

- **Snap Mount**
- **Downsize**
- **High Voltage**
- **Long Life**
- **RoHS Compliant**
- **+85°C Maximum Temperature**



The SMM series is a high voltage, long life snap-in capacitor series that offers downsized versions of the SMH series. Compared to our SMH series, the SMM capacitors have a longer rated lifetime of 3,000 hours with the full rated ripple current applied and are also one case size smaller than equivalently rated SMH capacitors. These characteristics allow downsizing for many power supplies and will provide better reliability due to increased life. The SMM capacitors are available in 2 or 4-pin snap-in styles and 4-pin straight terminals. The SMM series capacitors are RoHS compliant offering Pb-free construction.

The standard SMM series capacitors are *not* solvent proof. Refer to guidelines and precautions on the website for usage and installation conditions recommended for United Chemi-Con products.

## Summary of Specifications

- **PC board 2 or 4-pin snap-in; optional 4-pin straight terminals.**
- **Capacitance range: 47 to 3,300µF.**
- **Voltage range: 160 to 450VDC.**
- **Category temperature range: -25°C to +85°C.**
- **Leakage current:  $3\sqrt{CV}$  (µA) maximum after 5 minutes at +20°C.**
- **Standard capacitance tolerance: ±20%**
- **Nominal case size (D × L): 20 × 25mm to 35 × 50mm.**
- **Rated lifetime: 3,000 hours at +85°C with the rated ripple current applied.**

## SMM Specifications - Snap Mount

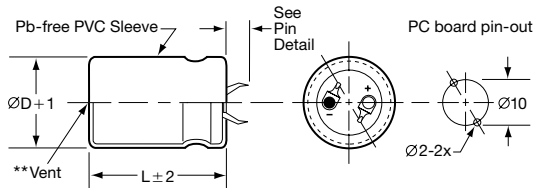
| Item                             | Characteristics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |           |       |      |       |       |  |                   |           |           |       |  |  |  |                       |      |      |      |  |  |  |                  |      |       |       |      |       |       |  |            |      |      |      |      |      |      |  |            |      |      |      |      |      |      |  |
|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------|------|-------|-------|--|-------------------|-----------|-----------|-------|--|--|--|-----------------------|------|------|------|--|--|--|------------------|------|-------|-------|------|-------|-------|--|------------|------|------|------|------|------|------|--|------------|------|------|------|------|------|------|--|
| Category Temperature Range       | − 25 to +85°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |           |       |      |       |       |  |                   |           |           |       |  |  |  |                       |      |      |      |  |  |  |                  |      |       |       |      |       |       |  |            |      |      |      |      |      |      |  |            |      |      |      |      |      |      |  |
| Rated Voltage Range              | 160 to 450VDC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |           |       |      |       |       |  |                   |           |           |       |  |  |  |                       |      |      |      |  |  |  |                  |      |       |       |      |       |       |  |            |      |      |      |      |      |      |  |            |      |      |      |      |      |      |  |
| Capacitance Range                | 47 to 3,300μF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |           |       |      |       |       |  |                   |           |           |       |  |  |  |                       |      |      |      |  |  |  |                  |      |       |       |      |       |       |  |            |      |      |      |      |      |      |  |            |      |      |      |      |      |      |  |
| Capacitance Tolerance            | ±20% (M) at +20°C, 120Hz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |           |       |      |       |       |  |                   |           |           |       |  |  |  |                       |      |      |      |  |  |  |                  |      |       |       |      |       |       |  |            |      |      |      |      |      |      |  |            |      |      |      |      |      |      |  |
| Leakage Current                  | I ≤ 3√CV (μA) after 5 minutes at +20°C.<br>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>160 - 400</td><td colspan="5">420 - 450</td></tr><tr><td>Tan δ (DF) Max.</td><td>0.15</td><td colspan="5">0.20</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                               |           |       |      |       |       |  | Rated Voltage (V) | 160 - 400 | 420 - 450 |       |  |  |  | Tan δ (DF) Max.       | 0.15 | 0.20 |      |  |  |  |                  |      |       |       |      |       |       |  |            |      |      |      |      |      |      |  |            |      |      |      |      |      |      |  |
| Rated Voltage (V)                | 160 - 400                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 420 - 450 |       |      |       |       |  |                   |           |           |       |  |  |  |                       |      |      |      |  |  |  |                  |      |       |       |      |       |       |  |            |      |      |      |      |      |      |  |            |      |      |      |      |      |      |  |
| 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>160 - 400</td><td colspan="5">420 - 450</td></tr><tr><td>Z (−25°C) / Z (+20°C)</td><td>4</td><td colspan="5">8</td></tr></table>                                                                                                                                                                                                                                                                                                                               |           |       |      |       |       |  | Rated Voltage (V) | 160 - 400 | 420 - 450 |       |  |  |  | Z (−25°C) / Z (+20°C) | 4    | 8    |      |  |  |  |                  |      |       |       |      |       |       |  |            |      |      |      |      |      |      |  |            |      |      |      |      |      |      |  |
| Rated Voltage (V)                | 160 - 400                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 420 - 450 |       |      |       |       |  |                   |           |           |       |  |  |  |                       |      |      |      |  |  |  |                  |      |       |       |      |       |       |  |            |      |      |      |      |      |      |  |            |      |      |      |      |      |      |  |
| Z (−25°C) / Z (+20°C)            | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 8         |       |      |       |       |  |                   |           |           |       |  |  |  |                       |      |      |      |  |  |  |                  |      |       |       |      |       |       |  |            |      |      |      |      |      |      |  |            |      |      |      |      |      |      |  |
| Rated Ripple Current Multipliers | Ambient Temperature (°C) <table border="1"><tr><td>+45°C</td><td>+60°C</td><td>+70°C</td><td colspan="4">+85°C</td></tr><tr><td>1.73</td><td>1.50</td><td>1.32</td><td colspan="4">1.00</td></tr></table><br>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 colspan="2">50kHz</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 colspan="2">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 colspan="2">1.43</td></tr></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 | 50kHz |  | 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  |      |       |       |  |                   |           |           |       |  |  |  |                       |      |      |      |  |  |  |                  |      |       |       |      |       |       |  |            |      |      |      |      |      |      |  |            |      |      |      |      |      |      |  |
| DC Rated Voltage                 | 50Hz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 120Hz     | 300Hz | 1kHz | 10kHz | 50kHz |  |                   |           |           |       |  |  |  |                       |      |      |      |  |  |  |                  |      |       |       |      |       |       |  |            |      |      |      |      |      |      |  |            |      |      |      |      |      |      |  |
| 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 3,000 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.<br>Capacitance change: ≤ ±20% of initial measured value<br>Tan δ (DF) : ≤ 200% of initial specified value<br>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.<br>Capacitance change: ≤ ±15% of initial measured value<br>Tan δ (DF) : ≤ 150% of initial specified value<br>Leakage current : ≤ initial specified value                                                                                                                                                   |           |       |      |       |       |  |                   |           |           |       |  |  |  |                       |      |      |      |  |  |  |                  |      |       |       |      |       |       |  |            |      |      |      |      |      |      |  |            |      |      |      |      |      |      |  |

## Diagram of Dimensions - Snap Mount

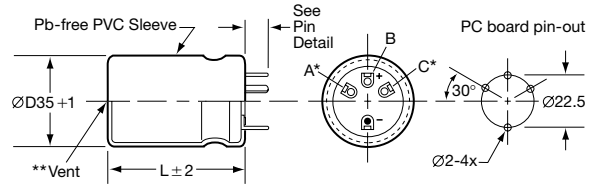
### Snap Mount

Unit: mm

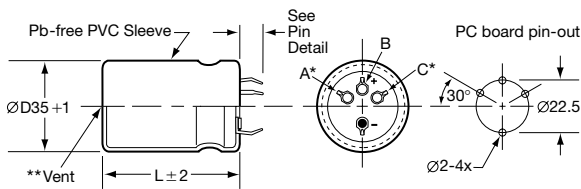
#### Types VSN $\varnothing 20 \sim \varnothing 35$ ; VNN $\varnothing 22 \sim \varnothing 35$



