

SMG Series

- Endurance : 2,000 hours at 85°C
- Solvent resistant type except 315 to 450V_{dc}
(see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant

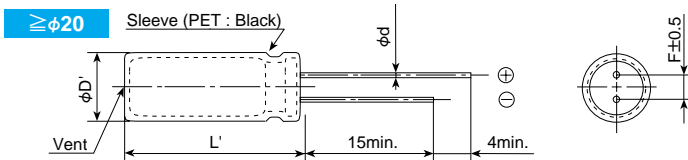
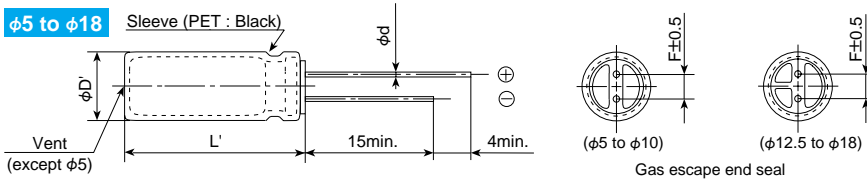


◆ SPECIFICATIONS

Items	Characteristics													
Category	-40 to +85°C(6.3 to 400V _{dc}) -25 to +85°C(450V _{dc})													
Temperature Range														
Rated Voltage Range	6.3 to 450V _{dc}													
Capacitance Tolerance	±20% (M) (at 20°C, 120Hz)													
Leakage Current	≤φ18	6.3 to 100V _{dc}						160 to 450V _{dc}						
		I=0.03CV or 4μA, whichever is greater. (at 20°C after 1 minute)												
			CV			Time			After 1 minute			After 5 minutes		
			CV ≤ 1,000						I=0.1CV+40 max.			I=0.03CV+15 max.		
		CV > 1,000						I=0.04CV+100 max.			I=0.02CV+25 max.			
≥φ20	I=0.03CV (at 20°C after 3 minutes)													
Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)														
Dissipation Factor (tanδ)	Rated voltage (V _{dc})	6.3V	10V	16V	25V	35V	50V	63V	100V	160 to 250V	315 to 400V	450V		
	tanδ (Max.)	≤φ18	0.34	0.24	0.20	0.16	0.14	0.12	0.09	0.08	0.20	0.24	0.24	
		≥φ20	0.28	0.24	0.20	0.16	0.14	0.12	0.09	0.08	0.15	0.15	0.20	
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 _{dc})	6.3V	10V	16V	25V	35V	50V	63V	100V	160 to 250V	315 to 400V	450V		
	Z(-25°C)/Z(+20°C)	≤φ18	5	4	3	2	2	2	2	2	3	6	6	
		≥φ20	5	4	3	2	2	2	2	2	4	6	6	
Z(-40°C)/Z(+20°C)	≤φ18	12	10	8	5	4	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.													
	Capacitance change	≤±20% of the initial value												
	D.F. (tanδ)	≤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.													
	Rated voltage	6.3 to 100V _{dc}						160 to 450V _{dc}						
	Capacitance change	≤±20% of the initial value						≤±20% of the initial value						
	D.F. (tanδ)	≤200% of the initial specified value						≤200% of the initial specified value						
	Leakage current	≤The initial specified value						≤500% of the initial specified value						

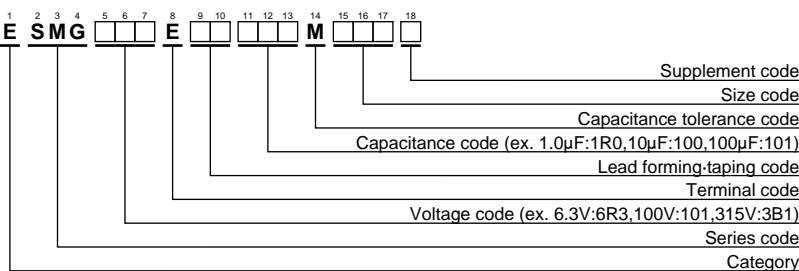
◆ DIMENSIONS [mm]

● Terminal Code : E



φD	5	6.3	8	10	12.5	16	18	20	22
φd	0.5	0.5	0.6	0.6	0.6	0.8	0.8	1.0	1.0
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5	10.0	10.0
φD'	φD+0.5max.							φD+0.5max.	
L'	L+1.5max.							L+2.0max.	

◆ PART NUMBERING SYSTEM



Please refer to "Product code guide (radial lead type)"

◆STANDARD RATINGS
 is not solvent resistant.

