA5M	50.8 × 105	CA5	6.7	13.66
	180,000	E36D250HPN184MCB7M	50.8 × 117	CB7	5.9	15.71
	220,000	E36D250HPN224MCE3M	50.8 × 143	CE3	5.1	19.03
	180,000	E36D250HPN184MD79M	63.5 × 79	D79	8.7	13.34
	270,000	E36D250HPN274MDA5M	63.5 × 105	DA5	6.3	18.44
	330,000	E36D250HPN334MDB7M	63.5 × 117	DB7	5.7	20.39
	390,000	E36D250HPN394MDE3M	63.5 × 143	DE3	5.0	24.24
	330,000	E36D250HPN334ME92M	76.2 × 92	E92	8.2	19.61
390,000	E36D250HPN394MEA5M	76.2 × 105	EA5	7.8	22.54	
470,000	E36D250HPN474MEB7M	76.2 × 117	EB7	6.4	24.52	
560,000	E36D250HPN564MEE3M	76.2 × 143	EE3	5.7	26.73	
820,000	E36D250HPN824MEM9M	76.2 × 219	EM9	3.9	38.03	
35 Volts 44 Volts Surge	10,000	E36D350HPN103MA41M	35 × 41	A41	47.1	2.57
	18,000	E36D350HPN183MA54M	35 × 54	A54	27.4	3.70
	27,000	E36D350HPN273MA67M	35 × 67	A67	19.3	4.73
	33,000	E36D350HPN333MA79M	35 × 79	A79	16.1	5.63
	39,000	E36D350HPN393MA92M	35 × 92	A92	13.9	6.56
	47,000	E36D350HPN473MAA5M	35 × 105	AA5	12.0	7.65
	56,000	E36D350HPN563MAB7M	35 × 117	AB7	10.6	8.54
	68,000	E36D350HPN683MAD0M	35 × 130	AD0	10.3	9.89
	22,000	E36D350HPN223MC48M	50.8 × 48	C48	22.4	4.32
	33,000	E36D350HPN333MC54M	50.8 × 54	C54	17.7	5.55
	56,000	E36D350HPN563MC67M	50.8 × 67	C67	12.5	7.68
	68,000	E36D350HPN683MC79M	50.8 × 79	C79	9.5	9.08
	100,000	E36D350HPN104MC92M	50.8 × 92	C92	8.0	11.09
	120,000	E36D350HPN124MCB7M	50.8 × 117	CB7	6.1	12.83
	150,000	E36D350HPN154MCE3M	50.8 × 143	CE3	5.9	15.04
	120,000	E36D350HPN124MD79M	63.5 × 79	D79	9.1	11.34
	180,000	E36D350HPN184MDA5M	63.5 × 105	DA5	6.7	15.68
	220,000	E36D350HPN224MDB7M	63.5 × 117	DB7	5.8	18.17
	270,000	E36D350HPN274MDE3M	63.5 × 143	DE3	5.0	22.01

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

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

SCREW MOUNT 85°C  
U36D

# U36D Series

## Standard Voltage Ratings - Screw Terminals

Rated Voltage (WVDC)	Capacitance (µF)	Global Part Number†	Nominal Case Size* D × L (mm)	Case Size Code	Maximum ESR (mΩ) at +25°C, 120Hz	Rated Ripple Current (A rms) at +85°C, 120Hz
<b>35 Volts</b> 44 Volts Surge	220,000	E36D350HPN224ME92M	76.2 × 92	E92	8.9	16.73
	270,000	E36D350HPN274MEA5M	76.2 × 105	EA5	7.8	19.58
	330,000	E36D350HPN334MED0M	76.2 × 130	ED0	6.0	22.72
	390,000	E36D350HPN394MEE3M	76.2 × 143	EE3	5.7	24.75
	560,000	E36D350HPN564MEM9M	76.2 × 219	EM9	3.9	35.94
<b>50 Volts</b> 63 Volts Surge	6,800	E36D500HPN682MA41M	35 × 41	A41	48.8	3.10
	12,000	E36D500HPN123MA54M	35 × 54	A54	28.7	4.34
	18,000	E36D500HPN183MA67M	35 × 67	A67	22.8	5.40
	22,000	E36D500HPN223MA79M	35 × 79	A79	16.8	6.39
	27,000	E36D500HPN273MA92M	35 × 92	A92	14.2	7.47
	33,000	E36D500HPN333MAA5M	35 × 105	AA5	12.1	8.57
	39,000	E36D500HPN393MAB7M	35 × 117	AB7	11.8	9.34
	47,000	E36D500HPN473MAE3M	35 × 143	AE3	9.3	11.03
	15,000	E36D500HPN153MC48M	50.8 × 48	C48	25.4	5.13
	22,000	E36D500HPN223MC54M	50.8 × 54	C54	18.4	6.42
	33,000	E36D500HPN333MC67M	50.8 × 67	C67	12.8	8.20
	47,000	E36D500HPN473MC79M	50.8 × 79	C79	9.7	10.09
	56,000	E36D500HPN563MC92M	50.8 × 92	C92	8.3	11.90
	68,000	E36D500HPN683MCA5M	50.8 × 105	CA5	7.1	13.36
	82,000	E36D500HPN823MCB7M	50.8 × 117	CB7	6.3	15.20
	100,000	E36D500HPN104MCE3M	50.8 × 143	CE3	5.4	17.99
	68,000	E36D500HPN683MD79M	63.5 × 79	D79	9.0	12.06
	120,000	E36D500HPN124MDA5M	63.5 × 105	DA5	6.6	15.71
	150,000	E36D500HPN154MDB7M	63.5 × 117	DB7	5.9	17.81
	180,000	E36D500HPN184MDE3M	63.5 × 143	DE3	5.0	20.74
120,000	E36D500HPN124ME92M	76.2 × 92	E92	8.3	14.86	
150,000	E36D500HPN154MEA5M	76.2 × 105	EA5	7.3	16.74	
180,000	E36D500HPN184MEB7M	76.2 × 117	EB7	6.6	18.42	
220,000	E36D500HPN224MED0M	76.2 × 130	ED0	6.2	20.04	
390,000	E36D500HPN394MEM9M	76.2 × 219	EM9	4.0	31.15	
<b>63 Volts</b> 79 Volts Surge	4,700	E36D630HPN472MA41M	35 × 41	A41	52.8	2.99
	8,200	E36D630HPN822MA54M	35 × 54	A54	31.2	4.17
	12,000	E36D630HPN123MA67M	35 × 67	A67	22.2	5.17
	15,000	E36D630HPN153MA79M	35 × 79	A79	18.2	6.15
	18,000	E36D630HPN183MA92M	35 × 92	A92	15.5	7.14
	22,000	E36D630HPN223MAA5M	35 × 105	AA5	13.2	8.22
	27,000	E36D630HPN273MAD0M	35 × 130	AD0	11.1	9.64
	33,000	E36D630HPN333MAE3M	35 × 143	AE3	9.7	10.75
	12,000	E36D630HPN123MC48M	50.8 × 48	C48	25.2	5.24
	15,000	E36D630HPN153MC54M	50.8 × 54	C54	19.8	6.21
	22,000	E36D630HPN223MC67M	50.8 × 67	C67	13.8	7.91
	33,000	E36D630HPN333MC79M	50.8 × 79	C79	11.2	9.85
	39,000	E36D630HPN393MC92M	50.8 × 92	C92	8.7	11.62
	47,000	E36D630HPN473MCA5M	50.8 × 105	CA5	7.5	13.01
	56,000	E36D630HPN563MCB7M	50.8 × 117	CB7	6.7	14.74
	68,000	E36D630HPN683MCE3M	50.8 × 143	CE3	5.7	17.51
	47,000	E36D630HPN473MD79M	63.5 × 79	D79	9.3	11.86
	82,000	E36D630HPN823MDA5M	63.5 × 105	DA5	6.8	15.60
	100,000	E36D630HPN104MDB7M	63.5 × 117	DB7	6.0	17.66
	120,000	E36D630HPN124MDE3M	63.5 × 143	DE3	5.2	20.55
	100,000	E36D630HPN104ME92M	76.2 × 92	E92	9.1	14.20
	120,000	E36D630HPN124MEA5M	76.2 × 105	EA5	7.9	16.10
	150,000	E36D630HPN154MED0M	76.2 × 130	ED0	6.2	19.88
180,000	E36D630HPN184MEE3M	76.2 × 143	EE3	5.9	21.42	
270,000	E36D630HPN274MEM9M	76.2 × 219	EM9	4.1	31.94	

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

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

# U36D Series

## Standard Voltage Ratings - Screw Terminals

Rated Voltage (WVDC)	Capacitance (µF)	Global Part Number†	Nominal Case Size* D × L (mm)	Case Size Code	Maximum ESR (mΩ) at +25°C, 120Hz	Rated Ripple Current (A rms) at +85°C, 120Hz
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<b>80 Volts 100 Volts Surge</b>	2,700	E36D800HPN272MA41M	35 × 41	A41	61.9	2.77
	4,700	E36D800HPN472MA54M	35 × 54	A54	36.4	3.87
	5,600	E36D800HPN562MA67M	35 × 67	A67	30.0	4.44
	8,200	E36D800HPN822MA79M	35 × 79	A79	21.7	5.65
	10,000	E36D800HPN103MA92M	35 × 92	A92	18.2	6.60
	12,000	E36D800HPN123MAA5M	35 × 105	AA5	15.6	7.56
	15,000	E36D800HPN153MAD0M	35 × 130	AD0	12.9	8.93
	18,000	E36D800HPN183MAE3M	35 × 143	AE3	12.8	9.99
	5,600	E36D800HPN562MC48M	50.8 × 48	C48	32.5	4.62
	8,200	E36D800HPN822MC54M	50.8 × 54	C54	23.2	5.59
	12,000	E36D800HPN123MC67M	50.8 × 67	C67	16.1	7.32
	18,000	E36D800HPN183MC79M	50.8 × 79	C79	13.0	9.22
	22,000	E36D800HPN223MC92M	50.8 × 92	C92	9.8	10.95
	27,000	E36D800HPN273MCA5M	50.8 × 105	CA5	9.8	12.39
	33,000	E36D800HPN333MCB7M	50.8 × 117	CB7	8.0	14.12
	39,000	E36D800HPN393MCE3M	50.8 × 143	CE3	6.3	16.65
	27,000	E36D800HPN273MD79M	63.5 × 79	D79	10.1	11.34
	39,000	E36D800HPN393MDA5M	63.5 × 105	DA5	7.4	15.07
	56,000	E36D800HPN563MDD0M	63.5 × 130	DD0	5.9	18.51
	47,000	E36D800HPN473ME92M	76.2 × 92	E92	8.7	14.52
	56,000	E36D800HPN563MEA5M	76.2 × 105	EA5	7.5	16.51
	68,000	E36D800HPN683MEB7M	76.2 × 117	EB7	6.7	18.28
	82,000	E36D800HPN823MED0M	76.2 × 130	ED0	6.2	19.88
	100,000	E36D800HPN104MEE3M	76.2 × 143	EE3	5.5	21.42
120,000	E36D800HPN124MEM9M	76.2 × 219	EM9	4.1	31.53	

<b>100 Volts 125 Volts Surge</b>	1,800	E36D101HPN182MA41M	35 × 41	A41	72.1	2.57
	2,700	E36D101HPN272MA54M	35 × 54	A54	47.5	3.39
	3,900	E36D101HPN392MA67M	35 × 67	A67	33.6	4.21
	4,700	E36D101HPN472MA79M	35 × 79	A79	28.1	4.97
	5,600	E36D101HPN562MA92M	35 × 92	A92	23.6	6.22
	8,200	E36D101HPN822MAB7M	35 × 117	AB7	17.2	7.39
	10,000	E36D101HPN103MAD0M	35 × 130	AD0	14.7	8.41
	3,900	E36D101HPN392MC48M	50.8 × 48	C48	36.4	4.38
	5,600	E36D101HPN562MC54M	50.8 × 54	C54	26.2	5.41
	8,200	E36D101HPN822MC67M	50.8 × 67	C67	18.2	6.92
	10,000	E36D101HPN103MC79M	50.8 × 79	C79	14.8	8.23
	15,000	E36D101HPN153MC92M	50.8 × 92	C92	12.5	10.38
	18,000	E36D101HPN183MCB7M	50.8 × 117	CB7	9.0	12.65
	22,000	E36D101HPN223MCD0M	50.8 × 130	CD0	7.8	14.15
	27,000	E36D101HPN273MCE3M	50.8 × 143	CE3	7.6	15.91
	18,000	E36D101HPN183MD79M	63.5 × 79	D79	11.2	10.83
	27,000	E36D101HPN273MDA5M	63.5 × 105	DA5	8.0	14.41
	33,000	E36D101HPN333MDB7M	63.5 × 117	DB7	7.1	16.47
	39,000	E36D101HPN393MDE3M	63.5 × 143	DE3	6.0	19.15
	33,000	E36D101HPN333ME92M	76.2 × 92	E92	9.3	14.05
	39,000	E36D101HPN393MEA5M	76.2 × 105	EA5	8.0	16.00
	47,000	E36D101HPN473MEB7M	76.2 × 117	EB7	7.2	17.65
	56,000	E36D101HPN563MED0M	76.2 × 130	ED0	6.6	19.42
	82,000	E36D101HPN823MEM9M	76.2 × 219	EM9	4.3	30.41

<b>160 Volts 200 Volts Surge</b>	820	E36D161HPN821MA41M	35 × 41	A41	202.0	1.95
	1,500	E36D161HPN152MA54M	35 × 54	A54	110.0	2.83
	2,200	E36D161HPN222MA67M	35 × 67	A67	76.9	3.57
	2,700	E36D161HPN272MA79M	35 × 79	A79	57.4	4.26
	3,300	E36D161HPN332MA92M	35 × 92	A92	51.1	5.05
	3,900	E36D161HPN392MAA5M	35 × 105	AA5	43.6	5.83
	4,700	E36D161HPN472MAB7M	35 × 117	AB7	36.7	6.55
	5,600	E36D161HPN562MAE3M	35 × 143	AE3	31.0	7.85

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

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

U36D  
SCREW MOUNT 85°C



# U36D Series

## Standard Voltage Ratings - Screw Terminals

Rated Voltage (WVDC)	Capacitance (µF)	Global Part Number†	Nominal Case Size* D × L (mm)	Case Size Code	Maximum ESR (mΩ) at +25°C, 120Hz	Rated Ripple Current (A rms) at +85°C, 120Hz
160 Volts 200 Volts Surge	2,200	E36D161HPN222MC48M	50.8 × 48	C48	80.9	3.86
	2,700	E36D161HPN272MC54M	50.8 × 54	C54	64.7	4.49
	3,900	E36D161HPN392MC67M	50.8 × 67	C67	44.7	5.73
	5,600	E36D161HPN562MC79M	50.8 × 79	C79	31.8	7.37
	8,200	E36D161HPN822MC92M	50.8 × 92	C92	22.4	9.53
	10,000	E36D161HPN103MCB7M	50.8 × 117	CB7	18.4	11.71
	12,000	E36D161HPN123MCD0M	50.8 × 130	CD0	15.9	13.46
	10,000	E36D161HPN103MD79M	63.5 × 79	D79	21.5	11.23
	15,000	E36D161HPN153MDA5M	63.5 × 105	DA5	14.9	15.52
	18,000	E36D161HPN183MDB7M	63.5 × 117	DB7	12.5	17.82
	22,000	E36D161HPN223MDE3M	63.5 × 143	DE3	10.6	21.54
	18,000	E36D161HPN183ME92M	76.2 × 92	E92	15.2	17.74
	22,000	E36D161HPN223MEA5M	76.2 × 105	EA5	12.9	20.73
	27,000	E36D161HPN273MED0M	76.2 × 130	ED0	10.3	25.17
33,000	E36D161HPN333MEE3M	76.2 × 143	EE3	9.2	29.02	
47,000	E36D161HPN473MEM9M	76.2 × 219	EM9	6.7	41.98	
200 Volts 250 Volts Surge	680	E36D201HPN681MA41M	35 × 41	A41	205.0	1.78
	1,000	E36D201HPN102MA54M	35 × 54	A54	137.0	2.31
	1,500	E36D201HPN152MA67M	35 × 67	A67	92.0	2.95
	1,800	E36D201HPN182MA79M	35 × 79	A79	76.6	3.48
	2,200	E36D201HPN222MA92M	35 × 92	A92	63.0	4.12
	2,700	E36D201HPN272MAA5M	35 × 105	AA5	51.8	4.85
	3,300	E36D201HPN332MAB7M	35 × 117	AB7	43.0	5.49
	3,900	E36D201HPN392MAD0M	35 × 130	AD0	36.8	6.27
	1,500	E36D201HPN152MC48M	50.8 × 48	C48	97.1	3.19
	2,200	E36D201HPN222MC54M	50.8 × 54	C54	67.0	4.05
	3,300	E36D201HPN332MC67M	50.8 × 67	C67	44.8	5.27
	3,900	E36D201HPN392MC79M	50.8 × 79	C79	37.4	6.15
	5,600	E36D201HPN562MC92M	50.8 × 92	C92	26.6	7.87
	8,200	E36D201HPN822MCB7M	50.8 × 117	CB7	18.9	10.60
	10,000	E36D201HPN103MCE3M	50.8 × 143	CE3	15.7	12.83
	6,800	E36D201HPN682MD79M	63.5 × 79	D79	24.9	9.26
	10,000	E36D201HPN103MDA5M	63.5 × 105	DA5	17.3	12.67
	12,000	E36D201HPN123MDB7M	63.5 × 117	DB7	14.5	14.55
	15,000	E36D201HPN153MDE3M	63.5 × 143	DE3	12.1	17.79
	12,000	E36D201HPN123ME92M	76.2 × 92	E92	17.0	14.49
15,000	E36D201HPN153MEA5M	76.2 × 105	EA5	14.3	17.12	
18,000	E36D201HPN183MEB7M	76.2 × 117	EB7	12.4	19.64	
22,000	E36D201HPN223MED0M	76.2 × 130	ED0	10.8	22.72	
33,000	E36D201HPN333MEM9M	76.2 × 219	EM9	7.3	35.17	
250 Volts 300 Volts Surge	470	E36D251HPN471MA41M	35 × 41	A41	271.2	1.48
	820	E36D251HPN821MA54M	35 × 54	A54	154.3	2.09
	1,200	E36D251HPN122MA67M	35 × 67	A67	105.8	2.64
	1,500	E36D251HPN152MA79M	35 × 79	A79	84.7	3.18
	1,800	E36D251HPN182MA92M	35 × 92	A92	70.8	3.73
	2,200	E36D251HPN222MAA5M	35 × 105	AA5	58.4	4.38
	2,700	E36D251HPN272MAD0M	35 × 130	AD0	47.8	5.21
	3,300	E36D251HPN332MAE3M	35 × 143	AE3	39.8	6.03
	1,200	E36D251HPN122MC48M	50.8 × 48	C48	111.5	2.85
	1,500	E36D251HPN152MC54M	50.8 × 54	C54	87.9	3.34
	2,200	E36D251HPN222MC67M	50.8 × 67	C67	59.8	4.31
	3,300	E36D251HPN332MC79M	50.8 × 79	C79	40.8	5.66
	3,900	E36D251HPN392MC92M	50.8 × 92	C92	34.4	6.57
	4,700	E36D251HPN472MCA5M	50.8 × 105	CA5	28.8	7.65
	5,600	E36D251HPN562MCB7M	50.8 × 117	CB7	24.5	8.76
	6,800	E36D251HPN682MCE3M	50.8 × 143	CE3	20.3	10.58
	4,700	E36D251HPN472MD79M	63.5 × 79	D79	31.0	7.70
	8,200	E36D251HPN822MDA5M	63.5 × 105	DA5	19.2	11.47

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

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

# U36D Series

## Standard Voltage Ratings - Screw Terminals

Rated Voltage (WVDC)	Capacitance (µF)	Global Part Number†	Nominal Case Size* D × L (mm)	Case Size Code	Maximum ESR (mΩ) at +25°C, 120Hz	Rated Ripple Current (A rms) at +85°C, 120Hz
<b>250 Volts 300 Volts Surge</b>	10,000	E36D251HPN103MDB7M	63.5 × 117	DB7	18.4	13.28
	12,000	E36D251HPN123MDE3M	63.5 × 143	DE3	13.6	15.91
	10,000	E36D251HPN103ME92M	76.2 × 92	E92	18.8	13.22
	12,000	E36D251HPN123MEA5M	76.2 × 105	EA5	15.9	15.31
	15,000	E36D251HPN153MED0M	76.2 × 130	ED0	12.6	18.76
	18,000	E36D251HPN183MEE3M	76.2 × 143	EE3	11.2	21.43
	27,000	E36D251HPN273MEM9M	76.2 × 219	EM9	7.7	31.82
<b>315 Volts 365 Volts Surge</b>	390	E36D3B1HPN391MA54M	35 × 54	A54	513.0	1.44
	560	E36D3B1HPN561MA67M	35 × 67	A67	356.0	1.80
	820	E36D3B1HPN821MA79M	35 × 79	A79	243.0	2.35
	1,000	E36D3B1HPN102MA92M	35 × 92	A92	200.0	2.78
	1,200	E36D3B1HPN122MAB7M	35 × 117	AB7	166.0	3.31
	1,500	E36D3B1HPN152MAD0M	35 × 130	AD0	133.0	3.89
	560	E36D3B1HPN561MC48M	50.8 × 48	C48	366.0	1.95
	820	E36D3B1HPN821MC54M	50.8 × 54	C54	248.0	2.47
	1,200	E36D3B1HPN122MC67M	50.8 × 67	C67	168.0	3.18
	1,500	E36D3B1HPN152MC79M	50.8 × 79	C79	134.0	3.81
	2,200	E36D3B1HPN222MC92M	50.8 × 92	C92	92.0	4.94
	2,700	E36D3B1HPN272MCB7M	50.8 × 117	CB7	74.9	6.09
	3,300	E36D3B1HPN332MCD0M	50.8 × 130	CD0	61.8	7.06
	3,900	E36D3B1HPN392MCE3M	50.8 × 143	CE3	52.5	8.01
	2,700	E36D3B1HPN272MD79M	63.5 × 79	D79	77.5	5.83
	3,900	E36D3B1HPN392MDA5M	63.5 × 105	DA5	53.8	7.91
	4,700	E36D3B1HPN472MDB7M	63.5 × 117	DB7	44.7	9.11
	5,600	E36D3B1HPN562MDD0M	63.5 × 130	DD0	38.1	10.41
	4,700	E36D3B1HPN472ME92M	76.2 × 92	E92	46.8	9.07
	5,600	E36D3B1HPN562MEA5M	76.2 × 105	EA5	39.4	10.46
6,800	E36D3B1HPN682MEB7M	76.2 × 117	EB7	32.9	12.07	
8,200	E36D3B1HPN822MED0M	76.2 × 130	ED0	27.8	13.87	
15,000	E36D3B1HPN153MEM9M	76.2 × 219	EM9	15.9	23.71	
<b>350 Volts 400 Volts Surge</b>	220	E36D351HPN221MA41M	35 × 41	A41	887.0	1.17
	330	E36D351HPN331MA54M	35 × 54	A54	545.0	1.53
	470	E36D351HPN471MA67M	35 × 67	A67	379.0	1.91
	680	E36D351HPN681MA79M	35 × 79	A79	262.0	2.47
	820	E36D351HPN821MA92M	35 × 92	A92	217.0	2.91
	1,000	E36D351HPN102MAA5M	35 × 105	AA5	178.0	3.41
	1,200	E36D351HPN122MAD0M	35 × 130	AD0	148.0	4.01
	470	E36D351HPN471MC48M	50.8 × 48	C48	390.0	2.06
	680	E36D351HPN681MC54M	50.8 × 54	C54	267.0	2.60
	1,000	E36D351HPN102MC67M	50.8 × 67	C67	180.0	3.35
	1,200	E36D351HPN122MC79M	50.8 × 79	C79	149.0	3.94
	1,800	E36D351HPN182MC92M	50.8 × 92	C92	100.0	5.15
	2,200	E36D351HPN222MCA5M	50.8 × 105	CA5	82.5	6.04
	2,700	E36D351HPN272MCB7M	50.8 × 117	CB7	67.3	7.03
	3,300	E36D351HPN332MCE3M	50.8 × 143	CE3	55.3	8.51
	2,200	E36D351HPN222MD79M	63.5 × 79	D79	84.5	6.08
	3,300	E36D351HPN332MDA5M	63.5 × 105	DA5	56.6	8.40
	3,900	E36D351HPN392MDB7M	63.5 × 117	DB7	47.9	9.58
	4,700	E36D351HPN472MDD0M	63.5 × 130	DD0	40.4	11.02
	3,900	E36D351HPN392ME92M	76.2 × 92	E92	49.9	9.54
	4,700	E36D351HPN472MEA5M	76.2 × 105	EA5	41.7	11.06
	5,600	E36D351HPN562MEB7M	76.2 × 117	EB7	35.3	12.65
	6,800	E36D351HPN682MED0M	76.2 × 130	ED0	29.6	14.59
	8,200	E36D351HPN822MEE3M	76.2 × 143	EE3	25.1	16.70
	12,000	E36D351HPN123MEM9M	76.2 × 219	EM9	17.4	24.49
	6,800	E36D351CPN682MFA5M	89 × 105	FA5	32.0	11.39
	8,200	E36D351CPN822MFB7M	89 × 117	FB7	27.0	12.88
10,000	E36D351CPN103MFE3M	89 × 143	FE3	23.0	15.17	

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

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

# U36D Series

## Standard Voltage Ratings - Screw Terminals

Rated Voltage (VWDC)	Capacitance (µF)	Global Part Number†	Nominal Case Size* D × L (mm)	Case Size Code	Maximum ESR (mΩ) at +25°C, 120Hz	Rated Ripple Current (A rms) at +85°C, 120Hz
<b>400 Volts 450 Volts Surge</b>	180	E36D401HPN181MA41M	35 × 41	A41	921.0	1.06
	330	E36D401HPN331MA54M	35 × 54	A54	495.0	1.53
	390	E36D401HPN391MA67M	35 × 67	A67	416.0	1.74
	560	E36D401HPN561MA79M	35 × 79	A79	289.0	2.24
	680	E36D401HPN681MA92M	35 × 92	A92	238.0	2.65
	820	E36D401HPN821MAA5M	35 × 105	AA5	197.0	3.09
	1,000	E36D401HPN102MAB7M	35 × 117	AB7	162.0	3.49
	1,200	E36D401HPN122MAE3M	35 × 143	AE3	135.0	4.20
	390	E36D401HPN391MC48M	50.8 × 48	C48	416.0	1.88
	560	E36D401HPN561MC54M	50.8 × 54	C54	295.0	2.36
	820	E36D401HPN821MC67M	50.8 × 67	C67	200.0	3.04
	1,200	E36D401HPN122MC79M	50.8 × 79	C79	137.0	3.94
	1,500	E36D401HPN152MC92M	50.8 × 92	C92	109.0	4.71
	1,800	E36D401HPN182MCA5M	50.8 × 105	CA5	91.5	5.47
	2,200	E36D401HPN222MCB7M	50.8 × 117	CB7	75.0	6.34
	2,700	E36D401HPN272MCE3M	50.8 × 143	CE3	61.3	7.70
	1,800	E36D401HPN182MD79M	63.5 × 79	D79	93.5	5.50
	2,700	E36D401HPN272MDA5M	63.5 × 105	DA5	62.6	7.60
	3,900	E36D401HPN392MDB7M	63.5 × 117	DB7	44.2	9.58
	4,700	E36D401HPN472MDE3M	63.5 × 143	DE3	37.0	11.50
	3,900	E36D401HPN392ME92M	76.2 × 92	E92	46.5	9.54
	4,700	E36D401HPN472MEA5M	76.2 × 105	EA5	38.8	11.06
	5,600	E36D401HPN562MED0M	76.2 × 130	ED0	32.3	13.24
	6,800	E36D401HPN682MEE3M	76.2 × 143	EE3	27.1	15.21
	10,000	E36D401HPN103MEM9M	76.2 × 219	EM9	18.7	22.36
	5,600	E36D401CPN562MFA5M	89 × 105	FA5	37.0	10.59
6,800	E36D401CPN682MFB7M	89 × 117	FB7	31.0	12.02	
8,200	E36D401CPN822MFD0M	89 × 130	FD0	26.0	13.82	
<b>450 Volts 500 Volts Surge</b>	150	E36D451HPN151MA41M	35 × 41	A41	1,687.8	0.96
	270	E36D451HPN271MA54M	35 × 54	A54	923.3	1.39
	330	E36D451HPN331MA67M	35 × 67	A67	749.9	1.60
	470	E36D451HPN471MA79M	35 × 79	A79	525.5	2.05
	560	E36D451HPN561MA92M	35 × 92	A92	440.3	2.40
	680	E36D451HPN681MAA5M	35 × 105	AA5	362.5	2.81
	820	E36D451HPN821MAB7M	35 × 117	AB7	300.7	3.16
	1,000	E36D451HPN102MAE3M	35 × 143	AE3	246.6	3.83
	330	E36D451HPN331MC48M	50.8 × 48	C48	653.4	1.73
	470	E36D451HPN471MC54M	50.8 × 54	C54	535.9	2.16
	680	E36D451HPN681MC67M	50.8 × 67	C67	366.8	2.76
	1,000	E36D451HPN102MC79M	50.8 × 79	C79	249.0	3.60
	1,200	E36D451HPN122MC92M	50.8 × 92	C92	207.1	4.21
	1,500	E36D451HPN152MCA5M	50.8 × 105	CA5	165.8	4.99
	1,800	E36D451HPN182MCB7M	50.8 × 117	CB7	138.3	5.74
	2,200	E36D451HPN222MCE3M	50.8 × 143	CE3	113.2	6.95
	1,500	E36D451HPN152MD79M	63.5 × 79	D79	168.2	5.02
	2,200	E36D451HPN222MDA5M	63.5 × 105	DA5	114.5	6.86
	2,700	E36D451HPN272MDB7M	63.5 × 117	DB7	93.7	7.97
	3,300	E36D451HPN332MDD0M	63.5 × 130	DD0	77.1	9.23
	3,900	E36D451HPN392MDE3M	63.5 × 143	DE3	65.6	10.47
	2,700	E36D451HPN272ME92M	76.2 × 92	E92	95.6	7.93
	3,900	E36D451HPN392MEA5M	76.2 × 105	EA5	78.4	10.08
	4,700	E36D451HPN472MED0M	76.2 × 130	ED0	55.7	12.13
	5,600	E36D451HPN562MEE3M	76.2 × 143	EE3	47.2	13.80
	8,200	E36D451HPN822MEM9M	76.2 × 219	EM9	32.4	20.25
4,700	E36D451CPN472MFA5M	89 × 105	FA5	67.0	7.87	
5,600	E36D451CPN562MFB7M	89 × 117	FB7	56.0	8.94	
6,800	E36D451CPN682MFD0M	89 × 130	FD0	47.0	10.28	

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

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

# U36D Series

## Standard Voltage Ratings - Screw Terminals

Rated Voltage (WVDC)	Capacitance (µF)	Global Part Number†	Nominal Case Size* D × L (mm)	Case Size Code	Maximum ESR (mΩ) at +25°C, 120Hz	Rated Ripple Current (A rms) at +85°C, 120Hz
<b>500 Volts</b> 550 Volts Surge	100	E36D501HPN101MA41M	35 × 41	A41	3,918.0	0.60
	180	E36D501HPN181MA54M	35 × 54	A54	2,141.0	0.87
	220	E36D501HPN221MA67M	35 × 67	A67	1,739.0	1.00
	330	E36D501HPN331MA79M	35 × 79	A79	1,155.0	1.32
	390	E36D501HPN391MA92M	35 × 92	A92	975.0	1.54
	470	E36D501HPN471MAA5M	35 × 105	AA5	808.0	1.79
	560	E36D501HPN561MAB7M	35 × 117	AB7	677.0	2.00
	680	E36D501HPN681MAE3M	35 × 143	AE3	557.0	2.42
	220	E36D501HPN221MC48M	50.8 × 48	C48	1,453.0	1.08
	330	E36D501HPN331MC54M	50.8 × 54	C54	1,177.0	1.39
	470	E36D501HPN471MC67M	50.8 × 67	C67	817.0	1.76
	680	E36D501HPN681MC79M	50.8 × 79	C79	563.0	2.27
	820	E36D501HPN821MC92M	50.8 × 92	C92	465.0	2.67
	1,000	E36D501HPN102MCA5M	50.8 × 105	CA5	381.0	3.12
	1,200	E36D501HPN122MCB7M	50.8 × 117	CB7	317.0	3.59
	1,500	E36D501HPN152MCE3M	50.8 × 143	CE3	253.0	4.40
	1,000	E36D501HPN102MD79M	63.5 × 79	D79	320.0	3.14
	1,500	E36D501HPN152MDA5M	63.5 × 105	DA5	213.0	4.35
	2,200	E36D501HPN222MDB7M	63.5 × 117	DB7	212.0	5.52
	2,200	E36D501HPN222ME92M	76.2 × 92	E92	175.0	5.49
	2,700	E36D501HPN272MEB7M	76.2 × 117	EB7	142.0	6.74
	3,900	E36D501HPN392MEE3M	76.2 × 143	EE3	99.0	8.83
	5,600	E36D501HPN562MEM9M	76.2 × 219	EM9	69.0	12.83
	3,900	E36D501CPN392MFA5M	89 × 105	FA5	131.0	5.63
4,700	E36D501CPN472MFB7M	89 × 117	FB7	109.0	6.62	
5,600	E36D501CPN562MFD0M	89 × 130	FD0	92.0	7.35	
6,800	E36D501CPN682MFE3M	89 × 143	FE3	76.0	8.35	
<b>550 Volts</b> 600 Volts Surge	68	E36D551HPN680MA41M	35 × 41	A41	3,997.0	0.50
	120	E36D551HPN121MA54M	35 × 54	A54	2,227.0	0.71
	150	E36D551HPN151MA67M	35 × 67	A67	1,769.0	0.83
	220	E36D551HPN221MA79M	35 × 79	A79	1,202.0	1.08
	270	E36D551HPN271MA92M	35 × 92	A92	977.0	1.28
	330	E36D551HPN331MAB7M	35 × 117	AB7	797.0	1.54
	390	E36D551HPN391MAD0M	35 × 130	AD0	674.0	1.75
	470	E36D551HPN471MAE3M	35 × 143	AE3	559.0	2.01
	220	E36D551HPN221MC54M	50.8 × 54	C54	1,224.0	1.13
	330	E36D551HPN331MC67M	50.8 × 67	C67	808.0	1.48
	470	E36D551HPN471MC79M	50.8 × 79	C79	565.0	1.89
	560	E36D551HPN561MC92M	50.8 × 92	C92	472.0	2.21
	680	E36D551HPN681MCA5M	50.8 × 105	CA5	388.0	2.58
	820	E36D551HPN821MCB7M	50.8 × 117	CB7	322.0	2.97
	1,000	E36D551HPN102MCE3M	50.8 × 143	CE3	263.0	3.59
	680	E36D551HPN681MD79M	63.5 × 79	D79	391.0	2.59
	1,000	E36D551HPN102MDA5M	63.5 × 105	DA5	265.0	3.89
	1,200	E36D551HPN122MDB7M	63.5 × 117	DB7	220.0	4.56
	1,500	E36D551HPN152MDE3M	63.5 × 143	DE3	176.0	5.46
	1,200	E36D551HPN122ME92M	76.2 × 92	E92	222.0	4.06
	1,500	E36D551HPN152MEA5M	76.2 × 105	EA5	178.0	4.79
	1,800	E36D551HPN182MEB7M	76.2 × 117	EB7	148.0	5.50
	2,200	E36D551HPN222MED0M	76.2 × 130	ED0	121.0	6.36
	3,900	E36D551HPN392MEM9M	76.2 × 219	EM9	69.0	10.71
1,800	E36D551CPN182MFA5M	89 × 105	FA5	159.0	5.11	
2,200	E36D551CPN222MFB7M	89 × 117	FB7	130.0	6.06	
2,700	E36D551CPN272MFD0M	89 × 130	FD0	107.0	6.81	
3,300	E36D551CPN332MFE3M	89 × 143	FE3	88.0	7.76	

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

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

- Large Can
- Screw Terminals
- High Ripple
- 6.3 to 400VDC Voltage Range
- Large Capacitance
- RoHS Compliant
- +105°C Maximum Temperature



The U32D series allows for extremely high ripple currents for applications such as inverter designs and motor controllers. This series of capacitors offers very large capacitance of up to 2.2F and a maximum temperature rating of +105°C which allows a high operating temperature without sacrificing life. These capacitors are available with a variety of high current English or Metric thread terminals. Mounting options include a three-footed clamp or bottom threaded stud. Custom designs are available upon request.