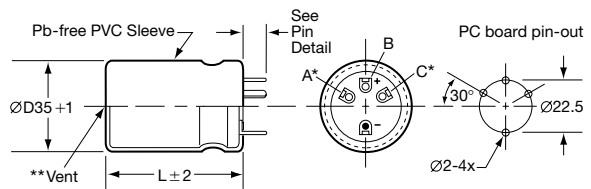
#### Type VRD $\varnothing 35$



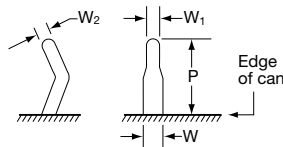
#### Type VND $\varnothing 35$



#### Type VQD $\varnothing 35$



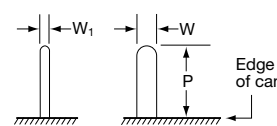
#### VS & VN Pin Dimensions



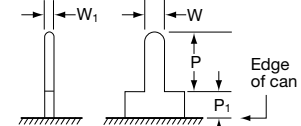
| Type                                     | P             | W             | W <sub>1</sub> | W <sub>2</sub> |
|------------------------------------------|---------------|---------------|----------------|----------------|
| VSN $\varnothing 20 \sim \varnothing 30$ | $4.0 \pm 0.5$ | $1.5 \pm 0.2$ | 1.0            | 1.0            |
| VSN $\varnothing 35$                     | $3.5 \pm 0.5$ |               |                |                |
| VNN $\varnothing 22 \sim \varnothing 35$ | $5.8 \pm 1.0$ |               |                |                |
| VND $\varnothing 35$                     | $5.8 \pm 1.0$ |               |                |                |

#### VR & VQ Pin Dimensions

##### VR Straight Pin



##### VQ Standoff Pin



| Type              | P              | P <sub>1</sub> | W             | W <sub>1</sub> |
|-------------------|----------------|----------------|---------------|----------------|
| Straight Pin (VR) | $5.50 \pm 1.0$ | —              | $1.5 \pm 0.1$ | 0.7            |
| Standoff Pin (VQ) | $3.75 \pm 1.0$ | 2.0 max.       |               |                |

#### 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 or positive terminal.

\*\*Vent may be located either on the bottom or side of the can.

## Part Numbering System for SMM Series

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



- 9 Supplement Code.** Field 18.  
All construction options listed have Sn100% terminal plating.  
S = PET sleeve without end disk.  
W = PET sleeve with end disk.  
M = Pb-free PVC sleeve without end disk.  
T = Pb-free PVC sleeve with end disk.
- 8 Case Size.** Fields 15, 16 and 17.  
The single letter diameter code is inserted in field 15.  
N = Ø20mm  
P = Ø22mm  
Q = Ø25.4mm  
R = Ø30mm  
A = Ø35mm  
The double digit length code is inserted in fields 16 and 17.  
20 = 20mm  
25 = 25mm  
30 = 30mm  
35 = 35mm  
40 = 40mm  
45 = 45mm  
50 = 50mm
- 7 Capacitance Tolerance.** Field 14.  
M =  $\pm 20\%$
- 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  $10\mu\text{F}$  or more. R indicates the decimal point for capacitance less than  $10\mu\text{F}$  (e.g. 5R6 =  $5.6\mu\text{F}$ ; 560 =  $56\mu\text{F}$ ; 561 =  $560\mu\text{F}$ ; 562 =  $5,600\mu\text{F}$ ; 563 =  $56,000\mu\text{F}$ ).
- 5 Dummy Terminals.** Field 10.  
N = No dummy terminals.  
D = 2 dummy terminals.
- 4 Terminal Type.** Fields 8 and 9.  
VS = Snap-in pins, 4.0mm in length, 3.5mm for Ø35 only.  
VN = Snap-in pins, 5.8mm in length.  
VR = Straight pins.  
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 315VDC = 3B1.
- 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).

## 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 |
|----------------------|------------------|---------------------|-------------------------------|----------------|---------------------------------|----------------------------------------------|
|----------------------|------------------|---------------------|-------------------------------|----------------|---------------------------------|----------------------------------------------|

|                              |       |                    |           |     |       |      |
|------------------------------|-------|--------------------|-----------|-----|-------|------|
| 160 Volts<br>200 Volts Surge | 270   | ESMM161VSN271MN25T | 20 × 25   | N25 | 0.921 | 1.28 |
|                              | 330   | ESMM161VSN331MN25T | 20 × 25   | N25 | 0.753 | 1.55 |
|                              | 390   | ESMM161VSN391MN30T | 20 × 30   | N30 | 0.638 | 1.63 |
|                              | 470   | ESMM161VSN471MN30T | 20 × 30   | N30 | 0.529 | 1.9  |
|                              | 560   | ESMM161VSN561MN35T | 20 × 35   | N35 | 0.444 | 2.14 |
|                              | 680   | ESMM161VSN681MN40T | 20 × 40   | N40 | 0.366 | 2.35 |
|                              | 820   | ESMM161VSN821MN45T | 20 × 45   | N45 | 0.303 | 2.64 |
|                              | 270   | ESMM161VSN271MP20T | 22 × 20   | P20 | 0.921 | 1.3  |
|                              | 390   | ESMM161VSN391MP25T | 22 × 25   | P25 | 0.638 | 1.63 |
|                              | 470   | ESMM161VSN471MP30T | 22 × 30   | P30 | 0.529 | 1.86 |
|                              | 560   | ESMM161VSN561MP30T | 22 × 30   | P30 | 0.444 | 2.15 |
|                              | 680   | ESMM161VSN681MP35T | 22 × 35   | P35 | 0.366 | 2.35 |
|                              | 820   | ESMM161VSN821MP40T | 22 × 40   | P40 | 0.303 | 2.68 |
|                              | 1,000 | ESMM161VSN102MP45T | 22 × 45   | P45 | 0.249 | 3.02 |
|                              | 1,200 | ESMM161VSN122MP50T | 22 × 50   | P50 | 0.207 | 3.47 |
|                              | 390   | ESMM161VSN391MQ20T | 25.4 × 20 | Q20 | 0.638 | 1.62 |
|                              | 470   | ESMM161VSN471MQ25T | 25.4 × 25 | Q25 | 0.529 | 1.86 |
|                              | 560   | ESMM161VSN561MQ25T | 25.4 × 25 | Q25 | 0.444 | 2.15 |
|                              | 680   | ESMM161VSN681MQ30T | 25.4 × 30 | Q30 | 0.366 | 2.33 |
|                              | 820   | ESMM161VSN821MQ30T | 25.4 × 30 | Q30 | 0.303 | 2.65 |
|                              | 1,000 | ESMM161VSN102MQ35T | 25.4 × 35 | Q35 | 0.249 | 3.0  |
|                              | 1,200 | ESMM161VSN122MQ40T | 25.4 × 40 | Q40 | 0.207 | 3.43 |
|                              | 1,500 | ESMM161VSN152MQ50T | 25.4 × 50 | Q50 | 0.166 | 3.96 |
|                              | 560   | ESMM161VSN561MR20T | 30 × 20   | R20 | 0.444 | 2.05 |
|                              | 680   | ESMM161VSN681MR25T | 30 × 25   | R25 | 0.366 | 2.33 |
|                              | 820   | ESMM161VSN821MR25T | 30 × 25   | R25 | 0.303 | 2.64 |
|                              | 1,000 | ESMM161VSN102MR30T | 30 × 30   | R30 | 0.249 | 2.96 |
|                              | 1,200 | ESMM161VSN122MR30T | 30 × 30   | R30 | 0.207 | 3.41 |
|                              | 1,500 | ESMM161VSN152MR35T | 30 × 35   | R35 | 0.166 | 3.96 |
|                              | 1,800 | ESMM161VSN182MR40T | 30 × 40   | R40 | 0.138 | 4.31 |
|                              | 2,200 | ESMM161VSN222MR50T | 30 × 50   | R50 | 0.113 | 4.96 |
|                              | 680   | ESMM161VSN681MA20T | 35 × 20   | A20 | 0.366 | 2.26 |
|                              | 820   | ESMM161VSN821MA20T | 35 × 20   | A20 | 0.303 | 2.49 |
|                              | 1,000 | ESMM161VSN102MA25T | 35 × 25   | A25 | 0.249 | 3.13 |
|                              | 1,200 | ESMM161VSN122MA25T | 35 × 25   | A25 | 0.207 | 3.4  |
|                              | 1,500 | ESMM161VSN152MA30T | 35 × 30   | A30 | 0.166 | 3.94 |
|                              | 1,800 | ESMM161VSN182MA35T | 35 × 35   | A35 | 0.138 | 4.28 |
|                              | 2,200 | ESMM161VSN222MA40T | 35 × 40   | A40 | 0.113 | 4.96 |
|                              | 2,700 | ESMM161VSN272MA45T | 35 × 45   | A45 | 0.092 | 5.57 |
|                              | 3,300 | ESMM161VSN332MA50T | 35 × 50   | A50 | 0.075 | 6.21 |

