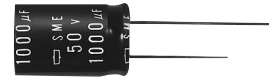


# SME Series

- Endurance : 85°C 2,000 hours
- Solvent-proof type except 350 to 450V<sub>dc</sub>
- Pb-free design

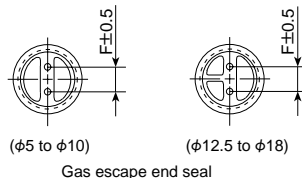
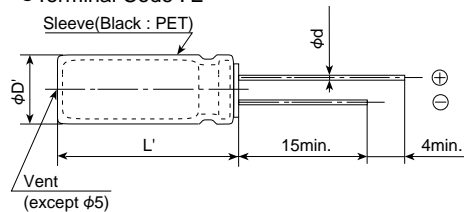


## ◆SPECIFICATIONS

Items	Characteristics													
Category	-40 to +85°C (6.3 to 400V <sub>dc</sub> ) -25 to +85°C (450V <sub>dc</sub> )													
Temperature Range														
Rated Voltage Range	6.3 to 450V <sub>dc</sub>													
Capacitance Tolerance	±20% (M) (at 20°C, 120Hz)													
Leakage Current	6.3 to 100V <sub>dc</sub>						160 to 450V <sub>dc</sub>							
	I=0.03CV or 4µA, whichever is greater. (at 20°C after 1 minute)						CV		Time		After 1 minute		After 5 minutes	
	I=0.01CV or 3µA, whichever is greater. (at 20°C after 2 minutes)						CV≤1,000		I=0.1CV+40		I=0.03CV+15			
							CV>1,000		I=0.04CV+100		I=0.02CV+25			
													(at 20°C)	
													Where, I : Max. leakage current (µA), C : Nominal capacitance (µF), V : Rated voltage (V <sub>dc</sub> )	
Dissipation Factor (tanδ)	Rated voltage (V <sub>dc</sub> )	6.3V	10V	16V	25V	35V	50V	63V	100V	160 to 250V	350 to 400V	450V		
	tanδ (Max.)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08	0.20	0.24	0.24		
	When nominal capacitance exceeds 1,000µF, add 0.02 to the value above for each 1,000µF increase. (at 20°C, 120Hz)													
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (V <sub>dc</sub> )	6.3V	10V	16V	25V	35V	50V	63V	100V	160 to 250V	350 to 400V	450V		
	Z(-25°C)/Z(+20°C)	4	3	2	2	2	2	2	2	3	6	16		
	Z(-40°C)/Z(+20°C)	8	6	4	3	3	3	3	3	4	6	—	(at 120Hz)	
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 2,000 hours at 85°C.													
	Rated voltage	6.3 to 100V <sub>dc</sub>						160 to 400V <sub>dc</sub>			450V <sub>dc</sub>			
	Capacitance change	≤±20% of the initial value						≤±20% of the initial value			≤±20% of the initial value			
	D.F. (tanδ)	≤150% of the initial specified value						≤200% of the initial specified value			≤150% of the initial specified value			
	Leakage current	≤The initial specified value						≤The initial specified value			≤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.													
	Rated voltage	6.3 to 100V <sub>dc</sub>						160 to 400V <sub>dc</sub>			450V <sub>dc</sub>			
	Capacitance change	≤±20% of the initial value						≤±20% of the initial value			≤±20% of the initial value			
	D.F. (tanδ)	≤150% of the initial specified value						≤200% of the initial specified value			≤200% of the initial specified value			
	Leakage current	≤The initial specified value						≤500% of the initial specified value			≤500% of the initial specified value			

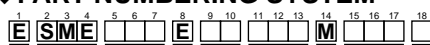
## ◆DIMENSIONS [mm]

- Terminal Code : E



φD	5	6.3	8	10	12.5	16	18
φd	0.5	0.5	0.6	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
φD'	φD+0.5max.						
L'	L+1.5max						

## ◆PART NUMBERING SYSTEM



- Supplement code
- Size code
- Capacitance tolerance code
- Capacitance code (ex. 0.1µF:R10,10µF:100,100µF:101)
- Lead forming-taping code
- Terminal code
- Voltage code (ex. 6.3V:6R3,35V:350,400V:401)
- Series code
- Category

Specifications in this bulletin are subject to change without notice.

