

# SMM Series

- Longer life from SMQ series
- Endurance with ripple current : 3,000 hours at 85°C
- Non solvent resistant type
- RoHS2 Compliant

SMM

Longer life  
SMQ

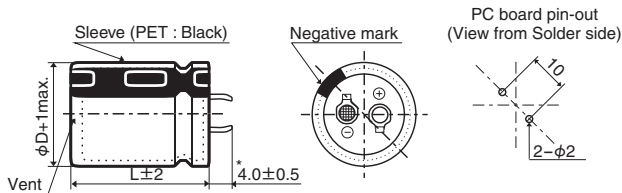


## SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                      |                                       |                      |
|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|----------------------|
| Category                                               | -25 to +85℃                                                                                                                                                                                                                                                                          |                                       |                      |
| Temperature Range                                      |                                                                                                                                                                                                                                                                                      |                                       |                      |
| Rated Voltage Range                                    | 160 to 450V <sub>dc</sub>                                                                                                                                                                                                                                                            |                                       |                      |
| Capacitance Tolerance                                  | ±20% (M) (at 20℃, 120Hz)                                                                                                                                                                                                                                                             |                                       |                      |
| Leakage Current                                        | I ≤ 3/CV<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20℃ after 5 minutes)                                                                                                                                                       |                                       |                      |
| Dissipation Factor (tan δ)                             | Rated voltage (V <sub>ac</sub> )                                                                                                                                                                                                                                                     | 160 to 400V                           | 420 & 450V           |
|                                                        | tan δ (Max.)                                                                                                                                                                                                                                                                         | 0.15                                  | 0.20 (at 20℃, 120Hz) |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>ac</sub> )                                                                                                                                                                                                                                                     | 160 to 400V                           | 420 & 450V           |
|                                                        | Z(-25℃)/Z(+20℃)                                                                                                                                                                                                                                                                      | 4                                     | 8 (at 120Hz)         |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied (the peak voltage shall not exceed the rated voltage) for 3,000 hours at 85℃.                                         |                                       |                      |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                   | ≤ ±20% of the initial value           |                      |
|                                                        | D.F. (tan δ)                                                                                                                                                                                                                                                                         | ≤ 200% of the initial specified value |                      |
|                                                        | Leakage current                                                                                                                                                                                                                                                                      | ≤ The initial specified value         |                      |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 85℃ without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                       |                      |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                   | ≤ ±15% of the initial value           |                      |
|                                                        | D.F. (tan δ)                                                                                                                                                                                                                                                                         | ≤ 150% of the initial specified value |                      |
|                                                        | Leakage current                                                                                                                                                                                                                                                                      | ≤ The initial specified value         |                      |

## DIMENSIONS [mm]

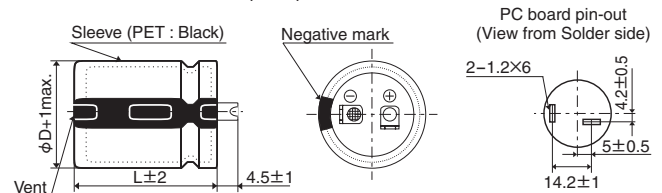
● Terminal Code : VS (φ22 to φ35) : Standard



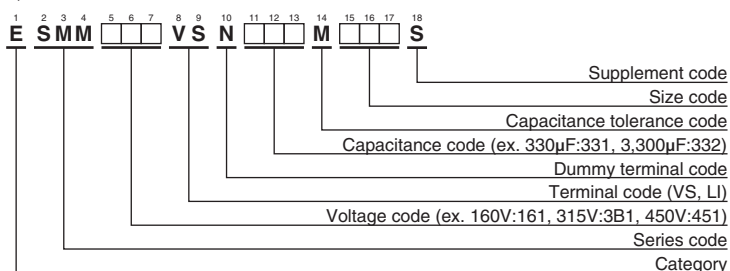
\* φD=35mm : 3.5 ± 0.5mm

The standard design has no plastic disc.

● Terminal Code : LI (φ35)



## PART NUMBERING SYSTEM



Please refer to "Product code guide (snap-in type)"

## RATED RIPPLE CURRENT MULTIPLIERS

● Frequency Multipliers

| Frequency(Hz)             | 50   | 120  | 300  | 1k   | 10k  | 50k  |
|---------------------------|------|------|------|------|------|------|
| 160 to 250V <sub>dc</sub> | 0.81 | 1.00 | 1.17 | 1.32 | 1.45 | 1.50 |
| 315 to 450V <sub>dc</sub> | 0.77 | 1.00 | 1.16 | 1.30 | 1.41 | 1.43 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.

