

SMH Series

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



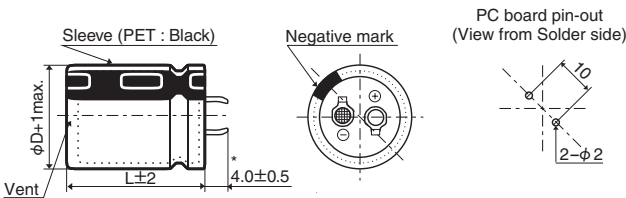
◆ SPECIFICATIONS

Items	Characteristics										
Category	-40 to +85°C										
Temperature Range											
Rated Voltage Range	6.3 to 100V _{dc}										
Capacitance Tolerance	±20% (M) (at 20°C, 120Hz)										
Leakage Current	I=0.02CV or 3mA, whichever is smaller. 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})	6.3V	10V	16V	25V	35V	50V	63V	80V	100V	
	tan δ (Max.)	0.60	0.50	0.40	0.30	0.25	0.20	0.15	0.15	0.15	(at 20°C, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (V _{dc})	6.3V	10V	16V	25V	35V	50V	63V	80V	100V	
	Z(-25°C)/Z(+20°C)	4	4	4	3	3	2	2	2	2	
	Z(-40°C)/Z(+20°C)	15	15	15	10	8	6	6	5	5	(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 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	≤ ±20% 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)



*φD=35mm : 3.5±0.5mm

The standard design has no plastic disc.