◆STANDARD RATINGS

VV (Vdc)	Cap (μF)	Case size φDXL(mm)	tanδ	Rated ripple current (mAmps/85°C,120Hz)	Part No.	VV (Vdc)	Cap (μF)	Case size φDXL(mm)	tanδ	Rated ripple current (mAmps/85°C,120Hz)	Part No.	
6.3	33	5X11	0.22	55	ESME6R3E□□330ME11D	50	0.10	5X11	0.10	1.3	ESME500E□□R10ME11D	
	47	5X11	0.22	79	ESME6R3E□□470ME11D		0.22	5X11	0.10	2.9	ESME500E□□R22ME11D	
	100	5X11	0.22	130	ESME6R3E□□101ME11D		0.33	5X11	0.10	4.4	ESME500E□□R33ME11D	
	220	6.3X11	0.22	230	ESME6R3E□□221MF11D		0.47	5X11	0.10	7.0	ESME500E□□R47ME11D	
	330	6.3X11	0.22	280	ESME6R3E□□331MF11D		1.0	5X11	0.10	13	ESME500E□□1R0ME11D	
	470	8X11.5	0.22	380	ESME6R3E□□471MHB5D		2.2	5X11	0.10	29	ESME500E□□2R2ME11D	
	1,000	10X12.5	0.22	650	ESME6R3E□□102MJC5S		3.3	5X11	0.10	35	ESME500E□□3R3ME11D	
	2,200	12.5X20	0.24	1,150	ESME6R3E□□222MK20S		4.7	5X11	0.10	42	ESME500E□□4R7ME11D	
	3,300	12.5X20	0.26	1,380	ESME6R3E□□332MK20S		10	5X11	0.10	65	ESME500E□□100ME11D	
	4,700	16X25	0.28	1,880	ESME6R3E□□472ML25S		22	5X11	0.10	95	ESME500E□□220ME11D	
	6,800	16X25	0.32	2,120	ESME6R3E□□682ML25S		33	6.3X11	0.10	125	ESME500E□□330MF11D	
	10,000	16X31.5	0.40	2,500	ESME6R3E□□103MLN3S		47	6.3X11	0.10	150	ESME500E□□470MF11D	
	15,000	18X35.5	0.50	2,990	ESME6R3E□□153MMP1S		100	8X11.5	0.10	255	ESME500E□□101MHB5D	
	10	22	5X11	0.19	59		ESME100E□□220ME11D	220	10X16	0.10	490	ESME500E□□221MJ16S
33		5X11	0.19	84	ESME100E□□330ME11D	330	10X20	0.10	650	ESME500E□□331MJ20S		
47		5X11	0.19	100	ESME100E□□470ME11D	470	12.5X20	0.10	860	ESME500E□□471MK20S		
100		5X11	0.19	145	ESME100E□□101ME11D	1,000	16X25	0.10	1,530	ESME500E□□102ML25S		
220		6.3X11	0.19	250	ESME100E□□221MF11D	2,200	18X35.5	0.12	2,160	ESME500E□□222MMP1S		
330		8X11.5	0.19	350	ESME100E□□331MHB5D	63	4.7	5X11	0.09	45	ESME630E□□4R7ME11D	
470		8X11.5	0.19	415	ESME100E□□471MHB5D		10	5X11	0.09	70	ESME630E□□100ME11D	
1,000		10X16	0.19	790	ESME100E□□102MJ16S		22	6.3X11	0.09	115	ESME630E□□220MF11D	
