SMG Series

- Endurance : 2,000 hours at 85℃
- Solvent resistant type except 315 to 450Vdc
  (see PRECAUTIONS AND GUIDELINES)
- **RoHS Compliant**

SMQ
↑ Downsized
SMG



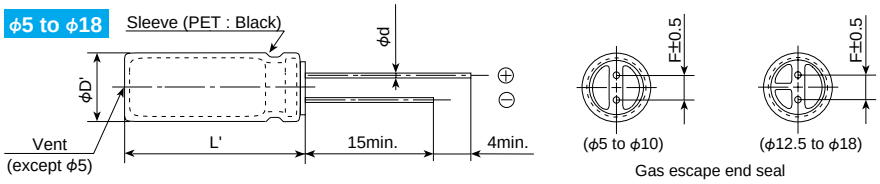
◆SPECIFICATIONS

Items	Characteristics												
Category Temperature Range	−40 to +85℃(6.3 to 400Vdc)　−25 to +85℃(450Vdc)												
Rated Voltage Range	6.3 to 450Vdc												
Capacitance Tolerance	±20% (M)												(at 20℃, 120Hz)
Leakage Current		6.3 to 100Vdc							160 to 450Vdc				
	≦φ18	I=0.03CV or 4μA, whichever is greater. (at 20℃ after 1 minute)							CV \ Time	After 1minute	After 5minutes		
									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℃)
	Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)												(at 20℃ after 3 minutes)
Dissipation Factor (tanδ)	Rated voltage (Vdc)		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℃, 120Hz)
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (Vdc)		6.3V	10V	16V	25V	35V	50V	63V	100V	160 to 250V	315 to 400V	450V
	Z(−25℃)/Z(+20℃)	≦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℃)/Z(+20℃)	≦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℃ after the rated voltage is applied for 2,000 hours at 85℃.												
	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℃ 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.												
	Rated voltage	6.3 to 100Vdc	160 to 450Vdc										
	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										

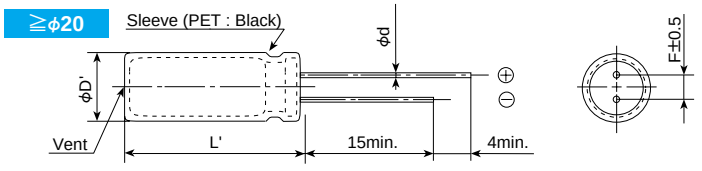
◆DIMENSIONS [mm]

- Terminal Code : E

φ5 to φ18

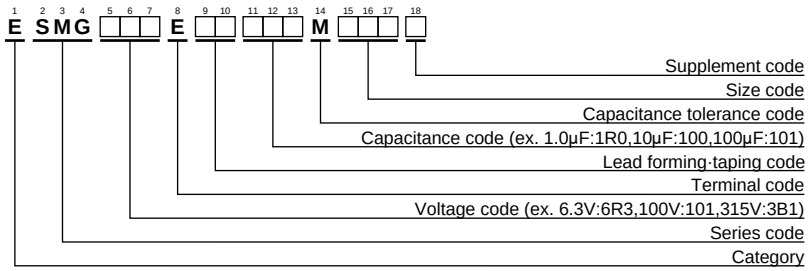


≧φ20



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)"

