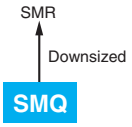
SMQ Series

- Endurance with ripple current : 2,000 hours at 85℃
- Non solvent resistant type
- RoHS2 Compliant

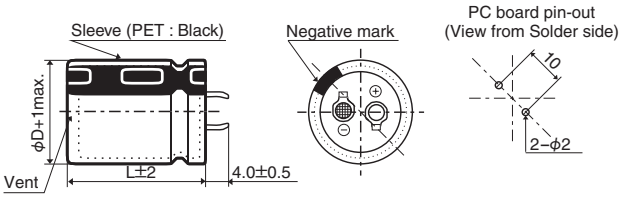


◆SPECIFICATIONS

Items	Characteristics				
Category Temperature Range	-25 to +85℃				
Rated Voltage Range	160 to 450Vdc				
Capacitance Tolerance	±20% (M)				(at 20℃, 120Hz)
Leakage Current	I≦3√CV 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 (Vdc)	160 to 250V	315 to 400V	420 & 450V	
	tan δ (Max.)	0.15	0.15	0.20	(at 20℃, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (Vdc)	160 to 250V	315 to 400V	420 & 450V	
	Z(-25℃)/Z(+20℃)	4	8	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 2,000 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			

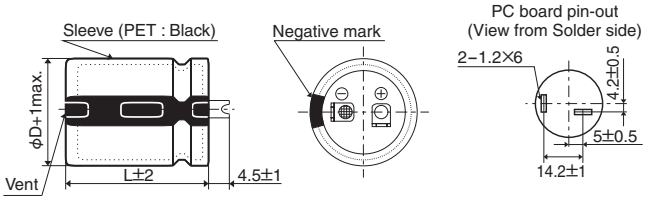
◆DIMENSIONS [mm]

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

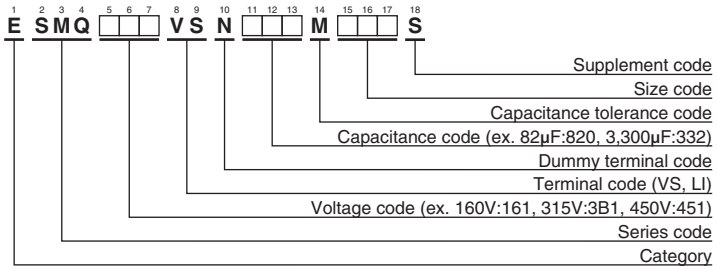


The standard design has no plastic disc.

●Terminal Code : LI (φ35)