2,200		12.5X20	0.21	1,240	ESME100E□□222MK20S		33	6.3X11	0.09	140	ESME630E□□330MF11D	
3,300		12.5X25	0.23	1,590	ESME100E□□332MK25S		47	8X11.5	0.09	190	ESME630E□□470MHB5D	
4,700		16X25	0.25	1,980	ESME100E□□472ML25S		100	10X12.5	0.09	320	ESME630E□□101MJC5S	
6,800		16X31.5	0.29	2,390	ESME100E□□682MLN3S		220	10X20	0.09	565	ESME630E□□221MJ20S	
10,000		18X35.5	0.37	2,840	ESME100E□□103MMP1S		330	12.5X20	0.09	765	ESME630E□□331MK20S	
16		10	5X11	0.16	44		ESME160E□□100ME11D	470	12.5X25	0.09	990	ESME630E□□471MK25S
	22	5X11	0.16	75	ESME160E□□220ME11D		1,000	16X31.5	0.09	1,700	ESME630E□□102MLN3S	
	33	5X11	0.16	90	ESME160E□□330ME11D		100	0.10	5X11	0.08	2.6	ESME101E□□R10ME11D
	47	5X11	0.16	110	ESME160E□□470ME11D			0.22	5X11	0.08	5.8	ESME101E□□R22ME11D
	100	6.3X11	0.16	180	ESME160E□□101MF11D			0.33	5X11	0.08	8.8	ESME101E□□R33ME11D
	220	8X11.5	0.16	300	ESME160E□□221MHB5D			0.47	5X11	0.08	12	ESME101E□□R47ME11D
	330	8X11.5	0.16	370	ESME160E□□331MHB5D	1.0		5X11	0.08	22	ESME101E□□1R0ME11D	
	470	10X12.5	0.16	520	ESME160E□□471MJC5S	2.2		5X11	0.08	33	ESME101E□□2R2ME11D	
	1,000	10X20	0.16	910	ESME160E□□102MJ20S	3.3		5X11	0.08	40	ESME101E□□3R3ME11D	
	2,200	12.5X25	0.18	1,420	ESME160E□□222MK25S	4.7		5X11	0.08	48	ESME101E□□4R7ME11D	
	3,300	16X25	0.20	1,840	ESME160E□□332ML25S	10		6.3X11	0.08	80	ESME101E□□100MF11D	
	4,700	16X31.5	0.22	2,260	ESME160E□□472MLN3S	22		8X11.5	0.08	135	ESME101E□□220MHB5D	
	6,800	18X35.5	0.26	2,690	ESME160E□□682MMP1S	33		10X12.5	0.08	195	ESME101E□□330MJC5S	
	10,000	18X40	0.34	2,920	ESME160E□□103MM40S	47		10X16	0.08	255	ESME101E□□470MJ16S	
25	4.7	5X11	0.14	31	ESME250E□□4R7ME11D	100		12.5X20	0.08	450	ESME101E□□101MK20S	
	10	5X11	0.14	54	ESME250E□□100ME11D	220		16X25	0.08	810	ESME101E□□221ML25S	
	22	5X11	0.14	80	ESME250E□□220ME11D	330	16X25	0.08	990	ESME101E□□331ML25S		
	33	5X11	0.14	97	ESME250E□□330ME11D	470	16X31.5	0.08	1,250	ESME101E□□471MLN3S		
