

SMR Series

- Endurance with ripple current : 2,000 hours at 85°C
- Downsized and high ripple current from SMQ series
- Non solvent resistant type
- RoHS2 Compliant

SMR

↑
Downsized
Higher ripple
SMQ



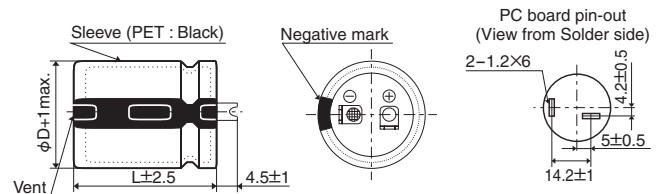
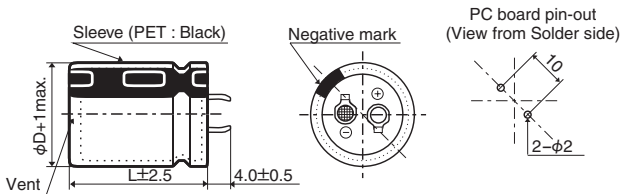
◆ SPECIFICATIONS

| Items | Characteristics | | |
|--|--|---------------------------------------|------------|
| Category | -25 to +85°C | | |
| Temperature Range | -25 to +85°C | | |
| Rated Voltage Range | 400 to 450V _{dc} | | |
| Capacitance Tolerance | ±20% (M) (at 20°C, 120Hz) | | |
| Leakage Current | $I \leq 3\sqrt{CV}$ Where, I : Max. leakage current (µA), C : Nominal capacitance (µF), V : Rated voltage (V) (at 20°C after 5 minutes) | | |
| Dissipation Factor (tan δ) | Rated voltage (V _{dc}) | 400V | 420 & 450V |
| | tan δ (Max.) | 0.15 | 0.20 |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V _{dc}) | 400 to 450V | |
| | Z(-25°C)/Z(+20°C) | 8 | |
| Endurance | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied (the peak voltage shall not exceed the rated voltage) for 2,000 hours at 85°C. | | |
| | 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°C after exposing them for 1,000 hours at 85°C 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]

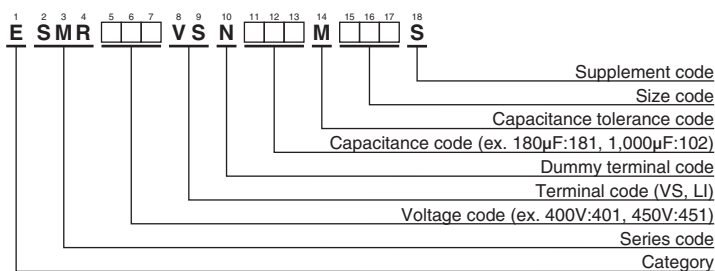
● Terminal Code : VS (φ22 to φ35) : Standard

● Terminal Code : LI (φ35)



The standard design has no plastic disc.