## ◆STANDARD RATINGS

| WV<br>(V <sub>dc</sub> ) | Cap<br>(μF) | Case size<br>φD×L(mm) | tan δ | Rated ripple<br>current<br>(Arms/<br>85°C, 120Hz) | Part No.           | WV<br>(V <sub>dc</sub> ) | Cap<br>(μF) | Case size<br>φD×L(mm) | tan δ | Rated ripple<br>current<br>(Arms/<br>85°C, 120Hz) | Part No.           |
|--------------------------|-------------|-----------------------|-------|---------------------------------------------------|--------------------|--------------------------|-------------|-----------------------|-------|---------------------------------------------------|--------------------|
| 160                      | 270         | 22 × 20               | 0.15  | 1.30                                              | ESMM161VSN271MP20S | 200                      | 390         | 22 × 30               | 0.15  | 1.73                                              | ESMM201VSN391MP30S |
|                          | 390         | 22 × 25               | 0.15  | 1.63                                              | ESMM161VSN391MP25S |                          | 390         | 25.4 × 25             | 0.15  | 1.71                                              | ESMM201VSN391MQ25S |
|                          | 390         | 25.4 × 20             | 0.15  | 1.62                                              | ESMM161VSN391MQ20S |                          | 390         | 30 × 20               | 0.15  | 1.71                                              | ESMM201VSN391MR20S |
|                          | 470         | 22 × 30               | 0.15  | 1.86                                              | ESMM161VSN471MP30S |                          | 470         | 22 × 30               | 0.15  | 1.97                                              | ESMM201VSN471MP30S |
|                          | 470         | 25.4 × 25             | 0.15  | 1.86                                              | ESMM161VSN471MQ25S |                          | 470         | 25.4 × 25             | 0.15  | 1.95                                              | ESMM201VSN471MQ25S |
|                          | 560         | 22 × 30               | 0.15  | 2.15                                              | ESMM161VSN561MP30S |                          | 470         | 30 × 20               | 0.15  | 1.88                                              | ESMM201VSN471MR20S |
|                          | 560         | 25.4 × 25             | 0.15  | 2.15                                              | ESMM161VSN561MQ25S |                          | 560         | 22 × 35               | 0.15  | 2.18                                              | ESMM201VSN561MP35S |
|                          | 560         | 30 × 20               | 0.15  | 2.05                                              | ESMM161VSN561MR20S |                          | 560         | 25.4 × 30             | 0.15  | 2.15                                              | ESMM201VSN561MQ30S |
|                          | 680         | 22 × 35               | 0.15  | 2.35                                              | ESMM161VSN681MP35S |                          | 560         | 30 × 25               | 0.15  | 2.15                                              | ESMM201VSN561MR25S |
|                          | 680         | 25.4 × 30             | 0.15  | 2.33                                              | ESMM161VSN681MQ30S |                          | 560         | 35 × 20               | 0.15  | 2.05                                              | ESMM201VSN561MA20S |
|                          | 680         | 30 × 25               | 0.15  | 2.33                                              | ESMM161VSN681MR25S |                          | 680         | 22 × 40               | 0.15  | 2.48                                              | ESMM201VSN681MP40S |
|                          | 680         | 35 × 20               | 0.15  | 2.26                                              | ESMM161VSN681MA20S |                          | 680         | 25.4 × 30             | 0.15  | 2.48                                              | ESMM201VSN681MQ30S |
|                          | 820         | 22 × 40               | 0.15  | 2.68                                              | ESMM161VSN821MP40S |                          | 680         | 30 × 25               | 0.15  | 2.48                                              | ESMM201VSN681MR25S |
|                          | 820         | 25.4 × 30             | 0.15  | 2.65                                              | ESMM161VSN821MQ30S |                          | 680         | 35 × 20               | 0.15  | 2.36                                              | ESMM201VSN681MA20S |
|                          | 820         | 30 × 25               | 0.15  | 2.64                                              | ESMM161VSN821MR25S |                          | 820         | 22 × 45               | 0.15  | 2.81                                              | ESMM201VSN821MP45S |
|                          | 820         | 35 × 20               | 0.15  | 2.49                                              | ESMM161VSN821MA20S |                          | 820         | 25.4 × 35             | 0.15  | 2.79                                              | ESMM201VSN821MQ35S |
|                          | 1,000       | 22 × 45               | 0.15  | 3.02                                              | ESMM161VSN102MP45S |                          | 820         | 30 × 30               | 0.15  | 2.80                                              | ESMM201VSN821MR30S |
|                          | 1,000       | 25.4 × 35             | 0.15  | 3.00                                              | ESMM161VSN102MQ35S |                          | 820         | 35 × 25               | 0.15  | 2.83                                              | ESMM201VSN821MA25S |
|                          | 1,000       | 30 × 30               | 0.15  | 2.96                                              | ESMM161VSN102MR30S |                          | 1,000       | 22 × 50               | 0.15  | 3.28                                              | ESMM201VSN102MP50S |
|                          | 1,000       | 35 × 25               | 0.15  | 3.13                                              | ESMM161VSN102MA25S |                          | 1,000       | 25.4 × 40             | 0.15  | 3.28                                              | ESMM201VSN102MQ40S |
|                          | 1,200       | 22 × 50               | 0.15  | 3.47                                              | ESMM161VSN122MP50S |                          | 1,000       | 30 × 35               | 0.15  | 3.15                                              | ESMM201VSN102MR35S |