◆PART NUMBERING SYSTEM



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

SMQ Series

◆STANDARD RATINGS

WV (V_{dc})	Cap (μF)	Case size φD×L(mm)	tan δ	Rated ripple current (Arms/ 85℃, 120Hz)	Part No.
160	560	22 × 25	0.15	2.25	ESMQ161VSN561MP25S
	680	22 × 30	0.15	2.50	ESMQ161VSN681MP30S
	820	22 × 35	0.15	2.75	ESMQ161VSN821MP35S
	1,000	22 × 40	0.15	3.00	ESMQ161VSN102MP40S
	1,000	25.4 × 30	0.15	3.00	ESMQ161VSN102MQ30S
	1,200	22 × 45	0.15	3.25	ESMQ161VSN122MP45S
	1,200	25.4 × 35	0.15	3.25	ESMQ161VSN122MQ35S
	1,200	30 × 25	0.15	3.25	ESMQ161VSN122MR25S
	1,500	22 × 50	0.15	3.73	ESMQ161VSN152MP50S
	1,500	25.4 × 40	0.15	3.73	ESMQ161VSN152MQ40S
	1,500	30 × 30	0.15	3.73	ESMQ161VSN152MR30S
	1,500	35 × 25	0.15	3.73	ESMQ161VSN152MA25S
	1,800	25.4 × 45	0.15	4.20	ESMQ161VSN182MQ45S
	1,800	30 × 35	0.15	4.20	ESMQ161VSN182MR35S
	1,800	35 × 30	0.15	4.20	ESMQ161VSN182MA30S
	2,200	30 × 40	0.15	4.78	ESMQ161VSN222MR40S
	2,200	35 × 35	0.15	4.78	ESMQ161VSN222MA35S
	2,700	35 × 40	0.15	5.45	ESMQ161VSN272MA40S
	3,300	35 × 45	0.15	5.75	ESMQ161VSN332MA45S
	3,900	35 × 50	0.15	6.00	ESMQ161VSN392MA50S
180	470	22 × 25	0.15	2.08	ESMQ181VSN471MP25S
	560	22 × 30	0.15	2.25	ESMQ181VSN561MP30S
	680	22 × 30	0.15	2.50	ESMQ181VSN681MP30S
	680	25.4 × 25	0.15	2.50	ESMQ181VSN681MQ25S
	820	22 × 35	0.15	2.75	ESMQ181VSN821MP35S
	820	25.4 × 30	0.15	2.75	ESMQ181VSN821MQ30S
	1,000	22 × 45	0.15	3.00	ESMQ181VSN102MP45S
	1,000	25.4 × 35	0.15	3.00	ESMQ181VSN102MQ35S
	1,000	30 × 25	0.15	3.00	ESMQ181VSN102MR25S
	1,200	22 × 50	0.15	3.31	ESMQ181VSN122MP50S
	1,200	25.4 × 40	0.15	3.31	ESMQ181VSN122MQ40S
	1,200	30 × 30	0.15	3.31	ESMQ181VSN122MR30S
	1,200	35 × 25	0.15	3.31	ESMQ181VSN122MA25S
	1,500	25.4 × 45	0.15	3.83	ESMQ181VSN152MQ45S
	1,500	30 × 35	0.15	3.83	ESMQ181VSN152MR35S
	1,500	35 × 30	0.15	3.83	ESMQ181VSN152MA30S
	1,800	25.4 × 50	0.15	4.32	ESMQ181VSN182MQ50S
	1,800	30 × 40	0.15	4.32	ESMQ181VSN182MR40S
	1,800	35 × 30	0.15	4.32	ESMQ181VSN182MA30S
	2,200	30 × 45	0.15	4.92	ESMQ181VSN222MR45S
	2,200	35 × 40	0.15	4.92	ESMQ181VSN222MA40S
	2,700	35 × 45	0.15	5.52	ESMQ181VSN272MA45S
	3,300	35 × 50	0.15	5.75	ESMQ181VSN332MA50S
200	390	22 × 25	0.15	1.68	ESMQ201VSN391MP25S
	470	22 × 30	0.15	1.85	ESMQ201VSN471MP30S
	560	22 × 30	0.15	2.43	ESMQ201VSN561MP30S
	560	25.4 × 25	0.15	2.43	ESMQ201VSN561MQ25S
	680	22 × 35	0.15	2.68	ESMQ201VSN681MP35S
	680	25.4 × 30	0.15	2.68	ESMQ201VSN681MQ30S
	820	22 × 40	0.15	2.93	ESMQ201VSN821MP40S
	820	25.4 × 30	0.15	2.93	ESMQ201VSN821MQ30S
	820	30 × 25	0.15	2.93	ESMQ201VSN821MR25S
	1,000	22 × 45	0.15	3.25	ESMQ201VSN102MP45S
	1,000	25.4 × 35	0.15	3.25	ESMQ201VSN102MQ35S
	1,000	30 × 30	0.15	3.25	ESMQ201VSN102MR30S
	1,000	35 × 25	0.15	3.25	ESMQ201VSN102MA25S
	1,200	25.4 × 40	0.15	3.50	ESMQ201VSN122MQ40S
	1,200	30 × 30	0.15	3.50	ESMQ201VSN122MR30S
	1,200	35 × 30	0.15	3.50	ESMQ201VSN122MA30S
	1,500	25.4 × 50	0.15	3.87	ESMQ201VSN152MQ50S
	1,500	30 × 35	0.15	3.87	ESMQ201VSN152MR35S
	1,500	35 × 30	0.15	3.87	ESMQ201VSN152MA30S
	1,800	30 × 45	0.15	4.32	ESMQ201VSN182MR45S
	1,800	35 × 35	0.15	4.32	ESMQ201VSN182MA35S
	2,200	30 × 50	0.15	4.92	ESMQ201VSN222MR50S
	2,200	35 × 40	0.15	4.92	ESMQ201VSN222MA40S
	2,700	35 × 50	0.15	5.45	ESMQ201VSN272MA50S