◆ PART NUMBERING SYSTEM



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

SMR Series

◆STANDARD RATINGS

| WV (V _{dc}) | Cap (μF) | Case size φD×L(mm) | tan δ | Rated ripple current (Arms/85°C, 120Hz) | Part No. | WV (V _{dc}) | Cap (μF) | Case size φD×L(mm) | tan δ | Rated ripple current (Arms/85°C, 120Hz) | Part No. | |
|-----------------------|----------|--------------------|-------|---|--------------------|-----------------------|----------|--------------------|-----------|---|--------------------|--------------------|
| 400 | 150 | 22 × 25 | 0.15 | 1.30 | ESMR401VSN151MP25S | 420 | 330 | 35 × 25 | 0.20 | 1.99 | ESMR421VSN331MA25S | |
| | 180 | 22 × 30 | 0.15 | 1.49 | ESMR401VSN181MP30S | | 390 | 25.4 × 45 | 0.20 | 2.47 | ESMR421VSN391MQ45S | |
| | 220 | 22 × 35 | 0.15 | 1.69 | ESMR401VSN221MP35S | | 390 | 30 × 35 | 0.20 | 2.32 | ESMR421VSN391MR35S | |
| | 220 | 25.4 × 25 | 0.15 | 1.65 | ESMR401VSN221MQ25S | | 470 | 25.4 × 50 | 0.20 | 2.77 | ESMR421VSN471MQ50S | |
| | 270 | 22 × 40 | 0.15 | 1.90 | ESMR401VSN271MP40S | | 470 | 30 × 40 | 0.20 | 2.61 | ESMR421VSN471MR40S | |
| | 270 | 25.4 × 30 | 0.15 | 1.88 | ESMR401VSN271MQ30S | | 470 | 35 × 30 | 0.20 | 2.41 | ESMR421VSN471MA30S | |
| | 330 | 22 × 45 | 0.15 | 2.15 | ESMR401VSN331MP45S | | 560 | 30 × 45 | 0.20 | 2.93 | ESMR421VSN561MR45S | |
| | 330 | 25.4 × 35 | 0.15 | 2.16 | ESMR401VSN331MQ35S | | 560 | 35 × 35 | 0.20 | 2.67 | ESMR421VSN561MA35S | |
| | 330 | 30 × 25 | 0.15 | 2.10 | ESMR401VSN331MR25S | | 680 | 30 × 50 | 0.20 | 3.28 | ESMR421VSN681MR50S | |
| | 390 | 22 × 50 | 0.15 | 2.40 | ESMR401VSN391MP50S | | 680 | 35 × 40 | 0.20 | 3.11 | ESMR421VSN681MA40S | |
| | 390 | 25.4 × 40 | 0.15 | 2.40 | ESMR401VSN391MQ40S | | 820 | 35 × 45 | 0.20 | 3.43 | ESMR421VSN821MA45S | |
| | 390 | 30 × 30 | 0.15 | 2.32 | ESMR401VSN391MR30S | | 450 | 120 | 22 × 25 | 0.20 | 1.12 | ESMR451VSN121MP25S |
| | 390 | 35 × 25 | 0.15 | 2.05 | ESMR401VSN391MA25S | | | 150 | 22 × 30 | 0.20 | 1.32 | ESMR451VSN151MP30S |
| | 470 | 25.4 × 45 | 0.15 | 2.69 | ESMR401VSN471MQ45S | | | 180 | 22 × 35 | 0.20 | 1.49 | ESMR451VSN181MP35S |
| | 470 | 30 × 35 | 0.15 | 2.60 | ESMR401VSN471MR35S | | | 180 | 25.4 × 25 | 0.20 | 1.42 | ESMR451VSN181MQ25S |
| | 470 | 35 × 30 | 0.15 | 2.28 | ESMR401VSN471MA30S | | | 220 | 22 × 40 | 0.20 | 1.67 | ESMR451VSN221MP40S |
| | 560 | 30 × 40 | 0.15 | 2.92 | ESMR401VSN561MR40S | | | 220 | 25.4 × 30 | 0.20 | 1.66 | ESMR451VSN221MQ30S |
| | 560 | 35 × 30 | 0.15 | 2.48 | ESMR401VSN561MA30S | | | 220 | 30 × 25 | 0.20 | 1.68 | ESMR451VSN221MR25S |
| | 680 | 30 × 45 | 0.15 | 3.30 | ESMR401VSN681MR45S | | | 270 | 22 × 45 | 0.20 | 1.88 | ESMR451VSN271MP45S |
| | 680 | 35 × 35 | 0.15 | 2.79 | ESMR401VSN681MA35S | | | 270 | 25.4 × 35 | 0.20 | 1.87 | ESMR451VSN271MQ35S |
| 820 | 35 × 45 | 0.15 | 3.25 | ESMR401VSN821MA45S | 330 | 25.4 × 40 | | 0.20 | 2.11 | ESMR451VSN331MQ40S | | |
| 1,000 | 35 × 50 | 0.15 | 3.66 | ESMR401VSN102MA50S | 330 | 30 × 30 | | 0.20 | 2.10 | ESMR451VSN331MR30S | | |
| 420 | 120 | 22 × 25 | 0.20 | 1.15 | ESMR421VSN121MP25S | 330 | | 35 × 25 | 0.20 | 2.10 | ESMR451VSN331MA25S | |
| | 180 | 22 × 30 | 0.20 | 1.48 | ESMR421VSN181MP30S | 390 | | 25.4 × 50 | 0.20 | 2.37 | ESMR451VSN391MQ50S | |
| | 180 | 25.4 × 25 | 0.20 | 1.51 | ESMR421VSN181MQ25S | 390 | | 30 × 35 | 0.20 | 2.32 | ESMR451VSN391MR35S | |
| | 220 | 22 × 35 | 0.20 | 1.68 | ESMR421VSN221MP35S | 390 | | 35 × 30 | 0.20 | 2.32 | ESMR451VSN391MA30S | |
| | 220 | 25.4 × 30 | 0.20 | 1.71 | ESMR421VSN221MQ30S | 470 | | 30 × 40 | 0.20 | 2.66 | ESMR451VSN471MR40S | |
| | 270 | 22 × 45 | 0.20 | 1.94 | ESMR421VSN271MP45S | 470 | | 35 × 35 | 0.20 | 2.54 | ESMR451VSN471MA35S | |
| | 270 | 25.4 × 35 | 0.20 | 1.99 | ESMR421VSN271MQ35S | 560 | | 30 × 45 | 0.20 | 2.93 | ESMR451VSN561MR45S | |
| | 270 | 30 × 25 | 0.20 | 1.87 | ESMR421VSN271MR25S | 560 | | 35 × 40 | 0.20 | 2.87 | ESMR451VSN561MA40S | |
| | 330 | 22 × 50 | 0.20 | 2.20 | ESMR421VSN331MP50S | 680 | | 35 × 45 | 0.20 | 3.21 | ESMR451VSN681MA45S | |
| | 330 | 25.4 × 40 | 0.20 | 2.24 | ESMR421VSN331MQ40S | 820 | 35 × 50 | 0.20 | 3.60 | ESMR451VSN821MA50S | | |
| | 330 | 30 × 30 | 0.20 | 2.08 | ESMR421VSN331MR30S | | | | | | | |

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

| Frequency(Hz) | 50 | 120 | 300 | 1k | 10k | 50k |
|---------------------------|------|------|------|------|------|------|
| 400 to 450V _{dc} | 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.