|                              |       |                    |           |     |       |      |
|------------------------------|-------|--------------------|-----------|-----|-------|------|
| 180 Volts<br>225 Volts Surge | 270   | ESMM181VSN271MN25T | 20 × 25   | N25 | 0.921 | 1.29 |
|                              | 330   | ESMM181VSN331MN30T | 20 × 30   | N30 | 0.753 | 1.77 |
|                              | 390   | ESMM181VSN391MN30T | 20 × 30   | N30 | 0.638 | 1.84 |
|                              | 470   | ESMM181VSN471MN35T | 20 × 35   | N35 | 0.529 | 1.91 |
|                              | 560   | ESMM181VSN561MN40T | 20 × 40   | N40 | 0.444 | 2.15 |
|                              | 680   | ESMM181VSN681MN45T | 20 × 45   | N45 | 0.366 | 2.41 |
|                              | 820   | ESMM181VSN821MN50T | 20 × 50   | N50 | 0.303 | 2.72 |
|                              | 220   | ESMM181VSN221MP20T | 22 × 20   | P20 | 1.13  | 1.18 |
|                              | 330   | ESMM181VSN331MP25T | 22 × 25   | P25 | 0.753 | 1.77 |
|                              | 390   | ESMM181VSN391MP25T | 22 × 25   | P25 | 0.638 | 1.84 |
|                              | 470   | ESMM181VSN471MP30T | 22 × 30   | P30 | 0.529 | 1.91 |
|                              | 560   | ESMM181VSN561MP35T | 22 × 35   | P35 | 0.444 | 2.25 |
|                              | 680   | ESMM181VSN681MP35T | 22 × 35   | P35 | 0.366 | 2.48 |
|                              | 820   | ESMM181VSN821MP40T | 22 × 40   | P40 | 0.303 | 2.86 |
|                              | 1,000 | ESMM181VSN102MP50T | 22 × 50   | P50 | 0.249 | 3.1  |
|                              | 330   | ESMM181VSN331MQ20T | 25.4 × 20 | Q20 | 0.753 | 1.49 |
|                              | 470   | ESMM181VSN471MQ25T | 25.4 × 25 | Q25 | 0.529 | 2.08 |

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

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

## Standard Voltage Ratings - Snap Mount

| Rated Voltage (VWDC) | 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>180 Volts<br/>225 Volts Surge</b> | 560   | ESMM181VSN561MQ25T | 25.4 × 25 | Q25 | 0.444 | 2.25 |
|                                      | 680   | ESMM181VSN681MQ30T | 25.4 × 30 | Q30 | 0.366 | 2.5  |
|                                      | 820   | ESMM181VSN821MQ35T | 25.4 × 35 | Q35 | 0.303 | 2.75 |
|                                      | 1,000 | ESMM181VSN102MQ40T | 25.4 × 40 | Q40 | 0.249 | 3.06 |
|                                      | 1,200 | ESMM181VSN122MQ45T | 25.4 × 45 | Q45 | 0.207 | 3.63 |
|                                      | 470   | ESMM181VSN471MR20T | 30 × 20   | R20 | 0.529 | 1.88 |
|                                      | 680   | ESMM181VSN681MR25T | 30 × 25   | R25 | 0.366 | 2.46 |
|                                      | 820   | ESMM181VSN821MR25T | 30 × 25   | R25 | 0.303 | 2.69 |
|                                      | 1,000 | ESMM181VSN102MR30T | 30 × 30   | R30 | 0.249 | 3.1  |
|                                      | 1,200 | ESMM181VSN122MR35T | 30 × 35   | R35 | 0.207 | 3.55 |
|                                      | 1,500 | ESMM181VSN152MR40T | 30 × 40   | R40 | 0.166 | 4.1  |
|                                      | 1,800 | ESMM181VSN182MR45T | 30 × 45   | R45 | 0.138 | 4.55 |
|                                      | 680   | ESMM181VSN681MA20T | 35 × 20   | A20 | 0.366 | 2.26 |
|                                      | 1,000 | ESMM181VSN102MA25T | 35 × 25   | A25 | 0.249 | 2.98 |
|                                      | 1,200 | ESMM181VSN122MA30T | 35 × 30   | A30 | 0.207 | 3.49 |
|                                      | 1,500 | ESMM181VSN152MA35T | 35 × 35   | A35 | 0.166 | 4.02 |
|                                      | 1,800 | ESMM181VSN182MA35T | 35 × 35   | A35 | 0.138 | 4.54 |
|                                      | 2,200 | ESMM181VSN222MA40T | 35 × 40   | A40 | 0.113 | 4.83 |
|                                      | 2,700 | ESMM181VSN272MA50T | 35 × 50   | A50 | 0.092 | 5.3  |