SMG Series

◆STANDARD RATINGS

WV (Vdc)	Cap (μF)	Case size φDXL(mm)	tanδ	Rated ripple current (mArms/ 85℃,120Hz)	Part No.
6.3	220	5×11	0.34	200	ESMG6R3E□□221ME11D
	330	6.3×11	0.34	270	ESMG6R3E□□331MF11D
	470	6.3×11	0.34	320	ESMG6R3E□□471MF11D
	1,000	8×11.5	0.34	540	ESMG6R3E□□102MHB5D
	2,200	10×20	0.36	1,000	ESMG6R3E□□222MJ20S
	3,300	10×20	0.38	1,185	ESMG6R3E□□332MJ20S
	4,700	12.5×20	0.40	1,545	ESMG6R3E□□472MK20S
	6,800	12.5×25	0.44	1,915	ESMG6R3E□□682MK25S
	10,000	16×25	0.52	2,330	ESMG6R3E□□103ML25S
	10,000	20×25	0.46	2,310	ESMG6R3E□□103MN25S
	15,000	16×35.5	0.62	2,845	ESMG6R3E□□153MLP1S
	15,000	20×30	0.56	2,660	ESMG6R3E□□153MN30S
	18,000	20×35	0.62	2,890	ESMG6R3E□□183MN35S
	18,000	22×30	0.62	2,860	ESMG6R3E□□183MP30S
	22,000	18×40	0.76	3,320	ESMG6R3E□□223MM40S
	22,000	20×40	0.70	3,130	ESMG6R3E□□223MN40S
	22,000	22×35	0.70	3,130	ESMG6R3E□□223MP35S
	27,000	22×40	0.80	3,280	ESMG6R3E□□273MP40S
10	220	5×11	0.24	240	ESMG100E□□221ME11D
	330	6.3×11	0.24	290	ESMG100E□□331MF11D
	470	6.3×11	0.24	350	ESMG100E□□471MF11D
	1,000	10×12.5	0.24	650	ESMG100E□□102MJC5S
	2,200	10×20	0.26	1,070	ESMG100E□□222MJ20S
	3,300	12.5×20	0.28	1,420	ESMG100E□□332MK20S
	4,700	12.5×25	0.30	1,780	ESMG100E□□472MK25S
	6,800	16×25	0.34	2,220	ESMG100E□□682ML25S
	6,800	20×20	0.34	2,080	ESMG100E□□682MN20S
	10,000	16×35.5	0.42	2,670	ESMG100E□□103MLP1S
	10,000	20×25	0.42	2,410	ESMG100E□□103MN25S
	12,000	20×30	0.46	2,620	ESMG100E□□123MN30S
	15,000	18×35.5	0.52	3,080	ESMG100E□□153MMP1S
	15,000	20×35	0.52	2,870	ESMG100E□□153MN35S
	15,000	22×30	0.52	2,660	ESMG100E□□153MP30S
	18,000	22×35	0.58	3,050	ESMG100E□□183MP35S
	22,000	22×40	0.66	3,480	ESMG100E□□223MP40S
16	100	5×11	0.20	160	ESMG160E□□101ME11D
	220	6.3×11	0.20	260	ESMG160E□□221MF11D
	330	8×11.5	0.20	370	ESMG160E□□331MHB5D
	470	8×11.5	0.20	440	ESMG160E□□471MHB5D
	1,000	10×16	0.20	785	ESMG160E□□102MJ16S
	2,200	12.5×20	0.22	1,295	ESMG160E□□222MK20S
	3,300	12.5×25	0.24	1,655	ESMG160E□□332MK25S
	4,700	16×25	0.26	2,090	ESMG160E□□472ML25S
	4,700	20×20	0.26	1,960	ESMG160E□□472MN20S
	6,800	16×31.5	0.30	2,520	ESMG160E□□682MLN3S
	6,800	20×25	0.30	2,330	ESMG160E□□682MN25S
	8,200	20×30	0.34	2,500	ESMG160E□□822MN30S
	10,000	18×35.5	0.38	2,920	ESMG160E□□103MMP1S
	10,000	20×35	0.38	2,720	ESMG160E□□103MN35S
	10,000	22×30	0.38	2,660	ESMG160E□□103MP30S
	12,000	20×40	0.42	2,900	ESMG160E□□123MN40S
	12,000	22×35	0.42	2,900	ESMG160E□□123MP35S
	15,000	22×40	0.48	3,380	ESMG160E□□153MP40S
25	47	5×11	0.16	115	ESMG250E□□470ME11D
	100	6.3×11	0.16	190	ESMG250E□□101MF11D
	220	8×11.5	0.16	330	ESMG250E□□221MHB5D
	330	8×11.5	0.16	440	ESMG250E□□331MHB5D
	470	10×12.5	0.16	545	ESMG250E□□471MJC5S
	1,000	10×20	0.16	955	ESMG250E□□102MJ20S
	2,200	12.5×25	0.18	1,540	ESMG250E□□222MK25S
	3,300	16×25	0.20	1,975	ESMG250E□□332ML25S
	3,300	20×20	0.20	1,850	ESMG250E□□332MN20S
	4,700	16×31.5	0.22	2,420	ESMG250E□□472MLN3S
	4,700	20×25	0.22	2,420	ESMG250E□□472MN25S