## Summary of Specifications

- Screw terminals: high and low post, English and Metric thread.
- Capacitance range: 180µF to 2.2F.
- Voltage range: 6.3 to 400VDC.
- Category temperature range: -40°C to +105°C.
- Leakage current: 0.02CV(µA) or 5mA, whichever is smaller, after 5 minutes at +25°C.
- Standard capacitance tolerance: ±20%
- Nominal case size (D × L): D = 35mm (1.375") to 89mm (3.500"); L = 41mm (1.625") to 219mm (8.625").
- Rated lifetime: 2,000 hours at +105°C with rated ripple current applied.

# U32D Series

## U32D Specifications - Screw Terminals

Item	Characteristics																																																																																										
Category Temperature Range	-40 to +105°C																																																																																										
Rated Voltage Range	6.3 to 400VDC																																																																																										
Capacitance Range	180μF to 2.2F at +25°C, 120Hz																																																																																										
Capacitance Tolerance	±20% (M) at +25°C, 120Hz																																																																																										
Leakage Current	I = 0.02CV (μA) or 5mA, whichever is smaller, after 5 minutes at +25°C. Where I = Max. leakage current (μA), C = Nominal capacitance (μF) and V = Rated voltage (V)																																																																																										
Rated Ripple Current Multipliers	<p>Ambient Temperature (°C)</p> <table border="1"> <tr> <td>≤ +45°C</td> <td>+65°C</td> <td>+85°C</td> <td>+105°C</td> </tr> <tr> <td>1.41</td> <td>1.29</td> <td>1.00</td> <td>0.57</td> </tr> </table> <p>Frequency (Hz)</p> <table border="1"> <thead> <tr> <th>DC Rated Voltage</th> <th>Case Diameter</th> <th>50Hz</th> <th>120Hz</th> <th>300Hz</th> <th>1kHz</th> <th>10kHz</th> <th>50kHz</th> </tr> </thead> <tbody> <tr> <td rowspan="2">6.3-50V</td> <td>ø35-ø76.2</td> <td>0.95</td> <td>1.00</td> <td>1.03</td> <td>1.05</td> <td>1.09</td> <td>1.12</td> </tr> <tr> <td>ø35</td> <td>0.90</td> <td>1.00</td> <td>1.06</td> <td>1.10</td> <td>1.18</td> <td>1.22</td> </tr> <tr> <td rowspan="2">63-80V</td> <td>ø50.8-ø76.2</td> <td>0.95</td> <td>1.00</td> <td>1.03</td> <td>1.05</td> <td>1.09</td> <td>1.12</td> </tr> <tr> <td>ø35</td> <td>0.82</td> <td>1.00</td> <td>1.12</td> <td>1.22</td> <td>1.30</td> <td>1.33</td> </tr> <tr> <td rowspan="3">100V</td> <td>ø50.8</td> <td>0.90</td> <td>1.00</td> <td>1.06</td> <td>1.10</td> <td>1.18</td> <td>1.22</td> </tr> <tr> <td>ø63.5-ø76.2</td> <td>0.95</td> <td>1.00</td> <td>1.03</td> <td>1.05</td> <td>1.09</td> <td>1.12</td> </tr> <tr> <td>ø35</td> <td>0.80</td> <td>1.00</td> <td>1.19</td> <td>1.34</td> <td>1.46</td> <td>1.52</td> </tr> <tr> <td rowspan="3">160-250V</td> <td>ø50.8-ø63.5</td> <td>0.81</td> <td>1.00</td> <td>1.14</td> <td>1.26</td> <td>1.36</td> <td>1.41</td> </tr> <tr> <td>ø76.2</td> <td>0.82</td> <td>1.00</td> <td>1.12</td> <td>1.22</td> <td>1.30</td> <td>1.33</td> </tr> <tr> <td>ø35-ø89</td> <td>0.80</td> <td>1.00</td> <td>1.19</td> <td>1.34</td> <td>1.46</td> <td>1.52</td> </tr> </tbody> </table>	≤ +45°C	+65°C	+85°C	+105°C	1.41	1.29	1.00	0.57	DC Rated Voltage	Case Diameter	50Hz	120Hz	300Hz	1kHz	10kHz	50kHz	6.3-50V	ø35-ø76.2	0.95	1.00	1.03	1.05	1.09	1.12	ø35	0.90	1.00	1.06	1.10	1.18	1.22	63-80V	ø50.8-ø76.2	0.95	1.00	1.03	1.05	1.09	1.12	ø35	0.82	1.00	1.12	1.22	1.30	1.33	100V	ø50.8	0.90	1.00	1.06	1.10	1.18	1.22	ø63.5-ø76.2	0.95	1.00	1.03	1.05	1.09	1.12	ø35	0.80	1.00	1.19	1.34	1.46	1.52	160-250V	ø50.8-ø63.5	0.81	1.00	1.14	1.26	1.36	1.41	ø76.2	0.82	1.00	1.12	1.22	1.30	1.33	ø35-ø89	0.80	1.00	1.19	1.34	1.46	1.52
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Endurance (Load Life)	<p>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.</p> <p>Capacitance change: ≤ 20% from initial measurement ESR change : ≤ 200% of initial specified limit Leakage current : ≤ initial specified limit</p>																																																																																										
Shelf Test	<p>The following specifications shall be satisfied when the capacitors are restored to +25°C after exposing them for 500 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.</p> <p>Capacitance change: ≤ 20% from initial measurement ESR change : ≤ 200% of initial specified limit Leakage current : ≤ initial specified limit</p>																																																																																										
Vibration Rating	10-55Hz, 10g sinusoidal in three axes, 2 hours per axis.																																																																																										
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Custom Designs	Custom CV values per case size and termination type may be available upon request. Contact appropriate representative with specific requirements.																																																																																										

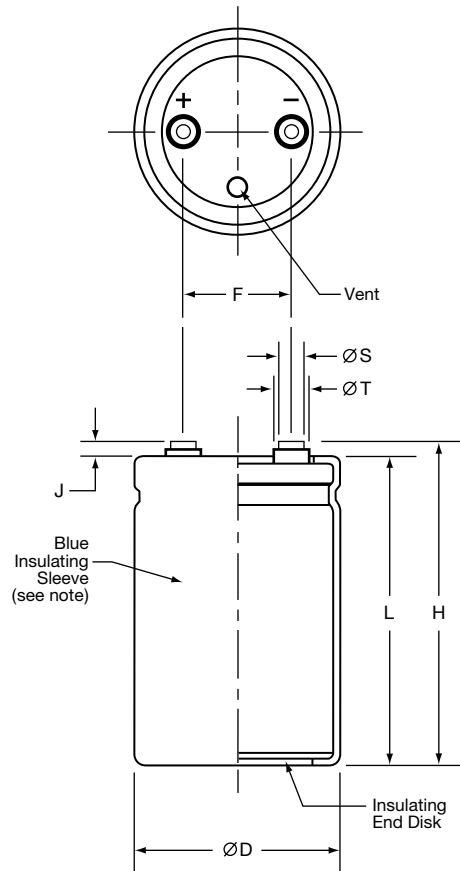


# U32D Series

## Diagram of Dimensions - Screw Terminals

### Large Can/Screw Terminals

Unit: mm (inches)



### Case Dimensions and Standard Box Quantities

Case Size Code	ØD +2.0 (0.080)	L ±1.0 (0.040)	F ±0.25 (0.010)	Standard Box Quantity
A41 A54 A67 A79 A92 AA5 AB7 AD0 AE3	35.0 (1.375)	41 (1.625) 54 (2.125) 67 (2.625) 79 (3.125) 92 (3.625) 105 (4.125) 117 (4.625) 130 (5.125) 143 (5.625)	12.7 (0.500)	100
C48 C54 C67 C79 C92 CA5 CB7 CD0 CE3	50.8 (2.000)	48 (1.875) 54 (2.125) 67 (2.625) 79 (3.125) 92 (3.625) 105 (4.125) 117 (4.625) 130 (5.125) 143 (5.625)	22.2 (0.875)	49
D79 DA5 DB7 DD0 DE3	63.5 (2.500)	79 (3.125) 105 (4.125) 117 (4.625) 130 (5.125) 143 (5.625)	28.6 (1.125)	20
E92 EA5 EB7 ED0 EE3 EM9	76.2 (3.000)	92 (3.625) 105 (4.125) 117 (4.625) 130 (5.125) 143 (5.625) 219 (8.625)	31.8 (1.250)	16    9
FA5 FB7 FE3	89.0 (3.500)	105 (4.125) 117 (4.625) 143 (5.625)	31.8 (1.250)	5

Note:  
In some cases, the color of the sleeve may change slightly due to the operating conditions, however, the discoloration will not impair capacitor function.

### Terminal Specifications

Terminal Code	Available Case Diameter		Thread Size	Minimum Thread Depth	J ±0.5 (0.020)	H ±2.0 (0.080)	ØS ±0.25 (0.010)	ØT ±0.25 (0.010)
	ØD Code	ØD mm (inches)						
HP	A-E	35.0 - 76.2 (1.375 - 3.000)	10-32 NF-2B	9.5 (0.375)	6.4 (0.250)	L+J	8.0 (0.313)	11.1 (0.438)
LP	A-E	35.0 - 76.2 (1.375 - 3.000)	10-32 NF-2B	5.6 (0.219)	1.6 (0.063)	L+J	8.0 (0.313)	—
HL	A-E	35.0 - 76.2 (1.375 - 3.000)	M5x0.8-6H	9.5 (0.375)	6.4 (0.250)	L+J	8.0 (0.313)	11.1 (0.438)
ML	A-E	35.0 - 76.2 (1.375 - 3.000)	M5x0.8-6H	5.6 (0.219)	1.6 (0.063)	L+J	8.0 (0.313)	11.1 (0.438)
CD	D-E	63.5 - 76.2 (2.500 - 3.000)	M5x0.8-6H	8.5 (0.335)	5.0 (0.200)	L+J	13.0 (0.512)	18.8 (0.740)
CP	D-F	63.5 - 89.0 (2.500 - 3.500)	¼-28 NF-2B	8.7 (0.344)	2.4 (0.093)	L+J	17.5 (0.689)	—
CH	D-F	63.5 - 89.0 (2.500 - 3.500)	¼-28 NF-2B	11.9 (0.468)	6.4 (0.250)	L+J	17.5 (0.689)	—
CA	D-F	63.5 - 89.0 (2.500 - 3.500)	M6x1-6H	8.7 (0.344)	2.4 (0.093)	L+J	17.5 (0.689)	—
CS	D-F	63.5 - 89.0 (2.500 - 3.500)	M6x1-6H	11.9 (0.468)	6.4 (0.250)	L+J	17.5 (0.689)	—

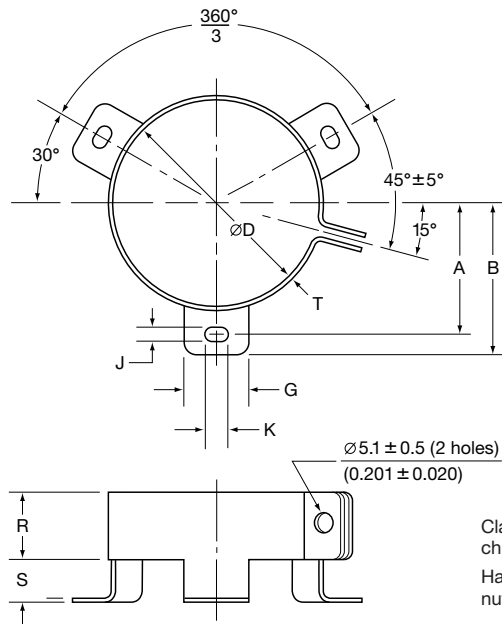
Mounting Hardware is optional. Refer to hardware specifications on the following page.

# U32D Series

## Mounting Hardware - Screw Terminals

### Type C: Three-Footed Clamp

Unit: mm (inches)

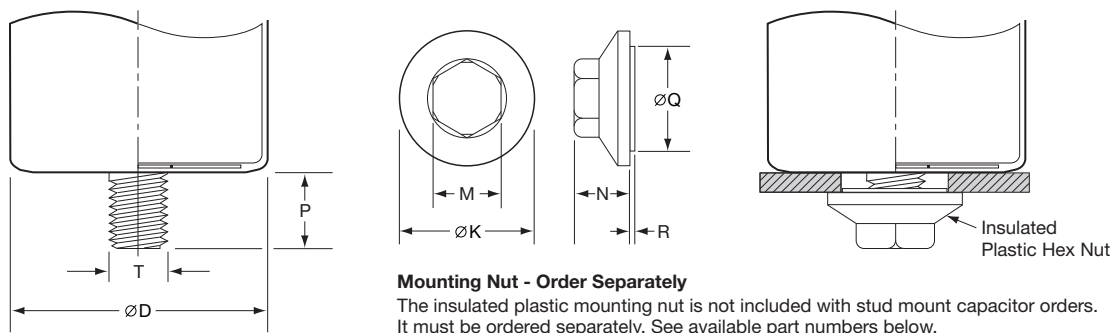


Clamp: Zinc with silver trivalent chromate post treatment.  
Hardware: Screw, washer and hexagon nut included with each clamp.

### Type C: Clamp Dimensions

Mounting Code	Case ØD	A ±1.0 (0.040)	B ±1.0 (0.040)	G ±1.0 (0.040)	J ±0.5 (0.020)	K ±0.5 (0.020)	R ±1.0 (0.040)	S ±1.0 (0.040)	T ±0.5 (0.020)
C	50.8 (2.000)	31.8 (1.250)	36.5 (1.437)	13.3 (0.524)	4.5 (0.177)	7.1 (0.280)	19.1 (0.751)	9.5 (0.374)	0.8 (0.032)
C	63.5 (2.500)	38.1 (1.500)	42.9 (1.689)	13.3 (0.524)	4.5 (0.177)	7.1 (0.280)	19.1 (0.751)	9.5 (0.374)	0.8 (0.032)
C	76.2 (3.000)	44.5 (1.750)	49.2 (1.937)	13.3 (0.524)	4.5 (0.177)	7.1 (0.280)	19.1 (0.751)	9.5 (0.374)	1.0 (0.040)
C	89.0 (3.500)	50.8 (2.000)	56.5 (2.224)	16.0 (0.630)	4.5 (0.177)	8.0 (0.313)	21.0 (0.827)	9.0 (0.354)	1.0 (0.040)

### Type S: Stud Mounting



#### Mounting Nut - Order Separately

The insulated plastic mounting nut is not included with stud mount capacitor orders. It must be ordered separately. See available part numbers below.

### Type S: Stud Dimensions

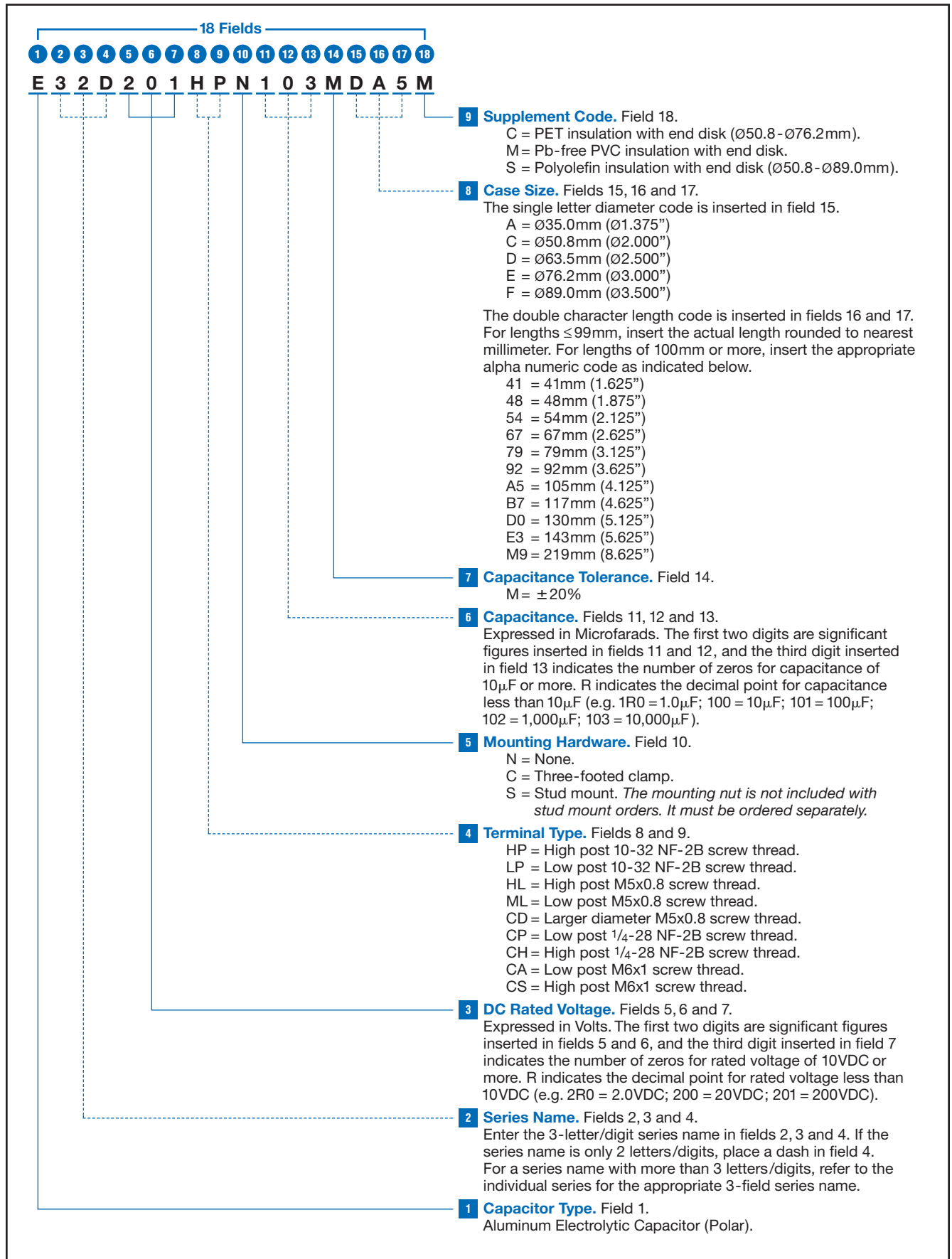
Mounting Code	P ±1.0 (0.040)	T Thread Size
S	16.0 (0.630)	M12

### Mounting Nut Dimensions

Part Number	ØK ±2.0 (0.080)	M ±1.0 (0.040)	N ±1.0 (0.040)	ØQ ±1.0 (0.040)	R ±1.0 (0.040)
50-8D	30.0 (1.181)	19.0 (0.748)	18.0 (0.709)	22.0 (0.866)	1.40 (0.055)
50-8E	38.0 (1.496)	19.0 (0.748)	18.0 (0.709)	30.0 (1.181)	1.40 (0.055)

# U32D Series

**Part Numbering System for U32D Series** When ordering, always specify complete 18-field global part number.



# U32D Series

## Standard Voltage Ratings - Screw Terminals

Rated Voltage (WVDC)	Capacitance (µF)	Global Part Number†	Nominal Case Size* D × L (mm)	Case Size Code	Maximum ESR (mΩ) at +25°C, 120Hz	Rated Ripple Current (A rms) at +85°C, 120Hz
<b>6.3 Volts 8 Volts Surge</b>	39,000	E32D6R3HPN393MA41M	35 × 41	A41	39.9	7.03
	68,000	E32D6R3HPN683MA54M	35 × 54	A54	24.0	9.62
	82,000	E32D6R3HPN823MA67M	35 × 67	A67	19.5	10.87
	120,000	E32D6R3HPN124MA79M	35 × 79	A79	14.5	13.76
	150,000	E32D6R3HPN154MA92M	35 × 92	A92	12.2	15.53
	180,000	E32D6R3HPN184MAA5M	35 × 105	AA5	11.8	18.10
	220,000	E32D6R3HPN224MAD0M	35 × 130	AD0	9.1	20.93
	82,000	E32D6R3HPN823MC48M	50.8 × 48	C48	22.1	11.19
	120,000	E32D6R3HPN124MC54M	50.8 × 54	C54	16.2	13.53
	180,000	E32D6R3HPN184MC67M	50.8 × 67	C67	11.3	17.11
	220,000	E32D6R3HPN224MC79M	50.8 × 79	C79	9.2	20.41
	330,000	E32D6R3HPN334MC92M	50.8 × 92	C92	7.7	24.76
	390,000	E32D6R3HPN394MCA5M	50.8 × 105	CA5	6.4	27.19
	470,000	E32D6R3HPN474MCB7M	50.8 × 117	CB7	6.0	30.87
	560,000	E32D6R3HPN564MCE3M	50.8 × 143	CE3	4.9	35.78
	390,000	E32D6R3HPN394MD79M	63.5 × 79	D79	8.7	22.54
	560,000	E32D6R3HPN564MDA5M	63.5 × 105	DA5	6.3	29.81
	820,000	E32D6R3HPN824MDB7M	63.5 × 117	DB7	5.7	32.97
	680,000	E32D6R3HPN684ME92M	76.2 × 92	E92	8.3	26.88
	820,000	E32D6R3HPN824MEA5M	76.2 × 105	EA5	7.2	30.40
1,000,000	E32D6R3HPN105MEB7M	76.2 × 117	EB7	6.6	33.32	
1,200,000	E32D6R3HPN125MED0M	76.2 × 130	ED0	6.1	36.04	
2,200,000	E32D6R3HPN225MEM9M	76.2 × 219	EM9	4.0	56.03	
<b>10 Volts 13 Volts Surge</b>	33,000	E32D100HPN333MA41M	35 × 41	A41	39.7	7.03
	56,000	E32D100HPN563MA54M	35 × 54	A54	24.3	9.55
	68,000	E32D100HPN683MA67M	35 × 67	A67	19.6	10.79
	100,000	E32D100HPN104MA79M	35 × 79	A79	14.6	13.71
	120,000	E32D100HPN124MA92M	35 × 92	A92	12.5	14.66
	150,000	E32D100HPN154MAB7M	35 × 117	AB7	10.4	18.83
	180,000	E32D100HPN184MAD0M	35 × 130	AD0	9.2	20.80
	68,000	E32D100HPN683MC48M	50.8 × 48	C48	22.2	11.13
	100,000	E32D100HPN104MC54M	50.8 × 54	C54	16.3	13.48
	150,000	E32D100HPN154MC67M	50.8 × 67	C67	11.4	17.11
	180,000	E32D100HPN184MC79M	50.8 × 79	C79	9.3	20.28
	270,000	E32D100HPN274MC92M	50.8 × 92	C92	7.8	24.76
	390,000	E32D100HPN394MCB7M	50.8 × 117	CB7	6.0	30.55
	470,000	E32D100HPN474MCE3M	50.8 × 143	CE3	4.9	35.78
	330,000	E32D100HPN334MD79M	63.5 × 79	D79	8.8	22.40
	470,000	E32D100HPN474MDA5M	63.5 × 105	DA5	6.4	29.81
	560,000	E32D100HPN564MDB7M	63.5 × 117	DB7	5.7	33.95
	680,000	E32D100HPN684MDD0M	63.5 × 130	DD0	5.3	36.68
	560,000	E32D100HPN564ME92M	76.2 × 92	E92	8.3	26.88
	680,000	E32D100HPN684MEA5M	76.2 × 105	EA5	7.2	30.40
820,000	E32D100HPN824MEB7M	76.2 × 117	EB7	6.5	33.32	
1,000,000	E32D100HPN105MED0M	76.2 × 130	ED0	6.1	36.04	
1,800,000	E32D100HPN185MEM9M	76.2 × 219	EM9	4.0	56.03	
<b>16 Volts 20 Volts Surge</b>	22,000	E32D160HPN223MA41M	35 × 41	A41	41.4	6.26
	39,000	E32D160HPN393MA54M	35 × 54	A54	27.3	8.68
	47,000	E32D160HPN473MA67M	35 × 67	A67	19.9	9.80
	68,000	E32D160HPN683MA79M	35 × 79	A79	15.0	12.48
	82,000	E32D160HPN823MA92M	35 × 92	A92	12.8	14.04
	100,000	E32D160HPN104MAA5M	35 × 105	AA5	11.1	16.47
	120,000	E32D160HPN124MAD0M	35 × 130	AD0	9.5	19.11
	150,000	E32D160HPN154MAE3M	35 × 143	AE3	9.3	21.33
	47,000	E32D160HPN473MC48M	50.8 × 48	C48	22.7	10.18
	68,000	E32D160HPN683MC54M	50.8 × 54	C54	16.7	12.38
	100,000	E32D160HPN104MC67M	50.8 × 67	C67	11.7	15.75
	120,000	E32D160HPN124MC79M	50.8 × 79	C79	9.6	18.66

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

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

# U32D Series

## Standard Voltage Ratings - Screw Terminals

Rated Voltage (WVDC)	Capacitance (µF)	Global Part Number†	Nominal Case Size* D × L (mm)	Case Size Code	Maximum ESR (mΩ) at +25°C, 120Hz	Rated Ripple Current (A rms) at +85°C, 120Hz
16 Volts 20 Volts Surge	180,000	E32D160HPN184MC92M	50.8 × 92	C92	7.5	22.89
	220,000	E32D160HPN224MCA5M	50.8 × 105	CA5	7.0	25.40
	270,000	E32D160HPN274MCB7M	50.8 × 117	CB7	6.1	28.80
	330,000	E32D160HPN334MCE3M	50.8 × 143	CE3	5.2	33.82
	220,000	E32D160HPN224MD79M	63.5 × 79	D79	8.9	21.75
	330,000	E32D160HPN334MDA5M	63.5 × 105	DA5	6.5	28.62
	390,000	E32D160HPN394MDB7M	63.5 × 117	DB7	5.9	32.66
	470,000	E32D160HPN474MDD0M	63.5 × 130	DD0	5.4	34.54
	390,000	E32D160HPN394ME92M	76.2 × 92	E92	8.5	26.07
	470,000	E32D160HPN474MEA5M	76.2 × 105	EA5	7.4	29.56
	560,000	E32D160HPN564MEB7M	76.2 × 117	EB7	6.7	32.56
	680,000	E32D160HPN684MED0M	76.2 × 130	ED0	6.2	35.45
	820,000	E32D160HPN824MEE3M	76.2 × 143	EE3	5.4	37.58
1,200,000	E32D160HPN125MEM9M	76.2 × 219	EM9	4.0	55.32	
25 Volts 32 Volts Surge	15,000	E32D250HPN153MA41M	35 × 41	A41	41.3	6.27
	22,000	E32D250HPN223MA54M	35 × 54	A54	27.7	8.20
	33,000	E32D250HPN333MA67M	35 × 67	A67	19.5	9.88
	47,000	E32D250HPN473MA79M	35 × 79	A79	16.6	12.53
	56,000	E32D250HPN563MA92M	35 × 92	A92	12.8	13.71
	68,000	E32D250HPN683MAA5M	35 × 105	AA5	12.3	16.47
	82,000	E32D250HPN823MAD0M	35 × 130	AD0	9.4	19.11
	33,000	E32D250HPN333MC48M	50.8 × 48	C48	22.4	10.23
	47,000	E32D250HPN473MC54M	50.8 × 54	C54	16.6	12.42
	68,000	E32D250HPN683MC67M	50.8 × 67	C67	11.7	15.68
	82,000	E32D250HPN823MC79M	50.8 × 79	C79	9.6	18.76
	120,000	E32D250HPN124MC92M	50.8 × 92	C92	7.6	22.73
	180,000	E32D250HPN184MCB7M	50.8 × 117	CB7	6.1	28.80
	220,000	E32D250HPN224MCE3M	50.8 × 143	CE3	5.3	33.82
	150,000	E32D250HPN154MD79M	63.5 × 79	D79	8.9	21.63
	220,000	E32D250HPN224MDA5M	63.5 × 105	DA5	6.5	28.62
	270,000	E32D250HPN274MDB7M	63.5 × 117	DB7	5.9	32.66
	330,000	E32D250HPN334MDE3M	63.5 × 143	DE3	4.9	37.88
	270,000	E32D250HPN274ME92M	76.2 × 92	E92	8.6	25.92
	330,000	E32D250HPN334MEA5M	76.2 × 105	EA5	7.5	29.16
390,000	E32D250HPN394MEB7M	76.2 × 117	EB7	6.8	32.31	
470,000	E32D250HPN474MED0M	76.2 × 130	ED0	6.3	35.16	
820,000	E32D250HPN824MEM9M	76.2 × 219	EM9	4.1	55.32	
35 Volts 44 Volts Surge	10,000	E32D350HPN103MA41M	35 × 41	A41	45.8	5.94
	18,000	E32D350HPN183MA54M	35 × 54	A54	26.7	8.33
	22,000	E32D350HPN223MA67M	35 × 67	A67	21.6	9.40
	33,000	E32D350HPN333MA79M	35 × 79	A79	15.7	12.14
	39,000	E32D350HPN393MA92M	35 × 92	A92	13.6	13.60
	47,000	E32D350HPN473MAA5M	35 × 105	AA5	11.8	15.95
	56,000	E32D350HPN563MAB7M	35 × 117	AB7	10.4	17.35
	68,000	E32D350HPN683MAE3M	35 × 143	AE3	8.9	20.57
	22,000	E32D350HPN223MC48M	50.8 × 48	C48	24.1	9.86
	33,000	E32D350HPN333MC54M	50.8 × 54	C54	17.4	12.15
	47,000	E32D350HPN473MC67M	50.8 × 67	C67	12.4	15.34
	68,000	E32D350HPN683MC79M	50.8 × 79	C79	9.4	18.76
	82,000	E32D350HPN823MC92M	50.8 × 92	C92	7.9	22.26
	100,000	E32D350HPN104MCA5M	50.8 × 105	CA5	6.9	24.82
	120,000	E32D350HPN124MCB7M	50.8 × 117	CB7	6.1	28.03
	150,000	E32D350HPN154MCE3M	50.8 × 143	CE3	5.2	33.12
	100,000	E32D350HPN104MD79M	63.5 × 79	D79	8.8	21.88
	150,000	E32D350HPN154MDA5M	63.5 × 105	DA5	6.5	28.84
	220,000	E32D350HPN224MDB7M	63.5 × 117	DB7	5.8	32.08

