



● Endurance with ripple current: 2,000 hours at 85°C

Non solvent resistant type

● RoHS2 Compliant



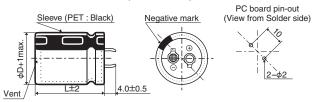


#### **SPECIFICATIONS**

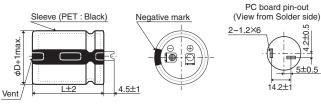
Items	Characteristics										
Category Temperature Range	-25 to +85℃										
Rated Voltage Range	160 to 450V <sub>dc</sub>										
Capacitance Tolerance	±20% (M) (at 20°C, 120Hz)										
Leakage Current	I≦3 $\sqrt{CV}$ Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 5 minutes)										
Dissipation Factor	Rated voltage (Vdc)	160 to 250V	315 to 400V	420 & 450V							
$(\tan \delta)$	tan δ (Max.)	0.15	0.15	0.20	(at 20℃, 120Hz)						
Low Temperature	Rated voltage (Vdc)	160 to 250V	315 to 400V	420 & 450V							
Characteristics	Z(-25°C)/Z(+20°C)	4	8	8							
(Max. Impedance Ratio)	(at 120Hz)										
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 init	tial value								
	D. F. (tan $\delta$ )	≦200% of the initi	al specified value								
	Leakage current	≦The initial specif	ied 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 init	tial value								
	D. F. (tan δ )	≦150% of the initi	al specified value								
	Leakage current	≦The initial specif	ied value								

### **◆DIMENSIONS** [mm]

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

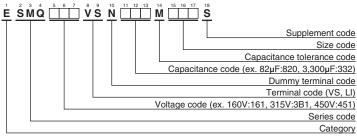


•Terminal Code : LI ( $\phi$ 35)



The standard design has no plastic disc.