	5,600	20×30	0.24	2,430	ESMG250E□□562MN30S
	6,800	18×35.5	0.26	2,880	ESMG250E□□682MMP1S
	6,800	20×35	0.26	2,680	ESMG250E□□682MN35S
25	6,800	22×30	0.26	2,510	ESMG250E□□682MP30S
	8,200	20×40	0.30	2,810	ESMG250E□□822MN40S
	8,200	22×35	0.30	2,810	ESMG250E□□822MP35S
	10,000	22×40	0.34	3,240	ESMG250E□□103MP40S
	12,000	22×40	0.38	3,240	ESMG250E□□123MP40S
35	47	5×11	0.14	130	ESMG350E□□470ME11D
	100	6.3×11	0.14	210	ESMG350E□□101MF11D
	220	8×11.5	0.14	385	ESMG350E□□221MHB5D
	330	10×12.5	0.14	490	ESMG350E□□331MJC5S
	470	10×16	0.14	645	ESMG350E□□471MJ16S
	1,000	12.5×20	0.14	1,145	ESMG350E□□102MK20S
	2,200	16×25	0.16	1,785	ESMG350E□□222ML25S
	2,200	20×20	0.16	1,670	ESMG350E□□222MN20S
	3,300	16×35.5	0.18	2,275	ESMG350E□□332MLP1S
	3,300	20×25	0.18	2,050	ESMG350E□□332MN25S
	3,900	20×30	0.18	2,310	ESMG350E□□392MN30S
	4,700	18×35.5	0.20	2,700	ESMG350E□□472MMP1S
	4,700	20×35	0.20	2,510	ESMG350E□□472MN35S
	4,700	22×30	0.20	2,380	ESMG350E□□472MP30S
	5,600	20×40	0.22	2,690	ESMG350E□□562MN40S
	5,600	22×35	0.22	2,690	ESMG350E□□562MP35S
	6,800	22×40	0.24	3,090	ESMG350E□□682MP40S
50	1.0	5×11	0.12	17	ESMG500E□□1R0ME11D
	2.2	5×11	0.12	28	ESMG500E□□2R2ME11D
	3.3	5×11	0.12	35	ESMG500E□□3R3ME11D
	4.7	5×11	0.12	41	ESMG500E□□4R7ME11D
	10	5×11	0.12	60	ESMG500E□□100ME11D
	22	5×11	0.12	95	ESMG500E□□220ME11D
	33	5×11	0.12	125	ESMG500E□□330ME11D
	47	6.3×11	0.12	155	ESMG500E□□470MF11D
	100	8×11.5	0.12	260	ESMG500E□□101MHB5D
	220	10×12.5	0.12	430	ESMG500E□□221MJC5S
	330	10×16	0.12	585	ESMG500E□□331MJ16S
	470	10×20	0.12	755	ESMG500E□□471MJ20S
	1,000	12.5×25	0.12	1,340	ESMG500E□□102MK25S
	1,500	20×20	0.12	1,570	ESMG500E□□152MN20S
	2,200	16×35.5	0.14	2,075	ESMG500E□□222MLP1S
	2,200	20×25	0.14	1,880	ESMG500E□□222MN25S
	2,700	20×30	0.14	2,150	ESMG500E□□272MN30S
	3,300	18×35.5	0.16	2,500	ESMG500E□□332MMP1S
	3,300	20×35	0.16	2,420	ESMG500E□□332MN35S
	3,300	22×30	0.16	2,420	ESMG500E□□332MP30S
	3,900	20×40	0.16	2,590	ESMG500E□□392MN40S
	3,900	22×35	0.16	2,590	ESMG500E□□392MP35S
	4,700	22×40	0.18	2,960	ESMG500E□□472MP40S
63	10	5×11	0.09	65	ESMG630E□□100ME11D
	22	5×11	0.09	100	ESMG630E□□220ME11D
	33	6.3×11	0.09	140	ESMG630E□□330MF11D
	47	6.3×11	0.09	170	ESMG630E□□470MF11D
	100	10×12.5	0.09	300	ESMG630E□□101MJC5S
	220	10×16	0.09	490	ESMG630E□□221MJ16S
	330	10×20	0.09	710	ESMG630E□□331MJ20S
	470	12.5×20	0.09	900	ESMG630E□□471MK20S
	820	20×20	0.09	1,370	ESMG630E□□821MN20S
	1,000	16×25	0.09	1,300	ESMG630E□□102ML25S
	1,000	20×25	0.09	1,600	ESMG630E□□102MN25S
	1,500	20×30	0.09	1,850	ESMG630E□□152MN30S
	2,200	20×35	0.11	2,330	ESMG630E□□222MN35S
	2,200	22×30	0.11	2,190	ESMG630E□□222MP30S
	2,700	20×40	0.11	2,640	ESMG630E□□272MN40S
	3,300	22×40	0.13	2,810	ESMG630E□□332MP40S
100	1.0	5×11	0.08	21	ESMG101E□□1R0ME11D
	2.2	5×11	0.08	30	ESMG101E□□2R2ME11D
	3.3	5×11	0.08	40	ESMG101E□□3R3ME11D
	4.7	5×11	0.08	45	ESMG101E□□4R7ME11D
	10	6.3×11	0.08	75	ESMG101E□□100MF11D
	22	8×11.5	0.08	130	ESMG101E□□220MHB5D