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

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

# U32D Series

## Standard Voltage Ratings - Screw Terminals

Rated Voltage (WVDC)	Capacitance (µF)	Global Part Number†	Nominal Case Size* D × L (mm)	Case Size Code	Maximum ESR (mΩ) at +25°C, 120Hz	Rated Ripple Current (A rms) at +85°C, 120Hz
<b>35 Volts 44 Volts Surge</b>	220,000	E32D350HPN224ME92M	76.2 × 92	E92	8.3	25.19
	270,000	E32D350HPN274MEB7M	76.2 × 117	EB7	6.6	32.81
	330,000	E32D350HPN334MED0M	76.2 × 130	ED0	6.2	35.45
	390,000	E32D350HPN394MEE3M	76.2 × 143	EE3	5.4	37.90
	560,000	E32D350HPN564MEM9M	76.2 × 219	EM9	4.0	56.03
<b>50 Volts 63 Volts Surge</b>	5,600	E32D500HPN562MA41M	35 × 41	A41	52.2	5.66
	10,000	E32D500HPN103MA54M	35 × 54	A54	30.3	7.25
	15,000	E32D500HPN153MA67M	35 × 67	A67	21.3	9.01
	18,000	E32D500HPN183MA79M	35 × 79	A79	17.9	10.92
	22,000	E32D500HPN223MA92M	35 × 92	A92	15.1	12.58
	27,000	E32D500HPN273MAA5M	35 × 105	AA5	12.9	15.23
	33,000	E32D500HPN333MAB7M	35 × 117	AB7	12.5	17.22
	39,000	E32D500HPN393MAE3M	35 × 143	AE3	9.7	20.56
	15,000	E32D500HPN153MC48M	50.8 × 48	C48	24.3	10.01
	18,000	E32D500HPN183MC54M	50.8 × 54	C54	19.4	11.50
	27,000	E32D500HPN273MC67M	50.8 × 67	C67	13.4	14.97
	39,000	E32D500HPN393MC79M	50.8 × 79	C79	10.1	19.30
	56,000	E32D500HPN563MC92M	50.8 × 92	C92	8.5	22.56
	68,000	E32D500HPN683MCB7M	50.8 × 117	CB7	6.5	27.67
	82,000	E32D500HPN823MCD0M	50.8 × 130	CD0	5.8	29.50
	100,000	E32D500HPN104MCE3M	50.8 × 143	CE3	5.6	34.03
	68,000	E32D500HPN683MD79M	63.5 × 79	D79	9.4	24.55
	100,000	E32D500HPN104MDA5M	63.5 × 105	DA5	6.8	31.43
	120,000	E32D500HPN124MDB7M	63.5 × 117	DB7	5.9	34.04
	150,000	E32D500HPN154MDE3M	63.5 × 143	DE3	5.1	37.63
120,000	E32D500HPN124ME92M	76.2 × 92	E92	8.9	33.88	
150,000	E32D500HPN154MEA5M	76.2 × 105	EA5	7.8	36.22	
180,000	E32D500HPN184MEB7M	76.2 × 117	EB7	6.5	38.22	
220,000	E32D500HPN224MEE3M	76.2 × 143	EE3	5.7	44.44	
330,000	E32D500HPN334MEM9M	76.2 × 219	EM9	4.0	65.97	
<b>63 Volts 79 Volts Surge</b>	4,700	E32D630HPN472MA41M	35 × 41	A41	57.1	5.18
	6,800	E32D630HPN682MA54M	35 × 54	A54	33.8	6.68
	10,000	E32D630HPN103MA67M	35 × 67	A67	23.9	7.36
	12,000	E32D630HPN123MA79M	35 × 79	A79	20.1	8.92
	15,000	E32D630HPN153MA92M	35 × 92	A92	16.6	10.39
	18,000	E32D630HPN183MAA5M	35 × 105	AA5	14.3	12.44
	22,000	E32D630HPN223MAB7M	35 × 117	AB7	12.3	14.06
	27,000	E32D630HPN273MAD0M	35 × 130	AD0	12.1	16.36
	10,000	E32D630HPN103MC48M	50.8 × 48	C48	26.7	8.18
	12,000	E32D630HPN123MC54M	50.8 × 54	C54	21.5	9.39
	22,000	E32D630HPN223MC67M	50.8 × 67	C67	14.8	13.52
	27,000	E32D630HPN273MC79M	50.8 × 79	C79	10.8	16.06
	39,000	E32D630HPN393MC92M	50.8 × 92	C92	9.1	20.62
	47,000	E32D630HPN473MCB7M	50.8 × 117	CB7	6.9	23.00
	56,000	E32D630HPN563MCD0M	50.8 × 130	CD0	6.2	26.34
	68,000	E32D630HPN683MCE3M	50.8 × 143	CE3	6.0	30.31
	47,000	E32D630HPN473MD79M	63.5 × 79	D79	9.6	22.05
	68,000	E32D630HPN683MDA5M	63.5 × 105	DA5	6.9	29.84
	82,000	E32D630HPN823MDB7M	63.5 × 117	DB7	6.2	29.93
	100,000	E32D630HPN104MDE3M	63.5 × 143	DE3	5.2	32.23
82,000	E32D630HPN823ME92M	76.2 × 92	E92	8.9	29.71	
100,000	E32D630HPN104MEA5M	76.2 × 105	EA5	7.7	34.67	
120,000	E32D630HPN124MEB7M	76.2 × 117	EB7	6.9	35.58	
150,000	E32D630HPN154MEE3M	76.2 × 143	EE3	5.7	39.63	
220,000	E32D630HPN224MEM9M	76.2 × 219	EM9	4.0	53.86	

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

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



# U32D Series

## Standard Voltage Ratings - Screw Terminals

Rated Voltage (WVDC)	Capacitance (µF)	Global Part Number†	Nominal Case Size* D × L (mm)	Case Size Code	Maximum ESR (mΩ) at +25°C, 120Hz	Rated Ripple Current (A rms) at +85°C, 120Hz
<b>80 Volts</b> 100 Volts Surge	2,200	E32D800HPN222MA41M	35 × 41	A41	67.0	4.09
	3,900	E32D800HPN392MA54M	35 × 54	A54	44.2	5.84
	4,700	E32D800HPN472MA67M	35 × 67	A67	31.7	6.51
	6,800	E32D800HPN682MA79M	35 × 79	A79	23.0	8.67
	8,200	E32D800HPN822MA92M	35 × 92	A92	19.5	9.92
	10,000	E32D800HPN103MAA5M	35 × 105	AA5	19.0	10.36
	12,000	E32D800HPN123MAD0M	35 × 130	AD0	14.0	12.19
	4,700	E32D800HPN472MC48M	50.8 × 48	C48	34.3	6.27
	6,800	E32D800HPN682MC54M	50.8 × 54	C54	24.6	7.90
	10,000	E32D800HPN103MC67M	50.8 × 67	C67	17.0	10.19
	12,000	E32D800HPN123MC79M	50.8 × 79	C79	14.0	11.97
	18,000	E32D800HPN183MC92M	50.8 × 92	C92	10.4	15.66
	22,000	E32D800HPN223MCA5M	50.8 × 105	CA5	9.9	18.36
	27,000	E32D800HPN273MCB7M	50.8 × 117	CB7	8.5	21.35
	33,000	E32D800HPN333MCE3M	50.8 × 143	CE3	7.2	25.86
	22,000	E32D800HPN223MD79M	63.5 × 79	D79	10.6	16.52
	33,000	E32D800HPN333MDA5M	63.5 × 105	DA5	7.6	22.84
	39,000	E32D800HPN393MDB7M	63.5 × 117	DB7	6.8	23.76
	47,000	E32D800HPN473MDD0M	63.5 × 130	DD0	6.1	25.31
	39,000	E32D800HPN393ME92M	76.2 × 92	E92	8.9	23.66
47,000	E32D800HPN473MEA5M	76.2 × 105	EA5	7.7	27.45	
56,000	E32D800HPN563MEB7M	76.2 × 117	EB7	6.9	31.38	
68,000	E32D800HPN683MED0M	76.2 × 130	ED0	6.4	33.51	
120,000	E32D800HPN124MEM9M	76.2 × 219	EM9	4.2	52.62	
<b>100 Volts</b> 125 Volts Surge	1,500	E32D101HPN152MA41M	35 × 41	A41	80.9	4.14
	2,700	E32D101HPN272MA54M	35 × 54	A54	45.9	5.95
	3,900	E32D101HPN392MA67M	35 × 67	A67	37.2	7.26
	4,700	E32D101HPN472MA79M	35 × 79	A79	27.1	8.82
	5,600	E32D101HPN562MA92M	35 × 92	A92	23.1	10.04
	6,800	E32D101HPN682MAA5M	35 × 105	AA5	19.5	11.03
	8,200	E32D101HPN822MAB7M	35 × 117	AB7	19.2	11.80
	10,000	E32D101HPN103MAE3M	35 × 143	AE3	14.1	13.44
	3,900	E32D101HPN392MC48M	50.8 × 48	C48	39.9	6.59
	4,700	E32D101HPN472MC54M	50.8 × 54	C54	28.7	7.59
	6,800	E32D101HPN682MC67M	50.8 × 67	C67	20.0	9.70
	10,000	E32D101HPN103MC79M	50.8 × 79	C79	14.5	12.62
	12,000	E32D101HPN123MC92M	50.8 × 92	C92	12.2	14.77
	15,000	E32D101HPN153MCA5M	50.8 × 105	CA5	10.2	17.51
	18,000	E32D101HPN183MCB7M	50.8 × 117	CB7	9.8	20.13
	22,000	E32D101HPN223MCE3M	50.8 × 143	CE3	7.5	24.38
	15,000	E32D101HPN153MD79M	63.5 × 79	D79	11.9	15.26
	22,000	E32D101HPN223MDA5M	63.5 × 105	DA5	8.5	20.85
	27,000	E32D101HPN273MDB7M	63.5 × 117	DB7	7.4	24.22
	33,000	E32D101HPN333MDD0M	63.5 × 130	DD0	6.6	28.05
39,000	E32D101HPN393MDE3M	63.5 × 143	DE3	6.3	31.82	
27,000	E32D101HPN273ME92M	76.2 × 92	E92	9.3	21.56	
33,000	E32D101HPN333MEA5M	76.2 × 105	EA5	8.0	25.20	
39,000	E32D101HPN393MEB7M	76.2 × 117	EB7	7.2	28.69	
47,000	E32D101HPN473MED0M	76.2 × 130	ED0	6.6	30.09	
56,000	E32D101HPN563MEE3M	76.2 × 143	EE3	6.1	34.25	
82,000	E32D101HPN823MEM9M	76.2 × 219	EM9	4.3	50.23	
<b>160 Volts</b> 200 Volts Surge	820	E32D161HPN821MA41M	35 × 41	A41	184.8	2.50
	1,500	E32D161HPN152MA54M	35 × 54	A54	101.2	3.62
	1,800	E32D161HPN182MA67M	35 × 67	A67	83.3	4.03
	2,700	E32D161HPN272MA79M	35 × 79	A79	56.8	5.46
	3,900	E32D161HPN392MAA5M	35 × 105	AA5	40.0	7.47
	4,700	E32D161HPN472MAD0M	35 × 130	AD0	33.4	8.81
	5,600	E32D161HPN562MAE3M	35 × 143	AE3	28.6	10.06

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

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

# U32D Series

## Standard Voltage Ratings - Screw Terminals

Rated Voltage (WVDC)	Capacitance (µF)	Global Part Number†	Nominal Case Size* D × L (mm)	Case Size Code	Maximum ESR (mΩ) at +25°C, 120Hz	Rated Ripple Current (A rms) at +85°C, 120Hz
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<b>160 Volts 200 Volts Surge</b>	2,200	E32D161HPN222MC48M	50.8 × 48	C48	74.6	4.29
	2,700	E32D161HPN272MC54M	50.8 × 54	C54	59.6	4.98
	3,900	E32D161HPN392MC67M	50.8 × 67	C67	41.1	6.36
	5,600	E32D161HPN562MC79M	50.8 × 79	C79	29.4	8.18
	6,800	E32D161HPN682MC92M	50.8 × 92	C92	24.0	9.63
	8,200	E32D161HPN822MCA5M	50.8 × 105	CA5	20.5	11.21
	10,000	E32D161HPN103MCB7M	50.8 × 117	CB7	17.0	12.99
	12,000	E32D161HPN123MCE3M	50.8 × 143	CE3	14.3	15.60
	8,200	E32D161HPN822MD79M	63.5 × 79	D79	22.6	11.28
	12,000	E32D161HPN123MDA5M	63.5 × 105	DA5	15.8	15.40
	18,000	E32D161HPN183MDB7M	63.5 × 117	DB7	11.8	19.77
	18,000	E32D161HPN183ME92M	76.2 × 92	E92	14.7	19.68
	22,000	E32D161HPN223MEB7M	76.2 × 117	EB7	11.3	24.09
	27,000	E32D161HPN273MED0M	76.2 × 130	ED0	9.9	27.93
47,000	E32D161HPN473MEM9M	76.2 × 219	EM9	6.2	46.58	

<b>200 Volts 250 Volts Surge</b>	680	E32D201HPN681MA41M	35 × 41	A41	192.4	2.28
	1,000	E32D201HPN102MA54M	35 × 54	A54	128.5	2.96
	1,500	E32D201HPN152MA67M	35 × 67	A67	86.3	3.68
	1,800	E32D201HPN182MA79M	35 × 79	A79	71.8	4.46
	2,200	E32D201HPN222MA92M	35 × 92	A92	59.1	5.14
	2,700	E32D201HPN272MAA5M	35 × 105	AA5	48.7	6.22
	3,300	E32D201HPN332MAB7M	35 × 117	AB7	40.4	7.03
	3,900	E32D201HPN392MAD0M	35 × 130	AD0	34.7	8.03
	1,500	E32D201HPN152MC48M	50.8 × 48	C48	110.7	4.09
	2,200	E32D201HPN222MC54M	50.8 × 54	C54	63.1	5.19
	3,300	E32D201HPN332MC67M	50.8 × 67	C67	42.2	6.76
	3,900	E32D201HPN392MC79M	50.8 × 79	C79	35.2	7.88
	5,600	E32D201HPN562MC92M	50.8 × 92	C92	25.1	10.09
	8,200	E32D201HPN822MCB7M	50.8 × 117	CB7	17.8	13.59
	10,000	E32D201HPN103MCE3M	50.8 × 143	CE3	14.8	16.44
	6,800	E32D201HPN682MD79M	63.5 × 79	D79	23.6	10.27
	10,000	E32D201HPN103MDA5M	63.5 × 105	DA5	16.5	14.06
	12,000	E32D201HPN123MDB7M	63.5 × 117	DB7	13.8	16.14
	15,000	E32D201HPN153MDE3M	63.5 × 143	DE3	11.5	19.74
	12,000	E32D201HPN123ME92M	76.2 × 92	E92	16.4	16.07
	15,000	E32D201HPN153MEA5M	76.2 × 105	EA5	13.7	18.99
	18,000	E32D201HPN183MEB7M	76.2 × 117	EB7	11.9	21.79
	22,000	E32D201HPN223MEE3M	76.2 × 143	EE3	9.8	26.29
	33,000	E32D201HPN333MEM9M	76.2 × 219	EM9	6.8	39.03

<b>250 Volts 300 Volts Surge</b>	470	E32D251HPN471MA41M	35 × 41	A41	273.0	1.89
	820	E32D251HPN821MA54M	35 × 54	A54	155.3	2.68
	1,200	E32D251HPN122MA67M	35 × 67	A67	106.5	3.29
	1,500	E32D251HPN152MA79M	35 × 79	A79	85.3	3.53
	1,800	E32D251HPN182MA92M	35 × 92	A92	71.3	4.02
	2,200	E32D251HPN222MAA5M	35 × 105	AA5	58.8	4.86
	2,700	E32D251HPN272MAB7M	35 × 117	AB7	48.5	5.51
	3,300	E32D251HPN332MAE3M	35 × 143	AE3	40.0	6.69
	1,200	E32D251HPN122MC48M	50.8 × 48	C48	112.1	3.17
	1,500	E32D251HPN152MC54M	50.8 × 54	C54	88.4	3.71
	2,200	E32D251HPN222MC67M	50.8 × 67	C67	60.1	4.78
	3,300	E32D251HPN332MC79M	50.8 × 79	C79	41.0	6.28
	3,900	E32D251HPN392MC92M	50.8 × 92	C92	34.6	7.29
	4,700	E32D251HPN472MCA5M	50.8 × 105	CA5	29.0	8.49
	5,600	E32D251HPN562MCB7M	50.8 × 117	CB7	24.7	9.72
	6,800	E32D251HPN682MCD0M	50.8 × 130	CD0	20.7	11.24
	5,600	E32D251HPN562MD79M	63.5 × 79	D79	27.7	9.32
	8,200	E32D251HPN822MDA5M	63.5 × 105	DA5	19.3	12.73

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

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

# U32D Series

## Standard Voltage Ratings - Screw Terminals

Rated Voltage (WVDC)	Capacitance (µF)	Global Part Number†	Nominal Case Size* D × L (mm)	Case Size Code	Maximum ESR (mΩ) at +25°C, 120Hz	Rated Ripple Current (A rms) at +85°C, 120Hz
250 Volts 300 Volts Surge	10,000	E32D251HPN103MDB7M	63.5 × 117	DB7	18.5	14.74
	12,000	E32D251HPN123MDE3M	63.5 × 143	DE3	13.6	17.65
	10,000	E32D251HPN103ME92M	76.2 × 92	E92	18.8	14.67
	12,000	E32D251HPN123MEA5M	76.2 × 105	EA5	15.9	16.99
	15,000	E32D251HPN153MED0M	76.2 × 130	ED0	12.7	20.82
	18,000	E32D251HPN183MEE3M	76.2 × 143	EE3	11.2	23.78
	27,000	E32D251HPN273MEM9M	76.2 × 219	EM9	7.7	35.30
315 Volts 365 Volts Surge	220	E32D3B1HPN221MA41M	35 × 41	A41	750.3	1.59
	330	E32D3B1HPN331MA54M	35 × 54	A54	492.0	2.08
	470	E32D3B1HPN471MA67M	35 × 67	A67	343.8	2.52
	680	E32D3B1HPN681MA79M	35 × 79	A79	237.8	3.36
	820	E32D3B1HPN821MA92M	35 × 92	A92	197.2	3.14
	1,000	E32D3B1HPN102MAA5M	35 × 105	AA5	161.9	8.46
	1,200	E32D3B1HPN122MAD0M	35 × 130	AD0	134.9	9.96
	470	E32D3B1HPN471MC48M	50.8 × 48	C48	354.0	2.80
	680	E32D3B1HPN681MC54M	50.8 × 54	C54	243.1	3.53
	1,000	E32D3B1HPN102MC67M	50.8 × 67	C67	164.1	3.72
	1,200	E32D3B1HPN122MC79M	50.8 × 79	C79	135.9	4.37
	1,800	E32D3B1HPN182MC92M	50.8 × 92	C92	91.0	5.72
	2,200	E32D3B1HPN222MCA5M	50.8 × 105	CA5	75.0	6.70
	2,700	E32D3B1HPN272MCB7M	50.8 × 117	CB7	61.3	7.80
	3,300	E32D3B1HPN332MCE3M	50.8 × 143	CE3	50.3	9.44
	2,200	E32D3B1HPN222MD79M	63.5 × 79	D79	77.0	6.75
	3,300	E32D3B1HPN332MDA5M	63.5 × 105	DA5	51.7	9.32
	3,900	E32D3B1HPN392MDB7M	63.5 × 117	DB7	43.7	10.63
	4,700	E32D3B1HPN472MDD0M	63.5 × 130	DD0	36.9	12.22
	3,900	E32D3B1HPN392ME92M	76.2 × 92	E92	45.7	10.58
	4,700	E32D3B1HPN472MEA5M	76.2 × 105	EA5	38.2	12.28
5,600	E32D3B1HPN562MEB7M	76.2 × 117	EB7	32.4	14.03	
6,800	E32D3B1HPN682MED0M	76.2 × 130	ED0	27.2	16.19	
8,200	E32D3B1HPN822MEE3M	76.2 × 143	EE3	23.1	18.53	
12,000	E32D3B1HPN123MEM9M	76.2 × 219	EM9	16.0	27.17	
350 Volts 400 Volts Surge	180	E32D351HPN181MA41M	35 × 41	A41	882.3	1.43
	330	E32D351HPN331MA54M	35 × 54	A54	475.0	2.08
	470	E32D351HPN471MA67M	35 × 67	A67	332.0	2.52
	560	E32D351HPN561MA79M	35 × 79	A79	277.6	3.05
	680	E32D351HPN681MA92M	35 × 92	A92	228.5	3.36
	820	E32D351HPN821MAA5M	35 × 105	AA5	189.6	3.43
	1,000	E32D351HPN102MAB7M	35 × 117	AB7	156.0	3.87
	1,200	E32D351HPN122MAD0M	35 × 130	AD0	130.0	4.45
	470	E32D351HPN471MC48M	50.8 × 48	C48	342.0	2.80
	680	E32D351HPN681MC54M	50.8 × 54	C54	235.0	3.53
	1,000	E32D351HPN102MC67M	50.8 × 67	C67	156.0	3.72
	1,200	E32D351HPN122MC79M	50.8 × 79	C79	131.3	4.37
	1,800	E32D351HPN182MC92M	50.8 × 92	C92	88.0	5.72
	2,200	E32D351HPN222MCB7M	50.8 × 117	CB7	71.9	7.04
	2,700	E32D351HPN272MCD0M	50.8 × 130	CD0	59.0	8.18
	2,200	E32D351HPN222MD79M	63.5 × 79	D79	75.0	6.75
	3,300	E32D351HPN332MDA5M	63.5 × 105	DA5	50.0	9.32
	3,900	E32D351HPN392MDB7M	63.5 × 117	DB7	42.0	10.63
	4,700	E32D351HPN472MDE3M	63.5 × 143	DE3	35.0	12.76
	3,900	E32D351HPN392ME92M	76.2 × 92	E92	44.0	10.58
	4,700	E32D351HPN472MEA5M	76.2 × 105	EA5	37.0	12.28
5,600	E32D351HPN562MEB7M	76.2 × 117	EB7	32.0	14.03	
6,800	E32D351HPN682MED0M	76.2 × 130	ED0	27.0	16.19	
10,000	E32D351HPN103MEM9M	76.2 × 219	EM9	17.9	24.81	

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

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

# U32D Series

## Standard Voltage Ratings - Screw Terminals

Rated Voltage (WVDC)	Capacitance (µF)	Global Part Number†	Nominal Case Size* D × L (mm)	Case Size Code	Maximum ESR (mΩ) at +25°C, 120Hz	Rated Ripple Current (A rms) at +85°C, 120Hz
<b>350 Volts</b> 400 Volts Surge	5,600	E32D351CPN562MFA5M	89 × 105	FA5	35.0	15.40
	6,800	E32D351CPN682MFB7M	89 × 117	FB7	30.0	17.28
	8,200	E32D351CPN822MFE3M	89 × 143	FE3	24.0	21.00
<b>400 Volts</b> 450 Volts Surge	180	E32D401HPN181MA41M	35 × 41	A41	806.0	1.43
	270	E32D401HPN271MA54M	35 × 54	A54	528.4	1.88
	390	E32D401HPN391MA67M	35 × 67	A67	364.1	2.30
	470	E32D401HPN471MA79M	35 × 79	A79	301.2	2.79
	680	E32D401HPN681MA92M	35 × 92	A92	209.0	2.86
	820	E32D401HPN821MAB7M	35 × 117	AB7	172.9	3.50
	1,000	E32D401HPN102MAD0M	35 × 130	AD0	142.0	4.06
	390	E32D401HPN391MC48M	50.8 × 48	C48	374.9	2.55
	560	E32D401HPN561MC54M	50.8 × 54	C54	259.0	3.21
	820	E32D401HPN821MC67M	50.8 × 67	C67	176.0	3.37
	1,000	E32D401HPN102MC79M	50.8 × 79	C79	143.3	3.99
	1,500	E32D401HPN152MC92M	50.8 × 92	C92	96.0	5.22
	2,200	E32D401HPN222MCB7M	50.8 × 117	CB7	66.0	7.04
	2,700	E32D401HPN272MCE3M	50.8 × 143	CE3	54.0	8.54
	1,800	E32D401HPN182MD79M	63.5 × 79	D79	82.0	6.10
	2,700	E32D401HPN272MDA5M	63.5 × 105	DA5	55.0	8.43
	3,300	E32D401HPN332MDB7M	63.5 × 117	DB7	45.4	9.78
	3,900	E32D401HPN392MDD0M	63.5 × 130	DD0	39.0	11.13
	3,300	E32D401HPN332ME92M	76.2 × 92	E92	48.0	9.73
	3,900	E32D401HPN392MEA5M	76.2 × 105	EA5	40.3	11.18
	4,700	E32D401HPN472MEB7M	76.2 × 117	EB7	34.0	12.86
	5,600	E32D401HPN562MED0M	76.2 × 130	ED0	29.0	14.69
	10,000	E32D401HPN103MEM9M	76.2 × 219	EM9	17.0	24.81
4,700	E32D401CPN472MFA5M	89 × 105	FA5	36.0	15.19	
5,600	E32D401CPN562MFB7M	89 × 117	FB7	32.0	16.73	
6,800	E32D401CPN682MFE3M	89 × 143	FE3	25.0	20.58	

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

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

# U37F Series NEW



- Large Can
- Screw Terminals
- High Ripple
- 350 to 500VDC Ratings
- RoHS Compliant
- 5,000 Hours Lifetime at +85°C
- Up to 150,000 Hours Useful Life



The U37F series is a screw mount U37 grade series specifically designed to provide the ripple current capability and long life required for high reliability inverter applications. The U37F has an endurance rating of 5,000 hours at +85°C with the rated ripple current applied. The useful life can exceed 150,000 hours at +40°C and 1.5x the ripple current. These capacitors are available in a variety of high current English or Metric thread terminals. Mounting options include a three-footed clamp or bottom threaded stud. Custom designs are also available.

## Summary of Specifications

- Screw terminals: high and low post, English and Metric thread.
- Capacitance range: 1,500 to 22,000µF.
- Voltage range: 350 to 500VDC.
- Category temperature range: -40°C to +85°C.
- Leakage current: 0.02CV(µA) or 5mA, whichever is smaller, after 5 minutes at +25°C.
- Standard capacitance tolerance: ±20%
- Nominal case size (D×L): D = 50.8mm (2.000") to 89mm (3.500"); L = 92mm (3.625") to 219mm (8.625").
- Rated lifetime: 5,000 hours at +85°C with rated ripple current applied.

# U37F Series

## U37F Specifications - Screw Terminals

Item	Characteristics																																															
Category Temperature Range	-40 to +85°C																																															
Rated Voltage Range	350 to 500VDC																																															
Capacitance Range	1,500 to 22,000µF at +25°C, 120Hz																																															
Capacitance Tolerance	±20% (M) at +25°C, 120Hz																																															
Leakage Current	$I = 0.02CV$ (µA) or 5mA, whichever is smaller, after 5 minutes at +25°C. Where I = Max. leakage current (µA), C = Nominal capacitance (µF) and V = Rated voltage (V)																																															
Rated Ripple Current Multipliers	<p>Ambient Temperature (°C)</p> <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> <p>Frequency (Hz)</p> <table border="1"> <tr> <td>DC Rated Voltage</td> <td>50Hz</td> <td>120Hz</td> <td>300Hz</td> <td>1kHz</td> <td>3kHz</td> <td>10kHz</td> </tr> <tr> <td>350-500V</td> <td>0.80</td> <td>1.00</td> <td>1.20</td> <td>1.30</td> <td>1.40</td> <td>1.41</td> </tr> </table> <p>To determine maximum ripple current at a specified temperature and frequency, use the appropriate multiplier shown.</p>	+45°C	+65°C	+85°C	2.82	1.73	1.00	DC Rated Voltage	50Hz	120Hz	300Hz	1kHz	3kHz	10kHz	350-500V	0.80	1.00	1.20	1.30	1.40	1.41																											
+45°C	+65°C	+85°C																																														
2.82	1.73	1.00																																														
DC Rated Voltage	50Hz	120Hz	300Hz	1kHz	3kHz	10kHz																																										
350-500V	0.80	1.00	1.20	1.30	1.40	1.41																																										
Endurance (Load Life)	<p>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.</p> <p>Capacitance change: ≤ 20% from initial measurement            ESR change : ≤ 200% of initial specified limit            Leakage current : ≤ initial specified limit</p>																																															
Useful Life	<p>With specified standard voltage and ripple current applied, typical life as function of ambient temperature is listed below.</p> <table border="1"> <tr> <td>+85°C</td> <td>6,500 hours max.</td> </tr> <tr> <td>+65°C</td> <td>23,800 hours max.</td> </tr> <tr> <td>+45°C</td> <td>124,700 hours max.</td> </tr> </table> <p>Capacitance change: ≤ 30% from initial measurement            ESR change : ≤ 300% of initial specified limit            Leakage current : ≤ initial specified limit</p>	+85°C	6,500 hours max.	+65°C	23,800 hours max.	+45°C	124,700 hours max.																																									
+85°C	6,500 hours max.																																															
+65°C	23,800 hours max.																																															
+45°C	124,700 hours max.																																															
Shelf Life	<p>The following specifications shall be satisfied when the capacitors are restored to +25°C after exposing them for 500 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.</p> <p>Capacitance change: ≤ 20% from initial measurement            ESR change : ≤ 200% of initial specified limit            Leakage current : ≤ initial specified limit</p>																																															
Vibration Rating	10-55Hz, 10g sinusoidal in three axes, 2 hours per axis.																																															
Maximum Tightening Torque	<table border="1"> <tr> <td>Terminal Code</td> <td>HP</td> <td>HL</td> <td>CD</td> <td>CP</td> <td>CH</td> <td>CA</td> <td>CS</td> </tr> <tr> <td>Thread Size</td> <td>10-32 NF-2B</td> <td>M5x0.8-6H</td> <td></td> <td>1/4-28 NF-2B</td> <td></td> <td>M6x1-6H</td> <td></td> </tr> <tr> <td>3 Threads Engaged</td> <td colspan="3">2.0 N·m (18.0 in·lb)</td> <td colspan="4">4.0 N·m (35.0 in·lb)</td> </tr> <tr> <td>6 Threads Engaged</td> <td colspan="3">2.8 N·m (25.0 in·lb)</td> <td colspan="4">6.2 N·m (55.0 in·lb)</td> </tr> </table>	Terminal Code	HP	HL	CD	CP	CH	CA	CS	Thread Size	10-32 NF-2B	M5x0.8-6H		1/4-28 NF-2B		M6x1-6H		3 Threads Engaged	2.0 N·m (18.0 in·lb)			4.0 N·m (35.0 in·lb)				6 Threads Engaged	2.8 N·m (25.0 in·lb)			6.2 N·m (55.0 in·lb)																		
Terminal Code	HP	HL	CD	CP	CH	CA	CS																																									
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Typical Inductance (nH) at 1MHz	<table border="1"> <tr> <td rowspan="2">Case Diameter (mm)</td> <td colspan="7">Terminal Code</td> </tr> <tr> <td>HP</td> <td>HL</td> <td>CD</td> <td>CP</td> <td>CH</td> <td>CA</td> <td>CS</td> </tr> <tr> <td>ø50.8</td> <td>—</td> <td>—</td> <td>NA</td> <td>NA</td> <td>NA</td> <td>NA</td> <td>NA</td> </tr> <tr> <td>ø63.5</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> </tr> <tr> <td>ø76.2</td> <td>30</td> <td>30</td> <td>25</td> <td>20</td> <td>25</td> <td>20</td> <td>25</td> </tr> <tr> <td>ø89.0</td> <td>30</td> <td>30</td> <td>25</td> <td>20</td> <td>25</td> <td>20</td> <td>25</td> </tr> </table>	Case Diameter (mm)	Terminal Code							HP	HL	CD	CP	CH	CA	CS	ø50.8	—	—	NA	NA	NA	NA	NA	ø63.5	—	—	—	—	—	—	—	ø76.2	30	30	25	20	25	20	25	ø89.0	30	30	25	20	25	20	25
Case Diameter (mm)	Terminal Code																																															
	HP	HL	CD	CP	CH	CA	CS																																									
ø50.8	—	—	NA	NA	NA	NA	NA																																									
ø63.5	—	—	—	—	—	—	—																																									
ø76.2	30	30	25	20	25	20	25																																									
ø89.0	30	30	25	20	25	20	25																																									
Custom Designs	Custom CV values per case size and termination type may be available upon request. Contact appropriate representative with specific requirements.																																															

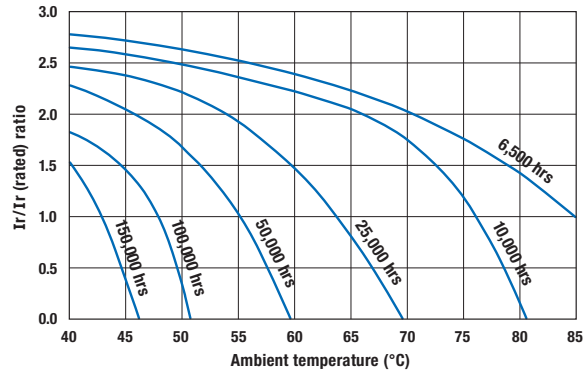


# U37F Series

## U37F Useful Life

### Useful Life: 6,500 Hours at +85°C

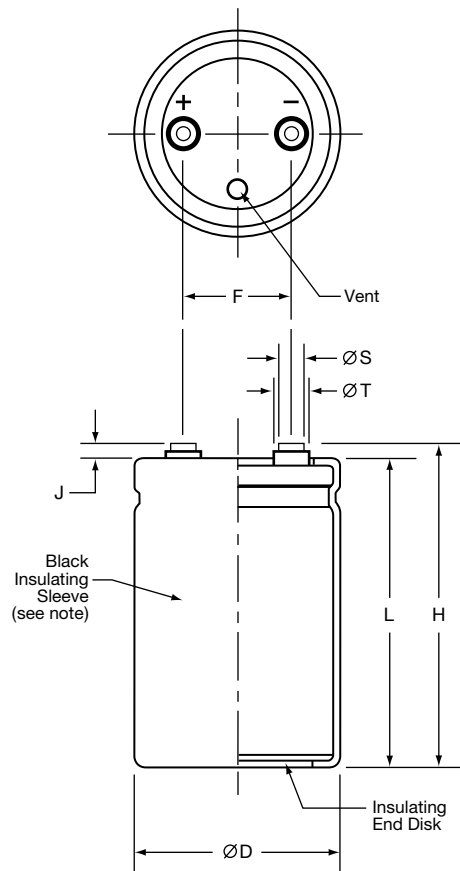
The life expectancy of a capacitor is shown as a function of ambient temperature and ripple current load.