|                                      |       |                    |           |     |       |      |
|--------------------------------------|-------|--------------------|-----------|-----|-------|------|
| <b>200 Volts<br/>250 Volts Surge</b> | 220   | ESMM201VSN221MN25T | 20 × 25   | N25 | 1.13  | 1.19 |
|                                      | 270   | ESMM201VSN271MN25T | 20 × 25   | N25 | 0.921 | 1.39 |
|                                      | 330   | ESMM201VSN331MN30T | 20 × 30   | N30 | 0.753 | 1.56 |
|                                      | 390   | ESMM201VSN391MN35T | 20 × 35   | N35 | 0.638 | 1.74 |
|                                      | 470   | ESMM201VSN471MN35T | 20 × 35   | N35 | 0.529 | 2.03 |
|                                      | 560   | ESMM201VSN561MN40T | 20 × 40   | N40 | 0.444 | 2.18 |
|                                      | 680   | ESMM201VSN681MN50T | 20 × 50   | N50 | 0.366 | 2.48 |
|                                      | 220   | ESMM201VSN221MP20T | 22 × 20   | P20 | 1.13  | 1.18 |
|                                      | 270   | ESMM201VSN221MP25T | 22 × 25   | P25 | 0.921 | 1.37 |
|                                      | 330   | ESMM201VSN331MP25T | 22 × 25   | P25 | 0.753 | 1.51 |
|                                      | 390   | ESMM201VSN391MP30T | 22 × 30   | P30 | 0.638 | 1.73 |
|                                      | 470   | ESMM201VSN471MP30T | 22 × 30   | P30 | 0.529 | 1.97 |
|                                      | 560   | ESMM201VSN561MP35T | 22 × 35   | P35 | 0.444 | 2.18 |
|                                      | 680   | ESMM201VSN681MP40T | 22 × 40   | P40 | 0.366 | 2.48 |
|                                      | 820   | ESMM201VSN821MP45T | 22 × 45   | P45 | 0.303 | 2.81 |
|                                      | 1,000 | ESMM201VSN102MP50T | 22 × 50   | P50 | 0.249 | 3.28 |
|                                      | 270   | ESMM201VSN271MQ20T | 25.4 × 20 | Q20 | 0.921 | 1.35 |
|                                      | 330   | ESMM201VSN331MQ20T | 25.4 × 20 | Q20 | 0.753 | 1.49 |
|                                      | 390   | ESMM201VSN391MQ25T | 25.4 × 25 | Q25 | 0.638 | 1.71 |
|                                      | 470   | ESMM201VSN471MQ25T | 25.4 × 25 | Q25 | 0.529 | 1.95 |
|                                      | 560   | ESMM201VSN561MQ30T | 25.4 × 30 | Q30 | 0.444 | 2.15 |
|                                      | 680   | ESMM201VSN681MQ30T | 25.4 × 30 | Q30 | 0.366 | 2.48 |
|                                      | 820   | ESMM201VSN821MQ35T | 25.4 × 35 | Q35 | 0.303 | 2.79 |
|                                      | 1,000 | ESMM201VSN102MQ40T | 25.4 × 40 | Q40 | 0.249 | 3.28 |
|                                      | 1,200 | ESMM201VSN122MQ45T | 25.4 × 45 | Q45 | 0.207 | 3.61 |
|                                      | 390   | ESMM201VSN391MR20T | 30 × 20   | R20 | 0.638 | 1.71 |
|                                      | 470   | ESMM201VSN471MR20T | 30 × 20   | R20 | 0.529 | 1.88 |
|                                      | 560   | ESMM201VSN561MR25T | 30 × 25   | R25 | 0.444 | 2.15 |
|                                      | 680   | ESMM201VSN681MR25T | 30 × 25   | R25 | 0.366 | 2.48 |
|                                      | 820   | ESMM201VSN821MR30T | 30 × 30   | R30 | 0.303 | 2.8  |
|                                      | 1,000 | ESMM201VSN102MR35T | 30 × 35   | R35 | 0.249 | 3.15 |
|                                      | 1,200 | ESMM201VSN122MR35T | 30 × 35   | R35 | 0.207 | 3.61 |
|                                      | 1,500 | ESMM201VSN152MR45T | 30 × 45   | R45 | 0.166 | 4.13 |
|                                      | 1,800 | ESMM201VSN182MR50T | 30 × 50   | R50 | 0.138 | 4.6  |
|                                      | 470   | ESMM201VSN471MA20T | 35 × 20   | A20 | 0.529 | 1.88 |
|                                      | 560   | ESMM201VSN561MA20T | 35 × 20   | A20 | 0.444 | 2.05 |
|                                      | 680   | ESMM201VSN681MA20T | 35 × 20   | A20 | 0.366 | 2.36 |
|                                      | 820   | ESMM201VSN821MA25T | 35 × 25   | A25 | 0.303 | 2.83 |
|                                      | 1,000 | ESMM201VSN102MA30T | 35 × 30   | A30 | 0.249 | 3.26 |

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

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

## 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<br/>250 Volts Surge</b> | 1,200 | ESMM201VSN122MA30T | 35 × 30 | A30 | 0.207 | 3.57 |
|                                      | 1,500 | ESMM201VSN152MA35T | 35 × 35 | A35 | 0.166 | 4.06 |
|                                      | 1,800 | ESMM201VSN182MA40T | 35 × 40 | A40 | 0.138 | 4.59 |
|                                      | 2,200 | ESMM201VSN222MA45T | 35 × 45 | A45 | 0.113 | 5.25 |

|                                      |       |                    |           |     |       |      |
|--------------------------------------|-------|--------------------|-----------|-----|-------|------|
| <b>220 Volts<br/>270 Volts Surge</b> | 220   | ESMM221VSN221MN25T | 20 × 25   | N25 | 1.13  | 1.25 |
|                                      | 270   | ESMM221VSN271MN30T | 20 × 30   | N30 | 0.921 | 1.46 |
|                                      | 330   | ESMM221VSN331MN35T | 20 × 35   | N35 | 0.753 | 1.64 |
|                                      | 390   | ESMM221VSN391MN40T | 20 × 40   | N40 | 0.638 | 1.84 |
|                                      | 470   | ESMM221VSN471MN45T | 20 × 45   | N45 | 0.529 | 2.12 |
|                                      | 560   | ESMM221VSN561MN50T | 20 × 50   | N50 | 0.444 | 2.33 |
|                                      | 180   | ESMM221VSN181MP20T | 22 × 20   | P20 | 1.381 | 1.06 |
|                                      | 270   | ESMM221VSN271MP25T | 22 × 25   | P25 | 0.921 | 1.47 |
|                                      | 330   | ESMM221VSN331MP30T | 22 × 30   | P30 | 0.753 | 1.7  |
|                                      | 390   | ESMM221VSN391MP35T | 22 × 35   | P35 | 0.638 | 1.89 |
|                                      | 470   | ESMM221VSN471MP35T | 22 × 35   | P35 | 0.529 | 2.0  |
|                                      | 560   | ESMM221VSN561MP40T | 22 × 40   | P40 | 0.444 | 2.33 |
|                                      | 680   | ESMM221VSN681MP45T | 22 × 45   | P45 | 0.366 | 2.63 |
|                                      | 270   | ESMM221VSN271MQ20T | 25.4 × 20 | Q20 | 0.921 | 1.35 |
|                                      | 330   | ESMM221VSN331MQ25T | 25.4 × 25 | Q25 | 0.753 | 1.69 |
|                                      | 390   | ESMM221VSN391MQ25T | 25.4 × 25 | Q25 | 0.638 | 1.84 |
|                                      | 470   | ESMM221VSN471MQ30T | 25.4 × 30 | Q30 | 0.529 | 2.08 |
|                                      | 560   | ESMM221VSN561MQ35T | 25.4 × 35 | Q35 | 0.444 | 2.38 |
|                                      | 680   | ESMM221VSN681MQ40T | 25.4 × 40 | Q40 | 0.366 | 2.68 |
|                                      | 820   | ESMM221VSN821MQ45T | 25.4 × 45 | Q45 | 0.303 | 3.01 |
|                                      | 1,000 | ESMM221VSN102MQ50T | 25.4 × 50 | Q50 | 0.249 | 3.4  |
|                                      | 330   | ESMM221VSN331MR20T | 30 × 20   | R20 | 0.753 | 1.58 |
|                                      | 390   | ESMM221VSN391MR20T | 30 × 20   | R20 | 0.638 | 1.71 |
|                                      | 470   | ESMM221VSN471MR25T | 30 × 25   | R25 | 0.529 | 2.12 |
|                                      | 560   | ESMM221VSN561MR25T | 30 × 25   | R25 | 0.444 | 2.31 |
|                                      | 680   | ESMM221VSN681MR30T | 30 × 30   | R30 | 0.366 | 2.62 |
|                                      | 820   | ESMM221VSN821MR35T | 30 × 35   | R35 | 0.303 | 2.99 |
|                                      | 1,000 | ESMM221VSN102MR40T | 30 × 40   | R40 | 0.249 | 3.42 |
|                                      | 1,200 | ESMM221VSN122MR45T | 30 × 45   | R45 | 0.207 | 3.88 |
|                                      | 1,500 | ESMM221VSN152MR50T | 30 × 50   | R50 | 0.166 | 4.44 |
|                                      | 390   | ESMM221VSN391MA20T | 35 × 20   | A20 | 0.638 | 1.79 |
|                                      | 470   | ESMM221VSN471MA20T | 35 × 20   | A20 | 0.529 | 1.88 |
|                                      | 560   | ESMM221VSN561MA20T | 35 × 20   | A20 | 0.444 | 2.14 |
|                                      | 680   | ESMM221VSN681MA25T | 35 × 25   | A25 | 0.366 | 2.58 |
|                                      | 820   | ESMM221VSN821MA30T | 35 × 30   | A30 | 0.303 | 2.79 |
|                                      | 1,000 | ESMM221VSN102MA30T | 35 × 30   | A30 | 0.249 | 3.29 |
|                                      | 1,200 | ESMM221VSN122MA35T | 35 × 35   | A35 | 0.207 | 3.68 |
|                                      | 1,500 | ESMM221VSN152MA40T | 35 × 40   | A40 | 0.166 | 4.10 |
|                                      | 1,800 | ESMM221VSN182MA45T | 35 × 45   | A45 | 0.138 | 4.52 |