	47	5X11	0.14	115	ESME250E□□470ME11D	160	0.47	6.3X11	0.20	12	ESME161E□□R47MF11D	
	100	6.3X11	0.14	190	ESME250E□□101MF11D		1.0	6.3X11	0.20	17	ESME161E□□1R0MF11D	
	220	8X11.5	0.14	320	ESME250E□□221MHB5D		2.2	6.3X11	0.20	26	ESME161E□□2R2MF11D	
	330	10X12.5	0.14	470	ESME250E□□331MJC5S		3.3	8X11.5	0.20	36	ESME161E□□3R3MHB5D	
	470	10X16	0.14	620	ESME250E□□471MJ16S		4.7	8X11.5	0.20	44	ESME161E□□4R7MHB5D	
	1,000	12.5X20	0.14	1,090	ESME250E□□102MK20S		10	10X16	0.20	83	ESME161E□□100MJ16S	
	2,200	16X25	0.16	1,660	ESME250E□□222ML25S		22	10X20	0.20	130	ESME161E□□220MJ20S	
	3,300	16X31.5	0.18	2,070	ESME250E□□332MLN3S		33	12.5X20	0.20	180	ESME161E□□330MK20S	
	4,700	18X35.5	0.20	2,520	ESME250E□□472MMP1S		47	12.5X25	0.20	230	ESME161E□□470MK25S	
	6,800	18X40	0.24	2,830	ESME250E□□682MM40S		100	16X25	0.20	380	ESME161E□□101ML25S	
35	4.7	5X11	0.12	40	ESME350E□□4R7ME11D		220	18X35.5	0.20	640	ESME161E□□221MMP1S	
	10	5X11	0.12	58	ESME350E□□100ME11D		200	0.47	6.3X11	0.20	12	ESME201E□□R47MF11D
	22	5X11	0.12	87	ESME350E□□220ME11D			1.0	6.3X11	0.20	17	ESME201E□□1R0MF11D
	33	5X11	0.12	105	ESME350E□□330ME11D			2.2	6.3X11	0.20	26	ESME201E□□2R2MF11D
	47	6.3X11	0.12	145	ESME350E□□470MF11D	3.3		8X11.5	0.20	36	ESME201E□□3R3MHB5D	
	100	8X11.5	0.12	240	ESME350E□□101MHB5D	4.7		10X12.5	0.20	51	ESME201E□□4R7MJC5S	
	220	10X12.5	0.12	420	ESME350E□□221MJC5S	10		10X16	0.20	83	ESME201E□□100MJ16S	
	330	10X16	0.12	570	ESME350E□□331MJ16S	22		10X20	0.20	130	ESME201E□□220MJ20S	
	470	10X20	0.12	740	ESME350E□□471MJ20S	33		12.5X25	0.20	190	ESME201E□□330MK25S	
	1,000	12.5X25	0.12	1,300	ESME350E□□102MK25S	47		12.5X25	0.20	230	ESME201E□□470MK25S	
	2,200	16X31.5	0.14	1,890	ESME350E□□222MLN3S	100		16X31.5	0.20	400	ESME201E□□101MLN3S	
	3,300	18X35.5	0.16	2,340	ESME350E□□332MMP1S	220		18X40	0.20	660	ESME201E□□221MM40S	
	4,700	18X40	0.18	2,690	ESME350E□□472MM40S							