## Diagram of Dimensions - Screw Terminals

### Large Can/Screw Terminals

Unit: mm (inches)



### Case Dimensions and Standard Box Quantities

Case Size Code	ØD +2.0 (0.080)	L ±1.0 (0.040)	F ±0.25 (0.010)	Standard Box Quantity
CB7 CD0	50.8 (2.000)	117 (4.625) 130 (5.125)	22.2 (0.875)	49
D92 DA5 DB7 DD0 DE3	63.5 (2.500)	92 (3.625) 105 (4.125) 117 (4.625) 130 (5.125) 143 (5.625)	28.6 (1.125)	20
E92 EA5 EB7 EE3 EJ1 EM9	76.2 (3.000)	92 (3.625) 105 (4.125) 117 (4.625) 143 (5.625) 181 (7.125) 219 (8.625)	31.8 (1.250)	16 9
F92 FA5 FB7 FE3 FF5 FK0 FM9	89.0 (3.500)	92 (3.625) 105 (4.125) 117 (4.625) 143 (5.625) 155 (6.125) 190 (7.500) 219 (8.625)	31.8 (1.250)	5

#### Note:

In some cases, the color of the sleeve may change slightly due to the operating conditions, however, the discoloration will not impair capacitor function.

### Terminal Specifications

Terminal Code	Available Case Diameter		Thread Size	Minimum Thread Depth	J ±0.5 (0.020)	H ±2.0 (0.080)	ØS ±0.25 (0.010)	ØT ±0.25 (0.010)
	ØD Code	ØD mm (inches)						
HP	C	50.8 (2.000)	10-32 NF-2B	9.5 (0.375)	6.4 (0.250)	L+J	8.0 (0.313)	11.1 (0.438)
HL	C	50.8 (2.000)	M5x0.8-6H	9.5 (0.375)	6.4 (0.250)	L+J	8.0 (0.313)	11.1 (0.438)
CD	D-E	63.5 - 76.2 (2.500 - 3.000)	M5x0.8-6H	8.5 (0.335)	5.0 (0.200)	L+J	13.0 (0.512)	18.8 (0.740)
CP	D-F	63.5 - 89.0 (2.500 - 3.500)	¼-28 NF-2B	8.7 (0.344)	2.4 (0.093)	L+J	17.5 (0.689)	—
CH	D-F	63.5 - 89.0 (2.500 - 3.500)	¼-28 NF-2B	11.9 (0.468)	6.4 (0.250)	L+J	17.5 (0.689)	—
CA	D-F	63.5 - 89.0 (2.500 - 3.500)	M6x1-6H	8.7 (0.344)	2.4 (0.093)	L+J	17.5 (0.689)	—
CS	D-F	63.5 - 89.0 (2.500 - 3.500)	M6x1-6H	11.9 (0.468)	6.4 (0.250)	L+J	17.5 (0.689)	—

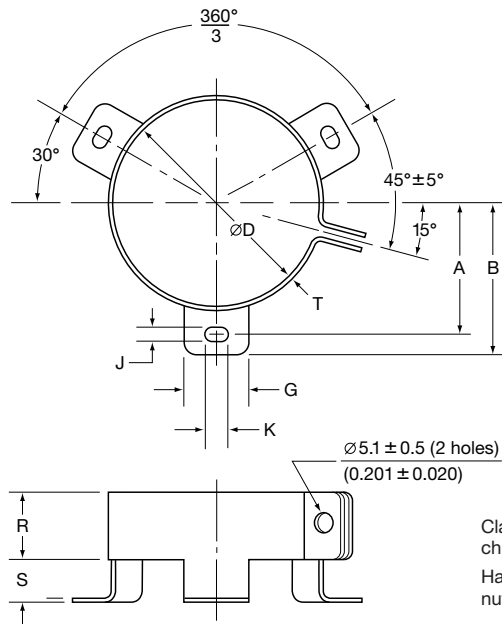
Mounting Hardware is optional. Refer to hardware specifications on the following page.

# U37F Series

## Mounting Hardware - Screw Terminals

### Type C: Three-Footed Clamp

Unit: mm (inches)

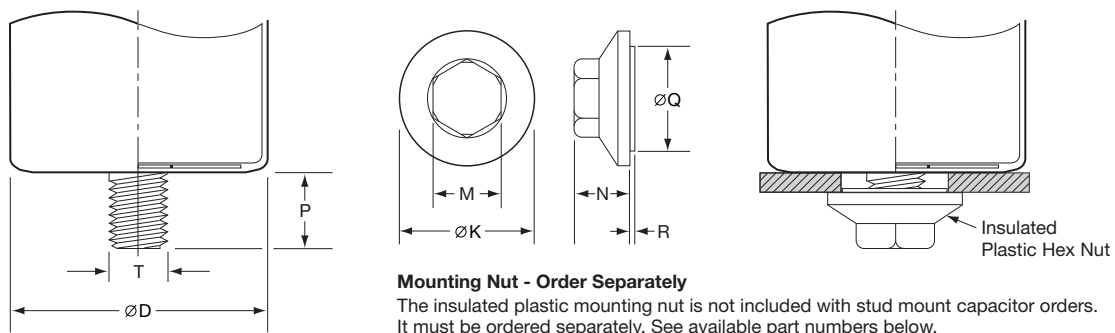


Clamp: Zinc with silver trivalent chromate post treatment.  
Hardware: Screw, washer and hexagon nut included with each clamp.

### Type C: Clamp Dimensions

Mounting Code	Case ØD	A ±1.0 (0.040)	B ±1.0 (0.040)	G ±1.0 (0.040)	J ±0.5 (0.020)	K ±0.5 (0.020)	R ±1.0 (0.040)	S ±1.0 (0.040)	T ±0.5 (0.020)
C	50.8 (2.000)	31.8 (1.250)	36.5 (1.437)	13.3 (0.524)	4.5 (0.177)	7.1 (0.280)	19.1 (0.751)	9.5 (0.374)	0.8 (0.032)
C	63.5 (2.500)	38.1 (1.500)	42.9 (1.689)	13.3 (0.524)	4.5 (0.177)	7.1 (0.280)	19.1 (0.751)	9.5 (0.374)	0.8 (0.032)
C	76.2 (3.000)	44.5 (1.750)	49.2 (1.937)	13.3 (0.524)	4.5 (0.177)	7.1 (0.280)	19.1 (0.751)	9.5 (0.374)	1.0 (0.040)
C	89.0 (3.500)	50.8 (2.000)	56.5 (2.224)	16.0 (0.630)	4.5 (0.177)	8.0 (0.313)	21.0 (0.827)	9.0 (0.354)	1.0 (0.040)

### Type S: Stud Mounting



#### Mounting Nut - Order Separately

The insulated plastic mounting nut is not included with stud mount capacitor orders. It must be ordered separately. See available part numbers below.

### Type S: Stud Dimensions

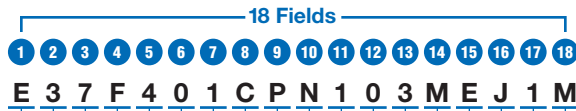
Mounting Code	P ±1.0 (0.040)	T Thread Size
S	16.0 (0.630)	M12

### Mounting Nut Dimensions

Part Number	ØK ±2.0 (0.080)	M ±1.0 (0.040)	N ±1.0 (0.040)	ØQ ±1.0 (0.040)	R ±1.0 (0.040)
50-8D	30.0 (1.181)	19.0 (0.748)	18.0 (0.709)	22.0 (0.866)	1.40 (0.055)
50-8E	38.0 (1.496)	19.0 (0.748)	18.0 (0.709)	30.0 (1.181)	1.40 (0.055)

# U37F Series

**Part Numbering System for U37F Series** When ordering, always specify complete 18-field global part number.



- 9 Supplement Code.** Field 18.  
 C = PET insulation with end disk (Ø50.8-Ø76.2mm).  
 M = Pb-free PVC insulation with end disk.  
 S = Polyolefin insulation with end disk (Ø50.8-Ø89.0mm).
- 8 Case Size.** Fields 15, 16 and 17.  
 The single letter diameter code is inserted in field 15.  
 C = Ø50.8mm (Ø2.000")  
 D = Ø63.5mm (Ø2.500")  
 E = Ø76.2mm (Ø3.000")  
 F = Ø89.0mm (Ø3.500")  
 The double character length code is inserted in fields 16 and 17.  
 For lengths ≤99mm, insert the actual length rounded to nearest millimeter. For lengths of 100mm or more, insert the appropriate alpha numeric code as indicated below.  
 92 = 92mm (3.625")  
 A5 = 105mm (4.125")  
 B7 = 117mm (4.625")  
 D0 = 130mm (5.125")  
 E3 = 143mm (5.625")  
 F5 = 155mm (6.125")  
 J1 = 181mm (7.125")  
 K0 = 190mm (7.500")  
 M9 = 219mm (8.625")
- 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. 1R0 = 1.0µF; 100 = 10µF; 101 = 100µF; 102 = 1,000µF; 103 = 10,000µF).
- 5 Mounting Hardware.** Field 10.  
 N = None.  
 C = Three-footed clamp.  
 S = Stud mount. *The mounting nut is not included with stud mount orders. It must be ordered separately.*
- 4 Terminal Type.** Fields 8 and 9.  
 HP = High post 10-32 NF-2B screw thread.  
 HL = High post M5x0.8 screw thread.  
 CD = Larger diameter M5x0.8 screw thread.  
 CP = Low post 1/4-28 NF-2B screw thread.  
 CH = High post 1/4-28 NF-2B screw thread.  
 CA = Low post M6x1 screw thread.  
 CS = High post M6x1 screw thread.
- 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).
- 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).

# U37F Series

## Standard Voltage Ratings - Screw Terminals

Rated Voltage (WVDC)	Capacitance (µF)	Global Part Number†	Nominal Case Size* D × L (mm)	Case Size Code	Maximum ESR (mΩ) at +25°C, 120Hz	Rated Ripple Current (A rms) at +85°C		
						120Hz	300Hz	>3kHz
<b>350 Volts</b> 400 Volts Surge	3,300	E37F351HPN332MCB7M	50.8 × 117	CB7	28	10.8	12.9	15.1
	3,900	E37F351HPN392MCD0M	50.8 × 130	CD0	23	12.2	14.6	17.0
	3,300	E37F351CPN332MD92M	63.5 × 92	D92	28	11.2	13.4	15.6
	3,900	E37F351CPN392MDA5M	63.5 × 105	DA5	23	12.7	15.2	17.7
	4,700	E37F351CPN472MDB7M	63.5 × 117	DB7	19	14.5	17.4	20.3
	5,600	E37F351CPN562MDD0M	63.5 × 130	DD0	16	16.4	19.7	22.9
	5,600	E37F351CPN562MDE3M	63.5 × 143	DE3	16	17.0	20.4	23.7
	4,700	E37F351CPN472ME92M	76.2 × 92	E92	20	14.5	17.4	20.2
	5,600	E37F351CPN562MEA5M	76.2 × 105	EA5	17	16.5	19.8	23.1
	6,800	E37F351CPN682MEB7M	76.2 × 117	EB7	14	18.9	22.6	26.4
	8,200	E37F351CPN822MEE3M	76.2 × 143	EE3	12	22.2	26.7	31.1
	12,000	E37F351CPN123MEJ1M	76.2 × 181	EJ1	8	29.4	35.2	41.1
	15,000	E37F351CPN153MEM9M	76.2 × 219	EM9	6	35.4	42.5	49.6
	6,800	E37F351CPN682MF92M	89 × 92	F92	14	19.1	22.9	26.7
	8,200	E37F351CPN822MFA5M	89 × 105	FA5	12	21.8	26.2	30.5
	10,000	E37F351CPN103MFB7M	89 × 117	FB7	10	25.0	30.0	35.0
	12,000	E37F351CPN123MFE3M	89 × 143	FE3	8	29.3	35.2	41.1
	15,000	E37F351CPN153MFF5M	89 × 155	FF5	6	33.8	40.5	47.3
	18,000	E37F351CPN183MFK0M	89 × 190	FK0	5	40.0	47.9	55.9
22,000	E37F351CPN223MFM9M	89 × 219	FM9	4	46.7	56.0	65.4	
<b>400 Volts</b> 450 Volts Surge	2,700	E37F401HPN272MCB7M	50.8 × 117	CB7	30	10.4	12.5	14.6
	3,300	E37F401HPN332MCD0M	50.8 × 130	CD0	26	11.6	13.9	16.2
	2,700	E37F401CPN272MD92M	63.5 × 92	D92	30	10.7	12.9	15.0
	3,300	E37F401CPN332MDA5M	63.5 × 105	DA5	25	12.3	14.7	17.2
	3,900	E37F401CPN392MDB7M	63.5 × 117	DB7	21	13.8	16.5	19.3
	4,700	E37F401CPN472MDD0M	63.5 × 130	DD0	19	15.3	18.3	21.4
	4,700	E37F401CPN472MDE3M	63.5 × 143	DE3	17	16.8	20.1	23.5
	3,900	E37F401CPN392ME92M	76.2 × 92	E92	21	14.3	17.2	20.0
	5,600	E37F401CPN562MEA5M	76.2 × 105	EA5	17	16.4	19.6	22.9
	5,600	E37F401CPN562MEB7M	76.2 × 117	EB7	15	18.4	22.0	25.7
	8,200	E37F401CPN822MEE3M	76.2 × 143	EE3	12	22.3	26.8	31.3
	10,000	E37F401CPN103MEJ1M	76.2 × 181	EJ1	9	28.2	33.8	39.5
	12,000	E37F401CPN123MEM9M	76.2 × 219	EM9	7	34.0	40.8	47.6
	5,600	E37F401CPN562MF92M	89 × 92	F92	15	18.6	22.3	26.1
	6,800	E37F401CPN682MFA5M	89 × 105	FA5	12	21.2	25.5	29.7
	8,200	E37F401CPN822MFB7M	89 × 117	FB7	11	23.8	28.6	33.4
	10,000	E37F401CPN103MFE3M	89 × 143	FE3	8	28.9	34.7	40.5
	12,000	E37F401CPN123MFF5M	89 × 155	FF5	7	31.4	37.7	44.0
	15,000	E37F401CPN153MFK0M	89 × 190	FK0	6	38.3	45.9	53.6
18,000	E37F401CPN183MFM9M	89 × 219	FM9	5	43.9	52.7	61.5	
<b>420 Volts</b> 470 Volts Surge	2,700	E37F421HPN272MCB7M	50.8 × 117	CB7	34	9.8	11.7	13.7
	3,300	E37F421HPN332MCD0M	50.8 × 130	CD0	28	11.2	13.4	15.7
	2,700	E37F421CPN272MD92M	63.5 × 92	D92	34	10.1	12.1	14.1
	3,300	E37F421CPN332MDA5M	63.5 × 105	DA5	28	11.7	14.0	16.3
	3,900	E37F421CPN392MDB7M	63.5 × 117	DB7	23	13.2	15.8	18.5
	3,900	E37F421CPN392MDD0M	63.5 × 130	DD0	23	13.7	16.4	19.1
	4,700	E37F421CPN472MDE3M	63.5 × 143	DE3	19	15.5	18.6	21.8
	3,900	E37F421CPN392ME92M	76.2 × 92	E92	24	13.2	15.8	18.4
	4,700	E37F421CPN472MEA5M	76.2 × 105	EA5	20	15.1	18.1	21.1
	5,600	E37F421CPN562MEB7M	76.2 × 117	EB7	17	17.1	20.5	24.0
	6,800	E37F421CPN682MEE3M	76.2 × 143	EE3	14	20.2	24.3	28.3
	10,000	E37F421CPN103MEJ1M	76.2 × 181	EJ1	10	26.8	32.2	37.5
	12,000	E37F421CPN123MEM9M	76.2 × 219	EM9	8	31.7	38.0	44.4
	5,600	E37F421CPN562MF92M	89 × 92	F92	17	17.3	20.8	24.2
	6,800	E37F421CPN682MFA5M	89 × 105	FA5	14	19.9	23.8	27.8

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

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

# U37F Series

## Standard Voltage Ratings - Screw Terminals

Rated Voltage (WVDC)	Capacitance (µF)	Global Part Number†	Nominal Case Size* D × L (mm)	Case Size Code	Maximum ESR (mΩ) at +25°C, 120Hz	Rated Ripple Current (A rms) at +85°C		
						120Hz	300Hz	>3kHz
<b>420 Volts</b> 470 Volts Surge	8,200	E37F421CPN822MFB7M	89 × 117	FB7	12	22.7	27.2	31.7
	10,000	E37F421CPN103MFE3M	89 × 143	FE3	10	26.8	32.1	37.5
	12,000	E37F421CPN123MFF5M	89 × 155	FF5	8	30.3	36.3	42.4
	15,000	E37F421CPN153MFK0M	89 × 190	FK0	6	36.5	43.8	51.1
	18,000	E37F421CPN183MFM9M	89 × 219	FM9	5	42.2	50.7	59.1
<b>450 Volts</b> 500 Volts Surge	2,700	E37F451HPN272MCB7M	50.8 × 117	CB7	34	9.8	11.7	13.7
	2,700	E37F451HPN272MCD0M	50.8 × 130	CD0	34	10.1	12.1	14.2
	2,200	E37F451CPN222MD92M	63.5 × 92	D92	42	9.1	10.9	12.8
	2,700	E37F451CPN272MDA5M	63.5 × 105	DA5	34	10.5	12.7	14.8
	3,300	E37F451CPN332MDB7M	63.5 × 117	DB7	28	12.1	14.6	17.0
	3,900	E37F451CPN392MDD0M	63.5 × 130	DD0	23	13.7	16.4	19.1
	4,700	E37F451CPN472MDE3M	63.5 × 143	DE3	19	15.5	18.6	21.8
	3,900	E37F451CPN392ME92M	76.2 × 92	E92	24	13.2	15.8	18.4
	4,700	E37F451CPN472MEA5M	76.2 × 105	EA5	20	15.1	18.1	21.1
	5,600	E37F451CPN562MEB7M	76.2 × 117	EB7	17	17.1	20.5	24.0
	6,800	E37F451CPN682MEE3M	76.2 × 143	EE3	14	20.2	24.3	28.3
	8,200	E37F451CPN822MEJ1M	76.2 × 181	EJ1	12	24.3	29.1	34.0
	12,000	E37F451CPN123MEM9M	76.2 × 219	EM9	8	31.7	38.0	44.4
	5,600	E37F451CPN562MF92M	89 × 92	F92	17	17.3	20.8	24.2
	6,800	E37F451CPN682MFA5M	89 × 105	FA5	14	19.9	23.8	27.8
	6,800	E37F451CPN682MFB7M	89 × 117	FB7	14	20.6	24.8	28.9
	8,200	E37F451CPN822MFE3M	89 × 143	FE3	12	24.3	29.1	34.0
	12,000	E37F451CPN123MFF5M	89 × 155	FF5	8	30.2	36.3	42.3
	15,000	E37F451CPN153MFK0M	89 × 190	FK0	6	36.5	43.8	51.1
	15,000	E37F451CPN153MFM9M	89 × 219	FM9	6	38.6	46.3	54.0
<b>500 Volts</b> 550 Volts Surge	1,500	E37F501HPN152MCB7M	50.8 × 117	CB7	63	7.2	8.6	10.1
	1,800	E37F501HPN182MCD0M	50.8 × 130	CD0	55	8.0	9.6	11.2
	1,800	E37F501CPN182MD92M	63.5 × 92	D92	52	8.2	9.8	11.5
	2,200	E37F501CPN222MDA5M	63.5 × 105	DA5	43	9.4	11.2	13.1
	2,700	E37F501CPN272MDB7M	63.5 × 117	DB7	37	10.5	12.6	14.7
	3,300	E37F501CPN332MDD0M	63.5 × 130	DD0	32	11.7	14.0	16.3
	3,300	E37F501CPN332MDE3M	63.5 × 143	DE3	29	12.8	15.4	17.9
	2,700	E37F501CPN272ME92M	76.2 × 92	E92	36	10.9	13.1	15.3
	3,300	E37F501CPN332MEA5M	76.2 × 105	EA5	30	12.5	15.0	17.5
	3,900	E37F501CPN392MEB7M	76.2 × 117	EB7	25	14.0	16.8	19.6
	5,600	E37F501CPN562MEE3M	76.2 × 143	EE3	20	17.1	20.5	23.9
	6,800	E37F501CPN682MEJ1M	76.2 × 181	EJ1	15	21.5	25.8	30.1
	8,200	E37F501CPN822MEM9M	76.2 × 219	EM9	12	26.0	31.2	36.3
	3,900	E37F501CPN392MF92M	89 × 92	F92	25	14.2	17.1	19.9
	4,700	E37F501CPN472MFA5M	89 × 105	FA5	21	16.2	19.5	22.7
	5,600	E37F501CPN562MFB7M	89 × 117	FB7	18	18.2	21.8	25.5
	6,800	E37F501CPN682MFE3M	89 × 143	FE3	14	22.1	26.5	30.9
	8,200	E37F501CPN822MFF5M	89 × 155	FF5	13	24.0	28.8	33.6
	10,000	E37F501CPN103MFK0M	89 × 190	FK0	10	29.2	35.1	40.9
	12,000	E37F501CPN123MFM9M	89 × 219	FM9	8	33.5	40.2	46.9

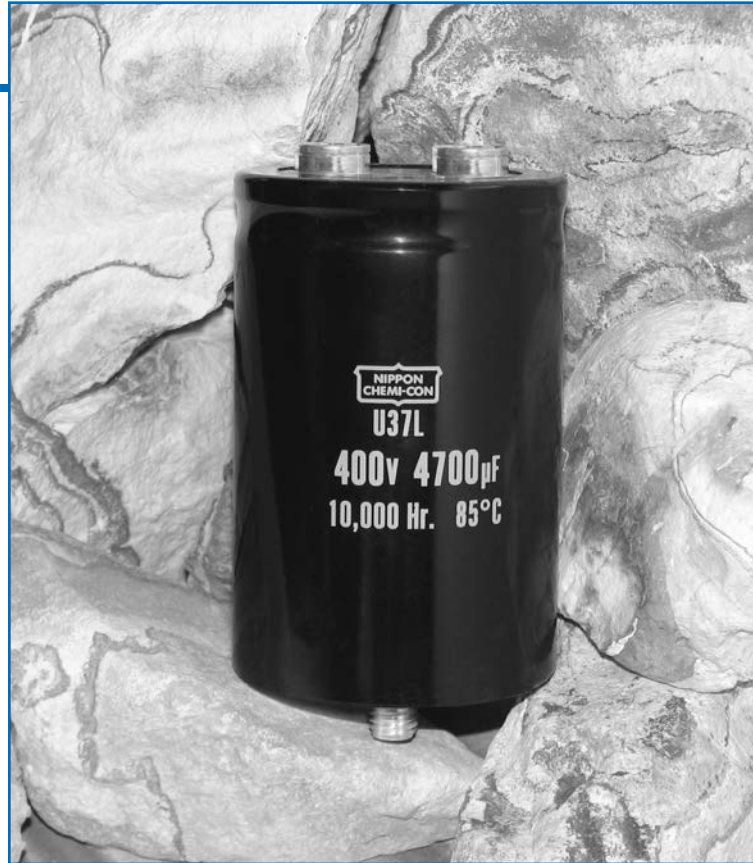
† For terminal, mounting and construction options, refer to the part numbering system for descriptions and codes.

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

# U37L Series NEW



- Large Can
- Screw Terminals
- High Ripple
- 350 to 500VDC Ratings
- RoHS Compliant
- 10,000 Hours Lifetime at +85°C
- Up to 175,000 Hours Useful Life



The U37L series is a longer life version of the U37 grade series and is specifically designed to provide the ripple current capability and long life required for high reliability inverter applications. The U37L has an endurance rating of 10,000 hours at +85°C with the rated ripple current applied. The useful life can exceed 175,000 hours at +40°C and 2x the ripple current. These capacitors are available in a variety of high current English or Metric thread terminals. Mounting options include a three-footed clamp or bottom threaded stud. Custom designs are also available.

## Summary of Specifications

- Screw terminals: high and low post, English and Metric thread.
- Capacitance range: 1,500 to 18,000µF.
- Voltage range: 350 to 500VDC.
- Category temperature range: -40°C to +85°C.
- Leakage current: 0.02CV(µA) or 5mA, whichever is smaller, after 5 minutes at +25°C.
- Standard capacitance tolerance: ±20%
- Nominal case size (D × L): D = 50.8mm (2.000") to 89mm (3.500"); L = 92mm (3.625") to 219mm (8.625").
- Rated lifetime: 10,000 hours at +85°C with rated ripple current applied.



# U37L Series

## U37L Specifications - Screw Terminals

Item	Characteristics																																															
Category Temperature Range	- 40 to +85°C																																															
Rated Voltage Range	350 to 500VDC																																															
Capacitance Range	1,500 to 18,000µF at +25°C, 120Hz																																															
Capacitance Tolerance	± 20% (M) at +25°C, 120Hz																																															
Leakage Current	I = 0.02CV (µA) or 5mA, whichever is smaller, after 5 minutes at +25°C. Where I = Max. leakage current (µA), C = Nominal capacitance (µF) and V = Rated voltage (V)																																															
Rated Ripple Current Multipliers	<p>Ambient Temperature (°C)</p> <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> <p>Frequency (Hz)</p> <table border="1"> <tr> <td>DC Rated Voltage</td> <td>50Hz</td> <td>120Hz</td> <td>300Hz</td> <td>1kHz</td> <td>3kHz</td> <td>10kHz</td> </tr> <tr> <td>350-500V</td> <td>0.80</td> <td>1.00</td> <td>1.20</td> <td>1.30</td> <td>1.40</td> <td>1.41</td> </tr> </table> <p>To determine maximum ripple current at a specified temperature and frequency, use the appropriate multiplier shown.</p>	+45°C	+65°C	+85°C	2.82	1.73	1.00	DC Rated Voltage	50Hz	120Hz	300Hz	1kHz	3kHz	10kHz	350-500V	0.80	1.00	1.20	1.30	1.40	1.41																											
+45°C	+65°C	+85°C																																														
2.82	1.73	1.00																																														
DC Rated Voltage	50Hz	120Hz	300Hz	1kHz	3kHz	10kHz																																										
350-500V	0.80	1.00	1.20	1.30	1.40	1.41																																										
Endurance (Load Life)	<p>The following specifications shall be satisfied when the capacitors are restored to +25°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.</p> <p>Capacitance change: ≤ 20% from initial measurement ESR change : ≤ 200% of initial specified limit Leakage current : ≤ initial specified limit</p>																																															
Useful Life	<p>With specified standard voltage and ripple current applied, typical life as function of ambient temperature is listed below.</p> <table border="1"> <tr> <td>+85°C</td> <td>13,000 hours max.</td> <td rowspan="3">Capacitance change: ≤ 30% from initial measurement ESR change : ≤ 300% of initial specified limit Leakage current : ≤ initial specified limit</td> </tr> <tr> <td>+65°C</td> <td>47,700 hours max.</td> </tr> <tr> <td>+45°C</td> <td>175,000 hours max.</td> </tr> </table>	+85°C	13,000 hours max.	Capacitance change: ≤ 30% from initial measurement ESR change : ≤ 300% of initial specified limit Leakage current : ≤ initial specified limit	+65°C	47,700 hours max.	+45°C	175,000 hours max.																																								
+85°C	13,000 hours max.	Capacitance change: ≤ 30% from initial measurement ESR change : ≤ 300% of initial specified limit Leakage current : ≤ initial specified limit																																														
+65°C	47,700 hours max.																																															
+45°C	175,000 hours max.																																															
Shelf Life	<p>The following specifications shall be satisfied when the capacitors are restored to +25°C after exposing them for 500 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.</p> <p>Capacitance change: ≤ 20% from initial measurement ESR change : ≤ 200% of initial specified limit Leakage current : ≤ initial specified limit</p>																																															
Vibration Rating	10-55Hz, 10g sinusoidal in three axes, 2 hours per axis.																																															
Maximum Tightening Torque	<table border="1"> <tr> <td>Terminal Code</td> <td>HP</td> <td>HL</td> <td>CD</td> <td>CP</td> <td>CH</td> <td>CA</td> <td>CS</td> </tr> <tr> <td>Thread Size</td> <td>10-32 NF-2B</td> <td>M5x0.8-6H</td> <td></td> <td>¼-28 NF-2B</td> <td></td> <td>M6x1-6H</td> <td></td> </tr> <tr> <td>3 Threads Engaged</td> <td colspan="3">2.0 N·m (18.0 in·lb)</td> <td colspan="4">4.0 N·m (35.0 in·lb)</td> </tr> <tr> <td>6 Threads Engaged</td> <td colspan="3">2.8 N·m (25.0 in·lb)</td> <td colspan="4">6.2 N·m (55.0 in·lb)</td> </tr> </table>	Terminal Code	HP	HL	CD	CP	CH	CA	CS	Thread Size	10-32 NF-2B	M5x0.8-6H		¼-28 NF-2B		M6x1-6H		3 Threads Engaged	2.0 N·m (18.0 in·lb)			4.0 N·m (35.0 in·lb)				6 Threads Engaged	2.8 N·m (25.0 in·lb)			6.2 N·m (55.0 in·lb)																		
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Typical Inductance (nH) at 1MHz	<table border="1"> <tr> <td rowspan="2">Case Diameter (mm)</td> <td colspan="7">Terminal Code</td> </tr> <tr> <td>HP</td> <td>HL</td> <td>CD</td> <td>CP</td> <td>CH</td> <td>CA</td> <td>CS</td> </tr> <tr> <td>Ø50.8</td> <td>—</td> <td>—</td> <td>NA</td> <td>NA</td> <td>NA</td> <td>NA</td> <td>NA</td> </tr> <tr> <td>Ø63.5</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> </tr> <tr> <td>Ø76.2</td> <td>30</td> <td>30</td> <td>25</td> <td>20</td> <td>25</td> <td>20</td> <td>25</td> </tr> <tr> <td>Ø89.0</td> <td>30</td> <td>30</td> <td>25</td> <td>20</td> <td>25</td> <td>20</td> <td>25</td> </tr> </table>	Case Diameter (mm)	Terminal Code							HP	HL	CD	CP	CH	CA	CS	Ø50.8	—	—	NA	NA	NA	NA	NA	Ø63.5	—	—	—	—	—	—	—	Ø76.2	30	30	25	20	25	20	25	Ø89.0	30	30	25	20	25	20	25
Case Diameter (mm)	Terminal Code																																															
	HP	HL	CD	CP	CH	CA	CS																																									
Ø50.8	—	—	NA	NA	NA	NA	NA																																									
Ø63.5	—	—	—	—	—	—	—																																									
Ø76.2	30	30	25	20	25	20	25																																									
Ø89.0	30	30	25	20	25	20	25																																									
Custom Designs	Custom CV values per case size and termination type may be available upon request. Contact appropriate representative with specific requirements.																																															

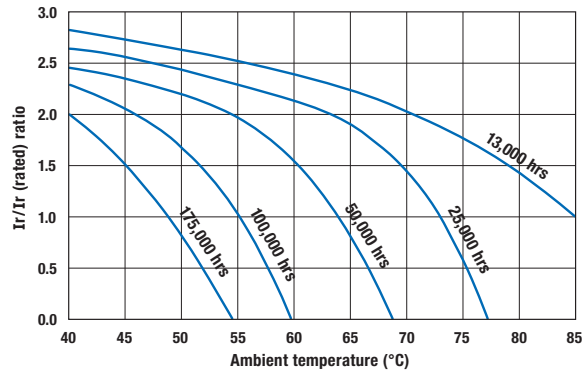
U37L  
SCREW MOUNT 85°C

# U37L Series

## U37L Useful Life

### Useful Life: 13,000 Hours at +85°C

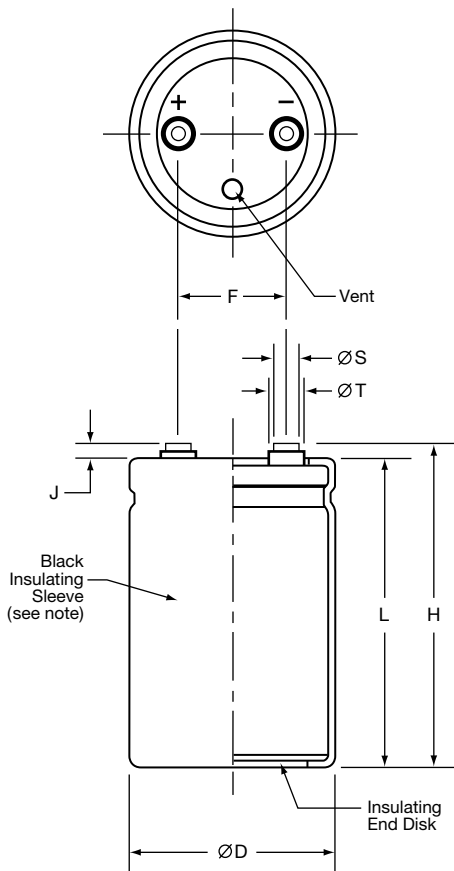
The life expectancy of a capacitor is shown as a function of ambient temperature and ripple current load.