|                          | 1,200       | 25.4 × 40             | 0.15  | 3.43                                              | ESMM161VSN122MQ40S |                          | 1,000       | 35 × 30               | 0.15  | 3.26                                              | ESMM201VSN102MA30S |
|                          | 1,200       | 30 × 30               | 0.15  | 3.41                                              | ESMM161VSN122MR30S |                          | 1,200       | 25.4 × 45             | 0.15  | 3.61                                              | ESMM201VSN122MQ45S |
|                          | 1,200       | 35 × 25               | 0.15  | 3.40                                              | ESMM161VSN122MA25S |                          | 1,200       | 30 × 35               | 0.15  | 3.61                                              | ESMM201VSN122MR35S |
|                          | 1,500       | 25.4 × 50             | 0.15  | 3.96                                              | ESMM161VSN152MQ50S |                          | 1,200       | 35 × 30               | 0.15  | 3.57                                              | ESMM201VSN122MA30S |
|                          | 1,500       | 30 × 35               | 0.15  | 3.96                                              | ESMM161VSN152MR35S |                          | 1,500       | 30 × 45               | 0.15  | 4.13                                              | ESMM201VSN152MR45S |
|                          | 1,500       | 35 × 30               | 0.15  | 3.94                                              | ESMM161VSN152MA30S |                          | 1,500       | 35 × 35               | 0.15  | 4.06                                              | ESMM201VSN152MA35S |
|                          | 1,800       | 30 × 40               | 0.15  | 4.31                                              | ESMM161VSN182MR40S |                          | 1,800       | 30 × 50               | 0.15  | 4.60                                              | ESMM201VSN182MR50S |
|                          | 1,800       | 35 × 35               | 0.15  | 4.28                                              | ESMM161VSN182MA35S |                          | 1,800       | 35 × 40               | 0.15  | 4.59                                              | ESMM201VSN182MA40S |
|                          | 2,200       | 30 × 50               | 0.15  | 4.96                                              | ESMM161VSN222MR50S |                          | 2,200       | 35 × 45               | 0.15  | 5.25                                              | ESMM201VSN222MA45S |
|                          | 2,200       | 35 × 40               | 0.15  | 4.96                                              | ESMM161VSN222MA40S | 220                      | 180         | 22 × 20               | 0.15  | 1.06                                              | ESMM221VSN181MP20S |
|                          | 2,700       | 35 × 45               | 0.15  | 5.57                                              | ESMM161VSN272MA45S |                          | 270         | 22 × 25               | 0.15  | 1.47                                              | ESMM221VSN271MP25S |
|                          | 3,300       | 35 × 50               | 0.15  | 6.21                                              | ESMM161VSN332MA50S |                          | 270         | 25.4 × 20             | 0.15  | 1.35                                              | ESMM221VSN271MQ20S |
| 180                      | 220         | 22 × 20               | 0.15  | 1.18                                              | ESMM181VSN221MP20S |                          | 330         | 22 × 30               | 0.15  | 1.70                                              | ESMM221VSN331MP30S |
|                          | 330         | 22 × 25               | 0.15  | 1.77                                              | ESMM181VSN331MP25S |                          | 330         | 25.4 × 25             | 0.15  | 1.69                                              | ESMM221VSN331MQ25S |
|                          | 330         | 25.4 × 20             | 0.15  | 1.49                                              | ESMM181VSN331MQ20S |                          | 330         | 30 × 20               | 0.15  | 1.58                                              | ESMM221VSN331MR20S |
|                          | 390         | 22 × 25               | 0.15  | 1.84                                              | ESMM181VSN391MP25S |                          | 390         | 22 × 30               | 0.15  | 1.89                                              | ESMM221VSN391MP30S |
|                          | 470         | 22 × 30               | 0.15  | 1.91                                              | ESMM181VSN471MP30S |                          | 390         | 25.4 × 25             | 0.15  | 1.84                                              | ESMM221VSN391MQ25S |
|                          | 470         | 25.4 × 25             | 0.15  | 2.08                                              | ESMM181VSN471MQ25S |                          | 390         | 30 × 20               | 0.15  | 1.71                                              | ESMM221VSN391MR20S |
|                          | 470         | 30 × 20               | 0.15  | 1.88                                              | ESMM181VSN471MR20S |                          | 470         | 22 × 35               | 0.15  | 2.08                                              | ESMM221VSN471MP35S |
|                          | 560         | 22 × 35               | 0.15  | 2.25                                              | ESMM181VSN561MP35S |                          | 470         | 25.4 × 30             | 0.15  | 2.08                                              | ESMM221VSN471MQ30S |
|                          | 560         | 25.4 × 25             | 0.15  | 2.25                                              | ESMM181VSN561MQ25S |                          | 470         | 30 × 25               | 0.15  | 2.12                                              | ESMM221VSN471MR25S |
|                          | 680         | 22 × 35               | 0.15  | 2.48                                              | ESMM181VSN681MP35S |                          | 470         | 35 × 20               | 0.15  | 1.88                                              | ESMM221VSN471MA20S |
|                          | 680         | 25.4 × 30             | 0.15  | 2.50                                              | ESMM181VSN681MQ30S |                          | 560         | 22 × 40               | 0.15  | 2.33                                              | ESMM221VSN561MP40S |