#### **◆PART NUMBERING SYSTEM**



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





#### **STANDARD RATINGS**

_			100							1		
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.	
	560	22 × 25	0.15	2.25	ESMQ161VSN561MP25S		270	22 × 25	0.15	1.31	ESMQ251VSN271MP25S	
	680	22 × 30	0.15	2.50	ESMQ161VSN681MP30S		330	22 × 30	0.15	1.75	ESMQ251VSN331MP30S	
	820	22 × 35	0.15	2.75	ESMQ161VSN821MP35S		390	22 × 30	0.15	1.91	ESMQ251VSN391MP30S	
	1,000	22 × 40	0.15	3.00	ESMQ161VSN102MP40S		390	25.4 × 25	0.15	1.91	ESMQ251VSN391MQ25S	
	1,000	25.4 × 30	0.15	3.00	ESMQ161VSN102MQ30S		470	22 × 35	0.15	2.11	ESMQ251VSN471MP35S	
	1,200	22 × 45	0.15	3.25	ESMQ161VSN122MP45S		470	$25.4 \times 30$	0.15	2.11	ESMQ251VSN471MQ30S	
	1,200	25.4 × 35	0.15	3.25	ESMQ161VSN122MQ35S		560	22 × 40	0.15	2.25	ESMQ251VSN561MP40S	
	1,200	30 × 25	0.15	3.25	ESMQ161VSN122MR25S		560	25.4 × 30	0.15	2.25	ESMQ251VSN561MQ30S	
	1,500	22 × 50	0.15	3.73	ESMQ161VSN152MP50S		560	30 × 25	0.15	2.25	ESMQ251VSN561MR25S	
160	1,500	25.4 × 40	0.15	3.73	ESMQ161VSN152MQ40S		680	22 × 45	0.15	2.50	ESMQ251VSN681MP45S	
100	1,500	30 × 30	0.15	3.73	ESMQ161VSN152MR30S		680	$25.4 \times 35$	0.15	2.50	ESMQ251VSN681MQ35S	
	1,500	35 × 25	0.15	3.73	ESMQ161VSN152MA25S	250	680	30 × 30	0.15	2.50	ESMQ251VSN681MR30S	
	1,800	$25.4 \times 45$	0.15	4.20	ESMQ161VSN182MQ45S	230	820	22 × 50	0.15	2.77	ESMQ251VSN821MP50S	
	1,800	30 × 35	0.15	4.20	ESMQ161VSN182MR35S		820	25.4 × 40	0.15	2.77	ESMQ251VSN821MQ40S	
	1,800	35 × 30	0.15	4.20	ESMQ161VSN182MA30S		820	30 × 30	0.15	2.77	ESMQ251VSN821MR30S	
	2,200	30 × 40	0.15	4.78	ESMQ161VSN222MR40S		820	35 × 25	0.15	2.77	ESMQ251VSN821MA25S	
	2,200	35 × 35	0.15	4.78	ESMQ161VSN222MA35S		1,000	25.4 × 45	0.15	3.32	ESMQ251VSN102MQ45S	
	2,700	35 × 40	0.15	5.45	ESMQ161VSN272MA40S		1,000	30 × 35	0.15	3.32	ESMQ251VSN102MR35S	
	3,300	35 × 45	0.15	5.75	ESMQ161VSN332MA45S		1,000	35 × 30	0.15	3.32	ESMQ251VSN102MA30S	
	3,900	35 × 50	0.15	6.00	ESMQ161VSN392MA50S		1,200	30 × 40	0.15	3.53	ESMQ251VSN122MR40S	
	470	22 × 25	0.15	2.08	ESMQ181VSN471MP25S		1,200	35 × 35	0.15	3.53	ESMQ251VSN122MA35S	
	560	22 × 30	0.15	2.25	ESMQ181VSN561MP30S		1,500	30 × 50	0.15	4.04	ESMQ251VSN152MR50S	
				2.25					0.15	4.04		
	680	22 × 30	0.15		ESMQ181VSN681MP30S		1,500	35 × 40			ESMQ251VSN152MA40S	
	680	25.4 × 25	0.15	2.50	ESMQ181VSN681MQ25S		1,800	35 × 45	0.15	4.55	ESMQ251VSN182MA45S	
	820	22 × 35	0.15	2.75	ESMQ181VSN821MP35S		180	22 × 25	0.15	1.21	ESMQ3B1VSN181MP25S	
	820	25.4 × 30	0.15	2.75	ESMQ181VSN821MQ30S		220	22 × 30	0.15	1.41	ESMQ3B1VSN221MP30S	
	1,000	22 × 45	0.15	3.00	ESMQ181VSN102MP45S		270	22 × 30	0.15	1.60	ESMQ3B1VSN271MP30S	
	1,000	25.4 × 35	0.15	3.00	ESMQ181VSN102MQ35S		330	22 × 40	0.15	1.82	ESMQ3B1VSN331MP40S	
	1,000	30 × 25	0.15	3.00	ESMQ181VSN102MR25S		330	25.4 × 30	0.15	1.82	ESMQ3B1VSN331MQ30S	
	1,200	22 × 50	0.15	3.31	ESMQ181VSN122MP50S		330	30 × 25	0.15	1.82	ESMQ3B1VSN331MR25S	
	1,200	$25.4 \times 40$	0.15	3.31	ESMQ181VSN122MQ40S		390	22 × 45	0.15	2.01	ESMQ3B1VSN391MP45S	
180	1,200	30 × 30	0.15	3.31	ESMQ181VSN122MR30S		390	25.4 × 35	0.15	2.01	ESMQ3B1VSN391MQ35S	