◆ PART NUMBERING SYSTEM



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

◆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.		
6.3	15,000	22 × 25	0.60	2.44	ESMH6R3VSN153MP25S	16	27,000	25.4 × 45	0.40	4.72	ESMH160VSN273MQ45S		
	18,000	22 × 30	0.60	2.67	ESMH6R3VSN183MP30S		27,000	30 × 35	0.40	4.82	ESMH160VSN273MR35S		
	18,000	25.4 × 25	0.60	2.70	ESMH6R3VSN183MQ25S		27,000	35 × 30	0.40	4.65	ESMH160VSN273MA30S		
	22,000	22 × 30	0.60	3.06	ESMH6R3VSN223MP30S		33,000	25.4 × 50	0.40	5.33	ESMH160VSN333MQ50S		
	22,000	25.4 × 25	0.60	3.07	ESMH6R3VSN223MQ25S		33,000	30 × 40	0.40	5.36	ESMH160VSN333MR40S		
	27,000	22 × 35	0.60	3.49	ESMH6R3VSN273MP35S		33,000	35 × 30	0.40	5.15	ESMH160VSN333MA30S		
	27,000	25.4 × 30	0.60	3.52	ESMH6R3VSN273MQ30S		39,000	30 × 45	0.40	6.01	ESMH160VSN393MR45S		
	27,000	30 × 25	0.60	3.57	ESMH6R3VSN273MR25S		39,000	35 × 35	0.40	5.95	ESMH160VSN393MA35S		
	33,000	22 × 40	0.60	3.97	ESMH6R3VSN333MP40S		47,000	30 × 50	0.40	6.79	ESMH160VSN473MR50S		
	33,000	25.4 × 35	0.60	4.02	ESMH6R3VSN333MQ35S		47,000	35 × 40	0.40	6.76	ESMH160VSN473MA40S		
	33,000	30 × 25	0.60	3.95	ESMH6R3VSN333MQ25S		56,000	35 × 45	0.40	7.62	ESMH160VSN563MA45S		
	39,000	22 × 50	0.60	4.55	ESMH6R3VSN393MP50S		68,000	35 × 50	0.40	8.63	ESMH160VSN683MA50S		
	39,000	25.4 × 40	0.60	4.50	ESMH6R3VSN393MQ40S		25	5,600	22 × 25	0.30	2.21	ESMH250VSN562MP25S	
	39,000	30 × 30	0.60	4.45	ESMH6R3VSN393MR30S			6,800	22 × 30	0.30	2.40	ESMH250VSN682MP30S	
	39,000	35 × 25	0.60	4.51	ESMH6R3VSN393MA25S			6,800	25.4 × 25	0.30	2.56	ESMH250VSN682MQ25S	
	47,000	25.4 × 45	0.60	5.09	ESMH6R3VSN473MQ45S			8,200	22 × 35	0.30	2.72	ESMH250VSN822MP35S	
	47,000	30 × 35	0.60	5.06	ESMH6R3VSN473MR35S			8,200	25.4 × 25	0.30	2.80	ESMH250VSN822MQ25S	
	47,000	35 × 30	0.60	5.01	ESMH6R3VSN473MA30S			10,000	22 × 40	0.30	3.09	ESMH250VSN103MP40S	
	56,000	25.4 × 50	0.60	5.71	ESMH6R3VSN563MQ50S			10,000	25.4 × 30	0.30	3.12	ESMH250VSN103MQ30S	
	56,000	30 × 40	0.60	5.70	ESMH6R3VSN563MR40S			10,000	30 × 25	0.30	3.21	ESMH250VSN103MR25S	
	56,000	35 × 30	0.60	5.77	ESMH6R3VSN563MA30S			12,000	22 × 45	0.30	3.48	ESMH250VSN123MP45S	
	68,000	30 × 45	0.60	6.48	ESMH6R3VSN683MR45S			12,000	25.4 × 35	0.30	3.43	ESMH250VSN123MQ35S	
	68,000	35 × 35	0.60	6.42	ESMH6R3VSN683MA35S			12,000	30 × 30	0.30	3.86	ESMH250VSN123MR30S	
	82,000	30 × 50	0.60	7.32	ESMH6R3VSN823MR50S			12,000	35 × 25	0.30	3.54	ESMH250VSN123MA25S	
	82,000	35 × 40	0.60	7.29	ESMH6R3VSN823MA40S			15,000	22 × 50	0.30	4.00	ESMH250VSN153MP50S	
	100,000	35 × 45	0.60	8.31	ESMH6R3VSN104MA45S			15,000	25.4 × 40	0.30	3.95	ESMH250VSN153MQ40S	
	10	12,000	22 × 25	0.50	2.39			ESMH100VSN123MP25S	15,000	30 × 30	0.30	4.00	ESMH250VSN153MR30S
		15,000	22 × 30	0.50	2.76			ESMH100VSN153MP30S	15,000	35 × 25	0.30	3.95	ESMH250VSN153MA25S
		15,000	25.4 × 25	0.50	2.77			ESMH100VSN153MQ25S	18,000	25.4 × 45	0.30	4.45	ESMH250VSN183MQ45S
		18,000	22 × 35	0.50	3.12			ESMH100VSN183MP35S	18,000	30 × 35	0.30	4.46	ESMH250VSN183MR35S
		18,000	25.4 × 25	0.50	3.04			ESMH100VSN183MQ25S	18,000	35 × 30	0.30	4.63	ESMH250VSN183MA30S
		22,000	22 × 40	0.50	3.55			ESMH100VSN223MP40S	22,000	25.4 × 50	0.30	5.02	ESMH250VSN223MQ50S
		22,000	25.4 × 30	0.50	3.48			ESMH100VSN223MQ30S	22,000	30 × 45	0.30	5.21	ESMH250VSN223MR45S