|                          | 680         | 30 × 25               | 0.15  | 2.46                                              | ESMM181VSN681MR25S |                          | 560         | 25.4 × 35             | 0.15  | 2.38                                              | ESMM221VSN561MQ35S |
|                          | 680         | 35 × 20               | 0.15  | 2.26                                              | ESMM181VSN681MA20S |                          | 560         | 30 × 25               | 0.15  | 2.31                                              | ESMM221VSN561MR25S |
|                          | 820         | 22 × 40               | 0.15  | 2.86                                              | ESMM181VSN821MP40S |                          | 560         | 35 × 20               | 0.15  | 2.14                                              | ESMM221VSN561MA20S |
|                          | 820         | 25.4 × 35             | 0.15  | 2.75                                              | ESMM181VSN821MQ35S |                          | 680         | 22 × 45               | 0.15  | 2.63                                              | ESMM221VSN681MP45S |
|                          | 820         | 30 × 25               | 0.15  | 2.69                                              | ESMM181VSN821MR25S |                          | 680         | 25.4 × 35             | 0.15  | 2.68                                              | ESMM221VSN681MQ35S |
|                          | 1,000       | 22 × 50               | 0.15  | 3.10                                              | ESMM181VSN102MP50S |                          | 680         | 30 × 30               | 0.15  | 2.62                                              | ESMM221VSN681MR30S |
|                          | 1,000       | 25.4 × 40             | 0.15  | 3.06                                              | ESMM181VSN102MQ40S |                          | 680         | 35 × 25               | 0.15  | 2.58                                              | ESMM221VSN681MA25S |
|                          | 1,000       | 30 × 30               | 0.15  | 3.10                                              | ESMM181VSN102MR30S |                          | 820         | 25.4 × 45             | 0.15  | 3.01                                              | ESMM221VSN821MQ45S |
|                          | 1,000       | 35 × 25               | 0.15  | 2.98                                              | ESMM181VSN102MA25S |                          | 820         | 30 × 35               | 0.15  | 2.99                                              | ESMM221VSN821MR35S |
|                          | 1,200       | 25.4 × 45             | 0.15  | 3.63                                              | ESMM181VSN122MQ45S |                          | 820         | 35 × 30               | 0.15  | 2.79                                              | ESMM221VSN821MA30S |
|                          | 1,200       | 30 × 35               | 0.15  | 3.55                                              | ESMM181VSN122MR35S |                          | 1,000       | 25.4 × 50             | 0.15  | 3.40                                              | ESMM221VSN102MQ50S |
|                          | 1,200       | 35 × 30               | 0.15  | 3.49                                              | ESMM181VSN122MA30S |                          | 1,000       | 30 × 35               | 0.15  | 3.42                                              | ESMM221VSN102MR35S |
|                          | 1,500       | 30 × 40               | 0.15  | 4.10                                              | ESMM181VSN152MR40S |                          | 1,000       | 35 × 30               | 0.15  | 3.29                                              | ESMM221VSN102MA30S |
|                          | 1,500       | 35 × 35               | 0.15  | 4.02                                              | ESMM181VSN152MA35S |                          | 1,200       | 30 × 40               | 0.15  | 3.88                                              | ESMM221VSN122MR40S |
|                          | 1,800       | 30 × 45               | 0.15  | 4.55                                              | ESMM181VSN182MR45S | 250                      | 150         | 22 × 20               | 0.15  | 0.97                                              | ESMM251VSN151MP20S |
|                          | 1,800       | 35 × 35               | 0.15  | 4.54                                              | ESMM181VSN182MA35S |                          | 180         | 22 × 20               | 0.15  | 1.06                                              | ESMM251VSN181MP20S |
|                          | 2,200       | 35 × 40               | 0.15  | 4.83                                              | ESMM181VSN222MA40S |                          | 220         | 22 × 25               | 0.15  | 1.24                                              | ESMM251VSN221MP25S |
|                          | 2,700       | 35 × 50               | 0.15  | 5.30                                              | ESMM181VSN272MA50S |                          | 220         | 25.4 × 20             | 0.15  | 1.22                                              | ESMM251VSN221MQ20S |
| 200                      | 220         | 22 × 20               | 0.15  | 1.18                                              | ESMM201VSN221MP20S |                          | 270         | 22 × 25               | 0.15  | 1.50                                              | ESMM251VSN271MP25S |
|                          | 270         | 22 × 25               | 0.15  | 1.37                                              | ESMM201VSN271MP25S |                          |             |                       |       |                                                   |                    |
|                          | 270         | 25.4 × 20             | 0.15  | 1.35                                              | ESMM201VSN271MQ20S |                          |             |                       |       |                                                   |                    |
|                          | 330         | 22 × 25               | 0.15  | 1.51                                              | ESMM201VSN331MP25S |                          |             |                       |       |                                                   |                    |
|                          | 330         | 25.4 × 20             | 0.15  | 1.49                                              | ESMM201VSN331MQ20S |                          |             |                       |       |                                                   |                    |