## Diagram of Dimensions - Screw Terminals

### Large Can/Screw Terminals

Unit: mm (inches)



### Case Dimensions and Standard Box Quantities

Case Size Code	$\varnothing D$ +2.0 (0.080)	L $\pm 1.0$ (0.040)	F $\pm 0.25$ (0.010)	Standard Box Quantity
CB7 CD0	50.8 (2.000)	117 (4.625) 130 (5.125)	22.2 (0.875)	49
D92 DA5 DB7 DD0 DE3	63.5 (2.500)	92 (3.625) 105 (4.125) 117 (4.625) 130 (5.125) 143 (5.625)	28.6 (1.125)	20
E92 EA5 EB7 EE3 EJ1 EM9	76.2 (3.000)	92 (3.625) 105 (4.125) 117 (4.625) 143 (5.625) 181 (7.125) 219 (8.625)	31.8 (1.250)	16 9
F92 FA5 FB7 FE3 FF5 FK0 FM9	89.0 (3.500)	92 (3.625) 105 (4.125) 117 (4.625) 143 (5.625) 155 (6.125) 190 (7.500) 219 (8.625)	31.8 (1.250)	5

Note:  
In some cases, the color of the sleeve may change slightly due to the operating conditions, however, the discoloration will not impair capacitor function.

### Terminal Specifications

Terminal Code	Available Case Diameter		Thread Size	Minimum Thread Depth	J $\pm 0.5$ (0.020)	H $\pm 2.0$ (0.080)	$\varnothing S$ $\pm 0.25$ (0.010)	$\varnothing T$ $\pm 0.25$ (0.010)
	$\varnothing D$ Code	$\varnothing D$ mm (inches)						
HP	C	50.8 (2.000)	10-32 NF-2B	9.5 (0.375)	6.4 (0.250)	L+J	8.0 (0.313)	11.1 (0.438)
HL	C	50.8 (2.000)	M5x0.8-6H	9.5 (0.375)	6.4 (0.250)	L+J	8.0 (0.313)	11.1 (0.438)
CD	D-E	63.5 - 76.2 (2.500 - 3.000)	M5x0.8-6H	8.5 (0.335)	5.0 (0.200)	L+J	13.0 (0.512)	18.8 (0.740)
CP	D-F	63.5 - 89.0 (2.500 - 3.500)	1/4 - 28 NF-2B	8.7 (0.344)	2.4 (0.093)	L+J	17.5 (0.689)	—
CH	D-F	63.5 - 89.0 (2.500 - 3.500)	1/4 - 28 NF-2B	11.9 (0.468)	6.4 (0.250)	L+J	17.5 (0.689)	—
CA	D-F	63.5 - 89.0 (2.500 - 3.500)	M6x1-6H	8.7 (0.344)	2.4 (0.093)	L+J	17.5 (0.689)	—
CS	D-F	63.5 - 89.0 (2.500 - 3.500)	M6x1-6H	11.9 (0.468)	6.4 (0.250)	L+J	17.5 (0.689)	—

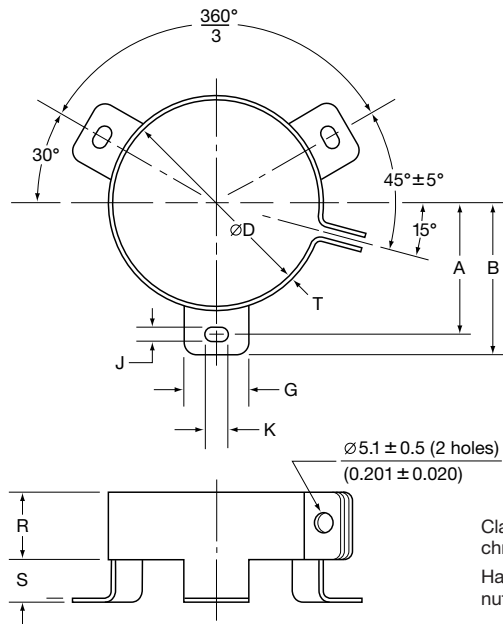
Mounting Hardware is optional. Refer to hardware specifications on the following page.

# U37L Series

## Mounting Hardware - Screw Terminals

### Type C: Three-Footed Clamp

Unit: mm (inches)



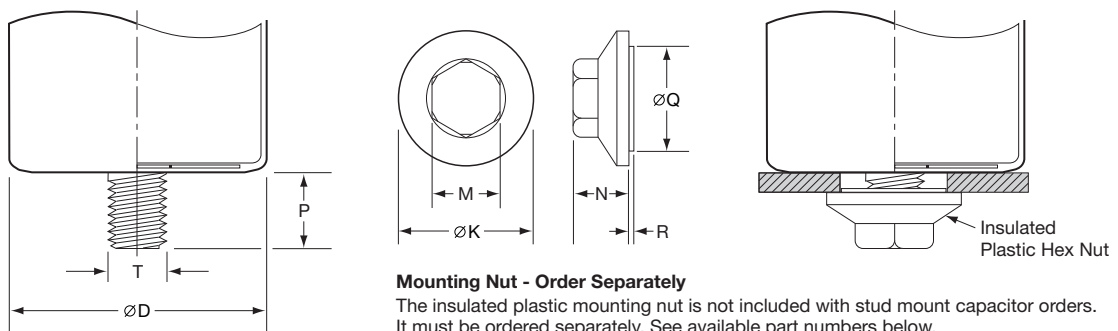
Clamp: Zinc with silver trivalent chromate post treatment.

Hardware: Screw, washer and hexagon nut included with each clamp.

### Type C: Clamp Dimensions

Mounting Code	Case øD	A ±1.0 (0.040)	B ±1.0 (0.040)	G ±1.0 (0.040)	J ±0.5 (0.020)	K ±0.5 (0.020)	R ±1.0 (0.040)	S ±1.0 (0.040)	T ±0.5 (0.020)
C	50.8 (2.000)	31.8 (1.250)	36.5 (1.437)	13.3 (0.524)	4.5 (0.177)	7.1 (0.280)	19.1 (0.751)	9.5 (0.374)	0.8 (0.032)
C	63.5 (2.500)	38.1 (1.500)	42.9 (1.689)	13.3 (0.524)	4.5 (0.177)	7.1 (0.280)	19.1 (0.751)	9.5 (0.374)	0.8 (0.032)
C	76.2 (3.000)	44.5 (1.750)	49.2 (1.937)	13.3 (0.524)	4.5 (0.177)	7.1 (0.280)	19.1 (0.751)	9.5 (0.374)	1.0 (0.040)
C	89.0 (3.500)	50.8 (2.000)	56.5 (2.224)	16.0 (0.630)	4.5 (0.177)	8.0 (0.313)	21.0 (0.827)	9.0 (0.354)	1.0 (0.040)

### Type S: Stud Mounting



#### Mounting Nut - Order Separately

The insulated plastic mounting nut is not included with stud mount capacitor orders. It must be ordered separately. See available part numbers below.

### Type S: Stud Dimensions

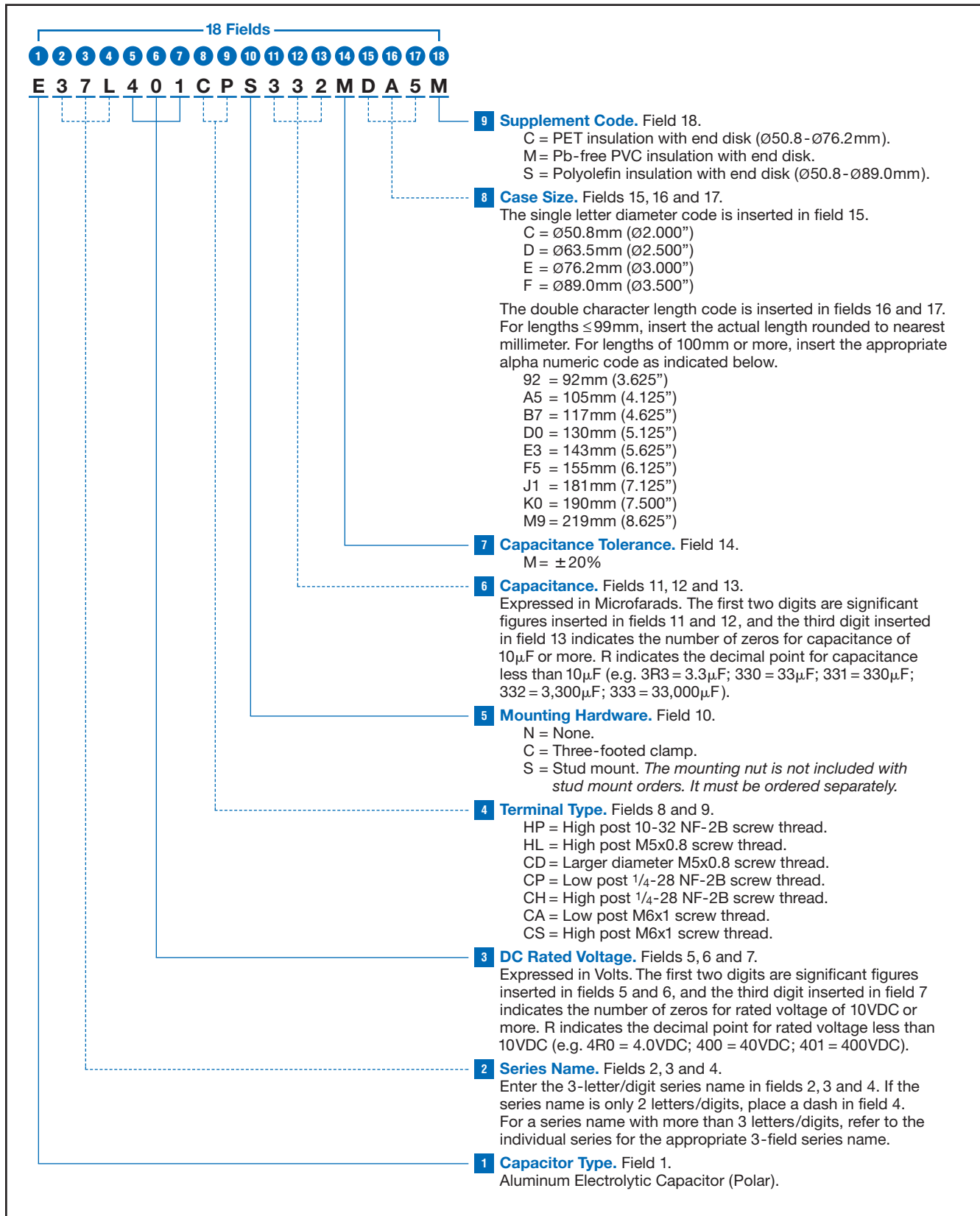
Mounting Code	P ±1.0 (0.040)	T Thread Size
S	16.0 (0.630)	M12

### Mounting Nut Dimensions

Part Number	øK ±2.0 (0.080)	M ±1.0 (0.040)	N ±1.0 (0.040)	øQ ±1.0 (0.040)	R ±1.0 (0.040)
50-8D	30.0 (1.181)	19.0 (0.748)	18.0 (0.709)	22.0 (0.866)	1.40 (0.055)
50-8E	38.0 (1.496)	19.0 (0.748)	18.0 (0.709)	30.0 (1.181)	1.40 (0.055)

# U37L Series

**Part Numbering System for U37L Series** When ordering, always specify complete 18-field global part number.



**U37L**  
**SCREW MOUNT 85°C**

# U37L Series

## Standard Voltage Ratings - Screw Terminals

Rated Voltage (VWDC)	Capacitance (µF)	Global Part Number†	Nominal Case Size* D × L (mm)	Case Size Code	Maximum ESR (mΩ) at +25°C, 120Hz	Rated Ripple Current (A rms) at +85°C		
						120Hz	300Hz	>3kHz
<b>350 Volts</b> 400 Volts Surge	3,300	E37L351HPN332MCB7M	50.8 × 117	CB7	29	10.6	12.7	14.8
	3,300	E37L351HPN332MCD0M	50.8 × 130	CD0	29	11.0	13.1	15.3
	3,300	E37L351CPN332MD92M	63.5 × 92	D92	30	10.7	12.8	15.0
	3,900	E37L351CPN392MDA5M	63.5 × 105	DA5	26	12.2	14.6	17.0
	3,900	E37L351CPN392MDB7M	63.5 × 117	DB7	26	12.6	15.2	17.7
	4,700	E37L351CPN472MDD0M	63.5 × 130	DD0	21	14.4	17.3	20.2
	5,600	E37L351CPN562MDE3M	63.5 × 143	DE3	18	16.3	19.5	22.8
	4,700	E37L351CPN472ME92M	76.2 × 92	E92	22	13.9	16.7	19.5
	5,600	E37L351CPN562MEA5M	76.2 × 105	EA5	18	15.8	19.0	22.1
	6,800	E37L351CPN682MEB7M	76.2 × 117	EB7	15	18.1	21.7	25.4
	8,200	E37L351CPN822MEE3M	76.2 × 143	EE3	13	21.3	25.6	29.9
	12,000	E37L351CPN123MEJ1M	76.2 × 181	EJ1	9	28.2	33.9	39.5
	15,000	E37L351CPN153MEM9M	76.2 × 219	EM9	7	34.0	40.8	47.6
	6,800	E37L351CPN682MF92M	89 × 92	F92	15	18.3	22.0	25.6
	8,200	E37L351CPN822MFA5M	89 × 105	FA5	13	21.0	25.2	29.3
	8,200	E37L351CPN822MFB7M	89 × 117	FB7	13	21.8	26.1	30.5
	12,000	E37L351CPN123MFE3M	89 × 143	FE3	9	28.2	33.8	39.5
	12,000	E37L351CPN123MFF5M	89 × 155	FF5	9	29.0	34.8	40.6
15,000	E37L351CPN153MFK0M	89 × 190	FK0	7	35.0	42.0	49.1	
18,000	E37L351CPN183MFM9M	89 × 219	FM9	6	41.1	49.4	57.6	
<b>400 Volts</b> 450 Volts Surge	2,700	E37L401HPN272MCB7M	50.8 × 117	CB7	35	9.5	11.5	13.4
	3,300	E37L401HPN332MCD0M	50.8 × 130	CD0	29	11.0	13.1	15.3
	2,700	E37L401CPN272MD92M	63.5 × 92	D92	37	9.7	11.6	13.6
	3,300	E37L401CPN332MDA5M	63.5 × 105	DA5	30	11.2	13.4	15.7
	3,900	E37L401CPN392MDB7M	63.5 × 117	DB7	26	12.6	15.2	17.7
	3,900	E37L401CPN392MDD0M	63.5 × 130	DD0	26	13.1	15.7	18.4
	4,700	E37L401CPN472MDE3M	63.5 × 143	DE3	21	14.9	17.9	20.9
	3,900	E37L401CPN392ME92M	76.2 × 92	E92	27	12.7	15.2	17.7
	4,700	E37L401CPN472MEA5M	76.2 × 105	EA5	22	14.5	17.4	20.3
	5,600	E37L401CPN562MEB7M	76.2 × 117	EB7	18	16.4	19.7	23.0
	6,800	E37L401CPN682MEE3M	76.2 × 143	EE3	15	19.4	23.3	27.2
	10,000	E37L401CPN103MEJ1M	76.2 × 181	EJ1	10	25.8	30.9	36.1
	12,000	E37L401CPN123MEM9M	76.2 × 219	EM9	9	30.4	36.5	42.6
	5,600	E37L401CPN562MF92M	89 × 92	F92	18	16.6	20.0	23.3
	6,800	E37L401CPN682MFA5M	89 × 105	FA5	15	19.1	22.9	26.7
	8,200	E37L401CPN822MFB7M	89 × 117	FB7	13	21.8	26.1	30.5
	10,000	E37L401CPN103MFE3M	89 × 143	FE3	10	25.7	30.9	36.0
	12,000	E37L401CPN123MFF5M	89 × 155	FF5	9	29.0	34.8	40.6
15,000	E37L401CPN153MFK0M	89 × 190	FK0	7	35.0	42.0	49.1	
18,000	E37L401CPN183MFM9M	89 × 219	FM9	6	40.6	48.7	56.8	
<b>420 Volts</b> 470 Volts Surge	2,700	E37L421HPN272MCB7M	50.8 × 117	CB7	35	9.5	11.5	13.4
	2,900	E37L421HPN292MCD0M	50.8 × 130	CD0	33	10.3	12.3	14.4
	2,200	E37L421CPN222MD92M	63.5 × 92	D92	45	8.7	10.5	12.2
	2,700	E37L421CPN272MDA5M	63.5 × 105	DA5	37	10.1	12.1	14.2
	3,300	E37L421CPN332MDB7M	63.5 × 117	DB7	30	11.6	14.0	16.3
	3,900	E37L421CPN392MDD0M	63.5 × 130	DD0	26	13.1	15.7	18.4
	4,700	E37L421CPN472MDE3M	63.5 × 143	DE3	21	14.9	17.9	20.9
	3,900	E37L421CPN392ME92M	76.2 × 92	E92	27	12.7	15.2	17.7
	4,700	E37L421CPN472MEA5M	76.2 × 105	EA5	22	14.5	17.4	20.3
	5,600	E37L421CPN562MEB7M	76.2 × 117	EB7	18	16.4	19.7	23.0
	6,800	E37L421CPN682MEE3M	76.2 × 143	EE3	15	19.4	23.3	27.2
	8,200	E37L421CPN822MEJ1M	76.2 × 181	EJ1	13	23.3	28.0	32.7
	12,000	E37L421CPN123MEM9M	76.2 × 219	EM9	9	30.4	36.5	42.6
	5,600	E37L421CPN562MF92M	89 × 92	F92	18	16.6	20.0	23.3
	6,800	E37L421CPN682MFA5M	89 × 105	FA5	15	19.1	22.9	26.7

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

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

# U37L Series

## Standard Voltage Ratings - Screw Terminals

Rated Voltage (WVDC)	Capacitance (µF)	Global Part Number†	Nominal Case Size* D × L (mm)	Case Size Code	Maximum ESR (mΩ) at +25°C, 120Hz	Rated Ripple Current (A rms) at +85°C		
						120Hz	300Hz	>3kHz

<b>420 Volts 470 Volts Surge</b>	6,800	E37L421CPN682MFB7M	89 × 117	FB7	15	19.8	23.8	27.8
	10,000	E37L421CPN103MFE3M	89 × 143	FE3	10	25.7	30.9	36.0
	10,000	E37L421CPN103MFF5M	89 × 155	FF5	10	26.5	31.8	37.1
	12,000	E37L421CPN123MFK0M	89 × 190	FK0	9	31.3	37.6	43.9
	15,000	E37L421CPN153MFM9M	89 × 219	FM9	7	37.0	44.5	51.9

<b>450 Volts 500 Volts Surge</b>	2,200	E37L451HPN222MCB7M	50.8 × 117	CB7	43	8.6	10.3	12.1
	2,200	E37L451HPN222MCD0M	50.8 × 130	CD0	43	8.9	10.7	12.5
	2,200	E37L451CPN222MD92M	63.5 × 92	D92	45	8.7	10.5	12.2
	2,200	E37L451CPN222MDA5M	63.5 × 105	DA5	45	9.1	11.0	12.8
	2,700	E37L451CPN272MDB7M	63.5 × 117	DB7	37	10.5	12.6	14.7
	3,300	E37L451CPN332MDD0M	63.5 × 130	DD0	30	12.1	14.5	16.9
	3,900	E37L451CPN392MDE3M	63.5 × 143	DE3	26	13.6	16.3	19.0
	3,300	E37L451CPN332ME92M	76.2 × 92	E92	31	11.6	14.0	16.3
	3,900	E37L451CPN392MEA5M	76.2 × 105	EA5	27	13.2	15.8	18.5
	4,700	E37L451CPN472MEB7M	76.2 × 117	EB7	22	15.1	18.1	21.1
	5,600	E37L451CPN562MEE3M	76.2 × 143	EE3	18	17.6	21.2	24.7
	6,800	E37L451CPN682MEJ1M	76.2 × 181	EJ1	15	21.2	25.5	29.7
	10,000	E37L451CPN103MEM9M	76.2 × 219	EM9	10	27.8	33.3	38.9
	4,700	E37L451CPN472MF92M	89 × 92	F92	22	15.2	18.3	21.3
	5,600	E37L451CPN562MFA5M	89 × 105	FA5	18	17.3	20.8	24.2
	5,600	E37L451CPN562MFB7M	89 × 117	FB7	18	18.0	21.6	25.2
	8,200	E37L451CPN822MFE3M	89 × 143	FE3	13	23.3	28.0	32.6
	8,200	E37L451CPN822MFF5M	89 × 155	FF5	13	24.0	28.8	33.6
12,000	E37L451CPN123MFK0M	89 × 190	FK0	9	31.3	37.6	43.9	
12,000	E37L451CPN123MFM9M	89 × 219	FM9	9	33.1	39.8	46.4	

<b>500 Volts 550 Volts Surge</b>	1,500	E37L501HPN152MCB7M	50.8 × 117	CB7	64	7.1	8.5	10.0
	1,500	E37L501HPN152MCD0M	50.8 × 130	CD0	64	7.4	8.9	10.3
	1,800	E37L501CPN182MD92M	63.5 × 92	D92	55	7.9	9.5	11.1
	2,200	E37L501CPN222MDA5M	63.5 × 105	DA5	45	9.1	11.0	12.8
	2,200	E37L501CPN222MDB7M	63.5 × 117	DB7	45	9.5	11.4	13.3
	2,700	E37L501CPN272MDD0M	63.5 × 130	DD0	37	10.9	13.1	15.3
	2,700	E37L501CPN272MDE3M	63.5 × 143	DE3	37	11.3	13.6	15.8
	2,700	E37L501CPN272ME92M	76.2 × 92	E92	38	10.5	12.6	14.7
	3,300	E37L501CPN332MEA5M	76.2 × 105	EA5	31	12.1	14.6	17.0
	3,300	E37L501CPN332MEB7M	76.2 × 117	EB7	31	12.6	15.2	17.7
	4,700	E37L501CPN472MEE3M	76.2 × 143	EE3	22	16.2	19.4	22.6
	5,600	E37L501CPN562MEJ1M	76.2 × 181	EJ1	18	19.3	23.1	27.0
	8,200	E37L501CPN822MEM9M	76.2 × 219	EM9	13	25.2	30.2	35.2
	3,900	E37L501CPN392MF92M	89 × 92	F92	27	13.9	16.6	19.4
	3,900	E37L501CPN392MFA5M	89 × 105	FA5	27	14.5	17.3	20.2
	4,700	E37L501CPN472MFB7M	89 × 117	FB7	22	16.5	19.8	23.1
	6,800	E37L501CPN682MFE3M	89 × 143	FE3	15	21.2	25.5	29.7
	6,800	E37L501CPN682MFF5M	89 × 155	FF5	15	21.9	26.2	30.6
	8,200	E37L501CPN822MFK0M	89 × 190	FK0	12	26.7	32.0	37.4
	10,000	E37L501CPN103MFM9M	89 × 219	FM9	9	33.1	39.8	46.4

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

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

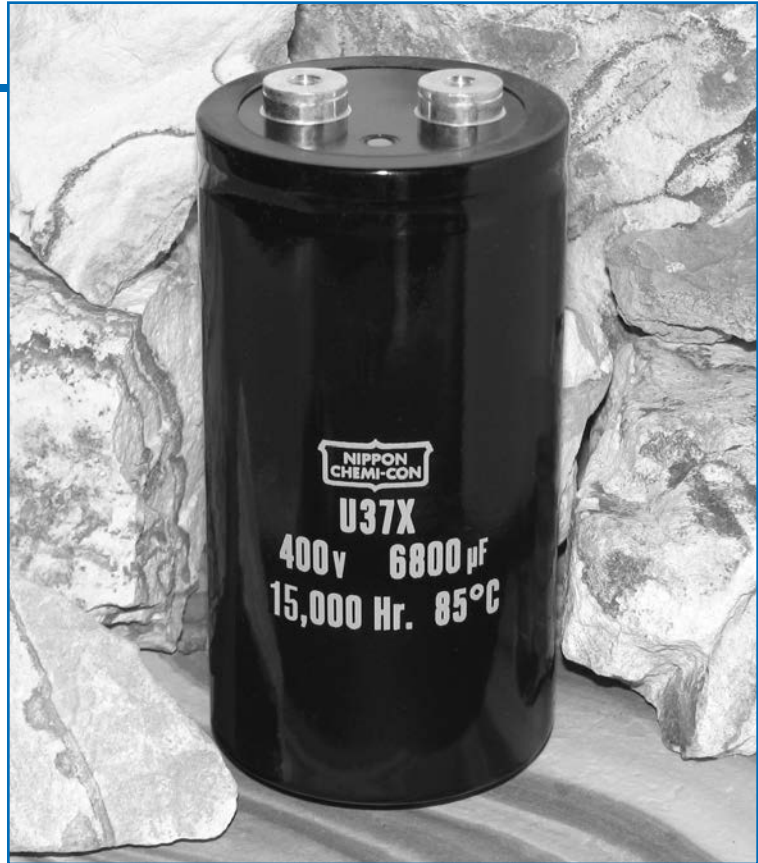
U37L  
SCREW MOUNT 85°C



# U37X Series NEW



- Large Can
- Screw Terminals
- High Ripple
- 350 to 500VDC Ratings
- RoHS Compliant
- 15,000 Hours Lifetime at +85°C
- Up to 175,000 Hours Useful Life



The U37X series is the longest life version of the U37 grade series and is specifically designed to provide the ripple current capability and long life required for high reliability inverter applications. The U37X has an endurance rating of 15,000 hours at +85°C with the rated ripple current applied. The useful life can exceed 175,000 hours at +40°C and 2.1x the ripple current. These capacitors are available in a variety of high current English or Metric thread terminals. Mounting options include a three-footed clamp or bottom threaded stud. Custom designs are also available.

## Summary of Specifications

- Screw terminals: high and low post, English and Metric thread.
- Capacitance range: 1,200 to 18,000µF.
- Voltage range: 350 to 500VDC.
- Category temperature range: -40°C to +85°C.
- Leakage current: 0.02CV(µA) or 5mA, whichever is smaller, after 5 minutes at +25°C.
- Standard capacitance tolerance: ±20%
- Nominal case size (D × L): D = 50.8mm (2.000") to 89mm (3.500"); L = 92mm (3.625") to 219mm (8.625").
- Rated lifetime: 15,000 hours at +85°C with rated ripple current applied.