□□ : Lead forming / Taping code

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◆STANDARD RATINGS

□ is non solvent-proof.

WV (Vdc)	Cap (μF)	Case size φDXL(mm)	tanδ	Rated ripple current (mAmps/85°C,120Hz)	Part No.	WV (Vdc)	Cap (μF)	Case size φDXL(mm)	tanδ	Rated ripple current (mAmps/85°C,120Hz)	Part No.	
250	0.47	6.3X11	0.20	12	ESME251E□□R47MF11D	400	1.0	8X11.5	0.24	22	ESME401E□□1R0MHB5D	
	1.0	6.3X11	0.20	17	ESME251E□□1R0MF11D		2.2	10X12.5	0.24	39	ESME401E□□2R2MJC5S	
	2.2	8X11.5	0.20	30	ESME251E□□2R2MHB5D		3.3	10X16	0.24	53	ESME401E□□3R3MJ16S	
	3.3	10X12.5	0.20	43	ESME251E□□3R3MJC5S		4.7	10X20	0.24	69	ESME401E□□4R7MJ20S	
	4.7	10X12.5	0.20	51	ESME251E□□4R7MJC5S		10	12.5X20	0.24	115	ESME401E□□100MK20S	
	10	10X20	0.20	90	ESME251E□□100MJ20S		22	16X25	0.24	200	ESME401E□□220ML25S	
	22	12.5X25	0.20	160	ESME251E□□220MK25S		33	16X31.5	0.24	265	ESME401E□□330MLN3S	
	33	12.5X25	0.20	190	ESME251E□□330MK25S		47	16X35.5	0.24	325	ESME401E□□470MLP1S	
	47	16X25	0.20	260	ESME251E□□470ML25S		450	1.0	8X11.5	0.24	25	ESME451E□□1R0MJC5S
	100	18X35.5	0.20	440	ESME251E□□101MMP1S			2.2	10X16	0.24	42	ESME451E□□2R2MJ16S
350	0.47	8X11.5	0.24	15	ESME351E□□R47MHB5D	3.3		10X20	0.24	56	ESME451E□□3R3MJ20S	
	1.0	8X11.5	0.24	22	ESME351E□□1R0MHB5D	4.7		12.5X20	0.24	75	ESME451E□□4R7MK20S	
	2.2	10X12.5	0.24	39	ESME351E□□2R2MJC5S	10		12.5X25	0.24	120	ESME451E□□100MK25S	
	3.3	10X16	0.24	53	ESME351E□□3R3MJ16S	22		16X31.5	0.24	210	ESME451E□□220MLN3S	
	4.7	10X16	0.24	63	ESME351E□□4R7MJ16S	33	18X35.5	0.24	275	ESME451E□□330MMP1S		
	10	12.5X20	0.24	115	ESME351E□□100MK20S							
	22	12.5X25	0.24	180	ESME351E□□220MK25S							
	33	16X25	0.24	245	ESME351E□□330ML25S							
	47	16X31.5	0.24	315	ESME351E□□470MLN3S							
	100	18X40	0.24	500	ESME351E□□101MM40S							

□ □ : Lead forming / Taping code

◆MAXIMUM ESR

(Ω) at 20°C, 120Hz

μF \ V <sub>dc</sub>	6.3	10	16	25	35	50	63	100	160 to 250	350 to 450
0.1						1,660		1,330		
0.22						754		603		
0.33						503		402		
0.47						353		282	706	847
1.0						166		133	332	398
2.2						75.4		60.3	151	181
3.3						50.3		40.3	101	121
4.7						35.3	31.8	28.2	70.6	84.7
10						16.6	14.9	13.3	33.2	39.8
22						7.54	6.79	6.03	15.1	18.1
33					6.03	5.03	4.52	4.02	10.1	12.1
47			5.65	4.94	4.23	3.53	3.18	2.82	7.06	8.47
100	3.70	3.15	2.65	2.32	1.99	1.66	1.49	1.33	3.32	3.98
220	1.66	1.43	1.21	1.06	0.905	0.754	0.679	0.603	1.51	
330	1.11	0.955	0.804	0.704	0.603	0.503	0.452	0.402		
470	0.776	0.671	0.565	0.494	0.423	0.353	0.318	0.282		
1,000	0.370	0.315	0.265	0.232	0.199	0.166	0.149			
2,200	0.181	0.158	0.136	0.121	0.106	0.0905				
3,300	0.131	0.116	0.101	0.0905	0.0804					
4,700	0.0988	0.0882	0.0776	0.0706	0.0635					
6,800	0.0781	0.0707	0.0634	0.0585						
10,000	0.0630	0.0581	0.0531							
15,000	0.0531									

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

Capacitance (μF) \ Frequency (Hz)	50	120	300	1k	10k	100k
0.1 to 4.7	0.65	1.00	1.35	1.75	2.30	2.50
10 to 47	0.75	1.00	1.25	1.50	1.75	1.80
100 to 1,000	0.80	1.00	1.15	1.30	1.40	1.50
2,200 to	0.85	1.00	1.03	1.05	1.08	1.08

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