### ◆STANDARD RATINGS

| WV<br>(V <sub>dc</sub> ) | Cap<br>(μF) | Case size<br>φD×L(mm) | tan δ | Rated ripple<br>current<br>(Arms/<br>85°C, 120Hz) | Part No.           | WV<br>(V <sub>dc</sub> ) | Cap<br>(μF) | Case size<br>φD×L(mm) | tan δ | Rated ripple<br>current<br>(Arms/<br>85°C, 120Hz) | Part No.           |
|--------------------------|-------------|-----------------------|-------|---------------------------------------------------|--------------------|--------------------------|-------------|-----------------------|-------|---------------------------------------------------|--------------------|
| 250                      | 330         | 22 × 30               | 0.15  | 1.66                                              | ESMM251VSN331MP30S | 350                      | 180         | 30 × 20               | 0.15  | 1.16                                              | ESMM351VSN181MR20S |
|                          | 330         | 25.4 × 25             | 0.15  | 1.61                                              | ESMM251VSN331MQ25S |                          | 220         | 22 × 35               | 0.15  | 1.47                                              | ESMM351VSN221MP35S |
|                          | 330         | 30 × 20               | 0.15  | 1.58                                              | ESMM251VSN331MR20S |                          | 220         | 25.4 × 30             | 0.15  | 1.53                                              | ESMM351VSN221MQ30S |
|                          | 390         | 22 × 35               | 0.15  | 1.88                                              | ESMM251VSN391MP35S |                          | 220         | 30 × 25               | 0.15  | 1.54                                              | ESMM351VSN221MR25S |
|                          | 390         | 25.4 × 30             | 0.15  | 1.88                                              | ESMM251VSN391MQ30S |                          | 220         | 35 × 20               | 0.15  | 1.29                                              | ESMM351VSN221MA20S |
|                          | 390         | 30 × 25               | 0.15  | 1.86                                              | ESMM251VSN391MR25S |                          | 270         | 22 × 40               | 0.15  | 1.70                                              | ESMM351VSN271MP40S |
|                          | 390         | 35 × 20               | 0.15  | 1.71                                              | ESMM251VSN391MA20S |                          | 270         | 25.4 × 35             | 0.15  | 1.73                                              | ESMM351VSN271MQ35S |
|                          | 470         | 22 × 35               | 0.15  | 2.15                                              | ESMM251VSN471MP35S |                          | 270         | 30 × 25               | 0.15  | 1.80                                              | ESMM351VSN271MR25S |
|                          | 470         | 25.4 × 35             | 0.15  | 2.15                                              | ESMM251VSN471MQ35S |                          | 270         | 35 × 20               | 0.15  | 1.49                                              | ESMM351VSN271MA20S |
|                          | 470         | 30 × 25               | 0.15  | 2.05                                              | ESMM251VSN471MR25S |                          | 330         | 22 × 45               | 0.15  | 1.87                                              | ESMM351VSN331MP45S |
|                          | 470         | 35 × 20               | 0.15  | 1.88                                              | ESMM251VSN471MA20S |                          | 330         | 25.4 × 35             | 0.15  | 1.97                                              | ESMM351VSN331MQ35S |
|                          | 560         | 22 × 40               | 0.15  | 2.48                                              | ESMM251VSN561MP40S |                          | 330         | 30 × 30               | 0.15  | 2.03                                              | ESMM351VSN331MR30S |
|                          | 560         | 25.4 × 35             | 0.15  | 2.35                                              | ESMM251VSN561MQ35S |                          | 330         | 35 × 25               | 0.15  | 1.80                                              | ESMM351VSN331MA25S |
|                          | 560         | 30 × 25               | 0.15  | 2.35                                              | ESMM251VSN561MR25S |                          | 390         | 25.4 × 40             | 0.15  | 2.14                                              | ESMM351VSN391MQ40S |
|                          | 680         | 22 × 50               | 0.15  | 2.61                                              | ESMM251VSN681MP50S |                          | 390         | 30 × 35               | 0.15  | 2.23                                              | ESMM351VSN391MR35S |
|                          | 680         | 25.4 × 40             | 0.15  | 2.67                                              | ESMM251VSN681MQ40S |                          | 390         | 35 × 30               | 0.15  | 2.30                                              | ESMM351VSN391MA30S |
|                          | 680         | 30 × 30               | 0.15  | 2.71                                              | ESMM251VSN681MR30S |                          | 470         | 25.4 × 50             | 0.15  | 2.55                                              | ESMM351VSN471MQ50S |
|                          | 680         | 35 × 25               | 0.15  | 2.58                                              | ESMM251VSN681MA25S |                          | 470         | 30 × 35               | 0.15  | 2.53                                              | ESMM351VSN471MR35S |
|                          | 820         | 25.4 × 45             | 0.15  | 3.01                                              | ESMM251VSN821MQ45S |                          | 470         | 35 × 30               | 0.15  | 2.55                                              | ESMM351VSN471MA30S |
|                          | 820         | 30 × 35               | 0.15  | 2.98                                              | ESMM251VSN821MR35S |                          | 560         | 30 × 40               | 0.15  | 2.73                                              | ESMM351VSN561MR40S |
|                          | 820         | 35 × 30               | 0.15  | 2.96                                              | ESMM251VSN821MA30S |                          | 560         | 35 × 35               | 0.15  | 2.75                                              | ESMM351VSN561MA35S |