# U37X Series

## U37X Specifications - Screw Terminals

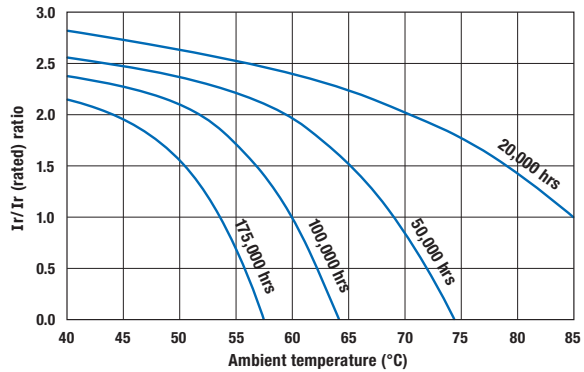
Item	Characteristics																																															
Category Temperature Range	- 40 to +85°C																																															
Rated Voltage Range	350 to 500VDC																																															
Capacitance Range	1,200 to 18,000µF at +25°C, 120Hz																																															
Capacitance Tolerance	±20% (M) at +25°C, 120Hz																																															
Leakage Current	I = 0.02CV (µA) or 5mA, whichever is smaller, after 5 minutes at +25°C. Where I = Max. leakage current (µA), C = Nominal capacitance (µF) and V = Rated voltage (V)																																															
Rated Ripple Current Multipliers	<p>Ambient Temperature (°C)</p> <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> <p>Frequency (Hz)</p> <table border="1"> <tr> <td>DC Rated Voltage</td> <td>50Hz</td> <td>120Hz</td> <td>300Hz</td> <td>1kHz</td> <td>3kHz</td> <td>10kHz</td> </tr> <tr> <td>350-500V</td> <td>0.80</td> <td>1.00</td> <td>1.20</td> <td>1.30</td> <td>1.40</td> <td>1.41</td> </tr> </table> <p>To determine maximum ripple current at a specified temperature and frequency, use the appropriate multiplier shown.</p>	+45°C	+65°C	+85°C	2.82	1.73	1.00	DC Rated Voltage	50Hz	120Hz	300Hz	1kHz	3kHz	10kHz	350-500V	0.80	1.00	1.20	1.30	1.40	1.41																											
+45°C	+65°C	+85°C																																														
2.82	1.73	1.00																																														
DC Rated Voltage	50Hz	120Hz	300Hz	1kHz	3kHz	10kHz																																										
350-500V	0.80	1.00	1.20	1.30	1.40	1.41																																										
Endurance (Load Life)	<p>The following specifications shall be satisfied when the capacitors are restored to +25°C after subjecting them to DC voltage for 15,000 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.</p> <p>Capacitance change: ≤ 20% from initial measurement ESR change : ≤ 200% of initial specified limit Leakage current : ≤ initial specified limit</p>																																															
Useful Life	<p>With specified standard voltage and ripple current applied, typical life as function of ambient temperature is listed below.</p> <table border="1"> <tr> <td>+85°C</td> <td>20,000 hours max.</td> </tr> <tr> <td>+65°C</td> <td>71,600 hours max.</td> </tr> <tr> <td>+45°C</td> <td>175,000 hours max.</td> </tr> </table> <p>Capacitance change: ≤ 30% from initial measurement ESR change : ≤ 300% of initial specified limit Leakage current : ≤ initial specified limit</p>	+85°C	20,000 hours max.	+65°C	71,600 hours max.	+45°C	175,000 hours max.																																									
+85°C	20,000 hours max.																																															
+65°C	71,600 hours max.																																															
+45°C	175,000 hours max.																																															
Shelf Life	<p>The following specifications shall be satisfied when the capacitors are restored to +25°C after exposing them for 500 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.</p> <p>Capacitance change: ≤ 20% from initial measurement ESR change : ≤ 200% of initial specified limit Leakage current : ≤ initial specified limit</p>																																															
Vibration Rating	10-55Hz, 10g sinusoidal in three axes, 2 hours per axis.																																															
Maximum Tightening Torque	<table border="1"> <tr> <td>Terminal Code</td> <td>HP</td> <td>HL</td> <td>CD</td> <td>CP</td> <td>CH</td> <td>CA</td> <td>CS</td> </tr> <tr> <td>Thread Size</td> <td>10-32 NF-2B</td> <td>M5x0.8-6H</td> <td></td> <td>1/4-28 NF-2B</td> <td></td> <td>M6x1-6H</td> <td></td> </tr> <tr> <td>3 Threads Engaged</td> <td colspan="3">2.0 N·m (18.0 in·lb)</td> <td colspan="4">4.0 N·m (35.0 in·lb)</td> </tr> <tr> <td>6 Threads Engaged</td> <td colspan="3">2.8 N·m (25.0 in·lb)</td> <td colspan="4">6.2 N·m (55.0 in·lb)</td> </tr> </table>	Terminal Code	HP	HL	CD	CP	CH	CA	CS	Thread Size	10-32 NF-2B	M5x0.8-6H		1/4-28 NF-2B		M6x1-6H		3 Threads Engaged	2.0 N·m (18.0 in·lb)			4.0 N·m (35.0 in·lb)				6 Threads Engaged	2.8 N·m (25.0 in·lb)			6.2 N·m (55.0 in·lb)																		
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Typical Inductance (nH) at 1MHz	<table border="1"> <tr> <td rowspan="2">Case Diameter (mm)</td> <td colspan="7">Terminal Code</td> </tr> <tr> <td>HP</td> <td>HL</td> <td>CD</td> <td>CP</td> <td>CH</td> <td>CA</td> <td>CS</td> </tr> <tr> <td>ø50.8</td> <td>—</td> <td>—</td> <td>NA</td> <td>NA</td> <td>NA</td> <td>NA</td> <td>NA</td> </tr> <tr> <td>ø63.5</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> </tr> <tr> <td>ø76.2</td> <td>30</td> <td>30</td> <td>25</td> <td>20</td> <td>25</td> <td>20</td> <td>25</td> </tr> <tr> <td>ø89.0</td> <td>30</td> <td>30</td> <td>25</td> <td>20</td> <td>25</td> <td>20</td> <td>25</td> </tr> </table>	Case Diameter (mm)	Terminal Code							HP	HL	CD	CP	CH	CA	CS	ø50.8	—	—	NA	NA	NA	NA	NA	ø63.5	—	—	—	—	—	—	—	ø76.2	30	30	25	20	25	20	25	ø89.0	30	30	25	20	25	20	25
Case Diameter (mm)	Terminal Code																																															
	HP	HL	CD	CP	CH	CA	CS																																									
ø50.8	—	—	NA	NA	NA	NA	NA																																									
ø63.5	—	—	—	—	—	—	—																																									
ø76.2	30	30	25	20	25	20	25																																									
ø89.0	30	30	25	20	25	20	25																																									
Custom Designs	Custom CV values per case size and termination type may be available upon request. Contact appropriate representative with specific requirements.																																															

# U37X Series

## U37X Useful Life

### Useful Life: 20,000 Hours at +85°C

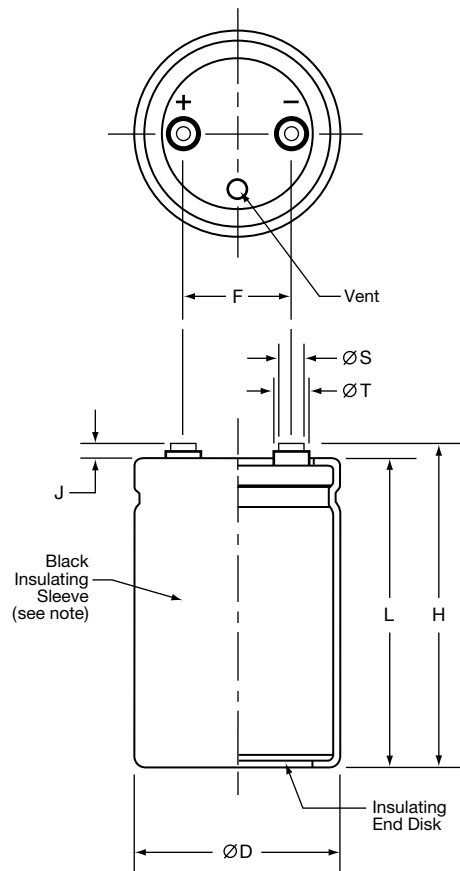
The life expectancy of a capacitor is shown as a function of ambient temperature and ripple current load.



## Diagram of Dimensions - Screw Terminals

### Large Can/Screw Terminals

Unit: mm (inches)



### Case Dimensions and Standard Box Quantities

Case Size Code	ØD +2.0 (0.080)	L ±1.0 (0.040)	F ±0.25 (0.010)	Standard Box Quantity
CB7 CD0	50.8 (2.000)	117 (4.625) 130 (5.125)	22.2 (0.875)	49
D92 DA5 DB7 DD0 DE3	63.5 (2.500)	92 (3.625) 105 (4.125) 117 (4.625) 130 (5.125) 143 (5.625)	28.6 (1.125)	20
E92 EA5 EB7 EE3 EJ1 EM9	76.2 (3.000)	92 (3.625) 105 (4.125) 117 (4.625) 143 (5.625) 181 (7.125) 219 (8.625)	31.8 (1.250)	16 9
F92 FA5 FB7 FE3 FF5 FK0 FM9	89.0 (3.500)	92 (3.625) 105 (4.125) 117 (4.625) 143 (5.625) 155 (6.125) 190 (7.500) 219 (8.625)	31.8 (1.250)	5

#### Note:

In some cases, the color of the sleeve may change slightly due to the operating conditions, however, the discoloration will not impair capacitor function.

### Terminal Specifications

Terminal Code	Available Case Diameter		Thread Size	Minimum Thread Depth	J ±0.5 (0.020)	H ±2.0 (0.080)	ØS ±0.25 (0.010)	ØT ±0.25 (0.010)
	ØD Code	ØD mm (inches)						
HP	C	50.8 (2.000)	10-32 NF-2B	9.5 (0.375)	6.4 (0.250)	L+J	8.0 (0.313)	11.1 (0.438)
HL	C	50.8 (2.000)	M5x0.8-6H	9.5 (0.375)	6.4 (0.250)	L+J	8.0 (0.313)	11.1 (0.438)
CD	D-E	63.5 - 76.2 (2.500 - 3.000)	M5x0.8-6H	8.5 (0.335)	5.0 (0.200)	L+J	13.0 (0.512)	18.8 (0.740)
CP	D-F	63.5 - 89.0 (2.500 - 3.500)	¼-28 NF-2B	8.7 (0.344)	2.4 (0.093)	L+J	17.5 (0.689)	—
CH	D-F	63.5 - 89.0 (2.500 - 3.500)	¼-28 NF-2B	11.9 (0.468)	6.4 (0.250)	L+J	17.5 (0.689)	—
CA	D-F	63.5 - 89.0 (2.500 - 3.500)	M6x1-6H	8.7 (0.344)	2.4 (0.093)	L+J	17.5 (0.689)	—
CS	D-F	63.5 - 89.0 (2.500 - 3.500)	M6x1-6H	11.9 (0.468)	6.4 (0.250)	L+J	17.5 (0.689)	—

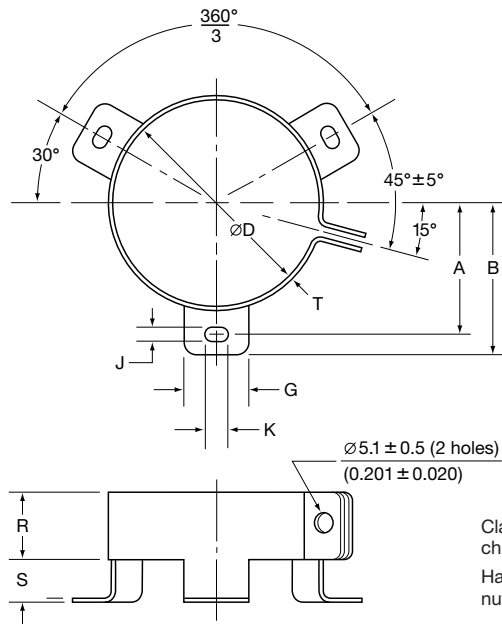
Mounting Hardware is optional. Refer to hardware specifications on the following page.

# U37X Series

## Mounting Hardware - Screw Terminals

### Type C: Three-Footed Clamp

Unit: mm (inches)

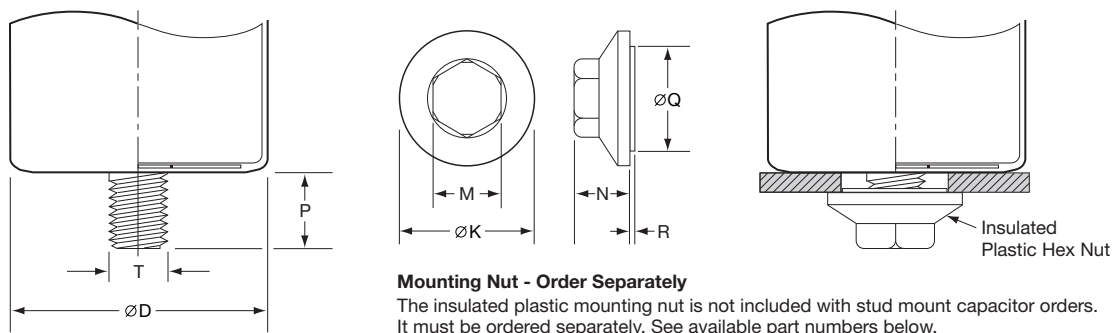


Clamp: Zinc with silver trivalent chromate post treatment.  
Hardware: Screw, washer and hexagon nut included with each clamp.

### Type C: Clamp Dimensions

Mounting Code	Case ØD	A ±1.0 (0.040)	B ±1.0 (0.040)	G ±1.0 (0.040)	J ±0.5 (0.020)	K ±0.5 (0.020)	R ±1.0 (0.040)	S ±1.0 (0.040)	T ±0.5 (0.020)
C	50.8 (2.000)	31.8 (1.250)	36.5 (1.437)	13.3 (0.524)	4.5 (0.177)	7.1 (0.280)	19.1 (0.751)	9.5 (0.374)	0.8 (0.032)
C	63.5 (2.500)	38.1 (1.500)	42.9 (1.689)	13.3 (0.524)	4.5 (0.177)	7.1 (0.280)	19.1 (0.751)	9.5 (0.374)	0.8 (0.032)
C	76.2 (3.000)	44.5 (1.750)	49.2 (1.937)	13.3 (0.524)	4.5 (0.177)	7.1 (0.280)	19.1 (0.751)	9.5 (0.374)	1.0 (0.040)
C	89.0 (3.500)	50.8 (2.000)	56.5 (2.224)	16.0 (0.630)	4.5 (0.177)	8.0 (0.313)	21.0 (0.827)	9.0 (0.354)	1.0 (0.040)

### Type S: Stud Mounting



#### Mounting Nut - Order Separately

The insulated plastic mounting nut is not included with stud mount capacitor orders. It must be ordered separately. See available part numbers below.

### Type S: Stud Dimensions

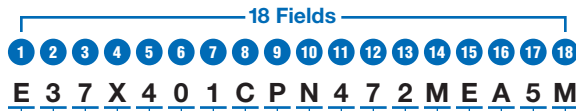
Mounting Code	P ±1.0 (0.040)	T Thread Size
S	16.0 (0.630)	M12

### Mounting Nut Dimensions

Part Number	ØK ±2.0 (0.080)	M ±1.0 (0.040)	N ±1.0 (0.040)	ØQ ±1.0 (0.040)	R ±1.0 (0.040)
50-8D	30.0 (1.181)	19.0 (0.748)	18.0 (0.709)	22.0 (0.866)	1.40 (0.055)
50-8E	38.0 (1.496)	19.0 (0.748)	18.0 (0.709)	30.0 (1.181)	1.40 (0.055)

# U37X Series

**Part Numbering System for U37X Series** When ordering, always specify complete 18-field global part number.



- 9 Supplement Code.** Field 18.  
 C = PET insulation with end disk (Ø50.8-Ø76.2mm).  
 M = Pb-free PVC insulation with end disk.  
 S = Polyolefin insulation with end disk (Ø50.8-Ø89.0mm).
- 8 Case Size.** Fields 15, 16 and 17.  
 The single letter diameter code is inserted in field 15.  
 C = Ø50.8mm (Ø2.000")  
 D = Ø63.5mm (Ø2.500")  
 E = Ø76.2mm (Ø3.000")  
 F = Ø89.0mm (Ø3.500")  
 The double character length code is inserted in fields 16 and 17.  
 For lengths ≤99mm, insert the actual length rounded to nearest millimeter. For lengths of 100mm or more, insert the appropriate alpha numeric code as indicated below.  
 92 = 92mm (3.625")  
 A5 = 105mm (4.125")  
 B7 = 117mm (4.625")  
 D0 = 130mm (5.125")  
 E3 = 143mm (5.625")  
 F5 = 155mm (6.125")  
 J1 = 181mm (7.125")  
 K0 = 190mm (7.500")  
 M9 = 219mm (8.625")
- 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 Mounting Hardware.** Field 10.  
 N = None.  
 C = Three-footed clamp.  
 S = Stud mount. *The mounting nut is not included with stud mount orders. It must be ordered separately.*
- 4 Terminal Type.** Fields 8 and 9.  
 HP = High post 10-32 NF-2B screw thread.  
 HL = High post M5x0.8 screw thread.  
 CD = Larger diameter M5x0.8 screw thread.  
 CP = Low post 1/4-28 NF-2B screw thread.  
 CH = High post 1/4-28 NF-2B screw thread.  
 CA = Low post M6x1 screw thread.  
 CS = High post M6x1 screw thread.
- 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).
- 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).

# U37X Series

## Standard Voltage Ratings - Screw Terminals

Rated Voltage (WVDC)	Capacitance (µF)	Global Part Number†	Nominal Case Size* D × L (mm)	Case Size Code	Maximum ESR (mΩ) at +25°C, 120Hz	Rated Ripple Current (A rms) at +85°C		
						120Hz	300Hz	>3kHz
<b>350 Volts</b> 400 Volts Surge	2,700	E37X351HPN272MCB7M	50.8 × 117	CB7	35	9.6	11.5	13.4
	3,300	E37X351HPN332MCD0M	50.8 × 130	CD0	31	10.6	12.8	14.9
	2,700	E37X351CPN272MD92M	63.5 × 92	D92	37	9.7	11.6	13.5
	3,300	E37X351CPN332MDA5M	63.5 × 105	DA5	31	11.1	13.3	15.5
	3,900	E37X351CPN392MDB7M	63.5 × 117	DB7	26	12.4	14.9	17.4
	4,700	E37X351CPN472MDD0M	63.5 × 130	DD0	23	13.8	16.5	19.3
	4,700	E37X351CPN472MDE3M	63.5 × 143	DE3	21	15.1	18.1	21.2
	3,900	E37X351CPN392ME92M	76.2 × 92	E92	26	12.7	15.2	17.8
	4,700	E37X351CPN472MEA5M	76.2 × 105	EA5	22	14.5	17.4	20.3
	5,600	E37X351CPN562MEB7M	76.2 × 117	EB7	19	16.3	19.5	22.8
	8,200	E37X351CPN822MEE3M	76.2 × 143	EE3	15	19.8	23.7	27.7
	10,000	E37X351CPN103MEJ1M	76.2 × 181	EJ1	11	25.0	30.0	35.0
	12,000	E37X351CPN123MEM9M	76.2 × 219	EM9	9	30.1	36.1	42.2
	5,600	E37X351CPN562MF92M	89 × 92	F92	19	16.2	19.4	22.7
	6,800	E37X351CPN682MFA5M	89 × 105	FA5	16	18.5	22.2	25.9
	8,200	E37X351CPN822MFB7M	89 × 117	FB7	14	20.7	24.9	29.0
	12,000	E37X351CPN123MFE3M	89 × 143	FE3	11	25.2	30.2	35.2
	12,000	E37X351CPN123MFF5M	89 × 155	FF5	10	27.3	32.8	38.2
15,000	E37X351CPN153MFK0M	89 × 190	FK0	8	33.3	40.0	46.6	
18,000	E37X351CPN183MFM9M	89 × 219	FM9	6	38.2	45.8	53.5	
<b>400 Volts</b> 450 Volts Surge	2,700	E37X401HPN272MCB7M	50.8 × 117	CB7	41	8.9	10.7	12.5
	2,700	E37X401HPN272MCD0M	50.8 × 130	CD0	35	9.9	11.9	13.9
	2,700	E37X401CPN272MD92M	63.5 × 92	D92	43	9.0	10.8	12.6
	2,700	E37X401CPN272MDA5M	63.5 × 105	DA5	36	10.3	12.3	14.4
	3,300	E37X401CPN332MDB7M	63.5 × 117	DB7	31	11.6	13.9	16.2
	3,900	E37X401CPN392MDD0M	63.5 × 130	DD0	27	12.8	15.4	18.0
	3,900	E37X401CPN392MDE3M	63.5 × 143	DE3	24	14.1	16.9	19.7
	3,900	E37X401CPN392ME92M	76.2 × 92	E92	30	11.8	14.2	16.5
	4,700	E37X401CPN472MEA5M	76.2 × 105	EA5	25	13.5	16.2	18.9
	5,600	E37X401CPN562MEB7M	76.2 × 117	EB7	22	15.2	18.2	21.2
	6,800	E37X401CPN682MEE3M	76.2 × 143	EE3	17	18.4	22.1	25.8
	8,200	E37X401CPN822MEJ1M	76.2 × 181	EJ1	13	23.3	27.9	32.6
	12,000	E37X401CPN123MEM9M	76.2 × 219	EM9	10	28.0	33.6	39.3
	5,600	E37X401CPN562MF92M	89 × 92	F92	22	15.1	18.1	21.1
	6,800	E37X401CPN682MFA5M	89 × 105	FA5	19	17.2	20.6	24.1
	6,800	E37X401CPN682MFB7M	89 × 117	FB7	16	19.3	23.2	27.0
	10,000	E37X401CPN103MFE3M	89 × 143	FE3	12	23.4	28.1	32.8
	10,000	E37X401CPN103MFF5M	89 × 155	FF5	11	25.4	30.5	35.6
12,000	E37X401CPN123MFK0M	89 × 190	FK0	9	31.0	37.2	43.4	
15,000	E37X401CPN153MFM9M	89 × 219	FM9	7	35.6	42.7	49.8	
<b>420 Volts</b> 470 Volts Surge	2,200	E37X421HPN222MCB7M	50.8 × 117	CB7	44	8.5	10.2	11.9
	2,700	E37X421HPN272MCD0M	50.8 × 130	CD0	39	9.4	11.3	13.2
	2,200	E37X421CPN222MD92M	63.5 × 92	D92	47	8.6	10.3	12.0
	2,700	E37X421CPN272MDA5M	63.5 × 105	DA5	39	9.8	11.8	13.8
	3,300	E37X421CPN332MDB7M	63.5 × 117	DB7	33	11.0	13.3	15.5
	3,900	E37X421CPN392MDD0M	63.5 × 130	DD0	29	12.2	14.7	17.1
	3,900	E37X421CPN392MDE3M	63.5 × 143	DE3	26	13.4	16.1	18.8
	3,300	E37X421CPN332ME92M	76.2 × 92	E92	33	11.3	13.5	15.8
	3,900	E37X421CPN392MEA5M	76.2 × 105	EA5	28	12.9	15.5	18.0
	4,700	E37X421CPN472MEB7M	76.2 × 117	EB7	24	14.5	17.4	20.3
	5,600	E37X421CPN562MEE3M	76.2 × 143	EE3	19	17.6	21.1	24.6
	8,200	E37X421CPN822MEJ1M	76.2 × 181	EJ1	14	22.2	26.6	31.1
	10,000	E37X421CPN103MEM9M	76.2 × 219	EM9	11	26.8	32.1	37.5
	4,700	E37X421CPN472MF92M	89 × 92	F92	25	14.4	17.3	20.2
	5,600	E37X421CPN562MFA5M	89 × 105	FA5	21	16.4	19.7	23.0

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

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



# U37X Series

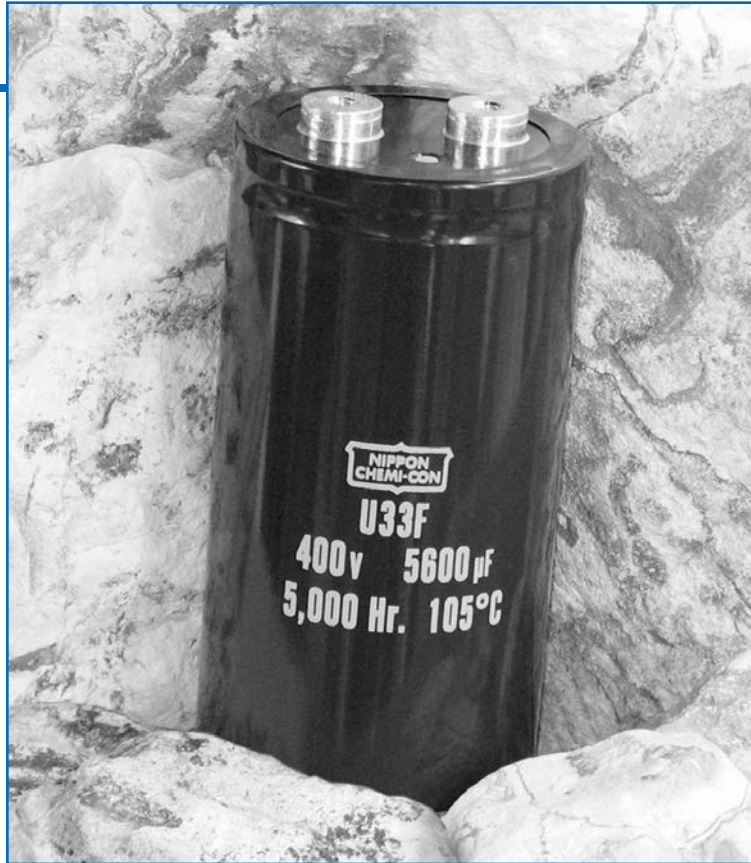
## Standard Voltage Ratings - Screw Terminals

Rated Voltage (WVDC)	Capacitance (µF)	Global Part Number†	Nominal Case Size* D × L (mm)	Case Size Code	Maximum ESR (mΩ) at +25°C, 120Hz	Rated Ripple Current (A rms) at +85°C		
						120Hz	300Hz	>3kHz
<b>420 Volts</b> 470 Volts Surge	6,800	E37X421CPN682MFB7M	89 × 117	FB7	18	18.4	22.1	25.8
	8,200	E37X421CPN822MFE3M	89 × 143	FE3	14	22.4	26.8	31.3
	10,000	E37X421CPN103MFF5M	89 × 155	FF5	12	24.3	29.1	34.0
	12,000	E37X421CPN123MFK0M	89 × 190	FK0	10	29.6	35.5	41.4
	15,000	E37X421CPN153MFM9M	89 × 219	FM9	8	34.0	40.7	47.5
<b>450 Volts</b> 500 Volts Surge	1,800	E37X451HPN182MCB7M	50.8 × 117	CB7	51	8.0	9.6	11.2
	2,200	E37X451HPN222MCD0M	50.8 × 130	CD0	44	8.9	10.6	12.4
	2,200	E37X451CPN222MD92M	63.5 × 92	D92	53	8.1	9.7	11.3
	2,200	E37X451CPN222MDA5M	63.5 × 105	DA5	44	9.2	11.1	12.9
	2,700	E37X451CPN272MDB7M	63.5 × 117	DB7	38	10.4	12.4	14.5
	3,300	E37X451CPN332MDD0M	63.5 × 130	DD0	33	11.5	13.8	16.1
	3,900	E37X451CPN392MDE3M	63.5 × 143	DE3	30	12.6	15.1	17.6
	3,300	E37X451CPN332ME92M	76.2 × 92	E92	38	10.6	12.7	14.8
	3,900	E37X451CPN392MEA5M	76.2 × 105	EA5	32	12.1	14.5	16.9
	3,900	E37X451CPN392MEB7M	76.2 × 117	EB7	27	13.6	16.3	19.0
	5,600	E37X451CPN562MEE3M	76.2 × 143	EE3	21	16.5	19.8	23.1
	6,800	E37X451CPN682MEJ1M	76.2 × 181	EJ1	16	20.8	25.0	29.2
	8,200	E37X451CPN822MEM9M	76.2 × 219	EM9	13	25.1	30.1	35.2
	3,900	E37X451CPN392MF92M	89 × 92	F92	28	13.5	16.2	18.9
	4,700	E37X451CPN472MFA5M	89 × 105	FA5	23	15.4	18.5	21.6
	5,600	E37X451CPN562MFB7M	89 × 117	FB7	20	17.3	20.7	24.2
	8,200	E37X451CPN822MFE3M	89 × 143	FE3	16	21.0	25.2	29.4
	8,200	E37X451CPN822MFF5M	89 × 155	FF5	14	22.8	27.3	31.9
	10,000	E37X451CPN103MFK0M	89 × 190	FK0	11	27.8	33.3	38.9
	12,000	E37X451CPN123MFM9M	89 × 219	FM9	9	32.2	38.6	45.0
<b>500 Volts</b> 550 Volts Surge	1,200	E37X501HPN122MCB7M	50.8 × 117	CB7	78	6.4	7.7	9.0
	1,500	E37X501HPN152MCD0M	50.8 × 130	CD0	68	7.2	8.6	10.0
	1,500	E37X501CPN152MD92M	63.5 × 92	D92	67	7.2	8.6	10.1
	1,800	E37X501CPN182MDA5M	63.5 × 105	DA5	56	8.2	9.9	11.5
	2,200	E37X501CPN222MDB7M	63.5 × 117	DB7	48	9.3	11.1	13.0
	2,700	E37X501CPN272MDD0M	63.5 × 130	DD0	42	10.3	12.3	14.4
	2,700	E37X501CPN272MDE3M	63.5 × 143	DE3	37	11.3	13.5	15.8
	2,200	E37X501CPN222ME92M	76.2 × 92	E92	48	9.5	11.3	13.2
	2,700	E37X501CPN272MEA5M	76.2 × 105	EA5	40	10.8	13.0	15.1
	3,300	E37X501CPN332MEB7M	76.2 × 117	EB7	34	12.1	14.6	17.0
	3,900	E37X501CPN392MEE3M	76.2 × 143	EE3	26	14.8	17.7	20.7
	5,600	E37X501CPN562MEJ1M	76.2 × 181	EJ1	20	18.6	22.3	26.1
	6,800	E37X501CPN682MEM9M	76.2 × 219	EM9	16	22.5	26.9	31.4
	3,300	E37X501CPN332MF92M	89 × 92	F92	35	12.1	14.5	16.9
	3,900	E37X501CPN392MFA5M	89 × 105	FA5	29	13.8	16.5	19.3
	4,700	E37X501CPN472MFB7M	89 × 117	FB7	25	15.5	18.5	21.6
	5,600	E37X501CPN562MFE3M	89 × 143	FE3	19	18.8	22.5	26.3
	6,800	E37X501CPN682MFF5M	89 × 155	FF5	18	20.4	24.4	28.5
	8,200	E37X501CPN822MFK0M	89 × 190	FK0	14	24.8	29.8	34.8
	10,000	E37X501CPN103MFM9M	89 × 219	FM9	12	28.5	34.2	39.9

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

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

- Large Can
- Screw Terminals
- High Ripple
- 350 to 500VDC Ratings
- RoHS Compliant
- 5,000 Hours Lifetime at +105°C
- Up to 175,000 Hours Useful Life



The U33F series is a high temperature screw mount series specifically designed to provide the ripple current capability and long life required for high reliability inverter applications. The U33F has an endurance rating of 5,000 hours at +105°C with the rated ripple current applied. The useful life can exceed 175,000 hours at +40°C and 1.5x the ripple current. These capacitors are available in a variety of high current English or Metric thread terminals. Mounting options include a three-footed clamp or bottom threaded stud. Custom designs are also available.

## Summary of Specifications

- Screw terminals: high and low post, English and Metric thread.
- Capacitance range: 1,200 to 15,000µF.
- Voltage range: 350 to 500VDC.
- Category temperature range: -40°C to +105°C.
- Leakage current: 0.02CV(µA) or 5mA, whichever is smaller, after 5 minutes at +25°C.
- Standard capacitance tolerance: ±20%
- Nominal case size (D × L): D = 50.8mm (2.000") to 89mm (3.500"); L = 92mm (3.625") to 219mm (8.625").
- Rated lifetime: 5,000 hours at +105°C with rated ripple current applied.