WV (Vdc)	Cap (µF)	Case size φDXL(mm)	tanδ	Rated ripple current (mA _{rms} /85°C,120Hz)	Part No.	WV (Vdc)	Cap (µF)	Case size φDXL(mm)	tanδ	Rated ripple current (mA _{rms} /85°C,120Hz)	Part No.	
100	33	8X11.5	0.08	180	ESMG101E□□330MHB5D	315	47	20X20	0.15	310	ESMG3B1E□□470MN20S	
	47	10X12.5	0.08	230	ESMG101E□□470MJC5S		68	20X25	0.15	400	ESMG3B1E□□680MN25S	
	100	10X20	0.08	370	ESMG101E□□101MJ20S		82	20X25	0.15	440	ESMG3B1E□□820MN25S	
	220	12.5X25	0.08	620	ESMG101E□□221MK25S		100	20X30	0.15	500	ESMG3B1E□□101MN30S	
	330	12.5X25	0.08	760	ESMG101E□□331MK25S		120	20X30	0.15	550	ESMG3B1E□□121MN30S	
	330	20X20	0.08	870	ESMG101E□□331MN20S		180	20X40	0.15	720	ESMG3B1E□□181MN40S	
	470	16X25	0.08	1,000	ESMG101E□□471ML25S		180	22X35	0.15	720	ESMG3B1E□□181MP35S	
	680	20X30	0.08	1,360	ESMG101E□□681MN30S		220	22X40	0.15	810	ESMG3B1E□□221MP40S	
	820	22X30	0.08	1,540	ESMG101E□□821MP30S		350	1.0	6.3X11	0.24	22	ESMG351E□□1R0MF11D
	1,000	18X40	0.08	1,380	ESMG101E□□102MN40S			2.2	8X11.5	0.24	38	ESMG351E□□2R2MHB5D
	1,000	20X35	0.08	1,720	ESMG101E□□102MN35S			3.3	8X11.5	0.24	46	ESMG351E□□3R3MHB5D
	1,200	22X40	0.08	1,980	ESMG101E□□122MP40S			4.7	10X12.5	0.24	65	ESMG351E□□4R7MJC5S
160	3.3	6.3X11	0.20	40	ESMG161E□□3R3MF11D	10		10X20	0.24	115	ESMG351E□□100MJ20S	
	4.7	6.3X11	0.20	48	ESMG161E□□4R7MF11D	22		12.5X20	0.24	185	ESMG351E□□2R20MN20S	
	10	10X12.5	0.20	94	ESMG161E□□100MJC5S	33		16X25	0.24	275	ESMG351E□□330ML25S	
	22	10X20	0.20	170	ESMG161E□□220MJ20S	47		16X25	0.24	325	ESMG351E□□470ML25S	
	33	10X20	0.20	205	ESMG161E□□330MJ20S	47		20X20	0.15	310	ESMG351E□□470MN20S	
	47	12.5X20	0.20	270	ESMG161E□□470MK20S	68		20X25	0.15	400	ESMG351E□□680MN25S	
	100	12.5X25	0.20	430	ESMG161E□□101MK25S	100		18X31.5	0.24	530	ESMG351E□□101MMN3S	
	220	16X31.5	0.20	760	ESMG161E□□221MLN3S	100		20X30	0.15	500	ESMG351E□□101MN30S	
	220	20X25	0.15	730	ESMG161E□□221MN25S	120	20X35	0.15	560	ESMG351E□□121MN35S		
	330	18X35.5	0.20	995	ESMG161E□□331MMP1S	400	1.0	6.3X11	0.24	22	ESMG401E□□1R0MF11D	
	330	20X30	0.15	920	ESMG161E□□331MN30S		2.2	8X11.5	0.24	38	ESMG401E□□2R2MHB5D	
	390	20X35	0.15	1,160	ESMG161E□□391MN35S		3.3	10X12.5	0.24	54	ESMG401E□□3R3MJC5S	
	390	22X30	0.15	1,160	ESMG161E□□391MP30S		4.7	10X16	0.24	71	ESMG401E□□4R7MJ16S	
	470	20X40	0.15	1,340	ESMG161E□□471MN40S		10	10X20	0.24	115	ESMG401E□□100MJ20S	
	470	22X35	0.15	1,340	ESMG161E□□471MP35S		22	12.5X25	0.24	205	ESMG401E□□220MK25S	
	560	22X40	0.15	1,470	ESMG161E□□561MP40S		33	16X25	0.24	275	ESMG401E□□330ML25S	
200	3.3	6.3X11	0.20	40	ESMG201E□□3R3MF11D		33	20X20	0.15	260	ESMG401E□□330MN20S	
	4.7	8X11.5	0.20	55	ESMG201E□□4R7MHB5D		47	16X31.5	0.24	350	ESMG401E□□470MLN3S	
	10	10X12.5	0.20	94	ESMG201E□□100MJC5S		56	20X25	0.15	350	ESMG401E□□560MN25S	
