

# SMR Series

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

SMR

↑  
Downsized  
Higher ripple  
SMQ P233



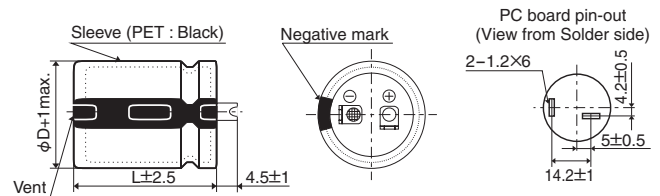
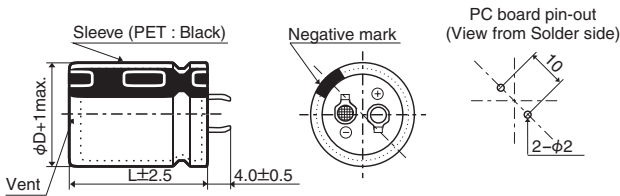
## SPECIFICATIONS

Items	Characteristics		
Category	-25 to +85°C		
Temperature Range	-25 to +85°C		
Rated Voltage Range	400 to 450V <sub>dc</sub>		
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 <sub>dc</sub> )	400V	420 & 450V
	tan δ (Max.)	0.15	0.20
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (V <sub>dc</sub> )	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]

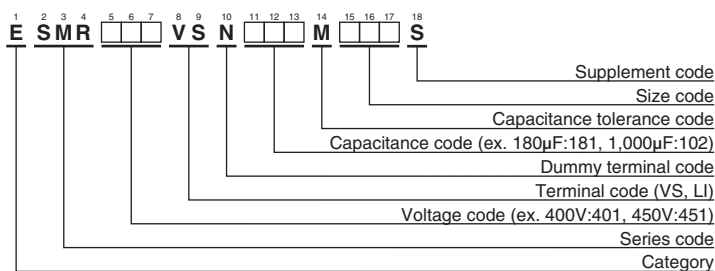
● Terminal Code : VS (φ22 to φ35) : Standard

● 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 <sub>dc</sub> )	Cap (μF)	Case size φD×L(mm)	tan δ	Rated ripple current (Arms/85°C, 120Hz)	Part No.	WV (V <sub>dc</sub> )	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 <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.