	1,200	35 × 25	0.15	3.31	ESMQ181VSN122MA25S		390	30 × 30	0.15	2.01	ESMQ3B1VSN391MR30S	
	1,500	25.4 × 45	0.15	3.83	ESMQ181VSN152MQ45S		470	22 × 50	0.15	2.27	ESMQ3B1VSN471MP50S	
	1,500	30 × 35	0.15	3.83	ESMQ181VSN152MR35S	315	470	25.4 × 40	0.15	2.27	ESMQ3B1VSN471MQ40S	
	1,500	35 × 30	0.15	3.83	ESMQ181VSN152MA30S	315	470	30 × 30	0.15	2.27	ESMQ3B1VSN471MR30S	
	1,800	25.4 × 50	0.15	4.32	ESMQ181VSN182MQ50S		470	35 × 25	0.15	2.27	ESMQ3B1VSN471MA25S	
	1,800	30 × 40	0.15	4.32	ESMQ181VSN182MR40S		560	25.4 × 45	0.15	2.56	ESMQ3B1VSN561MQ45S	
	1,800	35 × 30	0.15	4.32	ESMQ181VSN182MA30S		560	30 × 35	0.15	2.56	ESMQ3B1VSN561MR35S	
	2,200	30 × 45	0.15	4.92	ESMQ181VSN222MR45S		560	35 × 30	0.15	2.56	ESMQ3B1VSN561MA30S	
	2,200	35 × 40	0.15	4.92	ESMQ181VSN222MA40S		680	30 × 40	0.15	2.87	ESMQ3B1VSN681MR40S	
	2,700	35 × 45	0.15	5.52	ESMQ181VSN272MA45S		680	35 × 35	0.15	2.87	ESMQ3B1VSN681MA35S	
	3,300	35 × 50	0.15	5.75	ESMQ181VSN332MA50S		820	30 × 45	0.15	3.25	ESMQ3B1VSN821MR45S	
	390	22 × 25	0.15	1.68	ESMQ201VSN391MP25S		820	35 × 40	0.15	3.25	ESMQ3B1VSN821MA40S	
	470	22 × 30	0.15	1.85	ESMQ201VSN471MP30S		1,000	30 × 50	0.15	3.63	ESMQ3B1VSN102MR50S	
	560	22 × 30	0.15	2.43	ESMQ201VSN561MP30S		1,000	35 × 45	0.15	3.63	ESMQ3B1VSN102MA45S	
	560	25.4 × 25	0.15	2.43	ESMQ201VSN561MQ25S		150	22 × 25	0.15	1.12	ESMQ351VSN151MP25S	
	680	22 × 35	0.15	2.43	ESMQ201VSN681MP35S		180	22 × 30	0.15	1.12	ESMQ351VSN181MP30S	
	680	25.4 × 30	0.15	2.68	ESMQ201VSN681MQ30S		220	22 × 35	0.15	1.44	ESMQ351VSN221MP35S	
	820	22 × 40	0.15	2.93	ESMQ201VSN821MP40S		270	22 × 40	0.15	1.66	ESMQ351VSN271MP40S	
	820	25.4 × 30	0.15	2.93	ESMQ201VSN821MQ30S		270	25.4 × 30	0.15	1.66	ESMQ351VSN271MQ30S	
	820	30 × 25	0.15	2.93	ESMQ201VSN821MR25S		330	22 × 45	0.15	1.88	ESMQ351VSN331MP45S	
	1,000	22 × 45	0.15	3.25	ESMQ201VSN102MP45S		330	25.4 × 35	0.15	1.88	ESMQ351VSN331MQ35S	
	1,000	25.4 × 35	0.15	3.25	ESMQ201VSN102MQ35S		390	22 × 50	0.15	2.06	ESMQ351VSN391MP50S	
200	1,000	30 × 30	0.15	3.25	ESMQ201VSN102MR30S		390	25.4 × 40	0.15	2.06	ESMQ351VSN391MQ40S	
200	1,000	35 × 25	0.15	3.25	ESMQ201VSN102MA25S		390	30 × 30	0.15	2.06	ESMQ351VSN391MR30S	
	1,200	25.4 × 40	0.15	3.50	ESMQ201VSN122MQ40S	350	390	35 × 25	0.15	2.06	ESMQ351VSN391MA25S	
	1,200	30 × 30	0.15	3.50	ESMQ201VSN122MR30S		470	25.4 × 45	0.15	2.40	ESMQ351VSN471MQ45S	
	1,200	35 × 30	0.15	3.50	ESMQ201VSN122MA30S		470	30 × 35	0.15	2.40	ESMQ351VSN471MR35S	
	1,500	25.4 × 50	0.15	3.87	ESMQ201VSN152MQ50S		470	35 × 30	0.15	2.40	ESMQ351VSN471MA30S	
	1,500	30 × 35	0.15	3.87	ESMQ201VSN152MR35S		560	25.4 × 50	0.15	2.60	ESMQ351VSN561MQ50S	
	1,500	35 × 30	0.15	3.87	ESMQ201VSN152MA30S		560	30 × 40	0.15	2.60	ESMQ351VSN561MR40S	
	1,800	30 × 45	0.15	4.32	ESMQ201VSN182MR45S		560	35 × 30	0.15	2.60	ESMQ351VSN561MA30S	
	1,800	35 × 35	0.15	4.32	ESMQ201VSN182MA35S		680	30 × 45	0.15	2.96	ESMQ351VSN681MR45S	
	2,200	30 × 50	0.15	4.92	ESMQ201VSN222MR50S		680	35 × 35	0.15	2.96	ESMQ351VSN681MA35S	
	2,200	35 × 40	0.15	4.92	ESMQ201VSN222MA40S		820	30 × 50	0.15	3.25	ESMQ351VSN821MR50S	
	2,700	35 × 50	0.15	5.45	ESMQ201VSN272MA50S		820	35 × 45	0.15	3.25	ESMQ351VSN821MA45S	