|                                      |     |                    |         |     |       |      |
|--------------------------------------|-----|--------------------|---------|-----|-------|------|
| <b>250 Volts<br/>300 Volts Surge</b> | 180 | ESMM251VSN181MN25T | 20 × 25 | N25 | 1.381 | 1.20 |
|                                      | 220 | ESMM251VSN221MN25T | 20 × 25 | N25 | 1.13  | 1.26 |
|                                      | 270 | ESMM251VSN271MN30T | 20 × 30 | N30 | 0.921 | 1.42 |
|                                      | 330 | ESMM251VSN331MN35T | 20 × 35 | N35 | 0.753 | 1.68 |
|                                      | 390 | ESMM251VSN391MN40T | 20 × 40 | N40 | 0.638 | 1.92 |
|                                      | 470 | ESMM251VSN471MN50T | 20 × 50 | N50 | 0.529 | 2.06 |
|                                      | 150 | ESMM251VSN151MP20T | 22 × 20 | P20 | 1.658 | 0.97 |
|                                      | 180 | ESMM251VSN181MP20T | 22 × 20 | P20 | 1.381 | 1.06 |
|                                      | 220 | ESMM251VSN221MP25T | 22 × 25 | P25 | 1.13  | 1.24 |
|                                      | 270 | ESMM251VSN271MP25T | 22 × 25 | P25 | 0.921 | 1.5  |
|                                      | 330 | ESMM251VSN331MP30T | 22 × 30 | P30 | 0.753 | 1.66 |
|                                      | 390 | ESMM251VSN391MP35T | 22 × 35 | P35 | 0.638 | 1.88 |
|                                      | 470 | ESMM251VSN471MP35T | 22 × 35 | P35 | 0.529 | 2.15 |

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

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

## Standard Voltage Ratings - Snap Mount

| Rated Voltage (VWDC) | 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>250 Volts<br/>300 Volts Surge</b> | 560   | ESMM251VSN561MP40T | 22 × 40   | P40 | 0.444 | 2.48 |
|                                      | 680   | ESMM251VSN681MP50T | 22 × 50   | P50 | 0.366 | 2.61 |
|                                      | 220   | ESMM251VSN221MQ20T | 25.4 × 20 | Q20 | 1.13  | 1.22 |
|                                      | 330   | ESMM251VSN331MQ25T | 25.4 × 25 | Q25 | 0.753 | 1.61 |
|                                      | 390   | ESMM251VSN391MQ30T | 25.4 × 30 | Q30 | 0.638 | 1.88 |
|                                      | 470   | ESMM251VSN471MQ35T | 25.4 × 35 | Q35 | 0.529 | 2.15 |
|                                      | 560   | ESMM251VSN561MQ35T | 25.4 × 35 | Q35 | 0.444 | 2.35 |
|                                      | 680   | ESMM251VSN681MQ40T | 25.4 × 40 | Q40 | 0.366 | 2.67 |
|                                      | 820   | ESMM251VSN821MQ45T | 25.4 × 45 | Q45 | 0.303 | 3.01 |
|                                      | 330   | ESMM251VSN331MR20T | 30 × 20   | R20 | 0.753 | 1.58 |
|                                      | 390   | ESMM251VSN391MR25T | 30 × 25   | R25 | 0.638 | 1.86 |
|                                      | 470   | ESMM251VSN471MR25T | 30 × 25   | R25 | 0.529 | 2.05 |
|                                      | 560   | ESMM251VSN561MR25T | 30 × 25   | R25 | 0.444 | 2.35 |
|                                      | 680   | ESMM251VSN681MR30T | 30 × 30   | R30 | 0.366 | 2.71 |
|                                      | 820   | ESMM251VSN821MR35T | 30 × 35   | R35 | 0.303 | 2.98 |
|                                      | 1,000 | ESMM251VSN102MR40T | 30 × 40   | R40 | 0.249 | 3.56 |
|                                      | 1,200 | ESMM251VSN122MR45T | 30 × 45   | R45 | 0.207 | 3.99 |
|                                      | 390   | ESMM251VSN391MA20T | 35 × 20   | A20 | 0.638 | 1.71 |
|                                      | 470   | ESMM251VSN471MA20T | 35 × 20   | A20 | 0.529 | 1.88 |
|                                      | 680   | ESMM251VSN681MA25T | 35 × 25   | A25 | 0.366 | 2.58 |
|                                      | 820   | ESMM251VSN821MA30T | 35 × 30   | A30 | 0.303 | 2.96 |
|                                      | 1,000 | ESMM251VSN102MA35T | 35 × 35   | A35 | 0.249 | 3.48 |
|                                      | 1,200 | ESMM251VSN122MA35T | 35 × 35   | A35 | 0.207 | 3.84 |
|                                      | 1,500 | ESMM251VSN152MA40T | 35 × 40   | A40 | 0.166 | 4.33 |
|                                      | 1,800 | ESMM251VSN182MA50T | 35 × 50   | A50 | 0.138 | 4.54 |

|                                      |     |                    |           |     |       |      |
|--------------------------------------|-----|--------------------|-----------|-----|-------|------|
| <b>315 Volts<br/>365 Volts Surge</b> | 120 | ESMM3B1VSN121MN25T | 20 × 25   | N25 | 2.763 | 0.89 |
|                                      | 150 | ESMM3B1VSN151MN30T | 20 × 30   | N30 | 2.21  | 1.05 |
|                                      | 180 | ESMM3B1VSN181MN35T | 20 × 35   | N35 | 1.381 | 1.18 |
|                                      | 220 | ESMM3B1VSN221MN35T | 20 × 35   | N35 | 1.13  | 1.3  |
|                                      | 270 | ESMM3B1VSN271MN45T | 20 × 45   | N45 | 0.921 | 1.52 |
|                                      | 330 | ESMM3B1VSN331MN50T | 20 × 50   | N50 | 0.753 | 1.73 |
|                                      | 100 | ESMM3B1VSN101MP20T | 22 × 20   | P20 | 3.315 | 0.79 |
|                                      | 150 | ESMM3B1VSN151MP25T | 22 × 25   | P25 | 2.21  | 1.06 |
|                                      | 180 | ESMM3B1VSN181MP30T | 22 × 30   | P30 | 1.381 | 1.29 |
|                                      | 220 | ESMM3B1VSN221MP30T | 22 × 30   | P30 | 1.13  | 1.41 |
|                                      | 270 | ESMM3B1VSN271MP35T | 22 × 35   | P35 | 0.921 | 1.68 |
|                                      | 330 | ESMM3B1VSN331MP40T | 22 × 40   | P40 | 0.753 | 1.91 |
|                                      | 390 | ESMM3B1VSN391MP45T | 22 × 45   | P45 | 0.638 | 2.07 |
|                                      | 120 | ESMM3B1VSN121MQ20T | 25.4 × 20 | Q20 | 2.763 | 0.9  |
|                                      | 150 | ESMM3B1VSN151MQ20T | 25.4 × 20 | Q20 | 2.21  | 1.0  |
|                                      | 180 | ESMM3B1VSN181MQ25T | 25.4 × 25 | Q25 | 1.381 | 1.38 |
|                                      | 220 | ESMM3B1VSN221MQ25T | 25.4 × 25 | Q25 | 1.13  | 1.47 |
|                                      | 270 | ESMM3B1VSN271MQ30T | 25.4 × 30 | Q30 | 0.921 | 1.7  |
|                                      | 330 | ESMM3B1VSN331MQ35T | 25.4 × 35 | Q35 | 0.753 | 1.94 |
|                                      | 390 | ESMM3B1VSN391MQ40T | 25.4 × 40 | Q40 | 0.638 | 2.11 |
|                                      | 470 | ESMM3B1VSN471MQ45T | 25.4 × 45 | Q45 | 0.529 | 2.31 |
|                                      | 560 | ESMM3B1VSN561MQ50T | 25.4 × 50 | Q50 | 0.444 | 2.46 |
|                                      | 180 | ESMM3B1VSN181MR20T | 30 × 20   | R20 | 1.381 | 1.16 |
|                                      | 220 | ESMM3B1VSN221MR20T | 30 × 20   | R20 | 1.13  | 1.28 |
|                                      | 270 | ESMM3B1VSN271MR25T | 30 × 25   | R25 | 0.921 | 1.55 |
|                                      | 330 | ESMM3B1VSN331MR25T | 30 × 25   | R25 | 0.753 | 1.98 |
|                                      | 390 | ESMM3B1VSN391MR30T | 30 × 30   | R30 | 0.638 | 2.15 |
|                                      | 470 | ESMM3B1VSN471MR35T | 30 × 35   | R35 | 0.529 | 2.38 |
|                                      | 560 | ESMM3B1VSN561MR35T | 30 × 35   | R35 | 0.444 | 2.63 |
|                                      | 680 | ESMM3B1VSN681MR45T | 30 × 45   | R45 | 0.366 | 2.82 |
|                                      | 820 | ESMM3B1VSN821MR50T | 30 × 50   | R50 | 0.303 | 3.28 |
|                                      | 270 | ESMM3B1VSN271MA20T | 35 × 20   | A20 | 0.921 | 1.43 |
|                                      | 390 | ESMM3B1VSN391MA25T | 35 × 25   | A25 | 0.638 | 1.95 |