WV (V_{dc})	Cap (μF)	Case size φD×L(mm)	tan δ	Rated ripple current (Arms/ 85℃, 120Hz)	Part No.
250	270	22 × 25	0.15	1.31	ESMQ251VSN271MP25S
	330	22 × 30	0.15	1.75	ESMQ251VSN331MP30S
	390	22 × 30	0.15	1.91	ESMQ251VSN391MP30S
	390	25.4 × 25	0.15	1.91	ESMQ251VSN391MQ25S
	470	22 × 35	0.15	2.11	ESMQ251VSN471MP35S
	470	25.4 × 30	0.15	2.11	ESMQ251VSN471MQ30S
	560	22 × 40	0.15	2.25	ESMQ251VSN561MP40S
	560	25.4 × 30	0.15	2.25	ESMQ251VSN561MQ30S
	560	30 × 25	0.15	2.25	ESMQ251VSN561MR25S
	680	22 × 45	0.15	2.50	ESMQ251VSN681MP45S
	680	25.4 × 35	0.15	2.50	ESMQ251VSN681MQ35S
	680	30 × 30	0.15	2.50	ESMQ251VSN681MR30S
	820	22 × 50	0.15	2.77	ESMQ251VSN821MP50S
	820	25.4 × 40	0.15	2.77	ESMQ251VSN821MQ40S
	820	30 × 30	0.15	2.77	ESMQ251VSN821MR30S
	820	35 × 25	0.15	2.77	ESMQ251VSN821MA25S
	1,000	25.4 × 45	0.15	3.32	ESMQ251VSN102MQ45S
	1,000	30 × 35	0.15	3.32	ESMQ251VSN102MR35S
	1,000	35 × 30	0.15	3.32	ESMQ251VSN102MA30S
	1,200	30 × 40	0.15	3.53	ESMQ251VSN122MR40S
	1,200	35 × 35	0.15	3.53	ESMQ251VSN122MA35S
	1,500	30 × 50	0.15	4.04	ESMQ251VSN152MR50S
	1,500	35 × 40	0.15	4.04	ESMQ251VSN152MA40S
	1,800	35 × 45	0.15	4.55	ESMQ251VSN182MA45S
315	180	22 × 25	0.15	1.21	ESMQ3B1VSN181MP25S
	220	22 × 30	0.15	1.41	ESMQ3B1VSN221MP30S
	270	22 × 30	0.15	1.60	ESMQ3B1VSN271MP30S
	330	22 × 40	0.15	1.82	ESMQ3B1VSN331MP40S
	330	25.4 × 30	0.15	1.82	ESMQ3B1VSN331MQ30S
	330	30 × 25	0.15	1.82	ESMQ3B1VSN331MR25S
	390	22 × 45	0.15	2.01	ESMQ3B1VSN391MP45S
	390	25.4 × 35	0.15	2.01	ESMQ3B1VSN391MQ35S
	390	30 × 30	0.15	2.01	ESMQ3B1VSN391MR30S
	470	22 × 50	0.15	2.27	ESMQ3B1VSN471MP50S
	470	25.4 × 40	0.15	2.27	ESMQ3B1VSN471MQ40S
	470	30 × 30	0.15	2.27	ESMQ3B1VSN471MR30S
	470	35 × 25	0.15	2.27	ESMQ3B1VSN471MA25S
	560	25.4 × 45	0.15	2.56	ESMQ3B1VSN561MQ45S
	560	30 × 35	0.15	2.56	ESMQ3B1VSN561MR35S
	560	35 × 30	0.15	2.56	ESMQ3B1VSN561MA30S
	680	30 × 40	0.15	2.87	ESMQ3B1VSN681MR40S
	680	35 × 35	0.15	2.87	ESMQ3B1VSN681MA35S
	820	30 × 45	0.15	3.25	ESMQ3B1VSN821MR45S
	820	35 × 40	0.15	3.25	ESMQ3B1VSN821MA40S
	1,000	30 × 50	0.15	3.63	ESMQ3B1VSN102MR50S
	1,000	35 × 45	0.15	3.63	ESMQ3B1VSN102MA45S
350	150	22 × 25	0.15	1.12	ESMQ351VSN151MP25S
	180	22 × 30	0.15	1.22	ESMQ351VSN181MP30S
	220	22 × 35	0.15	1.44	ESMQ351VSN221MP35S
	270	22 × 40	0.15	1.66	ESMQ351VSN271MP40S
	270	25.4 × 30	0.15	1.66	ESMQ351VSN271MQ30S
	330	22 × 45	0.15	1.88	ESMQ351VSN331MP45S
	330	25.4 × 35	0.15	1.88	ESMQ351VSN331MQ35S
	390	22 × 50	0.15	2.06	ESMQ351VSN391MP50S
	390	25.4 × 40	0.15	2.06	ESMQ351VSN391MQ40S
	390	30 × 30	0.15	2.06	ESMQ351VSN391MR30S
	390	35 × 25	0.15	2.06	ESMQ351VSN391MA25S
	470	25.4 × 45	0.15	2.40	ESMQ351VSN471MQ45S
	470	30 × 35	0.15	2.40	ESMQ351VSN471MR35S
	470	35 × 30	0.15	2.40	ESMQ351VSN471MA30S
	560	25.4 × 50	0.15	2.60	ESMQ351VSN561MQ50S
	560	30 × 40	0.15	2.60	ESMQ351VSN561MR40S
	560	35 × 30	0.15	2.60	ESMQ351VSN561MA30S
	680	30 × 45	0.15	2.96	ESMQ351VSN681MR45S
	680	35 × 35	0.15	2.96	ESMQ351VSN681MA35S
	820	30 × 50	0.15	3.25	ESMQ351VSN821MR50S
	820	35 × 45	0.15	3.25	ESMQ351VSN821MA45S