#### **STANDARD RATINGS**

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 Case size (μF) ΦD×L(mm)		tan δ	Rated ripple current (Arms/ 85°C, 120Hz)	Part No.
350	1,000	35 × 50	0.15	3.54	ESMQ351VSN102MA50S		270	30 × 30	0.20	1.94	ESMQ421VSN271MR30S
	120	22 × 25	0.15	1.02	ESMQ401VSN121MP25S		330	25.4 × 45	0.20	2.17	ESMQ421VSN331MQ45S
	150	22 × 30	0.15	1.16	ESMQ401VSN151MP30S		330	30 × 35	0.20	2.17	ESMQ421VSN331MR35S
	180	22 × 35	0.15	1.44	ESMQ401VSN181MP35S		330	35 × 30	0.20	2.17	ESMQ421VSN331MA30S
	220	22 × 40	0.15	1.49	ESMQ401VSN221MP40S		390	25.4 × 50	0.20	2.27	ESMQ421VSN391MQ50S
	220	25.4 × 30	0.15	1.49	ESMQ401VSN221MQ30S	420	390	30 × 35	0.20	2.27	ESMQ421VSN391MR35S
	270	22 × 45	0.15	1.67	ESMQ401VSN271MP45S	420	390	35 × 30	0.20	2.27	ESMQ421VSN391MA30S
	270	25.4 × 35	0.15	1.67	ESMQ401VSN271MQ35S		470	30 × 40	0.20	2.61	ESMQ421VSN471MR40S
İ	270	30 × 25	0.15	1.67	ESMQ401VSN271MR25S		470	35 × 35	0.20	2.61	ESMQ421VSN471MA35S
	330	22 × 50	0.15	1.90	ESMQ401VSN331MP50S		560	30 × 50	0.20	2.82	ESMQ421VSN561MR50S
	330	25.4 × 40	0.15	1.90	ESMQ401VSN331MQ40S		560	35 × 40	0.20	2.82	ESMQ421VSN561MA40S
	330	30 × 30	0.15	1.90	ESMQ401VSN331MR30S		680	35 × 45	0.20	3.11	ESMQ421VSN681MA45S
400	330	35 × 25	0.15	1.90	ESMQ401VSN331MA25S		82	22 × 25	0.20	0.83	ESMQ451VSN820MP25S
	390	25.4 × 45	0.15	2.13	ESMQ401VSN391MQ45S		100	22 × 25	0.20	0.93	ESMQ451VSN101MP25S
	390	30 × 35	0.15	2.13	ESMQ401VSN391MR35S		120	22 × 30	0.20	1.04	ESMQ451VSN121MP30S
	390	35 × 30	0.15	2.13	ESMQ401VSN391MA30S		150	22 × 35	0.20	1.19	ESMQ451VSN151MP35S
	470	25.4 × 50	0.15	2.39	ESMQ401VSN471MQ50S		150	25.4 × 25	0.20	1.19	ESMQ451VSN151MQ25S
	470	30 × 40	0.15	2.39	ESMQ401VSN471MR40S		180	22 × 40	0.20	1.35	ESMQ451VSN181MP40S
	470	35 × 30	0.15	2.39	ESMQ401VSN471MA30S		180	25.4 × 30	0.20	1.35	ESMQ451VSN181MQ30S
	560	30 × 45	0.15	2.69	ESMQ401VSN561MR45S		220	22 × 45	0.20	1.55	ESMQ451VSN221MP45S
	560	35 × 35	0.15	2.69	ESMQ401VSN561MA35S		220	25.4 × 40	0.20	1.55	ESMQ451VSN221MQ40S
	680	30 × 50	0.15	2.96	ESMQ401VSN681MR50S		220	30 × 30	0.20	1.55	ESMQ451VSN221MR30S
	680	35 × 40	0.15	2.96	ESMQ401VSN681MA40S		220	35 × 25	0.20	1.55	ESMQ451VSN221MA25S
	820	35 × 45	0.15	3.25	ESMQ401VSN821MA45S	450	270	22 × 50	0.20	1.78	ESMQ451VSN271MP50S
	100	22 × 25	0.20	0.97	ESMQ421VSN101MP25S		270	25.4 × 40	0.20	1.78	ESMQ451VSN271MQ40S
	120	22 × 25	0.20	1.08	ESMQ421VSN121MP25S		270	30 × 30	0.20	1.78	ESMQ451VSN271MR30S
	150	22 × 30	0.20	1.30	ESMQ421VSN151MP30S		330	25.4 × 50	0.20	2.01	ESMQ451VSN331MQ50S
	150	25.4 × 25	0.20	1.30	ESMQ421VSN151MQ25S		330	30 × 40	0.20	2.01	ESMQ451VSN331MR40S
	180	22 × 35	0.20	1.48	ESMQ421VSN181MP35S		330	35 × 30	0.20	2.01	ESMQ451VSN331MA30S
420	180	25.4 × 30	0.20	1.48	ESMQ421VSN181MQ30S		390	30 × 40	0.20	2.24	ESMQ451VSN391MR40S
	220	22 × 40	0.20	1.65	ESMQ421VSN221MP40S		390	35 × 35	0.20	2.24	ESMQ451VSN391MA35S
	220	25.4 × 35	0.20	1.65	ESMQ421VSN221MQ35S		470	30 × 45	0.20	2.53	ESMQ451VSN471MR45S
	220	30 × 25	0.20	1.65	ESMQ421VSN221MR25S		470	35 × 40	0.20	2.53	ESMQ451VSN471MA40S
	270	22 × 50	0.20	1.94	ESMQ421VSN271MP50S		560	30 × 50	0.20	2.82	ESMQ451VSN561MR50S
	270	25.4 × 35	0.20	1.94	ESMQ421VSN271MQ35S		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 <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.