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

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

## 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>315 Volts<br/>365 Volts Surge</b> | 470   | ESMM3B1VSN471MA30T | 35 × 30 | A30 | 0.529 | 2.46 |
|                                      | 560   | ESMM3B1VSN561MA30T | 35 × 30 | A30 | 0.444 | 2.69 |
|                                      | 680   | ESMM3B1VSN681MA35T | 35 × 35 | A35 | 0.366 | 3.05 |
|                                      | 820   | ESMM3B1VSN821MA40T | 35 × 40 | A40 | 0.303 | 3.45 |
|                                      | 1,000 | ESMM3B1VSN102MA45T | 35 × 45 | A45 | 0.249 | 3.59 |

|                                      |       |                    |           |     |       |      |
|--------------------------------------|-------|--------------------|-----------|-----|-------|------|
| <b>350 Volts<br/>400 Volts Surge</b> | 100   | ESMM351VSN101MN25T | 20 × 25   | N25 | 3.315 | 0.81 |
|                                      | 120   | ESMM351VSN121MN30T | 20 × 30   | N30 | 2.763 | 0.96 |
|                                      | 150   | ESMM351VSN151MN30T | 20 × 30   | N30 | 2.21  | 1.1  |
|                                      | 180   | ESMM351VSN181MN35T | 20 × 35   | N35 | 1.381 | 1.24 |
|                                      | 220   | ESMM351VSN221MN45T | 20 × 45   | N45 | 1.13  | 1.37 |
|                                      | 270   | ESMM351VSN271MN50T | 20 × 50   | N50 | 0.921 | 1.56 |
|                                      | 82    | ESMM351VSN820MP20T | 22 × 20   | P20 | 4.043 | 0.72 |
|                                      | 120   | ESMM351VSN121MP25T | 22 × 25   | P25 | 2.763 | 1.04 |
|                                      | 150   | ESMM351VSN151MP30T | 22 × 30   | P30 | 2.21  | 1.2  |
|                                      | 180   | ESMM351VSN181MP30T | 22 × 30   | P30 | 1.381 | 1.34 |
|                                      | 220   | ESMM351VSN221MP35T | 22 × 35   | P35 | 1.13  | 1.47 |
|                                      | 270   | ESMM351VSN271MP40T | 22 × 40   | P40 | 0.921 | 1.7  |
|                                      | 330   | ESMM351VSN331MP45T | 22 × 45   | P45 | 0.753 | 1.87 |
|                                      | 120   | ESMM351VSN121MQ20T | 25.4 × 20 | Q20 | 2.763 | 0.9  |
|                                      | 150   | ESMM351VSN151MQ25T | 25.4 × 25 | Q25 | 2.21  | 1.22 |
|                                      | 180   | ESMM351VSN181MQ25T | 25.4 × 25 | Q25 | 1.381 | 1.37 |
|                                      | 220   | ESMM351VSN221MQ30T | 25.4 × 30 | Q30 | 1.13  | 1.53 |
|                                      | 270   | ESMM351VSN271MQ35T | 25.4 × 35 | Q35 | 0.921 | 1.73 |
|                                      | 330   | ESMM351VSN331MQ35T | 25.4 × 35 | Q35 | 0.753 | 1.97 |
|                                      | 390   | ESMM351VSN391MQ40T | 25.4 × 40 | Q40 | 0.638 | 2.14 |
|                                      | 470   | ESMM351VSN471MQ50T | 25.4 × 50 | Q50 | 0.529 | 2.55 |
|                                      | 150   | ESMM351VSN151MR20T | 30 × 20   | R20 | 2.21  | 1.06 |
|                                      | 180   | ESMM351VSN181MR20T | 30 × 20   | R20 | 1.381 | 1.16 |
|                                      | 220   | ESMM351VSN221MR25T | 30 × 25   | R25 | 1.13  | 1.54 |
|                                      | 270   | ESMM351VSN271MR25T | 30 × 25   | R25 | 0.921 | 1.8  |
|                                      | 330   | ESMM351VSN331MR30T | 30 × 30   | R30 | 0.753 | 2.03 |
|                                      | 390   | ESMM351VSN391MR35T | 30 × 35   | R35 | 0.638 | 2.23 |
|                                      | 470   | ESMM351VSN471MR35T | 30 × 35   | R35 | 0.529 | 2.53 |
|                                      | 560   | ESMM351VSN561MR40T | 30 × 40   | R40 | 0.444 | 2.73 |
|                                      | 680   | ESMM351VSN681MR50T | 30 × 50   | R50 | 0.366 | 3.15 |
|                                      | 220   | ESMM351VSN221MA20T | 35 × 20   | A20 | 1.13  | 1.29 |
|                                      | 270   | ESMM351VSN271MA20T | 35 × 20   | A20 | 0.921 | 1.49 |
|                                      | 330   | ESMM351VSN331MA25T | 35 × 25   | A25 | 0.753 | 1.8  |
|                                      | 390   | ESMM351VSN391MA30T | 35 × 30   | A30 | 0.638 | 2.3  |
|                                      | 470   | ESMM351VSN471MA30T | 35 × 30   | A30 | 0.529 | 2.55 |
|                                      | 560   | ESMM351VSN561MA35T | 35 × 35   | A35 | 0.444 | 2.75 |
|                                      | 680   | ESMM351VSN681MA40T | 35 × 40   | A40 | 0.366 | 3.15 |
|                                      | 820   | ESMM351VSN821MA45T | 35 × 45   | A45 | 0.303 | 3.47 |
|                                      | 1,000 | ESMM351VSN102MA50T | 35 × 50   | A50 | 0.249 | 3.6  |