22,000		30 × 25	0.50	3.53	ESMH100VSN223MR25S	22,000		35 × 35	0.30	5.16	ESMH250VSN223MA35S		
27,000		22 × 45	0.50	4.04	ESMH100VSN273MP45S	27,000		30 × 50	0.30	5.94	ESMH250VSN273MR50S		
27,000		25.4 × 35	0.50	3.98	ESMH100VSN273MQ35S	27,000		35 × 40	0.30	5.92	ESMH250VSN273MA40S		
27,000		30 × 30	0.50	3.73	ESMH100VSN273MR30S	33,000		35 × 45	0.30	6.75	ESMH250VSN333MA45S		
27,000		35 × 25	0.50	3.73	ESMH100VSN273MA25S	39,000		35 × 50	0.30	7.56	ESMH250VSN393MA50S		
33,000		22 × 50	0.50	4.58	ESMH100VSN333MP50S	35		3,900	22 × 25	0.25	2.22	ESMH350VSN392MP25S	
33,000		25.4 × 40	0.50	4.54	ESMH100VSN333MQ40S			4,700	22 × 30	0.25	2.41	ESMH350VSN472MP30S	
33,000		30 × 30	0.50	4.13	ESMH100VSN333MR30S			4,700	25.4 × 25	0.25	2.42	ESMH350VSN472MQ25S	
33,000		35 × 25	0.50	4.13	ESMH100VSN333MA25S			5,600	22 × 35	0.25	2.75	ESMH350VSN562MP35S	
39,000		25.4 × 45	0.50	5.08	ESMH100VSN393MQ45S			5,600	25.4 × 25	0.25	2.64	ESMH350VSN562MQ25S	
39,000		30 × 35	0.50	5.05	ESMH100VSN393MR35S			6,800	22 × 40	0.25	2.80	ESMH350VSN682MP40S	
39,000		35 × 30	0.50	4.80	ESMH100VSN393MA30S			6,800	25.4 × 30	0.25	2.74	ESMH350VSN682MQ30S	
47,000		25.4 × 50	0.50	5.73	ESMH100VSN473MQ50S		6,800	30 × 25	0.25	2.97	ESMH350VSN682MR25S		
47,000		30 × 40	0.50	5.72	ESMH100VSN473MR40S		8,200	22 × 45	0.25	3.47	ESMH350VSN822MP45S		
47,000		35 × 30	0.50	5.27	ESMH100VSN473MA30S		8,200	25.4 × 35	0.25	3.10	ESMH350VSN822MQ35S		
56,000		30 × 45	0.50	6.44	ESMH100VSN563MR45S		8,200	30 × 30	0.25	3.13	ESMH350VSN822MR30S		
56,000		35 × 35	0.50	6.38	ESMH100VSN563MA35S		8,200	35 × 25	0.25	2.73	ESMH350VSN822MA25S		
68,000		30 × 50	0.50	7.27	ESMH100VSN683MR50S		10,000	22 × 50	0.25	3.57	ESMH350VSN103MP50S		
68,000		35 × 40	0.50	7.27	ESMH100VSN683MA40S		10,000	25.4 × 40	0.25	3.53	ESMH350VSN103MQ40S		
82,000		35 × 50	0.50	8.49	ESMH100VSN823MA50S		10,000	30 × 30	0.25	3.46	ESMH350VSN103MR30S		
16		8,200	22 × 25	0.40	2.51		ESMH160VSN822MP25S	10,000	35 × 25	0.25	3.02	ESMH350VSN103MA25S	
		10,000	22 × 25	0.40	2.77		ESMH160VSN103MP25S	12,000	25.4 × 45	0.25	3.98	ESMH350VSN123MQ45S	
		12,000	22 × 30	0.40	2.86		ESMH160VSN123MP30S	12,000	30 × 35	0.25	4.01	ESMH350VSN123MR35S	
		12,000	25.4 × 25	0.40	2.95		ESMH160VSN123MQ25S	12,000	35 × 30	0.25	4.42	ESMH350VSN123MA30S	
		15,000	22 × 35	0.40	3.29		ESMH160VSN153MP35S	15,000	25.4 × 50	0.25	4.54	ESMH350VSN153MQ50S	
		15,000	25.4 × 30	0.40	3.46		ESMH160VSN153MQ30S	15,000	30 × 40	0.25	4.52	ESMH350VSN153MR40S	
	15,000	30 × 25	0.40	3.66	ESMH160VSN153MR25S		15,000	35 × 35	0.25	5.01	ESMH350VSN153MA35S		
	18,000	22 × 40	0.40	3.72	ESMH160VSN183MP40S		18,000	30 × 45	0.25	4.71	ESMH350VSN183MR45S		
	18,000	25.4 × 35	0.40	3.98	ESMH160VSN183MQ35S		18,000	35 × 40	0.25	5.54	ESMH350VSN183MA40S		
	18,000	30 × 25	0.40	4.00	ESMH160VSN183MR25S		22,000	30 × 50	0.25	5.33	ESMH350VSN223MR50S		
	22,000	22 × 50	0.40	4.37	ESMH160VSN223MP50S		22,000	35 × 45	0.25	6.04	ESMH350VSN223MA45S		
	22,000	25.4 × 40	0.40	4.26	ESMH160VSN223MQ40S		27,000	35 × 50	0.25	6.89	ESMH350VSN273MA50S		
	22,000	30 × 30	0.40	4.21	ESMH160VSN223MR30S		50	2,200	22 × 25	0.20	1.91	ESMH500VSN222MP25S	
	22,000	35 × 25	0.40	4.15	ESMH160VSN223MA25S			3,300	22 × 30	0.20	2.37	ESMH500VSN332MP30S	