|                          | 1,000       | 30 × 40               | 0.15  | 3.56                                              | ESMM251VSN102MR40S |                          | 680         | 30 × 50               | 0.15  | 3.15                                              | ESMM351VSN681MR50S |
|                          | 1,000       | 35 × 35               | 0.15  | 3.48                                              | ESMM251VSN102MA35S |                          | 680         | 35 × 40               | 0.15  | 3.15                                              | ESMM351VSN681MA40S |
|                          | 1,200       | 30 × 45               | 0.15  | 3.99                                              | ESMM251VSN122MR45S |                          | 820         | 35 × 45               | 0.15  | 3.47                                              | ESMM351VSN821MA45S |
|                          | 1,200       | 35 × 35               | 0.15  | 3.84                                              | ESMM251VSN122MA35S |                          | 1,000       | 35 × 50               | 0.15  | 3.60                                              | ESMM351VSN102MA50S |
| 315                      | 100         | 22 × 20               | 0.15  | 0.79                                              | ESMM3B1VSN101MP20S | 400                      | 68          | 22 × 20               | 0.15  | 0.65                                              | ESMM401VSN680MP20S |
|                          | 120         | 25.4 × 20             | 0.15  | 0.90                                              | ESMM3B1VSN121MQ20S |                          | 82          | 22 × 25               | 0.15  | 0.84                                              | ESMM401VSN820MP25S |
|                          | 150         | 22 × 25               | 0.15  | 1.06                                              | ESMM3B1VSN151MP25S |                          | 82          | 25.4 × 20             | 0.15  | 0.74                                              | ESMM401VSN820MQ20S |
|                          | 150         | 25.4 × 20             | 0.15  | 1.00                                              | ESMM3B1VSN151MQ20S |                          | 100         | 22 × 25               | 0.15  | 0.99                                              | ESMM401VSN101MP25S |
|                          | 180         | 22 × 30               | 0.15  | 1.29                                              | ESMM3B1VSN181MP30S |                          | 100         | 25.4 × 20             | 0.15  | 0.82                                              | ESMM401VSN101MQ20S |
|                          | 180         | 25.4 × 25             | 0.15  | 1.38                                              | ESMM3B1VSN181MQ25S |                          | 120         | 22 × 30               | 0.15  | 1.09                                              | ESMM401VSN121MP30S |
|                          | 180         | 30 × 20               | 0.15  | 1.16                                              | ESMM3B1VSN181MR20S |                          | 120         | 25.4 × 25             | 0.15  | 1.13                                              | ESMM401VSN121MQ25S |
|                          | 220         | 22 × 30               | 0.15  | 1.41                                              | ESMM3B1VSN221MP30S |                          | 120         | 30 × 20               | 0.15  | 0.95                                              | ESMM401VSN121MR20S |
|                          | 220         | 25.4 × 25             | 0.15  | 1.47                                              | ESMM3B1VSN221MQ25S |                          | 150         | 22 × 35               | 0.15  | 1.24                                              | ESMM401VSN151MP35S |
|                          | 220         | 30 × 20               | 0.15  | 1.28                                              | ESMM3B1VSN221MR20S |                          | 150         | 25.4 × 30             | 0.15  | 1.27                                              | ESMM401VSN151MQ30S |
|                          | 270         | 22 × 35               | 0.15  | 1.68                                              | ESMM3B1VSN271MP35S |                          | 150         | 30 × 25               | 0.15  | 1.20                                              | ESMM401VSN151MR25S |
|                          | 270         | 25.4 × 30             | 0.15  | 1.70                                              | ESMM3B1VSN271MQ30S |                          | 180         | 22 × 40               | 0.15  | 1.41                                              | ESMM401VSN181MP40S |
|                          | 270         | 30 × 25               | 0.15  | 1.55                                              | ESMM3B1VSN271MR25S |                          | 180         | 25.4 × 30             | 0.15  | 1.44                                              | ESMM401VSN181MQ30S |
|                          | 270         | 35 × 20               | 0.15  | 1.43                                              | ESMM3B1VSN271MA20S |                          | 180         | 30 × 25               | 0.15  | 1.52                                              | ESMM401VSN181MR25S |
|                          | 330         | 22 × 40               | 0.15  | 1.91                                              | ESMM3B1VSN331MP40S |                          | 180         | 35 × 20               | 0.15  | 1.16                                              | ESMM401VSN181MA20S |
|                          | 330         | 25.4 × 35             | 0.15  | 1.94                                              | ESMM3B1VSN331MQ35S |                          | 220         | 22 × 45               | 0.15  | 1.58                                              | ESMM401VSN221MP45S |
|                          | 330         | 30 × 25               | 0.15  | 1.98                                              | ESMM3B1VSN331MR25S |                          | 220         | 25.4 × 35             | 0.15  | 1.64                                              | ESMM401VSN221MQ35S |
|                          | 390         | 22 × 45               | 0.15  | 2.07                                              | ESMM3B1VSN391MP45S |                          | 220         | 30 × 30               | 0.15  | 1.66                                              | ESMM401VSN221MR30S |
|                          | 390         | 25.4 × 40             | 0.15  | 2.11                                              | ESMM3B1VSN391MQ40S |                          | 220         | 35 × 25               | 0.15  | 1.47                                              | ESMM401VSN221MA25S |