SMQ Series

◆STANDARD RATINGS

WV (V_{dc})	Cap (μF)	Case size φD×L(mm)	tan δ	Rated ripple current (Arms/ 85℃, 120Hz)	Part No.
350	1,000	35 × 50	0.15	3.54	ESMQ351VSN102MA50S
400	120	22 × 25	0.15	1.02	ESMQ401VSN121MP25S
	150	22 × 30	0.15	1.16	ESMQ401VSN151MP30S
	180	22 × 35	0.15	1.44	ESMQ401VSN181MP35S
	220	22 × 40	0.15	1.49	ESMQ401VSN221MP40S
	220	25.4 × 30	0.15	1.49	ESMQ401VSN221MQ30S
	270	22 × 45	0.15	1.67	ESMQ401VSN271MP45S
	270	25.4 × 35	0.15	1.67	ESMQ401VSN271MQ35S
	270	30 × 25	0.15	1.67	ESMQ401VSN271MR25S
	330	22 × 50	0.15	1.90	ESMQ401VSN331MP50S
	330	25.4 × 40	0.15	1.90	ESMQ401VSN331MQ40S
	330	30 × 30	0.15	1.90	ESMQ401VSN331MR30S
	330	35 × 25	0.15	1.90	ESMQ401VSN331MA25S
	390	25.4 × 45	0.15	2.13	ESMQ401VSN391MQ45S
	390	30 × 35	0.15	2.13	ESMQ401VSN391MR35S
	390	35 × 30	0.15	2.13	ESMQ401VSN391MA30S
	470	25.4 × 50	0.15	2.39	ESMQ401VSN471MQ50S
	470	30 × 40	0.15	2.39	ESMQ401VSN471MR40S
	470	35 × 30	0.15	2.39	ESMQ401VSN471MA30S
	560	30 × 45	0.15	2.69	ESMQ401VSN561MR45S
	560	35 × 35	0.15	2.69	ESMQ401VSN561MA35S
	680	30 × 50	0.15	2.96	ESMQ401VSN681MR50S
	680	35 × 40	0.15	2.96	ESMQ401VSN681MA40S
	820	35 × 45	0.15	3.25	ESMQ401VSN821MA45S
420	100	22 × 25	0.20	0.97	ESMQ421VSN101MP25S
	120	22 × 25	0.20	1.08	ESMQ421VSN121MP25S
	150	22 × 30	0.20	1.30	ESMQ421VSN151MP30S
	150	25.4 × 25	0.20	1.30	ESMQ421VSN151MQ25S
	180	22 × 35	0.20	1.48	ESMQ421VSN181MP35S
	180	25.4 × 30	0.20	1.48	ESMQ421VSN181MQ30S
	220	22 × 40	0.20	1.65	ESMQ421VSN221MP40S
	220	25.4 × 35	0.20	1.65	ESMQ421VSN221MQ35S
	220	30 × 25	0.20	1.65	ESMQ421VSN221MR25S
	270	22 × 50	0.20	1.94	ESMQ421VSN271MP50S
	270	25.4 × 35	0.20	1.94	ESMQ421VSN271MQ35S