◆ **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.	
				Arms/ 85°C, 120Hz							Arms/ 85°C, 120Hz			
50	3,300	25.4 × 25	0.20	2.38		ESMH500VSN332MQ25S	80	1,200	22 × 25	0.15	1.69		ESMH800VSN122MP25S	
	3,900	22 × 35	0.20	2.65		ESMH500VSN392MP35S		1,500	22 × 25	0.15	1.88		ESMH800VSN152MP25S	
	3,900	25.4 × 30	0.20	2.68		ESMH500VSN392MQ30S		1,800	22 × 30	0.15	2.14		ESMH800VSN182MP30S	
	3,900	30 × 25	0.20	2.55		ESMH500VSN392MR25S		1,800	25.4 × 25	0.15	2.26		ESMH800VSN182MQ25S	
	4,700	22 × 40	0.20	2.99		ESMH500VSN472MP40S		2,200	22 × 35	0.15	2.44		ESMH800VSN222MP35S	
	4,700	25.4 × 35	0.20	3.03		ESMH500VSN472MQ35S		2,200	25.4 × 30	0.15	2.46		ESMH800VSN222MQ30S	
	4,700	30 × 25	0.20	2.81		ESMH500VSN472MR25S		2,200	30 × 25	0.15	2.49		ESMH800VSN222MR25S	
	5,600	22 × 45	0.20	3.36		ESMH500VSN562MP45S		2,700	22 × 40	0.15	2.78		ESMH800VSN272MP40S	
	5,600	25.4 × 35	0.20	3.31		ESMH500VSN562MQ35S		2,700	25.4 × 35	0.15	2.81		ESMH800VSN272MQ35S	
	5,600	30 × 30	0.20	3.37		ESMH500VSN562MR30S		2,700	30 × 25	0.15	2.75		ESMH800VSN272MR25S	
	5,600	35 × 25	0.20	3.42		ESMH500VSN562MA25S		3,300	22 × 45	0.15	3.16		ESMH800VSN332MP45S	
	6,800	22 × 50	0.20	3.81		ESMH500VSN682MP50S		3,300	25.4 × 40	0.15	3.21		ESMH800VSN332MQ40S	
	6,800	25.4 × 40	0.20	3.81		ESMH500VSN682MQ40S		3,300	30 × 30	0.15	3.17		ESMH800VSN332MR30S	
	6,800	30 × 35	0.20	3.85		ESMH500VSN682MR35S		3,300	35 × 25	0.15	3.21		ESMH800VSN332MA25S	
	6,800	35 × 30	0.20	3.85		ESMH500VSN682MA30S		3,900	22 × 50	0.15	3.52		ESMH800VSN392MP50S	
	8,200	25.4 × 50	0.20	4.37		ESMH500VSN822MQ50S		3,900	25.4 × 45	0.15	3.59		ESMH800VSN392MQ45S	
	8,200	30 × 40	0.20	4.36		ESMH500VSN822MR40S		3,900	30 × 35	0.15	3.57		ESMH800VSN392MP35S	
	8,200	35 × 30	0.20	4.41		ESMH500VSN822MA30S		3,900	35 × 25	0.15	3.50		ESMH800VSN392MA25S	
10,000	30 × 45	0.20	4.97		ESMH500VSN103MR45S	4,700	25.4 × 50	0.15	4.05		ESMH800VSN472MQ50S			
10,000	35 × 35	0.20	4.92		ESMH500VSN103MA35S	4,700	30 × 40	0.15	4.05		ESMH800VSN472MR40S			
12,000	30 × 50	0.20	5.60		ESMH500VSN123MR50S	4,700	35 × 30	0.15	4.09		ESMH800VSN472MA30S			
12,000	35 × 40	0.20	5.58		ESMH500VSN123MA40S	5,600	30 × 45	0.15	4.55		ESMH800VSN562MR45S			
15,000	35 × 45	0.20	6.44		ESMH500VSN153MA45S	5,600	35 × 35	0.15	4.51		ESMH800VSN562MA35S			
18,000	35 × 50	0.20	6.71		ESMH500VSN183MA50S	6,800	30 × 50	0.15	5.16		ESMH800VSN682MR50S			
63	1,800	22 × 25	0.15	1.82		ESMH630VSN182MP25S	6,800	35 × 40	0.15	5.14		ESMH800VSN682MA40S		
	2,200	22 × 30	0.15	2.31		ESMH630VSN222MP30S	8,200	35 × 45	0.15	5.83		ESMH800VSN822MA45S		
	2,200	25.4 × 25	0.15	2.30		ESMH630VSN222MQ25S	10,000	35 × 50	0.15	6.63		ESMH800VSN103MA50S		