|                          | 390         | 30 × 30               | 0.15  | 2.15                                              | ESMM3B1VSN391MR30S |                          | 270         | 22 × 50               | 0.15  | 1.65                                              | ESMM401VSN271MP50S |
|                          | 390         | 35 × 25               | 0.15  | 1.95                                              | ESMM3B1VSN391MA25S |                          | 270         | 25.4 × 40             | 0.15  | 1.79                                              | ESMM401VSN271MQ40S |
|                          | 470         | 25.4 × 45             | 0.15  | 2.31                                              | ESMM3B1VSN471MQ45S |                          | 270         | 30 × 30               | 0.15  | 1.82                                              | ESMM401VSN271MR30S |
|                          | 470         | 30 × 35               | 0.15  | 2.38                                              | ESMM3B1VSN471MR35S |                          | 270         | 35 × 25               | 0.15  | 1.63                                              | ESMM401VSN271MA25S |
|                          | 470         | 35 × 30               | 0.15  | 2.46                                              | ESMM3B1VSN471MA30S |                          | 330         | 25.4 × 45             | 0.15  | 2.00                                              | ESMM401VSN331MQ45S |
|                          | 560         | 25.4 × 50             | 0.15  | 2.46                                              | ESMM3B1VSN561MQ50S |                          | 330         | 30 × 35               | 0.15  | 2.05                                              | ESMM401VSN331MR35S |
| 350                      | 560         | 30 × 35               | 0.15  | 2.63                                              | ESMM3B1VSN561MR35S | 420                      | 330         | 35 × 30               | 0.15  | 2.05                                              | ESMM401VSN331MA30S |
|                          | 560         | 35 × 30               | 0.15  | 2.69                                              | ESMM3B1VSN561MA30S |                          | 390         | 25.4 × 50             | 0.15  | 2.12                                              | ESMM401VSN391MQ50S |
|                          | 680         | 30 × 45               | 0.15  | 2.82                                              | ESMM3B1VSN681MR45S |                          | 390         | 30 × 40               | 0.15  | 2.26                                              | ESMM401VSN391MR40S |
|                          | 680         | 35 × 35               | 0.15  | 3.05                                              | ESMM3B1VSN681MA35S |                          | 390         | 35 × 35               | 0.15  | 2.28                                              | ESMM401VSN391MA35S |
|                          | 820         | 30 × 50               | 0.15  | 3.28                                              | ESMM3B1VSN821MR50S |                          | 470         | 30 × 45               | 0.15  | 2.51                                              | ESMM401VSN471MR45S |
|                          | 820         | 35 × 40               | 0.15  | 3.45                                              | ESMM3B1VSN821MA40S |                          | 470         | 35 × 35               | 0.15  | 2.54                                              | ESMM401VSN471MA35S |
|                          | 1,000       | 35 × 45               | 0.15  | 3.59                                              | ESMM3B1VSN102MA45S |                          | 560         | 30 × 50               | 0.15  | 2.85                                              | ESMM401VSN561MR50S |
|                          | 82          | 22 × 20               | 0.15  | 0.72                                              | ESMM351VSN820MP20S |                          | 560         | 35 × 40               | 0.15  | 2.85                                              | ESMM401VSN561MA40S |
|                          | 120         | 22 × 25               | 0.15  | 1.04                                              | ESMM351VSN121MP25S |                          | 680         | 35 × 50               | 0.15  | 3.10                                              | ESMM401VSN681MA50S |
|                          | 120         | 25.4 × 20             | 0.15  | 0.90                                              | ESMM351VSN121MQ20S |                          | 47          | 22 × 20               | 0.20  | 0.54                                              | ESMM421VSN470MP20S |
|                          | 150         | 22 × 30               | 0.15  | 1.20                                              | ESMM351VSN151MP30S |                          | 56          | 22 × 20               | 0.20  | 0.59                                              | ESMM421VSN560MP20S |
|                          | 150         | 25.4 × 25             | 0.15  | 1.22                                              | ESMM351VSN151MQ25S |                          | 68          | 25.4 × 20             | 0.20  | 0.68                                              | ESMM421VSN680MQ20S |
|                          | 150         | 30 × 20               | 0.15  | 1.06                                              | ESMM351VSN151MR20S |                          | 82          | 22 × 25               | 0.20  | 0.85                                              | ESMM421VSN820MP25S |
|                          | 180         | 22 × 30               | 0.15  | 1.34                                              | ESMM351VSN181MP30S |                          | 82          | 25.4 × 20             | 0.20  | 0.74                                              | ESMM421VSN820MQ20S |
|                          | 180         | 25.4 × 25             | 0.15  | 1.37                                              | ESMM351VSN181MQ25S |                          | 100         | 22 × 30               | 0.20  | 0.97                                              | ESMM421VSN101MP30S |
|                          |             |                       |       |                                                   |                    |                          | 100         | 25.4 × 25             | 0.20  | 0.98                                              | ESMM421VSN101MQ25S |
|                          |             |                       |       |                                                   |                    |                          | 100         | 30 × 20               | 0.20  | 0.87                                              | ESMM421VSN101MR20S |