# U33F Series

## U33F Specifications - Screw Terminals

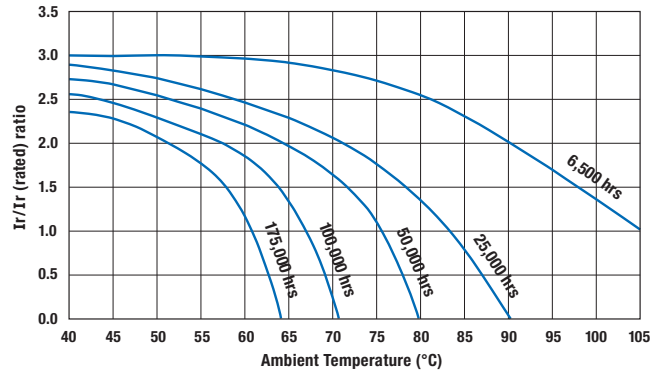
Item	Characteristics																																															
Category Temperature Range	- 40 to +105°C																																															
Rated Voltage Range	350 to 500VDC																																															
Capacitance Range	1,200 to 15,000µF at +25°C, 120Hz																																															
Capacitance Tolerance	± 20% (M) at +25°C, 120Hz																																															
Leakage Current	I = 0.02CV (µA) or 5mA, whichever is smaller, after 5 minutes at +25°C. Where I = Max. leakage current (µA), C = Nominal capacitance (µF) and V = Rated voltage (V)																																															
Rated Ripple Current Multipliers	<p>Ambient Temperature (°C)</p> <table border="1"> <tr> <td>+65°C</td> <td>+85°C</td> <td>+105°C</td> </tr> <tr> <td>2.20</td> <td>1.73</td> <td>1.00</td> </tr> </table> <p>Frequency (Hz)</p> <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> <p>To determine maximum ripple current at a specified temperature and frequency, use the appropriate multiplier shown.</p>	+65°C	+85°C	+105°C	2.20	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																																														
2.20	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)	<p>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.</p> <p>Capacitance change: ≤ 20% from initial measurement ESR change : ≤ 200% of initial specified limit Leakage current : ≤ initial specified limit</p>																																															
Useful Life	<p>With specified standard voltage and ripple current applied, typical life as function of ambient temperature is listed below.</p> <table border="1"> <tr> <td>+105°C</td> <td>6,500 hours max.</td> <td rowspan="3">           Capacitance change: ≤ 30% from initial measurement            ESR change : ≤ 300% of initial specified limit            Leakage current : ≤ initial specified limit         </td> </tr> <tr> <td>+85°C</td> <td>24,000 hours max.</td> </tr> <tr> <td>+65°C</td> <td>122,000 hours max.</td> </tr> </table>	+105°C	6,500 hours max.	Capacitance change: ≤ 30% from initial measurement ESR change : ≤ 300% of initial specified limit Leakage current : ≤ initial specified limit	+85°C	24,000 hours max.	+65°C	122,000 hours max.																																								
+105°C	6,500 hours max.	Capacitance change: ≤ 30% from initial measurement ESR change : ≤ 300% of initial specified limit Leakage current : ≤ initial specified limit																																														
+85°C	24,000 hours max.																																															
+65°C	122,000 hours max.																																															
Shelf Life	<p>The following specifications shall be satisfied when the capacitors are restored to +25°C after exposing them for 500 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.</p> <p>Capacitance change: ≤ 20% from initial measurement ESR change : ≤ 200% of initial specified limit Leakage current : ≤ initial specified limit</p>																																															
Vibration Rating	10-55Hz, 10g sinusoidal in three axes, 2 hours per axis.																																															
Maximum Tightening Torque	<table border="1"> <tr> <td>Terminal Code</td> <td>HP</td> <td>HL</td> <td>CD</td> <td>CP</td> <td>CH</td> <td>CA</td> <td>CS</td> </tr> <tr> <td>Thread Size</td> <td>10-32 NF-2B</td> <td>M5x0.8-6H</td> <td></td> <td>¼-28 NF-2B</td> <td></td> <td>M6x1-6H</td> <td></td> </tr> <tr> <td>3 Threads Engaged</td> <td colspan="3">2.0 N·m (18.0 in·lb)</td> <td colspan="4">4.0 N·m (35.0 in·lb)</td> </tr> <tr> <td>6 Threads Engaged</td> <td colspan="3">2.8 N·m (25.0 in·lb)</td> <td colspan="4">6.2 N·m (55.0 in·lb)</td> </tr> </table>	Terminal Code	HP	HL	CD	CP	CH	CA	CS	Thread Size	10-32 NF-2B	M5x0.8-6H		¼-28 NF-2B		M6x1-6H		3 Threads Engaged	2.0 N·m (18.0 in·lb)			4.0 N·m (35.0 in·lb)				6 Threads Engaged	2.8 N·m (25.0 in·lb)			6.2 N·m (55.0 in·lb)																		
Terminal Code	HP	HL	CD	CP	CH	CA	CS																																									
Thread Size	10-32 NF-2B	M5x0.8-6H		¼-28 NF-2B		M6x1-6H																																										
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Typical Inductance (nH) at 1MHz	<table border="1"> <tr> <td rowspan="2">Case Diameter (mm)</td> <td colspan="7">Terminal Code</td> </tr> <tr> <td>HP</td> <td>HL</td> <td>CD</td> <td>CP</td> <td>CH</td> <td>CA</td> <td>CS</td> </tr> <tr> <td>Ø50.8</td> <td>—</td> <td>—</td> <td>NA</td> <td>NA</td> <td>NA</td> <td>NA</td> <td>NA</td> </tr> <tr> <td>Ø63.5</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> </tr> <tr> <td>Ø76.2</td> <td>30</td> <td>30</td> <td>25</td> <td>20</td> <td>25</td> <td>20</td> <td>25</td> </tr> <tr> <td>Ø89.0</td> <td>30</td> <td>30</td> <td>25</td> <td>20</td> <td>25</td> <td>20</td> <td>25</td> </tr> </table>	Case Diameter (mm)	Terminal Code							HP	HL	CD	CP	CH	CA	CS	Ø50.8	—	—	NA	NA	NA	NA	NA	Ø63.5	—	—	—	—	—	—	—	Ø76.2	30	30	25	20	25	20	25	Ø89.0	30	30	25	20	25	20	25
Case Diameter (mm)	Terminal Code																																															
	HP	HL	CD	CP	CH	CA	CS																																									
Ø50.8	—	—	NA	NA	NA	NA	NA																																									
Ø63.5	—	—	—	—	—	—	—																																									
Ø76.2	30	30	25	20	25	20	25																																									
Ø89.0	30	30	25	20	25	20	25																																									
Custom Designs	Custom CV values per case size and termination type may be available upon request. Contact appropriate representative with specific requirements.																																															

# U33F Series

## U33F Useful Life

### Useful Life: 6,500 Hours at +105°C

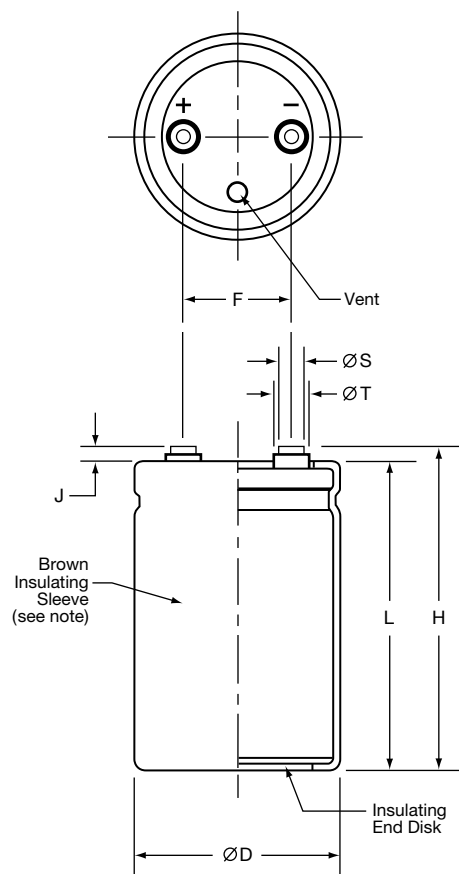
The life expectancy of a capacitor is shown as a function of ambient temperature and ripple current load.



## Diagram of Dimensions - Screw Terminals

### Large Can/Screw Terminals

Unit: mm (inches)



### Case Dimensions and Standard Box Quantities

Case Size Code	$\pm 2.0$ (0.080) $\varnothing D$	$\pm 1.0$ (0.040) L	$\pm 0.25$ (0.010) F	Standard Box Quantity
CB7 CD0	50.8 (2.000)	117 (4.625) 130 (5.125)	22.2 (0.875)	49
D92 DA5 DB7 DD0 DE3	63.5 (2.500)	92 (3.625) 105 (4.125) 117 (4.625) 130 (5.125) 143 (5.625)	28.6 (1.125)	20
E92 EA5 EB7 EE3 EJ1 EM9	76.2 (3.000)	92 (3.625) 105 (4.125) 117 (4.625) 143 (5.625) 181 (7.125) 219 (8.625)	31.8 (1.250)	16 9
F92 FA5 FB7 FE3 FF5 FK0 FM9	89.0 (3.500)	92 (3.625) 105 (4.125) 117 (4.625) 143 (5.625) 155 (6.125) 190 (7.500) 219 (8.625)	31.8 (1.250)	5

### Note:

In some cases, the color of the sleeve may change slightly due to the operating conditions, however, the discoloration will not impair capacitor function.

### Terminal Specifications

Terminal Code	Available Case Diameter		Thread Size	Minimum Thread Depth	J $\pm 0.5$ (0.020)	H $\pm 2.0$ (0.080)	$\varnothing S$ $\pm 0.25$ (0.010)	$\varnothing T$ $\pm 0.25$ (0.010)
	$\varnothing D$ Code	$\varnothing D$ mm (inches)						
HP	C	50.8 (2.000)	10-32 NF-2B	9.5 (0.375)	6.4 (0.250)	L+J	8.0 (0.313)	11.1 (0.438)
HL	C	50.8 (2.000)	M5x0.8-6H	9.5 (0.375)	6.4 (0.250)	L+J	8.0 (0.313)	11.1 (0.438)
CD	D-E	63.5 - 76.2 (2.500 - 3.000)	M5x0.8-6H	8.5 (0.335)	5.0 (0.200)	L+J	13.0 (0.512)	18.8 (0.740)
CP	D-F	63.5 - 89.0 (2.500 - 3.500)	1/4 - 28 NF-2B	8.7 (0.344)	2.4 (0.093)	L+J	17.5 (0.689)	—
CH	D-F	63.5 - 89.0 (2.500 - 3.500)	1/4 - 28 NF-2B	11.9 (0.468)	6.4 (0.250)	L+J	17.5 (0.689)	—
CA	D-F	63.5 - 89.0 (2.500 - 3.500)	M6x1-6H	8.7 (0.344)	2.4 (0.093)	L+J	17.5 (0.689)	—
CS	D-F	63.5 - 89.0 (2.500 - 3.500)	M6x1-6H	11.9 (0.468)	6.4 (0.250)	L+J	17.5 (0.689)	—

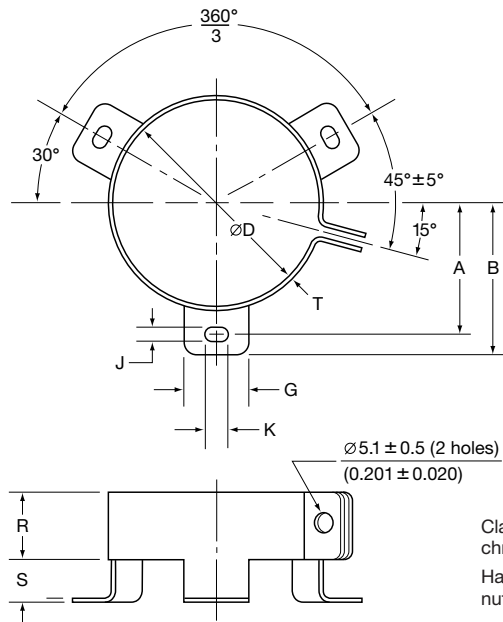
Mounting Hardware is optional. Refer to hardware specifications on the following page.

# U33F Series

## Mounting Hardware - Screw Terminals

### Type C: Three-Footed Clamp

Unit: mm (inches)



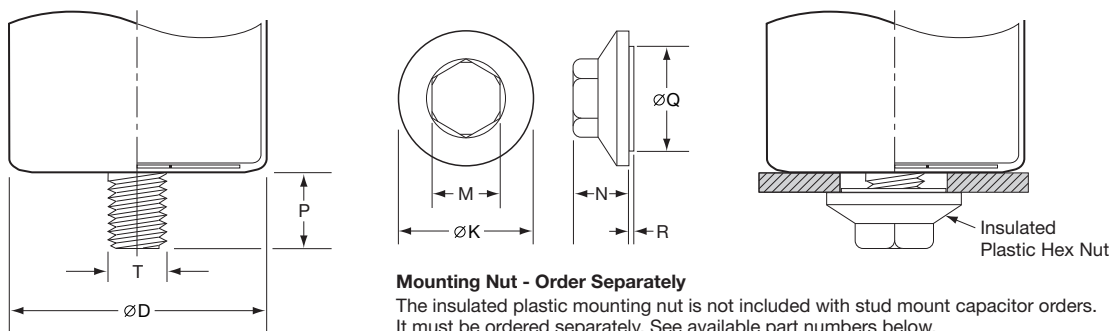
Clamp: Zinc with silver trivalent chromate post treatment.

Hardware: Screw, washer and hexagon nut included with each clamp.

### Type C: Clamp Dimensions

Mounting Code	Case ØD	A ±1.0 (0.040)	B ±1.0 (0.040)	G ±1.0 (0.040)	J ±0.5 (0.020)	K ±0.5 (0.020)	R ±1.0 (0.040)	S ±1.0 (0.040)	T ±0.5 (0.020)
C	50.8 (2.000)	31.8 (1.250)	36.5 (1.437)	13.3 (0.524)	4.5 (0.177)	7.1 (0.280)	19.1 (0.751)	9.5 (0.374)	0.8 (0.032)
C	63.5 (2.500)	38.1 (1.500)	42.9 (1.689)	13.3 (0.524)	4.5 (0.177)	7.1 (0.280)	19.1 (0.751)	9.5 (0.374)	0.8 (0.032)
C	76.2 (3.000)	44.5 (1.750)	49.2 (1.937)	13.3 (0.524)	4.5 (0.177)	7.1 (0.280)	19.1 (0.751)	9.5 (0.374)	1.0 (0.040)
C	89.0 (3.500)	50.8 (2.000)	56.5 (2.224)	16.0 (0.630)	4.5 (0.177)	8.0 (0.313)	21.0 (0.827)	9.0 (0.354)	1.0 (0.040)

### Type S: Stud Mounting



#### Mounting Nut - Order Separately

The insulated plastic mounting nut is not included with stud mount capacitor orders. It must be ordered separately. See available part numbers below.

### Type S: Stud Dimensions

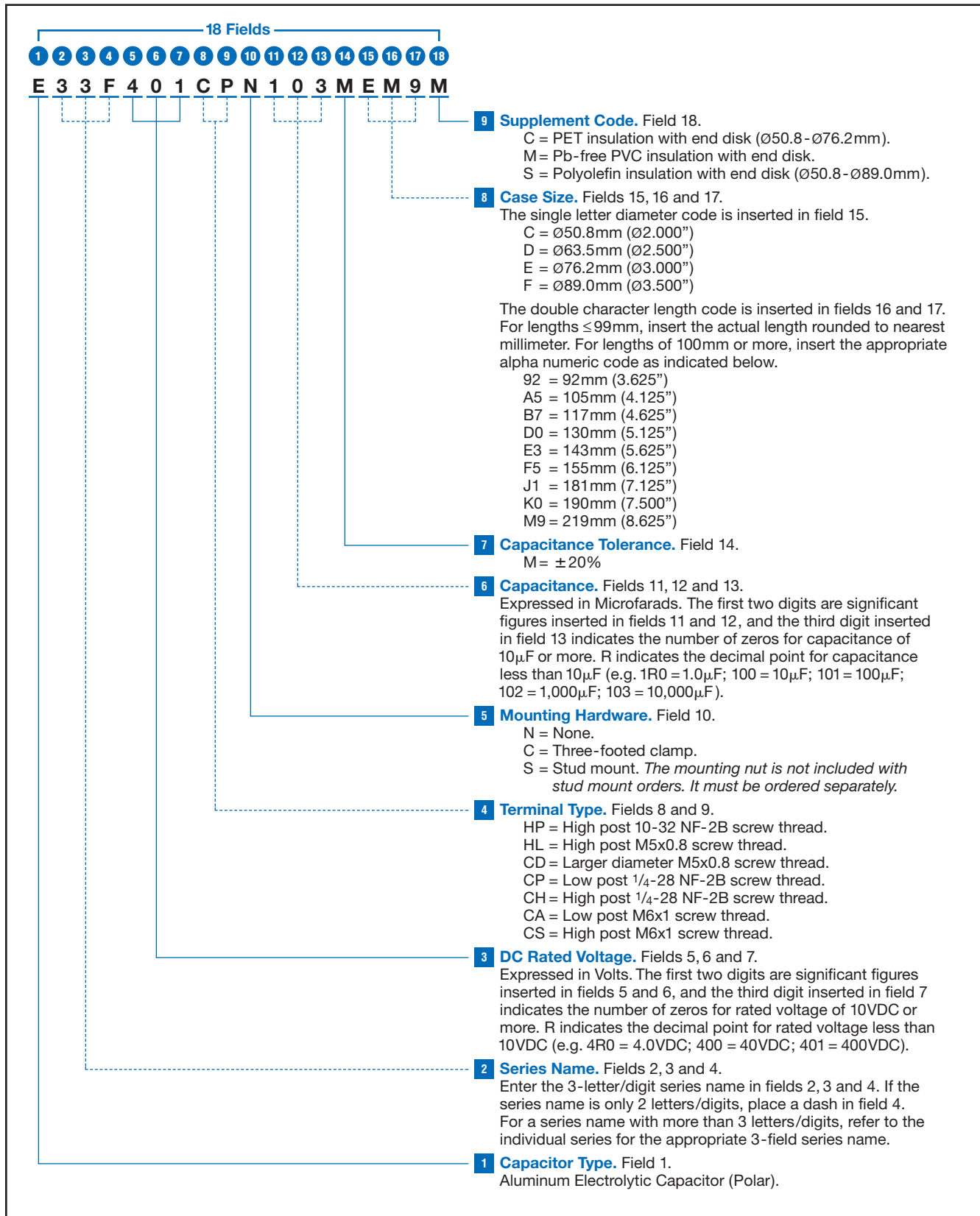
Mounting Code	P ±1.0 (0.040)	T Thread Size
S	16.0 (0.630)	M12

### Mounting Nut Dimensions

Part Number	ØK ±2.0 (0.080)	M ±1.0 (0.040)	N ±1.0 (0.040)	ØQ ±1.0 (0.040)	R ±1.0 (0.040)
50-8D	30.0 (1.181)	19.0 (0.748)	18.0 (0.709)	22.0 (0.866)	1.40 (0.055)
50-8E	38.0 (1.496)	19.0 (0.748)	18.0 (0.709)	30.0 (1.181)	1.40 (0.055)

# U33F Series

**Part Numbering System for U33F Series** When ordering, always specify complete 18-field global part number.





# U33F Series

## Standard Voltage Ratings - Screw Terminals

Rated Voltage (WVDC)	Capacitance (µF)	Global Part Number†	Nominal Case Size* D × L (mm)	Case Size Code	Maximum ESR (mΩ) at +25°C, 120Hz	Rated Ripple Current (A rms) at +105°C		
						120Hz	300Hz	>3kHz
<b>350 Volts</b> 400 Volts Surge	1,800	E33F351HPN182MCB7M	50.8 × 117	CB7	58	7.5	9.0	10.5
	2,200	E33F351HPN222MCD0M	50.8 × 130	CD0	51	8.3	9.9	11.6
	2,200	E33F351CPN222MD92M	63.5 × 92	D92	48	8.5	10.2	11.9
	2,700	E33F351CPN272MDA5M	63.5 × 105	DA5	40	9.7	11.7	13.6
	3,300	E33F351CPN332MDB7M	63.5 × 117	DB7	34	10.9	13.1	15.3
	3,900	E33F351CPN392MDD0M	63.5 × 130	DD0	30	12.1	14.6	17.0
	3,900	E33F351CPN392MDE3M	63.5 × 143	DE3	29	12.8	15.4	17.9
	3,300	E33F351CPN332ME92M	76.2 × 92	E92	34	11.2	13.4	15.6
	3,900	E33F351CPN392MEA5M	76.2 × 105	EA5	28	12.8	15.3	17.9
	5,600	E33F351CPN562MEB7M	76.2 × 117	EB7	21	15.3	18.4	21.4
	6,800	E33F351CPN682MEE3M	76.2 × 143	EE3	19	17.4	20.9	24.4
	8,200	E33F351CPN822MEJ1M	76.2 × 181	EJ1	14	22.0	26.4	30.8
	10,000	E33F351CPN103MEM9M	76.2 × 219	EM9	11	26.5	31.8	37.1
	4,700	E33F351CPN472MF92M	89 × 92	F92	25	14.3	17.1	20.0
	5,600	E33F351CPN562MFA5M	89 × 105	FA5	21	16.3	19.5	22.8
	6,800	E33F351CPN682MFB7M	89 × 117	FB7	18	18.3	21.9	25.6
	8,200	E33F351CPN822MFE3M	89 × 143	FE3	14	22.2	26.6	31.0
	10,000	E33F351CPN103MFF5M	89 × 155	FF5	13	24.1	28.9	33.7
12,000	E33F351CPN123MFK0M	89 × 190	FK0	10	29.3	35.2	41.1	
15,000	E33F351CPN153MFM9M	89 × 219	FM9	8	33.6	40.4	47.1	
<b>400 Volts</b> 450 Volts Surge	1,800	E33F401HPN182MCB7M	50.8 × 117	CB7	58	7.5	9.0	10.5
	2,200	E33F401HPN222MCD0M	50.8 × 130	CD0	50	8.3	10.0	11.6
	2,200	E33F401CPN222MD92M	63.5 × 92	D92	47	8.5	10.2	12.0
	2,700	E33F401CPN272MDA5M	63.5 × 105	DA5	40	9.8	11.7	13.7
	3,300	E33F401CPN332MDB7M	63.5 × 117	DB7	34	11.0	13.2	15.4
	3,900	E33F401CPN392MDD0M	63.5 × 130	DD0	30	12.2	14.6	17.0
	3,900	E33F401CPN392MDE3M	63.5 × 143	DE3	26	13.4	16.0	18.7
	3,300	E33F401CPN332ME92M	76.2 × 92	E92	34	11.2	13.4	15.7
	3,900	E33F401CPN392MEA5M	76.2 × 105	EA5	28	12.8	15.4	17.9
	4,700	E33F401CPN472MEB7M	76.2 × 117	EB7	24	14.4	17.3	20.1
	5,600	E33F401CPN562MEE3M	76.2 × 143	EE3	19	17.5	21.0	24.5
	8,200	E33F401CPN822MEJ1M	76.2 × 181	EJ1	14	22.1	26.5	30.9
	10,000	E33F401CPN103MEM9M	76.2 × 219	EM9	11	26.6	31.9	37.2
	4,700	E33F401CPN472MF92M	89 × 92	F92	25	14.3	17.2	20.0
	5,600	E33F401CPN562MFA5M	89 × 105	FA5	21	16.3	19.6	22.9
	6,800	E33F401CPN682MFB7M	89 × 117	FB7	18	18.3	22.0	25.6
	8,200	E33F401CPN822MFE3M	89 × 143	FE3	14	22.2	26.7	31.1
	10,000	E33F401CPN103MFF5M	89 × 155	FF5	12	24.1	29.0	33.8
12,000	E33F401CPN123MFK0M	89 × 190	FK0	10	29.4	35.3	41.2	
15,000	E33F401CPN153MFM9M	89 × 219	FM9	8	33.7	40.5	47.2	
<b>420 Volts</b> 470 Volts Surge	1,500	E33F421HPN152MCB7M	50.8 × 117	CB7	69	6.9	8.2	9.6
	1,800	E33F421HPN182MCD0M	50.8 × 130	CD0	60	7.6	9.1	10.7
	1,800	E33F421CPN182MD92M	63.5 × 92	D92	57	7.8	9.4	10.9
	2,200	E33F421CPN222MDA5M	63.5 × 105	DA5	47	8.9	10.7	12.5
	2,700	E33F421CPN272MDB7M	63.5 × 117	DB7	40	10.1	12.1	14.1
	3,300	E33F421CPN332MDD0M	63.5 × 130	DD0	35	11.1	13.4	15.6
	3,300	E33F421CPN332MDE3M	63.5 × 143	DE3	34	11.8	14.1	16.5
	2,700	E33F421CPN272ME92M	76.2 × 92	E92	40	10.3	12.3	14.4
	3,300	E33F421CPN332MEA5M	76.2 × 105	EA5	34	11.7	14.1	16.4
	3,900	E33F421CPN392MEB7M	76.2 × 117	EB7	29	13.2	15.8	18.4
	5,600	E33F421CPN562MEE3M	76.2 × 143	EE3	22	16.0	19.2	22.4
	6,800	E33F421CPN682MEJ1M	76.2 × 181	EJ1	17	19.8	23.8	27.8
	8,200	E33F421CPN822MEM9M	76.2 × 219	EM9	14	23.9	28.7	33.5
	3,900	E33F421CPN392MF92M	89 × 92	F92	30	13.1	15.7	18.3
	4,700	E33F421CPN472MFA5M	89 × 105	FA5	25	15.0	17.9	20.9

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

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

# U33F Series

## Standard Voltage Ratings - Screw Terminals

Rated Voltage (WVDC)	Capacitance (µF)	Global Part Number†	Nominal Case Size* D × L (mm)	Case Size Code	Maximum ESR (mΩ) at +25°C, 120Hz	Rated Ripple Current (A rms) at +105°C		
						120Hz	300Hz	>3kHz

<b>420 Volts 470 Volts Surge</b>	5,600	E33F421CPN562MFB7M	89 × 117	FB7	21	16.8	20.1	23.5
	8,200	E33F421CPN822MFE3M	89 × 143	FE3	17	20.4	24.4	28.5
	8,200	E33F421CPN822MFF5M	89 × 155	FF5	15	22.1	26.5	31.0
	10,000	E33F421CPN103MFK0M	89 × 190	FK0	12	26.9	32.3	37.7
	12,000	E33F421CPN123MFM9M	89 × 219	FM9	10	30.9	37.1	43.3

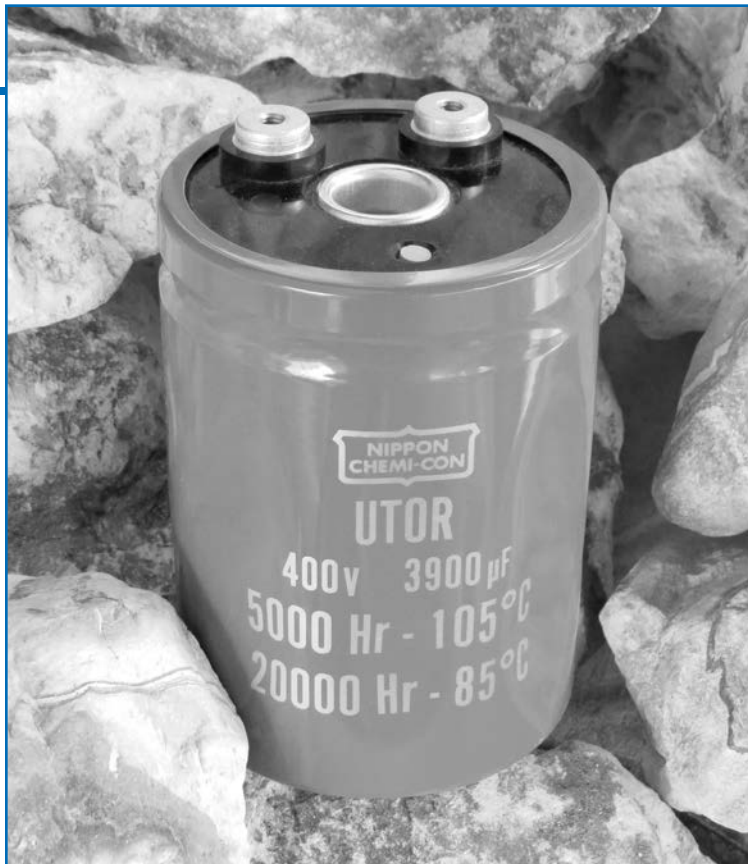
<b>450 Volts 500 Volts Surge</b>	1,500	E33F451HPN152MCB7M	50.8 × 117	CB7	69	6.9	8.2	9.6
	1,800	E33F451HPN182MCD0M	50.8 × 130	CD0	60	7.6	9.1	10.6
	1,800	E33F451CPN182MD92M	63.5 × 92	D92	57	7.8	9.4	10.9
	2,200	E33F451CPN222MDA5M	63.5 × 105	DA5	47	8.9	10.7	12.5
	2,700	E33F451CPN272MDB7M	63.5 × 117	DB7	40	10.0	12.0	14.1
	3,300	E33F451CPN332MDD0M	63.5 × 130	DD0	35	11.1	13.4	15.6
	3,300	E33F451CPN332MDE3M	63.5 × 143	DE3	34	11.8	14.1	16.5
	2,700	E33F451CPN272ME92M	76.2 × 92	E92	40	10.3	12.3	14.4
	3,300	E33F451CPN332MEA5M	76.2 × 105	EA5	34	11.7	14.1	16.4
	3,900	E33F451CPN392MEB7M	76.2 × 117	EB7	29	13.2	15.8	18.4
	4,700	E33F451CPN472MEE3M	76.2 × 143	EE3	22	16.0	19.2	22.4
	6,800	E33F451CPN682MEJ1M	76.2 × 181	EJ1	17	20.2	24.2	28.3
	8,200	E33F451CPN822MEM9M	76.2 × 219	EM9	13	24.3	29.2	34.1
	3,900	E33F451CPN392MF92M	89 × 92	F92	30	13.1	15.7	18.3
	4,700	E33F451CPN472MFA5M	89 × 105	FA5	25	14.9	17.9	20.9
	5,600	E33F451CPN562MFB7M	89 × 117	FB7	21	16.8	20.1	23.5
	6,800	E33F451CPN682MFE3M	89 × 143	FE3	17	20.3	24.4	28.5
	8,200	E33F451CPN822MFF5M	89 × 155	FF5	15	22.1	26.5	30.9
10,000	E33F451CPN103MFK0M	89 × 190	FK0	12	26.9	32.3	37.7	
12,000	E33F451CPN123MFM9M	89 × 219	FM9	10	30.9	37.0	43.2	

<b>500 Volts 550 Volts Surge</b>	1,200	E33F501HPN122MCB7M	50.8 × 117	CB7	82	6.3	7.5	8.8
	1,500	E33F501HPN152MCD0M	50.8 × 130	CD0	72	6.9	8.3	9.7
	1,500	E33F501CPN152MD92M	63.5 × 92	D92	71	7.0	8.4	9.8
	1,800	E33F501CPN182MDA5M	63.5 × 105	DA5	59	8.0	9.6	11.2
	2,200	E33F501CPN222MDB7M	63.5 × 117	DB7	51	9.0	10.8	12.6
	2,200	E33F501CPN222MDD0M	63.5 × 130	DD0	44	10.0	12.0	13.9
	2,700	E33F501CPN272MDE3M	63.5 × 143	DE3	39	10.9	13.1	15.3
	2,200	E33F501CPN222ME92M	76.2 × 92	E92	51	9.2	11.0	12.8
	2,700	E33F501CPN272MEA5M	76.2 × 105	EA5	42	10.5	12.6	14.7
	3,300	E33F501CPN332MEB7M	76.2 × 117	EB7	36	11.8	14.1	16.5
	3,900	E33F501CPN392MEE3M	76.2 × 143	EE3	28	14.3	17.2	20.0
	5,600	E33F501CPN562MEJ1M	76.2 × 181	EJ1	21	18.1	21.7	25.3
	6,800	E33F501CPN682MEM9M	76.2 × 219	EM9	17	21.8	26.1	30.5
	3,300	E33F501CPN332MF92M	89 × 92	F92	37	11.7	14.0	16.4
	3,900	E33F501CPN392MFA5M	89 × 105	FA5	31	13.4	16.0	18.7
	4,700	E33F501CPN472MFB7M	89 × 117	FB7	27	15.0	18.0	21.0
	5,600	E33F501CPN562MFE3M	89 × 143	FE3	21	18.2	21.8	25.5
	6,800	E33F501CPN682MFF5M	89 × 155	FF5	19	19.8	23.7	27.7
	8,200	E33F501CPN822MFK0M	89 × 190	FK0	15	24.1	28.9	33.7
	10,000	E33F501CPN103MFM9M	89 × 219	FM9	12	27.6	33.1	38.7

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

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

- **Toroidal Design**
- **Screw Mount**
- **Lowest Thermal Resistance**
- **Optimum Cooling Capability**
- **New Lower Profile Sizes**
- **New Heat Sink Mounting Kit**
- **RoHS Compliant**



The UTOR series available in low profile sizes offers high capacitance and ripple current per case size which allows the inverter designer to significantly reduce the size, weight, and cost of the capacitor bank. The toroidal geometry is ideal for cooling by either forced air or by heat sink with the use of a new mounting kit option. The heat sink kit option provides optimum thermal transfer while maintaining electrical isolation. These capacitors have an endurance rating of 5,000 hours at +105°C or 20,000 hours at +85°C with the rated ripple current applied. The UTOR series represents the optimum cost per amp of ripple current for a screw terminal mounted electrolytic capacitor.