	22	10X20	0.20	170	ESMG201E□□220MJ20S		68	20X30	0.15	420	ESMG401E□□680MN30S	
	33	10X20	0.20	205	ESMG201E□□330MJ20S		100	20X35	0.15	520	ESMG401E□□101MN35S	
	47	12.5X20	0.20	270	ESMG201E□□470MK20S	100	22X30	0.15	520	ESMG401E□□101MP30S		
	100	16X25	0.20	475	ESMG201E□□101ML25S	120	20X40	0.15	580	ESMG401E□□121MN40S		
	100	20X20	0.15	460	ESMG201E□□101MN20S	120	22X35	0.15	580	ESMG401E□□121MP35S		
	180	20X25	0.15	660	ESMG201E□□181MN25S	450	2.2	10X12.5	0.24	32	ESMG451E□□2R2MJC5S	
	220	18X35.5	0.20	810	ESMG201E□□221MMP1S		3.3	10X16	0.24	44	ESMG451E□□3R3MJ16S	
	220	20X30	0.15	750	ESMG201E□□221MN30S		4.7	10X20	0.24	56	ESMG451E□□4R7MJ20S	
	270	20X30	0.15	830	ESMG201E□□271MN30S		10	12.5X20	0.24	91	ESMG451E□□100MK20S	
	330	20X35	0.15	1,070	ESMG201E□□331MN35S		22	16X25	0.24	165	ESMG451E□□220ML25S	
	330	22X30	0.15	1,070	ESMG201E□□331MP30S		22	20X20	0.20	180	ESMG451E□□220MN20S	
	390	20X40	0.15	1,190	ESMG201E□□391MN40S		33	16X31.5	0.24	215	ESMG451E□□330MLN3S	
	390	22X30	0.15	1,160	ESMG201E□□391MP30S		33	20X25	0.20	240	ESMG451E□□330MN25S	
470	22X40	0.15	1,350	ESMG201E□□471MP40S	47		16X35.5	0.24	265	ESMG451E□□470MLP1S		
560	22X40	0.15	1,430	ESMG201E□□561MP40S	47		20X25	0.20	290	ESMG451E□□470MN25S		
250	2.2	6.3X11	0.20	32	ESMG251E□□2R2MF11D		56	20X30	0.20	320	ESMG451E□□560MN30S	
	3.3	8X11.5	0.20	46	ESMG251E□□3R3MHB5D		68	20X35	0.20	370	ESMG451E□□680MN35S	
	4.7	8X11.5	0.20	55	ESMG251E□□4R7MHB5D	68	22X30	0.20	370	ESMG451E□□680MP30S		
	10	10X16	0.20	105	ESMG251E□□100MJ16S	82	20X40	0.20	420	ESMG451E□□820MN40S		
	22	10X20	0.20	170	ESMG251E□□220MJ20S	82	22X35	0.20	420	ESMG451E□□820MP35S		
	33	12.5X20	0.20	230	ESMG251E□□330MK20S	100	22X40	0.20	470	ESMG451E□□101MP40S		
	47	12.5X25	0.20	295	ESMG251E□□470MK25S							
	82	20X20	0.15	420	ESMG251E□□820MN20S							
	100	16X31.5	0.20	515	ESMG251E□□101MLN3S							
	100	20X25	0.15	490	ESMG251E□□101MN25S							
	120	20X25	0.15	530	ESMG251E□□121MN25S							
	180	20X30	0.15	680	ESMG251E□□181MN30S							
	220	18X40	0.20	825	ESMG251E□□221MM40S							
	220	20X35	0.15	780	ESMG251E□□221MN35S							
	220	22X30	0.15	820	ESMG251E□□221MP30S							
	270	20X40	0.15	880	ESMG251E□□271MN40S							
	270	22X35	0.15	880	ESMG251E□□271MP35S							
	330	22X40	0.15	1,060	ESMG251E□□331MP40S							

□□ : Enter the appropriate lead forming or taping code.

◆ RATED RIPPLE CURRENT MULTIPLIERS
● Frequency Multipliers

(φ5 to φ18)

Capacitance (μF) \ Frequency (Hz)	50	120	300	1k	10k	100k
1.0 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

(φ20, φ22)

Rated Voltage (V _{dc}) \ Frequency (Hz)	50	120	300	1k	10k	100k
6.3 to 50	0.95	1.00	1.03	1.05	1.08	1.08
63 to 100	0.92	1.00	1.07	1.13	1.19	1.20
160 to 250	0.81	1.00	1.17	1.32	1.45	1.50
315 to 450	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.