# SMM Series

## ◆STANDARD RATINGS

| WV<br>(V <sub>dc</sub> ) | Cap<br>(μF) | Case size<br>φD×L(mm) | tan δ | Rated ripple<br>current<br>(Arms/<br>85°C, 120Hz) | Part No.           | WV<br>(V <sub>dc</sub> ) | Cap<br>(μF) | Case size<br>φD×L(mm) | tan δ | Rated ripple<br>current<br>(Arms/<br>85°C, 120Hz) | Part No.           |
|--------------------------|-------------|-----------------------|-------|---------------------------------------------------|--------------------|--------------------------|-------------|-----------------------|-------|---------------------------------------------------|--------------------|
| 420                      | 120         | 22 × 30               | 0.20  | 1.07                                              | ESMM421VSN121MP30S | 450                      | 82          | 25.4 × 20             | 0.20  | 0.74                                              | ESMM451VSN820MQ20S |
|                          | 120         | 25.4 × 25             | 0.20  | 1.08                                              | ESMM421VSN121MQ25S |                          | 82          | 30 × 20               | 0.20  | 0.79                                              | ESMM451VSN820MR20S |
|                          | 120         | 30 × 20               | 0.20  | 0.95                                              | ESMM421VSN121MR20S |                          | 100         | 22 × 30               | 0.20  | 0.95                                              | ESMM451VSN101MP30S |
|                          | 150         | 22 × 35               | 0.20  | 1.21                                              | ESMM421VSN151MP35S |                          | 100         | 25.4 × 25             | 0.20  | 0.97                                              | ESMM451VSN101MQ25S |
|                          | 150         | 25.4 × 30             | 0.20  | 1.26                                              | ESMM421VSN151MQ30S |                          | 100         | 30 × 20               | 0.20  | 0.87                                              | ESMM451VSN101MR20S |
|                          | 150         | 30 × 25               | 0.20  | 1.30                                              | ESMM421VSN151MR25S |                          | 120         | 22 × 35               | 0.20  | 1.07                                              | ESMM451VSN121MP35S |
|                          | 150         | 35 × 20               | 0.20  | 1.11                                              | ESMM421VSN151MA20S |                          | 120         | 25.4 × 30             | 0.20  | 1.09                                              | ESMM451VSN121MQ30S |
|                          | 180         | 22 × 40               | 0.20  | 1.33                                              | ESMM421VSN181MP40S |                          | 120         | 30 × 25               | 0.20  | 1.12                                              | ESMM451VSN121MR25S |
|                          | 180         | 25.4 × 35             | 0.20  | 1.42                                              | ESMM421VSN181MQ35S |                          | 120         | 35 × 20               | 0.20  | 0.99                                              | ESMM451VSN121MA20S |
|                          | 180         | 30 × 25               | 0.20  | 1.48                                              | ESMM421VSN181MR25S |                          | 150         | 22 × 40               | 0.20  | 1.18                                              | ESMM451VSN151MP40S |
|                          | 180         | 35 × 20               | 0.20  | 1.16                                              | ESMM421VSN181MA20S |                          | 150         | 25.4 × 30             | 0.20  | 1.25                                              | ESMM451VSN151MQ30S |
|                          | 220         | 22 × 45               | 0.20  | 1.55                                              | ESMM421VSN221MP45S |                          | 150         | 30 × 25               | 0.20  | 1.29                                              | ESMM451VSN151MR25S |
|                          | 220         | 25.4 × 35             | 0.20  | 1.58                                              | ESMM421VSN221MQ35S |                          | 150         | 35 × 20               | 0.20  | 1.06                                              | ESMM451VSN151MA20S |
|                          | 220         | 30 × 30               | 0.20  | 1.65                                              | ESMM421VSN221MR30S |                          | 180         | 22 × 45               | 0.20  | 1.32                                              | ESMM451VSN181MP45S |
|                          | 220         | 35 × 25               | 0.20  | 1.47                                              | ESMM421VSN221MA25S |                          | 180         | 25.4 × 35             | 0.20  | 1.40                                              | ESMM451VSN181MQ35S |
|                          | 270         | 25.4 × 40             | 0.20  | 1.74                                              | ESMM421VSN271MQ40S |                          | 180         | 30 × 30               | 0.20  | 1.45                                              | ESMM451VSN181MR30S |
|                          | 270         | 30 × 35               | 0.20  | 1.90                                              | ESMM421VSN271MR35S |                          | 180         | 35 × 25               | 0.20  | 1.33                                              | ESMM451VSN181MA25S |
|                          | 270         | 35 × 30               | 0.20  | 1.94                                              | ESMM421VSN271MA30S |                          | 220         | 22 × 50               | 0.20  | 1.48                                              | ESMM451VSN221MP50S |
|                          | 330         | 25.4 × 50             | 0.20  | 2.20                                              | ESMM421VSN331MQ50S |                          | 220         | 25.4 × 40             | 0.20  | 1.59                                              | ESMM451VSN221MQ40S |
|                          | 330         | 30 × 35               | 0.20  | 1.98                                              | ESMM421VSN331MR35S |                          | 220         | 30 × 30               | 0.20  | 1.64                                              | ESMM451VSN221MR30S |
|                          | 330         | 35 × 35               | 0.20  | 2.17                                              | ESMM421VSN331MA35S |                          | 220         | 35 × 25               | 0.20  | 1.66                                              | ESMM451VSN221MA25S |
|                          | 390         | 30 × 40               | 0.20  | 2.22                                              | ESMM421VSN391MR40S |                          | 270         | 25.4 × 45             | 0.20  | 1.73                                              | ESMM451VSN271MQ45S |
|                          | 390         | 35 × 35               | 0.20  | 2.27                                              | ESMM421VSN391MA35S |                          | 270         | 30 × 35               | 0.20  | 1.89                                              | ESMM451VSN271MR35S |
|                          | 470         | 30 × 45               | 0.20  | 2.50                                              | ESMM421VSN471MR45S |                          | 270         | 35 × 30               | 0.20  | 1.90                                              | ESMM451VSN271MA30S |
|                          | 470         | 35 × 40               | 0.20  | 2.61                                              | ESMM421VSN471MA40S |                          | 330         | 25.4 × 50             | 0.20  | 2.12                                              | ESMM451VSN331MQ50S |
| 450                      | 560         | 35 × 45               | 0.20  | 2.95                                              | ESMM421VSN561MA45S |                          | 330         | 30 × 40               | 0.20  | 2.12                                              | ESMM451VSN331MR40S |
|                          | 680         | 35 × 50               | 0.20  | 3.15                                              | ESMM421VSN681MA50S |                          | 330         | 35 × 35               | 0.20  | 2.15                                              | ESMM451VSN331MA35S |
|                          | 47          | 22 × 20               | 0.20  | 0.54                                              | ESMM451VSN470MP20S |                          | 390         | 30 × 45               | 0.20  | 2.35                                              | ESMM451VSN391MR45S |
|                          | 56          | 22 × 20               | 0.20  | 0.59                                              | ESMM451VSN560MP20S |                          | 390         | 35 × 40               | 0.20  | 2.38                                              | ESMM451VSN391MA40S |
|                          | 68          | 22 × 25               | 0.20  | 0.71                                              | ESMM451VSN680MP25S |                          | 470         | 30 × 50               | 0.20  | 2.65                                              | ESMM451VSN471MR50S |
|                          | 68          | 25.4 × 20             | 0.20  | 0.68                                              | ESMM451VSN680MQ20S |                          | 470         | 35 × 45               | 0.20  | 2.68                                              | ESMM451VSN471MA45S |
|                          | 82          | 22 × 25               | 0.20  | 0.86                                              | ESMM451VSN820MP25S |                          | 560         | 35 × 50               | 0.20  | 2.88                                              | ESMM451VSN561MA50S |

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