	2,700	22 × 35	0.15	2.40		ESMH630VSN272MP35S	820	22 × 25	0.15	1.86		ESMH101VSN821MP25S		
	2,700	25.4 × 25	0.15	2.40		ESMH630VSN272MQ25S	1,200	22 × 30	0.15	2.09		ESMH101VSN122MP30S		
	3,300	22 × 35	0.15	2.62		ESMH630VSN332MP35S	1,200	25.4 × 25	0.15	2.10		ESMH101VSN122MQ25S		
	3,300	25.4 × 30	0.15	2.64		ESMH630VSN332MQ30S	1,500	22 × 35	0.15	2.41		ESMH101VSN152MP35S		
	3,300	30 × 25	0.15	2.78		ESMH630VSN332MR25S	1,500	25.4 × 30	0.15	2.43		ESMH101VSN152MQ30S		
	3,900	22 × 40	0.15	2.93		ESMH630VSN392MP40S	1,500	30 × 25	0.15	2.46		ESMH101VSN152MR25S		
	3,900	25.4 × 35	0.15	2.97		ESMH630VSN392MQ35S	1,800	22 × 40	0.15	2.71		ESMH101VSN182MP40S		
	3,900	30 × 30	0.15	3.00		ESMH630VSN392MR30S	1,800	25.4 × 35	0.15	2.75		ESMH101VSN182MQ35S		
	3,900	35 × 25	0.15	3.00		ESMH630VSN392MA25S	1,800	30 × 25	0.15	2.72		ESMH101VSN182MR25S		
	4,700	22 × 50	0.15	3.39		ESMH630VSN472MP50S	2,200	22 × 45	0.15	3.08		ESMH101VSN222MP45S		
	4,700	25.4 × 40	0.15	3.36		ESMH630VSN472MQ40S	2,200	25.4 × 40	0.15	3.13		ESMH101VSN222MQ40S		
	4,700	30 × 30	0.15	3.32		ESMH630VSN472MR30S	2,200	30 × 30	0.15	3.09		ESMH101VSN222MR30S		
	4,700	35 × 25	0.15	3.36		ESMH630VSN472MA25S	2,200	35 × 25	0.15	3.14		ESMH101VSN222MA25S		
	5,600	25.4 × 45	0.15	3.77		ESMH630VSN562MQ45S	2,700	22 × 50	0.15	3.53		ESMH101VSN272MP50S		
	5,600	30 × 35	0.15	3.75		ESMH630VSN562MR35S	2,700	25.4 × 45	0.15	3.57		ESMH101VSN272MQ45S		
5,600	35 × 30	0.15	3.76		ESMH630VSN562MA30S	2,700	30 × 35	0.15	3.55		ESMH101VSN272MR35S			
6,800	25.4 × 50	0.15	4.27		ESMH630VSN682MQ50S	2,700	35 × 30	0.15	3.71		ESMH101VSN272MA30S			
6,800	30 × 40	0.15	4.27		ESMH630VSN682MR40S	3,300	25.4 × 50	0.15	4.06		ESMH101VSN332MQ50S			
6,800	35 × 30	0.15	4.15		ESMH630VSN682MA30S	3,300	30 × 40	0.15	4.05		ESMH101VSN332MR40S			
8,200	30 × 45	0.15	4.83		ESMH630VSN822MR45S	3,300	35 × 30	0.15	4.05		ESMH101VSN332MA30S			
8,200	35 × 35	0.15	4.79		ESMH630VSN822MA35S	3,900	30 × 45	0.15	4.54		ESMH101VSN392MR45S			
10,000	30 × 50	0.15	5.49		ESMH630VSN103MR50S	3,900	35 × 35	0.15	4.49		ESMH101VSN392MA35S			
10,000	35 × 40	0.15	5.47		ESMH630VSN103MA40S	4,700	30 × 50	0.15	5.13		ESMH101VSN472MR50S			
12,000	35 × 45	0.15	6.19		ESMH630VSN123MA45S	4,700	35 × 40	0.15	5.11		ESMH101VSN472MA40S			
						5,600	35 × 45	0.15	5.75		ESMH101VSN562MA45S			
						6,800	35 × 50	0.15	6.50		ESMH101VSN682MA50S			

*For the rated voltage ≥ 160V_{dc}, please use SMQ series

◆ **RATED RIPPLE CURRENT MULTIPLIERS**

● Frequency Multipliers

Frequency(Hz)	50	120	300	1k	10k	50k
6.3 to 50V _{dc}	0.95	1.00	1.03	1.05	1.08	1.08
63 to 100V _{dc}	0.92	1.00	1.07	1.13	1.19	1.20

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.