|                                      |     |                    |         |     |       |      |
|--------------------------------------|-----|--------------------|---------|-----|-------|------|
| <b>400 Volts<br/>450 Volts Surge</b> | 68  | ESMM401VSN680MN25T | 20 × 25 | N25 | 4.875 | 0.75 |
|                                      | 82  | ESMM401VSN820MN30T | 20 × 30 | N30 | 4.043 | 0.82 |
|                                      | 100 | ESMM401VSN101MN30T | 20 × 30 | N30 | 3.315 | 0.95 |
|                                      | 120 | ESMM401VSN121MN35T | 20 × 35 | N35 | 2.763 | 1.07 |
|                                      | 150 | ESMM401VSN151MN40T | 20 × 40 | N40 | 2.21  | 1.22 |
|                                      | 180 | ESMM401VSN181MN45T | 20 × 45 | N45 | 1.842 | 1.28 |
|                                      | 220 | ESMM401VSN221MN50T | 20 × 50 | N50 | 1.507 | 1.41 |
|                                      | 68  | ESMM401VSN680MP20T | 22 × 20 | P20 | 4.878 | 0.65 |
|                                      | 82  | ESMM401VSN820MP25T | 22 × 25 | P25 | 4.043 | 0.84 |
|                                      | 100 | ESMM401VSN101MP25T | 22 × 25 | P25 | 3.315 | 0.99 |
|                                      | 120 | ESMM401VSN121MP30T | 22 × 30 | P30 | 2.763 | 1.09 |
|                                      | 150 | ESMM401VSN151MP35T | 22 × 35 | P35 | 2.21  | 1.24 |
|                                      | 180 | ESMM401VSN181MP40T | 22 × 40 | P40 | 1.842 | 1.41 |

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

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

## Standard Voltage Ratings - Snap Mount

| Rated Voltage (VWDC) | 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<br/>450 Volts Surge</b> | 220 | ESMM401VSN221MP45T | 22 × 45   | P45 | 1.507 | 1.58 |
|                                      | 270 | ESMM401VSN271MP50T | 22 × 50   | P50 | 1.228 | 1.65 |
|                                      | 82  | ESMM401VSN820MQ20T | 25.4 × 20 | Q20 | 4.043 | 0.74 |
|                                      | 100 | ESMM401VSN101MQ20T | 25.4 × 20 | Q20 | 3.315 | 0.82 |
|                                      | 120 | ESMM401VSN121MQ25T | 25.4 × 25 | Q25 | 2.763 | 1.13 |
|                                      | 150 | ESMM401VSN151MQ30T | 25.4 × 30 | Q30 | 2.21  | 1.27 |
|                                      | 180 | ESMM401VSN181MQ30T | 25.4 × 30 | Q30 | 1.842 | 1.44 |
|                                      | 220 | ESMM401VSN221MQ35T | 25.4 × 35 | Q35 | 1.507 | 1.64 |
|                                      | 270 | ESMM401VSN271MQ40T | 25.4 × 40 | Q40 | 1.228 | 1.79 |
|                                      | 330 | ESMM401VSN331MQ45T | 25.4 × 45 | Q45 | 1.005 | 2.0  |
|                                      | 390 | ESMM401VSN391MQ50T | 25.4 × 50 | Q50 | 0.85  | 2.12 |
|                                      | 120 | ESMM401VSN121MR20T | 30 × 20   | R20 | 2.763 | 0.95 |
|                                      | 150 | ESMM401VSN151MR25T | 30 × 25   | R25 | 2.21  | 1.2  |
|                                      | 180 | ESMM401VSN181MR25T | 30 × 25   | R25 | 1.842 | 1.52 |
|                                      | 220 | ESMM401VSN221MR30T | 30 × 30   | R30 | 1.507 | 1.66 |
|                                      | 270 | ESMM401VSN271MR30T | 30 × 30   | R30 | 1.228 | 1.82 |
|                                      | 330 | ESMM401VSN331MR35T | 30 × 35   | R35 | 1.005 | 2.05 |
|                                      | 390 | ESMM401VSN391MR40T | 30 × 40   | R40 | 0.85  | 2.26 |
|                                      | 470 | ESMM401VSN471MR45T | 30 × 45   | R45 | 0.705 | 2.51 |
|                                      | 560 | ESMM401VSN561MR50T | 30 × 50   | R50 | 0.592 | 2.85 |
|                                      | 180 | ESMM401VSN181MA20T | 35 × 20   | A20 | 1.842 | 1.16 |
|                                      | 220 | ESMM401VSN221MA25T | 35 × 25   | A25 | 1.507 | 1.47 |
|                                      | 270 | ESMM401VSN271MA25T | 35 × 25   | A25 | 1.228 | 1.63 |
|                                      | 330 | ESMM401VSN331MA30T | 35 × 30   | A30 | 1.005 | 2.05 |
|                                      | 390 | ESMM401VSN391MA35T | 35 × 35   | A35 | 0.85  | 2.28 |
|                                      | 470 | ESMM401VSN471MA35T | 35 × 35   | A35 | 0.705 | 2.54 |
|                                      | 560 | ESMM401VSN561MA40T | 35 × 40   | A40 | 0.592 | 2.85 |
|                                      | 680 | ESMM401VSN681MA50T | 35 × 50   | A50 | 0.488 | 3.1  |

|                                      |     |                    |           |     |       |      |
|--------------------------------------|-----|--------------------|-----------|-----|-------|------|
| <b>420 Volts<br/>470 Volts Surge</b> | 56  | ESMM421VSN560MN25T | 20 × 25   | N25 | 5.92  | 0.58 |
|                                      | 68  | ESMM421VSN680MN25T | 20 × 25   | N25 | 4.875 | 0.7  |
|                                      | 82  | ESMM421VSN820MN30T | 20 × 30   | N30 | 4.043 | 0.8  |
|                                      | 100 | ESMM421VSN101MN35T | 20 × 35   | N35 | 3.315 | 0.9  |
|                                      | 120 | ESMM421VSN121MN35T | 20 × 35   | N35 | 2.763 | 1.04 |
|                                      | 150 | ESMM421VSN151MN40T | 20 × 40   | N40 | 2.21  | 1.17 |
|                                      | 180 | ESMM421VSN181MN50T | 20 × 50   | N50 | 1.842 | 1.27 |
|                                      | 47  | ESMM421VSN470MP20T | 22 × 20   | P20 | 7.053 | 0.54 |
|                                      | 56  | ESMM421VSN560MP20T | 22 × 20   | P20 | 5.92  | 0.59 |
|                                      | 82  | ESMM421VSN820MP25T | 22 × 25   | P25 | 4.043 | 0.85 |
|                                      | 100 | ESMM421VSN101MP30T | 22 × 30   | P30 | 3.315 | 0.97 |
|                                      | 120 | ESMM421VSN121MP30T | 22 × 30   | P30 | 2.763 | 1.07 |
|                                      | 150 | ESMM421VSN151MP35T | 22 × 35   | P35 | 2.21  | 1.21 |
|                                      | 180 | ESMM421VSN181MP40T | 22 × 40   | P40 | 1.842 | 1.33 |
|                                      | 220 | ESMM421VSN221MP45T | 22 × 45   | P45 | 1.507 | 1.55 |
|                                      | 68  | ESMM421VSN680MQ20T | 25.4 × 20 | Q20 | 4.875 | 0.68 |
|                                      | 82  | ESMM421VSN820MQ20T | 25.4 × 20 | Q20 | 4.043 | 0.74 |
|                                      | 100 | ESMM421VSN101MQ25T | 25.4 × 25 | Q25 | 3.315 | 0.98 |
|                                      | 120 | ESMM421VSN121MQ25T | 25.4 × 25 | Q25 | 2.763 | 1.08 |
|                                      | 150 | ESMM421VSN151MQ30T | 25.4 × 30 | Q30 | 2.21  | 1.26 |
|                                      | 180 | ESMM421VSN181MQ35T | 25.4 × 35 | Q35 | 1.842 | 1.42 |
|                                      | 220 | ESMM421VSN221MQ35T | 25.4 × 35 | Q35 | 1.507 | 1.58 |
|                                      | 270 | ESMM421VSN271MQ40T | 25.4 × 40 | Q40 | 1.228 | 1.74 |
|                                      | 330 | ESMM421VSN331MQ50T | 25.4 × 50 | Q50 | 1.005 | 2.2  |
|                                      | 100 | ESMM421VSN101MR20T | 30 × 20   | R20 | 3.315 | 0.87 |
|                                      | 120 | ESMM421VSN121MR20T | 30 × 20   | R20 | 2.763 | 0.95 |
|                                      | 150 | ESMM421VSN151MR25T | 30 × 25   | R25 | 2.21  | 1.3  |
|                                      | 180 | ESMM421VSN181MR25T | 30 × 25   | R25 | 1.842 | 1.48 |
|                                      | 220 | ESMM421VSN221MR30T | 30 × 30   | R30 | 1.507 | 1.65 |
|                                      | 270 | ESMM421VSN271MR35T | 30 × 35   | R35 | 1.228 | 1.9  |