# **Mouser Electronics**

**Authorized Distributor** 

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

## United Chemi-Con (UCC):

```
ESMQ451VSN561MR50S ESMQ401VSN271MR25S ESMQ161VSN182MQ45S ESMQ201VSN152MQ50S
ESMQ251VSN152MR50S ESMQ251VSN182MA45S ESMQ351VSN391MP50S ESMQ351VSN821MR50S
ESMQ3B1VSN102MR50S ESMQ251VSN102MQ45S ESMQ201VSN102MQ35S ESMQ201VRD272MA50S
ESMQ251VSN821MR30S ESMQ161VSN332MA45S ESMQ500ELL221MJC5S ESMQ161VSN681MP30S
ESMQ251VSN681MQ35S ESMQ251VSN391MP30S ESMQ201ELL100MHB5D ESMQ401VSN681MA40S
ESMQ251VSN471MQ25S ESMQ201VSN222MA40S
                                      ESMQ401VSN151MP30S ESMQ251VSN821MA25W
ESMQ3B1VSN102MR50W ESMQ251VSN152MA40S ESMQ500ETD470MF11D ESMQ351VSN561MR40S
ESMQ451VSN151MQ25S ESMQ421VSN181MQ30S ESMQ201ELL3R3MF11D ESMQ451VSN221MP45S
ESMQ451VSN391MA30S ESMQ161VSN182MA30S ESMQ201VSN152MA30S ESMQ251VSN561MP40S
ESMQ401VSN471MQ50W ESMQ630ELL101MHB5D ESMQ451VSN681MA50S ESMQ401VSN271MQ35S
ESMQ251VSN471MQ30S
                   ESMQ201VSN391MP25S
                                      ESMQ101ELL101MJ16S ESMQ3B1VSN102MA45W
ESMQ451VSN181MQ30S ESMQ451VSN121MP30S
                                      ESMQ3B1VSN391MP45S ESMQ201VSN561MQ30W
ESMQ401VSN221MP40S ESMQ500ELL101MHB5D
                                     ESMQ401ELL3R3MHB5D ESMQ500EMC222MLN3S
ESMQ401VSN391MR35T ESMQ401VSN221MQ30S
                                      ESMQ451VSN271MQ40S ESMQ451VSN271MR30S
ESMQ201VSN122MQ40S ESMQ3B1VSN821MR45W ESMQ250ELL682MLP1S ESMQ451VSN391MR40S
ESMQ401VSN331MA25S ESMQ160ELL472ML25S ESMQ401VSN331MP50S ESMQ160ETC331MF11D
ESMQ401VSN471MQ50S ESMQ161VSN152MR30S
                                      ESMQ401VSN681MR50W ESMQ251VSN182MA45W
ESMQ251VSN821MP50S
                  ESMQ101VSD502MA40S
                                      ESMQ201VSN222MR50T ESMQ201VSN681MQ30S
ESMQ201VSN471MP30T ESMQ161VSN102MP40S ESMQ500ELL100ME11D ESMQ250ELL102MJ16S
ESMQ201VSN182MR45S ESMQ251VSN821MQ40S ESMQ201VSN272MA50S ESMQ351VSN271MQ30S
ESMQ251VSN681MP45S ESMQ201VSN561MQ25W
                                      ESMQ401VSN271MP45S ESMQ401VSN391MQ45S
ESMQ451VSN561MA45S ESMQ161VSN222MR40S
                                      ESMQ251VSN122MR40S ESMQ161VSN561MP25S
ESMQ421VSN121MP25S ESMQ451VSN331MA30S ESMQ251VSN561MQ30S ESMQ401VSN821MA45S
ESMQ401VSN561MA35S ESMQ401VSN561MR45S ESMQ351VSN151MP25S ESMQ401VSN681MR50S
ESMQ401VSN471MR40S ESMQ401VSN331MQ40S ESMQ201VSN102MP45S ESMQ201VSN821MP40S
```