WV (V_{dc})	Cap (μF)	Case size φD×L(mm)	tan δ	Rated ripple current (Arms/ 85℃, 120Hz)	Part No.
420	270	30 × 30	0.20	1.94	ESMQ421VSN271MR30S
	330	25.4 × 45	0.20	2.17	ESMQ421VSN331MQ45S
	330	30 × 35	0.20	2.17	ESMQ421VSN331MR35S
	330	35 × 30	0.20	2.17	ESMQ421VSN331MA30S
	390	25.4 × 50	0.20	2.27	ESMQ421VSN391MQ50S
	390	30 × 35	0.20	2.27	ESMQ421VSN391MR35S
	390	35 × 30	0.20	2.27	ESMQ421VSN391MA30S
	470	30 × 40	0.20	2.61	ESMQ421VSN471MR40S
	470	35 × 35	0.20	2.61	ESMQ421VSN471MA35S
	560	30 × 50	0.20	2.82	ESMQ421VSN561MR50S
	560	35 × 40	0.20	2.82	ESMQ421VSN561MA40S
	680	35 × 45	0.20	3.11	ESMQ421VSN681MA45S
450	82	22 × 25	0.20	0.83	ESMQ451VSN820MP25S
	100	22 × 25	0.20	0.93	ESMQ451VSN101MP25S
	120	22 × 30	0.20	1.04	ESMQ451VSN121MP30S
	150	22 × 35	0.20	1.19	ESMQ451VSN151MP35S
	150	25.4 × 25	0.20	1.19	ESMQ451VSN151MQ25S
	180	22 × 40	0.20	1.35	ESMQ451VSN181MP40S
	180	25.4 × 30	0.20	1.35	ESMQ451VSN181MQ30S
	220	22 × 45	0.20	1.55	ESMQ451VSN221MP45S
	220	25.4 × 40	0.20	1.55	ESMQ451VSN221MQ40S
	220	30 × 30	0.20	1.55	ESMQ451VSN221MR30S
	220	35 × 25	0.20	1.55	ESMQ451VSN221MA25S
	270	22 × 50	0.20	1.78	ESMQ451VSN271MP50S
	270	25.4 × 40	0.20	1.78	ESMQ451VSN271MQ40S
	270	30 × 30	0.20	1.78	ESMQ451VSN271MR30S
	330	25.4 × 50	0.20	2.01	ESMQ451VSN331MQ50S
	330	30 × 40	0.20	2.01	ESMQ451VSN331MR40S
	330	35 × 30	0.20	2.01	ESMQ451VSN331MA30S
	390	30 × 40	0.20	2.24	ESMQ451VSN391MR40S
	390	35 × 35	0.20	2.24	ESMQ451VSN391MA35S
	470	30 × 45	0.20	2.53	ESMQ451VSN471MR45S
	470	35 × 40	0.20	2.53	ESMQ451VSN471MA40S
	560	30 × 50	0.20	2.82	ESMQ451VSN561MR50S
	560	35 × 45	0.20	2.82	ESMQ451VSN561MA45S

◆RATED RIPPLE CURRENT MULTIPLIERS

Frequency Multipliers

Frequency(Hz)	50	120	300	1k	10k	50k
160 to 250V_{dc}	0.81	1.00	1.17	1.32	1.45	1.50
315 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℃ rise. When long life performance is required in actual use, the rms ripple current has to be reduced.