## Summary of Specifications

- **Screw terminals, high ripple Metric thread.**
- **Capacitance range: 680 to 10,000µF.**
- **Voltage range: 350 to 500VDC.**
- **Operating temperature range: -40°C to +105°C.**
- **Leakage current: 0.02CV(µA) or 5mA, whichever is smaller, after 5 minutes at +25°C.**
- **Standard capacitance tolerance: ±20%**
- **Nominal case size (D × L): D = 76.2mm (3.000"); L = 54mm (2.125") to 168mm (6.625").**
- **Rated lifetime: 5,000 hours at +105°C with rated ripple current applied.**

# UTOR Series

## UTOR Specifications - Screw Terminals

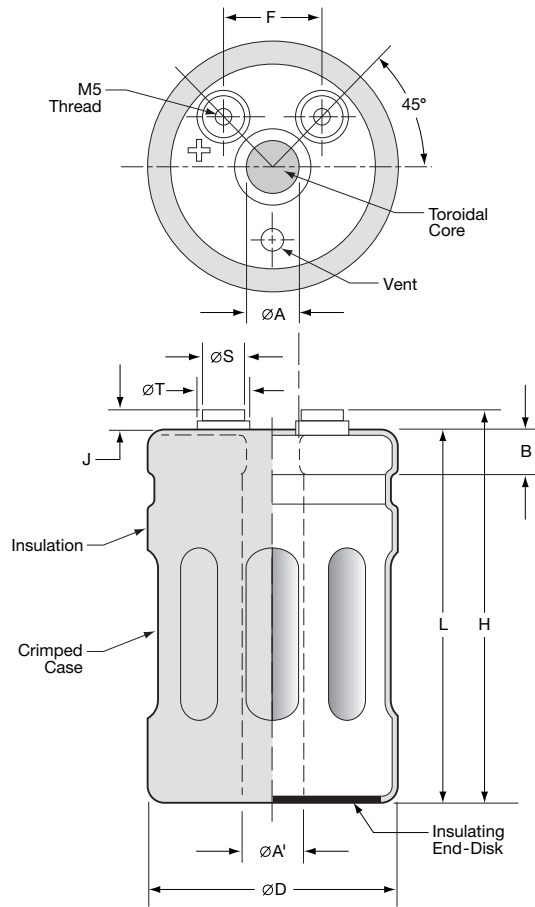
Item	Characteristics																											
Category Temperature Range	- 40 to +105°C																											
Rated Voltage Range	350 to 500VDC																											
Capacitance Range	680 to 10,000 $\mu$ F at +25°C, 120Hz																											
Capacitance Tolerance	$\pm$ 20% (M) at +25°C, 120Hz																											
Leakage Current	I = 0.02CV ( $\mu$ A) or 5mA, whichever is smaller, after 5 minutes at +25°C. Where I = Max. leakage current ( $\mu$ A), C = Nominal capacitance ( $\mu$ F) and V = Rated voltage (V)																											
Rated Ripple Current Multipliers	<p>Ambient Temperature (°C)</p> <table border="1"> <thead> <tr> <th>+45°C</th> <th>+65°C</th> <th>+85°C</th> <th>+105°C</th> </tr> </thead> <tbody> <tr> <td>2.45</td> <td>2.12</td> <td>1.73</td> <td>1.00</td> </tr> </tbody> </table> <p>Cooling</p> <table border="1"> <thead> <tr> <th rowspan="2">Mounting Type</th> <th colspan="3">Air Velocity</th> </tr> <tr> <th>Static</th> <th>1.0m/s</th> <th>2.0m/s</th> </tr> </thead> <tbody> <tr> <td>Clamp Mount</td> <td>1.00</td> <td>1.20</td> <td>1.30</td> </tr> <tr> <td>Heat Sink (air cooled)</td> <td>1.20</td> <td>1.45</td> <td>1.55</td> </tr> <tr> <td>Heat Sink (fluid cooled)</td> <td>1.35</td> <td>1.65</td> <td>1.75</td> </tr> </tbody> </table>	+45°C	+65°C	+85°C	+105°C	2.45	2.12	1.73	1.00	Mounting Type	Air Velocity			Static	1.0m/s	2.0m/s	Clamp Mount	1.00	1.20	1.30	Heat Sink (air cooled)	1.20	1.45	1.55	Heat Sink (fluid cooled)	1.35	1.65	1.75
+45°C	+65°C	+85°C	+105°C																									
2.45	2.12	1.73	1.00																									
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Heat Sink (fluid cooled)	1.35	1.65	1.75																									
Endurance (Load Life)	<p>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.</p> <p>Capacitance change: <math>\leq \pm</math>20% of initial measured value            ESR change : <math>\leq</math> 200% of initial specified value            Leakage current : <math>\leq</math> initial specified value</p>																											
Shelf Test	<p>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.</p> <p>Capacitance change: <math>\leq \pm</math>20% of initial measured value            ESR change : <math>\leq</math> 200% of initial specified value            Leakage current : <math>\leq</math> initial specified value</p>																											
Vibration Rating	10-55Hz, 10g sinusoidal in three axis, 2 hours per axis.																											
Maximum Tightening Torque	<table border="1"> <thead> <tr> <th rowspan="2">Terminal Code</th> <th rowspan="2">Thread Size</th> <th colspan="2">3 Threads Engaged</th> <th colspan="2">6 Threads Engaged</th> </tr> <tr> <th>in·lb</th> <th>N·m</th> <th>in·lb</th> <th>N·m</th> </tr> </thead> <tbody> <tr> <td>CT</td> <td>M5x0.8</td> <td>18.0</td> <td>2.0</td> <td>28.5</td> <td>3.2</td> </tr> </tbody> </table>	Terminal Code	Thread Size	3 Threads Engaged		6 Threads Engaged		in·lb	N·m	in·lb	N·m	CT	M5x0.8	18.0	2.0	28.5	3.2											
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Typical Inductance	25nH at 1MHz																											
Custom Designs	Custom CV values per case size may be available upon request. Contact appropriate representative with specific requirements.																											

# UTOR Series

## Diagram of Dimensions - Screw Terminals

### Toroidal Large Can/Screw Terminals

Unit: mm and inches



#### Terminal Specifications in Millimeters

Terminal Code	Thread Size	Minimum Thread Depth	J $\pm 0.50$	$\phi S$ $\pm 0.25$	$\phi T$ $\pm 0.25$
CT	M5x0.8	10.5	7.0	13.0	18.5

#### Terminal Specifications in Inches

Terminal Code	Thread Size	Minimum Thread Depth	J $\pm 0.020$	$\phi S$ $\pm 0.010$	$\phi T$ $\pm 0.010$
CT	M5x0.8	0.413	0.276	0.512	0.728

#### Case Dimensions in Millimeters

$\phi A$ $\pm 0.20$	$\phi A'$ $\pm 0.30$	B $\pm 0.5$	F $\pm 0.25$
16.3	18.9	9.5	31.8

#### Case Dimensions in Inches

$\phi A$ $\pm 0.008$	$\phi A'$ $\pm 0.012$	B $\pm 0.020$	F $\pm 0.010$
0.642	0.744	0.374	1.250

Case Size Code	$\phi D$ $+2.0$	L $+2.0$	H $\pm 1.0$
E54	76.2	54	61
E67	76.2	67	74
E79	76.2	79	86
E92	76.2	92	99
EA5	76.2	105	112
EB7	76.2	117	124
ED0	76.2	130	137
EE3	76.2	143	150
EF5	76.2	155	162
EG8	76.2	168	175

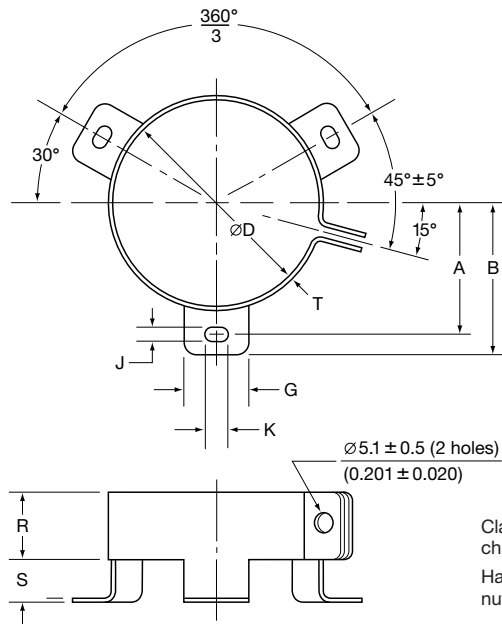
Case Size Code	$\phi D$ $+0.080$	L $+0.080$	H $\pm 0.040$
E54	3.000	2.125	2.402
E67	3.000	2.625	2.913
E79	3.000	3.125	3.386
E92	3.000	3.625	3.898
EA5	3.000	4.125	4.409
EB7	3.000	4.625	4.882
ED0	3.000	5.125	5.394
EE3	3.000	5.625	5.906
EF5	3.000	6.125	6.378
EG8	3.000	6.625	6.890

# UTOR Series

## Mounting Hardware - Screw Terminals

### Type C: Three-Footed Clamp

Unit: mm (inches)



### Type C: Clamp Specifications

Mounting Code	Case $\varnothing D$	A $\pm 1.0$ (0.040)	B $\pm 1.0$ (0.040)	G $\pm 1.0$ (0.040)	J $\pm 0.5$ (0.020)	K $\pm 0.5$ (0.020)	R $\pm 1.0$ (0.040)	S $\pm 1.0$ (0.040)	T $\pm 0.5$ (0.020)
C	76.2 (3.000)	44.5 (1.750)	49.2 (1.937)	13.3 (0.524)	4.5 (0.177)	7.1 (0.280)	19.1 (0.751)	9.5 (0.374)	1.0 (0.040)

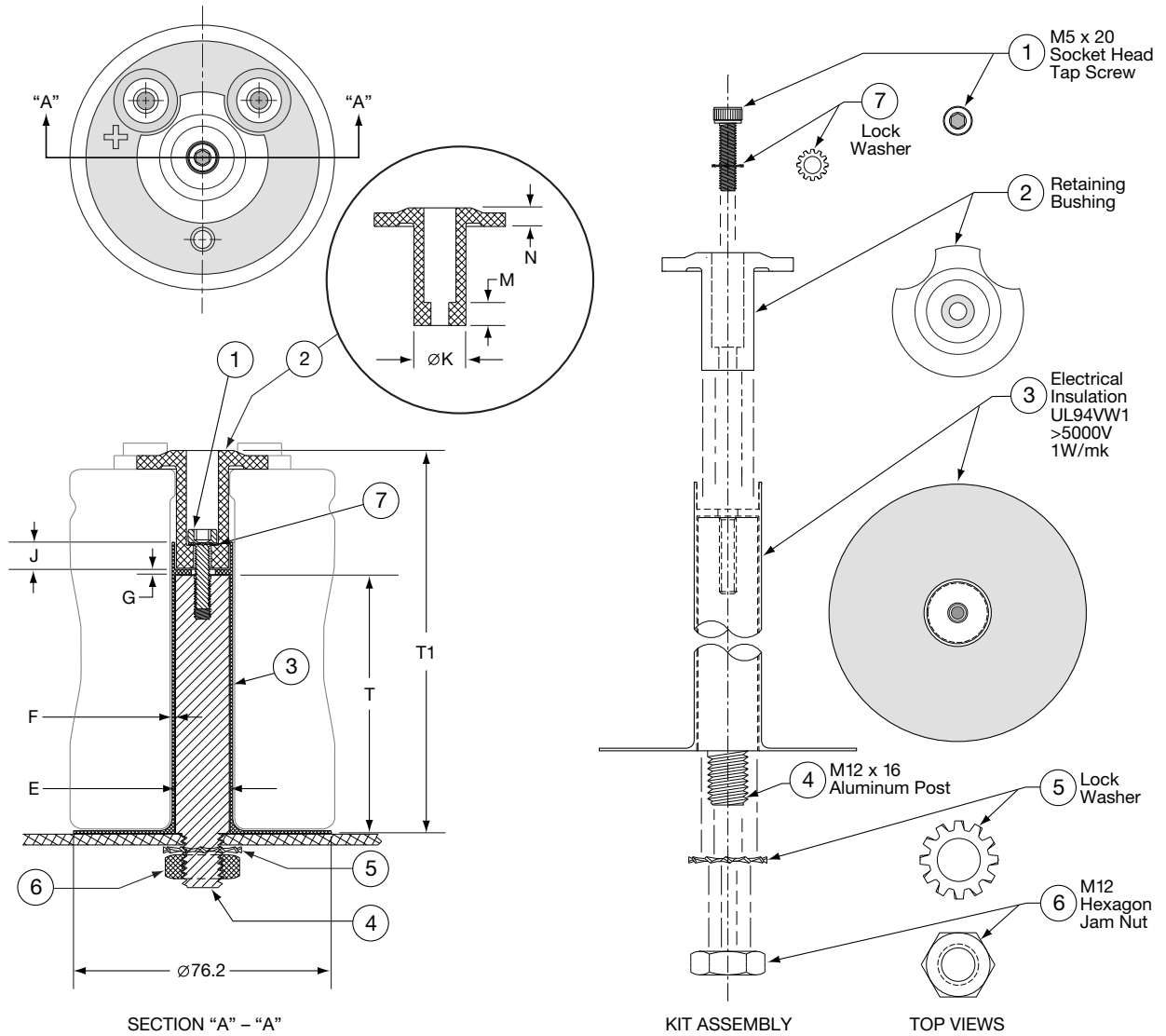


# UTOR Series

## Mounting Hardware - Screw Terminals

### Type H: Heat Sink Mounting Kit

Unit: mm (inches)



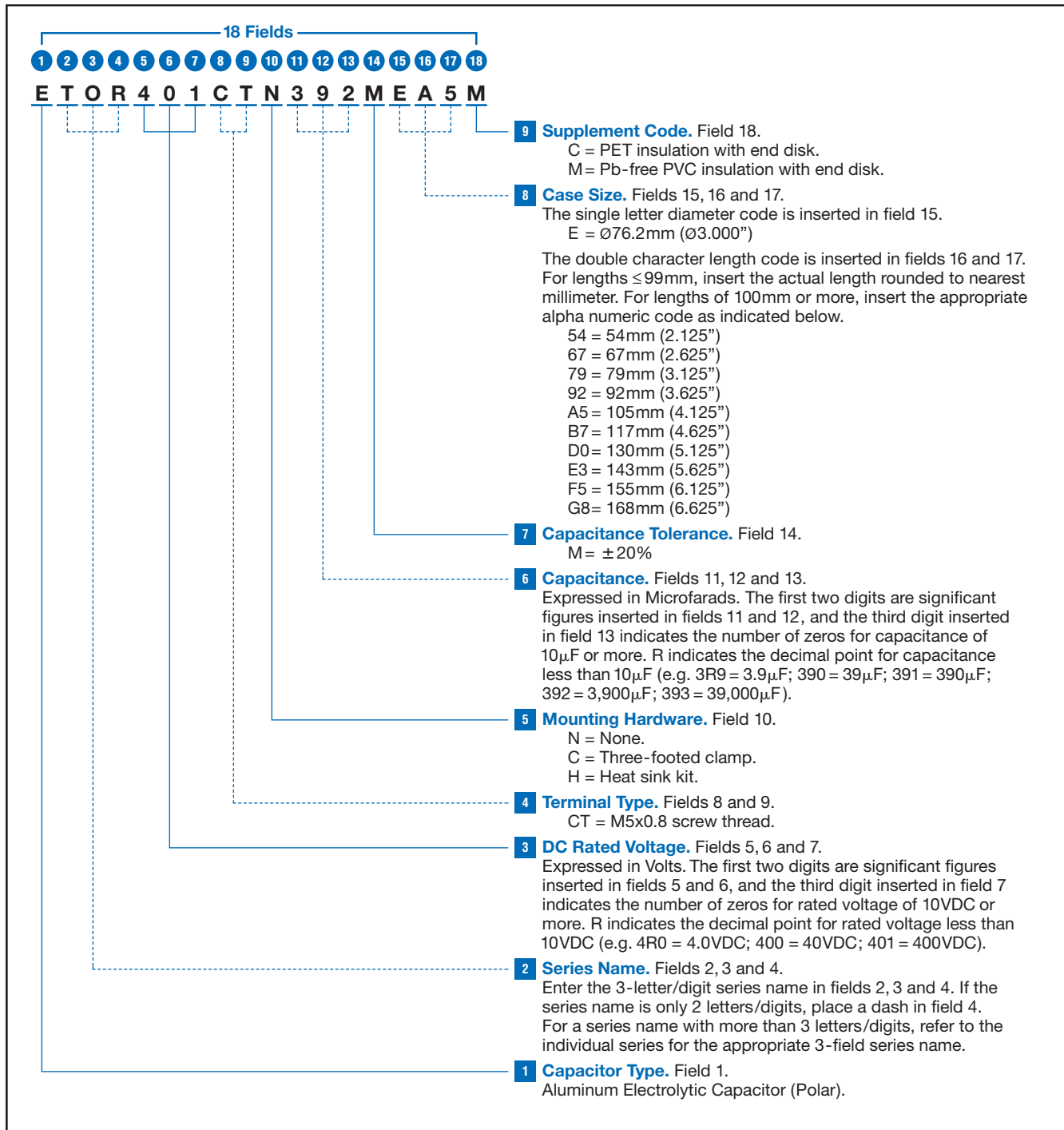
### Type H: Heat Sink Mounting Kit Dimensions

Mounting Code	Case Size Code	T ±0.2 (0.008)	T1 ±0.5 (0.020)
H	E54	35 (1.378)	58 (2.280)
H	E67	35 (1.378)	71 (2.780)
H	E79	60 (2.362)	83 (3.280)
H	E92	60 (2.362)	96 (3.780)
H	EA5	60 (2.362)	109 (4.280)
H	EB7	60 (2.362)	121 (4.780)
H	ED0	111 (4.370)	134 (5.280)
H	EE3	111 (4.370)	147 (5.780)
H	EF5	111 (4.370)	160 (6.280)
H	EG8	111 (4.370)	172 (6.780)

Dimension	Millimeters	Inches
E	18.6 Max.	0.732 Max.
F	0.56 ± 0.05	0.022 ± 0.002
G	2.00 ± 0.13	0.080 ± 0.005
J	8.00 ± 0.13	0.315 ± 0.005
ØK	15.24 ± 0.20	0.600 ± 0.008
M	6.76 ± 0.13	0.266 ± 0.005
N	5.49 ± 0.13	0.216 ± 0.005

# UTOR Series

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



# UTOR Series

## Standard Voltage Ratings - Screw Terminals

Rated Voltage (WVDC)	Capacitance (μF)	Global Part Number†	Nominal Case Size* D × L (mm)	Case Size Code	Maximum ESR (mΩ) at +25°C, 120Hz	Rated Ripple Current (A rms) at +105°C		
						120Hz	300Hz	>3kHz
<b>350 Volts</b> 400 Volts Surge	1,800	ETOR351CTN182ME54M	76.2 × 54	E54	44	11.8	14.1	16.5
	2,700	ETOR351CTN272ME67M	76.2 × 67	E67	30	15.4	18.5	21.6
	3,300	ETOR351CTN332ME79M	76.2 × 79	E79	24	17.1	20.5	23.9
	4,700	ETOR351CTN472ME92M	76.2 × 92	E92	17	21.6	26.0	30.3
	5,600	ETOR351CTN562MEA5M	76.2 × 105	EA5	14	24.9	29.9	34.9
	6,800	ETOR351CTN682MED0M	76.2 × 130	ED0	12	30.2	36.2	42.2
	8,200	ETOR351CTN822MEE3M	76.2 × 143	EE3	10	34.5	41.4	48.3
	10,000	ETOR351CTN103MEG8M	76.2 × 168	EG8	8	41.0	49.2	57.4
<b>400 Volts</b> 450 Volts Surge	1,500	ETOR401CTN152ME54M	76.2 × 54	E54	53	10.7	12.9	15.0
	2,200	ETOR401CTN222ME67M	76.2 × 67	E67	36	13.9	16.7	19.5
	2,700	ETOR401CTN272ME79M	76.2 × 79	E79	30	15.4	18.5	21.6
	3,300	ETOR401CTN332ME92M	76.2 × 92	E92	24	18.1	21.8	25.4
	3,900	ETOR401CTN392MEA5M	76.2 × 105	EA5	21	20.8	25.0	29.1
	4,700	ETOR401CTN472MEB7M	76.2 × 117	EB7	17	24.0	28.8	33.6
	5,600	ETOR401CTN562MED0M	76.2 × 130	ED0	14	27.4	32.9	38.3
	6,800	ETOR401CTN682MEE3M	76.2 × 143	EE3	12	31.4	37.7	44.0
8,200	ETOR401CTN822MEG8M	76.2 × 168	EG8	10	37.1	44.5	52.0	
<b>420 Volts</b> 470 Volts Surge	1,200	ETOR421CTN122ME54M	76.2 × 54	E54	89	9.3	11.1	13.0
	1,800	ETOR421CTN182ME67M	76.2 × 67	E67	59	12.2	14.6	17.1
	2,200	ETOR421CTN222ME79M	76.2 × 79	E79	40	14.9	17.9	20.9
	3,300	ETOR421CTN332ME92M	76.2 × 92	E92	32	17.5	21.0	24.5
	3,900	ETOR421CTN392MEA5M	76.2 × 105	EA5	27	20.1	24.1	28.2
	4,700	ETOR421CTN472MED0M	76.2 × 130	ED0	23	24.2	29.1	33.9
	5,600	ETOR421CTN562MEE3M	76.2 × 143	EE3	19	27.6	33.1	38.6
	6,800	ETOR421CTN682MEG8M	76.2 × 168	EG8	16	32.7	39.2	45.7
<b>450 Volts</b> 500 Volts Surge	1,000	ETOR451CTN102ME54M	76.2 × 54	E54	89	9.3	11.1	13.0
	1,500	ETOR451CTN152ME67M	76.2 × 67	E67	59	12.2	14.6	17.1
	2,200	ETOR451CTN222ME79M	76.2 × 79	E79	48	13.5	16.2	18.9
	2,700	ETOR451CTN272ME92M	76.2 × 92	E92	40	15.9	19.0	22.2
	3,300	ETOR451CTN332MEA5M	76.2 × 105	EA5	32	18.5	22.2	25.9
	3,900	ETOR451CTN392MEB7M	76.2 × 117	EB7	27	21.1	25.3	29.6
	4,700	ETOR451CTN472MED0M	76.2 × 130	ED0	23	24.2	29.1	33.9
	5,600	ETOR451CTN562MEF5M	76.2 × 155	EF5	19	28.6	34.3	40.1
<b>500 Volts</b> 550 Volts Surge	680	ETOR501CTN681ME54M	76.2 × 54	E54	206	6.5	7.8	9.1
	1,000	ETOR501CTN102ME67M	76.2 × 67	E67	140	8.4	10.1	11.8
	1,500	ETOR501CTN152ME79M	76.2 × 79	E79	93	10.3	12.4	14.4
	1,800	ETOR501CTN182ME92M	76.2 × 92	E92	78	12.0	14.4	16.8
	2,200	ETOR501CTN222MEA5M	76.2 × 105	EA5	64	14.0	16.8	19.6
	2,700	ETOR501CTN272MEB7M	76.2 × 117	EB7	52	16.3	19.5	22.8
	3,300	ETOR501CTN332MEE3M	76.2 × 143	EE3	42	19.6	23.5	27.4
	3,900	ETOR501CTN392MEG8M	76.2 × 168	EG8	36	22.1	26.5	31.0

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

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

# Metric Conversion Table

Inches: Fractions/ Decimals		Inches/Millimeters												Celsius/ Fahrenheit		
		0"	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	°C	°F
0	—	—	25.400	50.800	76.200	101.600	127.000	152.400	177.800	203.200	228.600	254.000	279.400	304.800	538	1000
1/64	0.0156	0.397	25.797	51.197	76.597	101.997	127.397	152.797	178.197	203.597	228.997	254.397	279.797	305.197	500	932
1/32	0.0313	0.794	26.194	51.594	76.994	102.394	127.794	153.194	178.594	203.994	229.394	254.794	280.194	305.594	482	900
3/64	0.0469	1.191	26.591	51.991	77.391	102.791	128.191	153.591	178.991	204.391	229.791	255.191	280.591	305.991	450	842
1/16	0.0625	1.588	26.988	52.388	77.788	103.188	128.588	153.988	179.388	204.788	230.188	255.588	280.988	306.388	427	800
5/64	0.0781	1.984	27.384	52.784	78.184	103.584	128.984	154.384	179.784	205.184	230.584	255.984	281.384	306.784	400	752
3/32	0.0938	2.381	27.781	53.181	78.581	103.981	129.381	154.781	180.181	205.581	230.981	256.381	281.781	307.181	371	700
7/64	0.1094	2.778	28.178	53.578	78.978	104.378	129.778	155.178	180.578	205.978	231.378	256.778	282.178	307.578	350	662
1/8	0.125	3.175	28.575	53.975	79.375	104.775	130.175	155.575	180.975	206.375	231.775	257.175	282.575	307.975	316	600
9/64	0.1406	3.572	28.972	54.372	79.772	105.172	130.572	155.972	181.372	206.772	232.172	257.572	282.972	308.372	300	572
5/32	0.1563	3.969	29.369	54.769	80.169	105.569	130.969	156.369	181.769	207.169	232.569	257.969	283.369	308.769	260	500
11/64	0.1719	4.366	29.766	55.166	80.566	105.966	131.366	156.766	182.166	207.566	232.966	258.366	283.766	309.166	250	482
3/16	0.1875	4.762	30.162	55.562	80.962	106.362	131.762	157.162	182.562	207.962	233.362	258.762	284.162	309.562	204	400
13/64	0.2031	5.159	30.559	55.959	81.359	106.759	132.159	157.559	182.959	208.359	233.759	259.159	284.559	309.959	200	392
7/32	0.2188	5.556	30.956	56.356	81.756	107.156	132.556	157.956	183.356	208.756	234.156	259.556	284.956	310.356	190	374
15/64	0.2344	5.953	31.353	56.753	82.153	107.553	132.953	158.353	183.753	209.153	234.553	259.953	285.353	310.753	180	356
1/4	0.250	6.350	31.750	57.150	82.550	107.950	133.350	158.750	184.150	209.550	234.950	260.350	285.750	311.150	170	338
17/64	0.2656	6.747	32.147	57.547	82.947	108.347	133.747	159.147	184.547	209.947	235.347	260.747	286.147	311.547	160	320
9/32	0.2813	7.144	32.544	57.944	83.344	108.744	134.144	159.544	184.944	210.344	235.744	261.144	286.544	311.944	150	302
19/64	0.2969	7.541	32.941	58.341	83.741	109.141	134.541	159.941	185.341	210.741	236.141	261.541	286.941	312.341	140	284
5/16	0.3125	7.938	33.338	58.738	84.138	109.538	134.938	160.338	185.738	211.138	236.538	261.938	287.338	312.738	130	266
21/64	0.3281	8.334	33.734	59.134	84.534	109.934	135.334	160.734	186.134	211.534	236.934	262.334	287.734	313.134	125	257
11/32	0.3438	8.731	34.131	59.531	84.931	110.331	135.731	161.131	186.531	211.931	237.331	262.731	288.131	313.531	120	248
23/64	0.3594	9.128	34.528	59.928	85.328	110.728	136.128	161.528	186.928	212.328	237.728	263.128	288.528	313.928	110	230
3/8	0.375	9.525	34.925	60.325	85.725	111.125	136.525	161.925	187.325	212.725	238.125	263.525	288.925	314.325	105	221
25/64	0.3906	9.922	35.322	60.722	86.122	111.522	136.922	162.322	187.722	213.122	238.522	263.922	289.322	314.722	100	212
13/32	0.4063	10.319	35.719	61.119	86.519	111.919	137.319	162.719	188.119	213.519	238.919	264.319	289.719	315.119	95	203
27/64	0.4219	10.716	36.116	61.516	86.916	112.316	137.716	163.116	188.516	213.916	239.316	264.716	290.116	315.516	90	194
7/16	0.4375	11.112	36.512	61.912	87.312	112.712	138.112	163.512	188.912	214.312	239.712	265.112	290.512	315.912	85	185
29/64	0.4531	11.509	36.909	62.309	87.709	113.109	138.509	163.909	189.309	214.709	240.109	265.509	290.909	316.309	80	176
15/32	0.4688	11.906	37.306	62.706	88.106	113.506	138.906	164.306	189.706	215.106	240.506	265.906	291.306	316.706	75	167
31/64	0.4844	12.303	37.703	63.103	88.503	113.903	139.303	164.703	190.103	215.503	240.903	266.303	291.703	317.103	70	158
1/2	0.500	12.700	38.100	63.500	88.900	114.300	139.700	165.100	190.500	215.900	241.300	266.700	292.100	317.500	65	149
33/64	0.5156	13.097	38.497	63.897	89.297	114.697	140.097	165.497	190.897	216.297	241.697	267.097	292.497	317.897	60	140
17/32	0.5313	13.494	38.894	64.294	89.694	115.094	140.494	165.894	191.294	216.694	242.094	267.494	292.894	318.294	55	131
35/64	0.5469	13.891	39.291	64.691	90.091	115.491	140.891	166.291	191.691	217.091	242.491	267.891	293.291	318.691	50	122
9/16	0.5625	14.288	39.688	65.088	90.488	115.888	141.288	166.688	192.088	217.488	242.888	268.288	293.688	319.088	45	113
37/64	0.5781	14.684	40.084	65.484	90.884	116.284	141.684	167.084	192.484	217.884	243.284	268.684	294.084	319.484	40	104
19/32	0.5938	15.081	40.481	65.881	91.281	116.681	142.081	167.481	192.881	218.281	243.681	269.081	294.481	319.881	35	95
39/64	0.6094	15.478	40.878	66.278	91.678	117.078	142.478	167.878	193.278	218.678	244.078	269.478	294.878	320.278	30	86
5/8	0.625	15.875	41.275	66.675	92.075	117.475	142.875	168.275	193.675	219.075	244.475	269.875	295.275	320.675	25	77
41/64	0.6406	16.272	41.672	67.072	92.472	117.872	143.272	168.672	194.072	219.472	244.872	270.272	295.672	321.072	20	68
21/32	0.6563	16.669	42.069	67.469	92.869	118.269	143.669	169.069	194.469	219.869	245.269	270.669	296.069	321.469	15	59
43/64	0.6719	17.066	42.466	67.866	93.266	118.666	144.066	169.466	194.866	220.266	245.666	271.066	296.466	321.866	10	50
11/16	0.6875	17.462	42.862	68.262	93.662	119.062	144.462	169.862	195.262	220.662	246.062	271.462	296.862	322.262	5	41
45/64	0.7031	17.859	43.259	68.659	94.059	119.459	144.859	170.259	195.659	221.059	246.459	271.859	297.259	322.659	0	32
23/32	0.7188	18.256	43.656	69.056	94.456	119.856	145.256	170.656	196.056	221.456	246.856	272.256	297.656	323.056	-5.0	23
47/64	0.7344	18.653	44.053	69.453	94.853	120.253	145.653	171.053	196.453	221.853	247.253	272.653	298.053	323.453	-10.0	14
3/4	0.750	19.050	44.450	69.850	95.250	120.650	146.050	171.450	196.850	222.250	247.650	273.050	298.450	323.850	-15.0	5
49/64	0.7656	19.447	44.847	70.247	95.647	121.047	146.447	171.847	197.247	222.647	248.047	273.447	298.847	324.247	-17.8	0
25/32	0.7813	19.844	45.244	70.644	96.044	121.444	146.844	172.244	197.644	223.044	248.444	273.844	299.244	324.644	-20.0	-4
51/64	0.7969	20.241	45.641	71.041	96.441	121.841	147.241	172.641	198.041	223.441	248.841	274.241	299.641	325.041	-20.6	-5
13/16	0.8125	20.638	46.038	71.438	96.838	122.238	147.638	173.038	198.438	223.838	249.238	274.638	300.038	325.438	-23.3	-10
53/64	0.8281	21.034	46.434	71.834	97.234	122.634	148.034	173.434	198.834	224.234	249.634	275.034	300.434	325.834	-25.0	-13
27/32	0.8438	21.431	46.831	72.231	97.631	123.031	148.431	173.831	199.231	224.631	250.031	275.431	300.831	326.231	-26.1	-15
55/64	0.8594	21.828	47.228	72.628	98.028	123.428	148.828	174.228	199.628	225.028	250.428	275.828	301.228	326.628	-28.9	-20
7/8	0.875	22.225	47.625	73.025	98.425	123.825	149.225	174.625	200.025	225.425	250.825	276.225	301.625	327.025	-30.0	-22
57/64	0.8906	22.622	48.022	73.422	98.822	124.222	149.622	175.022	200.422	225.822	251.222	276.622	302.022	327.422	-31.7	-25
29/32	0.9063	23.019	48.419	73.819	99.219	124.619	150.019	175.419	200.819	226.219	251.619	277.019	302.419	327.819	-34.4	-30
59/64	0.9219	23.416	48.816	74.216	99.616	125.016	150.416	175.816	201.216	226.616	252.016	277.416	302.816	328.216	-35.0	-31
15/16	0.9375	23.812	49.212	74.612	100.012	125.412	150.812	176.212	201.612	227.012	252.412	277.812	303.212	328.612	-37.2	-35
61/64	0.9531	24.209	49.609	75.009	100.409	125.809	151.209	176.609	202.009	227.409	252.809	278.209	303.609	329.009	-40.0	-40
31/32	0.9688	24.606	50.006	75.406	100.806	126.206	151.606	177.006	202.406	227.806	253.206	278.606	304.006	329.406	-42.8	-45

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