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

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

## 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 |
|----------------------|------------------|---------------------|-------------------------------|----------------|---------------------------------|----------------------------------------------|
|----------------------|------------------|---------------------|-------------------------------|----------------|---------------------------------|----------------------------------------------|

|                              |     |                    |         |     |       |      |
|------------------------------|-----|--------------------|---------|-----|-------|------|
| 420 Volts<br>470 Volts Surge | 330 | ESMM421VSN331MR35T | 30 × 35 | R35 | 1.005 | 1.98 |
|                              | 390 | ESMM421VSN391MR40T | 30 × 40 | R40 | 0.85  | 2.22 |
|                              | 470 | ESMM421VSN471MR45T | 30 × 45 | R45 | 0.705 | 2.5  |
|                              | 150 | ESMM421VSN151MA20T | 35 × 20 | A20 | 2.21  | 1.11 |
|                              | 180 | ESMM421VSN181MA20T | 35 × 20 | A20 | 1.842 | 1.16 |
|                              | 220 | ESMM421VSN221MA25T | 35 × 25 | A25 | 1.507 | 1.47 |
|                              | 270 | ESMM421VSN271MA30T | 35 × 30 | A30 | 1.228 | 1.94 |
|                              | 330 | ESMM421VSN331MA35T | 35 × 35 | A35 | 1.005 | 2.17 |
|                              | 390 | ESMM421VSN391MA35T | 35 × 35 | A35 | 0.85  | 2.27 |
|                              | 470 | ESMM421VSN471MA40T | 35 × 40 | A40 | 0.705 | 2.61 |
|                              | 560 | ESMM421VSN561MA45T | 35 × 45 | A45 | 0.592 | 2.95 |
|                              | 680 | ESMM421VSN681MA50T | 35 × 50 | A50 | 0.488 | 3.15 |

|                              |     |                    |           |     |       |      |
|------------------------------|-----|--------------------|-----------|-----|-------|------|
| 450 Volts<br>500 Volts Surge | 56  | ESMM451VSN560MN25T | 20 × 25   | N25 | 5.92  | 0.61 |
|                              | 68  | ESMM451VSN680MN30T | 20 × 30   | N30 | 4.875 | 0.71 |
|                              | 82  | ESMM451VSN820MN35T | 20 × 35   | N35 | 4.043 | 0.8  |
|                              | 100 | ESMM451VSN101MN35T | 20 × 35   | N35 | 3.315 | 0.88 |
|                              | 120 | ESMM451VSN121MN40T | 20 × 40   | N40 | 2.763 | 0.99 |
|                              | 150 | ESMM451VSN151MN45T | 20 × 45   | N45 | 2.21  | 1.13 |
|                              | 47  | ESMM451VSN470MP20T | 22 × 20   | P20 | 7.053 | 0.54 |
|                              | 56  | ESMM451VSN560MP20T | 22 × 20   | P20 | 5.92  | 0.59 |
|                              | 68  | ESMM451VSN680MP25T | 22 × 25   | P25 | 4.875 | 0.71 |
|                              | 82  | ESMM451VSN820MP25T | 22 × 25   | P25 | 4.043 | 0.86 |
|                              | 100 | ESMM451VSN101MP30T | 22 × 30   | P30 | 3.315 | 0.95 |
|                              | 120 | ESMM451VSN121MP35T | 22 × 35   | P35 | 2.763 | 1.07 |
|                              | 150 | ESMM451VSN151MP40T | 22 × 40   | P40 | 2.21  | 1.18 |
|                              | 180 | ESMM451VSN181MP45T | 22 × 45   | P45 | 1.842 | 1.32 |
|                              | 220 | ESMM451VSN221MP50T | 22 × 50   | P50 | 1.507 | 1.48 |
|                              | 68  | ESMM451VSN680MQ20T | 25.4 × 20 | Q20 | 4.875 | 0.68 |
|                              | 82  | ESMM451VSN820MQ20T | 25.4 × 20 | Q20 | 4.043 | 0.74 |
|                              | 100 | ESMM451VSN101MQ25T | 25.4 × 25 | Q25 | 3.315 | 0.97 |
|                              | 120 | ESMM451VSN121MQ30T | 25.4 × 30 | Q30 | 2.763 | 1.09 |
|                              | 150 | ESMM451VSN151MQ30T | 25.4 × 30 | Q30 | 2.21  | 1.25 |
|                              | 180 | ESMM451VSN181MQ35T | 25.4 × 35 | Q35 | 1.842 | 1.4  |
|                              | 220 | ESMM451VSN221MQ40T | 25.4 × 40 | Q40 | 1.507 | 1.59 |
|                              | 270 | ESMM451VSN271MQ45T | 25.4 × 45 | Q45 | 1.228 | 1.73 |
|                              | 330 | ESMM451VSN331MQ50T | 25.4 × 50 | Q50 | 1.005 | 2.12 |
|                              | 82  | ESMM451VSN820MR20T | 30 × 20   | R20 | 4.043 | 0.79 |
|                              | 100 | ESMM451VSN101MR20T | 30 × 20   | R20 | 3.315 | 0.87 |
|                              | 120 | ESMM451VSN121MR25T | 30 × 25   | R25 | 2.763 | 1.12 |
|                              | 150 | ESMM451VSN151MR25T | 30 × 25   | R25 | 2.21  | 1.29 |
|                              | 180 | ESMM451VSN181MR30T | 30 × 30   | R30 | 1.842 | 1.45 |
|                              | 220 | ESMM451VSN221MR30T | 30 × 30   | R30 | 1.507 | 1.64 |
|                              | 270 | ESMM451VSN271MR35T | 30 × 35   | R35 | 1.228 | 1.89 |
|                              | 330 | ESMM451VSN331MR40T | 30 × 40   | R40 | 1.005 | 2.12 |
|                              | 390 | ESMM451VSN391MR45T | 30 × 45   | R45 | 0.85  | 2.35 |
|                              | 470 | ESMM451VSN471MR50T | 30 × 50   | R50 | 0.705 | 2.65 |
|                              | 120 | ESMM451VSN121MA20T | 35 × 20   | A20 | 2.763 | 0.99 |
|                              | 150 | ESMM451VSN151MA20T | 35 × 20   | A20 | 2.21  | 1.06 |
|                              | 180 | ESMM451VSN181MA25T | 35 × 25   | A25 | 1.842 | 1.33 |
|                              | 220 | ESMM451VSN221MA25T | 35 × 25   | A25 | 1.507 | 1.66 |
|                              | 270 | ESMM451VSN271MA30T | 35 × 30   | A30 | 1.228 | 1.9  |
|                              | 330 | ESMM451VSN331MA35T | 35 × 35   | A35 | 1.005 | 2.15 |
|                              | 390 | ESMM451VSN391MA40T | 35 × 40   | A40 | 0.85  | 2.38 |
|                              | 470 | ESMM451VSN471MA45T | 35 × 45   | A45 | 0.705 | 2.68 |
|                              | 560 | ESMM451VSN561MA50T | 35 × 50   | A50 | 0.592 | 2.88 |

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

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