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

SMG Series

◆STANDARD RATINGS

is not solvent resistant.

WV (Vdc)	Cap (μF)	Case size φDXL(mm)	tanδ	Rated ripple current (mArms/ 85℃,120Hz)	Part No.
100	33	8×11.5	0.08	180	ESMG101E□□330MHB5D
	47	10×12.5	0.08	230	ESMG101E□□470MJC5S
	100	10×20	0.08	370	ESMG101E□□101MJ20S
	220	12.5×25	0.08	620	ESMG101E□□221MK25S
	330	12.5×25	0.08	760	ESMG101E□□331MK25S
	330	20×20	0.08	870	ESMG101E□□331MN20S
	470	16×25	0.08	1,000	ESMG101E□□471ML25S
	680	20×30	0.08	1,360	ESMG101E□□681MN30S
	820	22×30	0.08	1,540	ESMG101E□□821MP30S
	1,000	18×40	0.08	1,380	ESMG101E□□102MM40S
	1,000	20×35	0.08	1,720	ESMG101E□□102MN35S
	1,200	22×40	0.08	1,980	ESMG101E□□122MP40S
160	3.3	6.3×11	0.20	40	ESMG161E□□3R3MF11D
	4.7	6.3×11	0.20	48	ESMG161E□□4R7MF11D
	10	10×12.5	0.20	94	ESMG161E□□100MJC5S
	22	10×20	0.20	170	ESMG161E□□220MJ20S
	33	10×20	0.20	20 5	ESMG161E□□330MJ20S
	47	12.5×20	0.20	270	ESMG161E□□470MK20S
	100	12.5×25	0.20	430	ESMG161E□□101MK25S
	220	16×31.5	0.20	760	ESMG161E□□221MLN3S
	220	20×25	0.15	730	ESMG161E□□221MN25S
	330	18×35.5	0.20	995	ESMG161E□□331MMP1S
	330	20×30	0.15	920	ESMG161E□□331MN30S
	390	20×35	0.15	1,160	ESMG161E□□391MN35S
	390	22×30	0.15	1,160	ESMG161E□□391MP30S
	470	20×40	0.15	1,340	ESMG161E□□471MN40S
	470	22×35	0.15	1,340	ESMG161E□□471MP35S
	560	22×40	0.15	1,470	ESMG161E□□561MP40S
200	3.3	6.3×11	0.20	40	ESMG201E□□3R3MF11D
	4.7	8×11.5	0.20	55	ESMG201E□□4R7MHB5D
	10	10×12.5	0.20	94	ESMG201E□□100MJC5S
	22	10×20	0.20	170	ESMG201E□□220MJ20S
	33	10×20	0.20	205	ESMG201E□□330MJ20S
	47	12.5×20	0.20	270	ESMG201E□□470MK20S
	100	16×25	0.20	475	ESMG201E□□101ML25S
	100	20×20	0.15	460	ESMG201E□□101MN20S
	180	20×25	0.15	660	ESMG201E□□181MN25S
	220	18×35.5	0.20	810	ESMG201E□□221MMP1S
	220	20×30	0.15	750	ESMG201E□□221MN30S
	270	20×30	0.15	830	ESMG201E□□271MN30S
	330	20×35	0.15	1,070	ESMG201E□□331MN35S
	330	22×30	0.15	1,070	ESMG201E□□331MP30S
	390	20×40	0.15	1,190	ESMG201E□□391MN40S
	390	22×30	0.15	1,160	ESMG201E□□391MP30S
	470	22×40	0.15	1,350	ESMG201E□□471MP40S
	560	22×40	0.15	1,430	ESMG201E□□561MP40S
250	2.2	6.3×11	0.20	32	ESMG251E□□2R2MF11D
	3.3	8×11.5	0.20	46	ESMG251E□□3R3MHB5D
	4.7	8×11.5	0.20	55	ESMG251E□□4R7MHB5D
	10	10×16	0.20	105	ESMG251E□□100MJ16S
	22	10×20	0.20	170	ESMG251E□□220MJ20S
	33	12.5×20	0.20	230	ESMG251E□□330MK20S
	47	12.5×25	0.20	295	ESMG251E□□470MK25S
	82	20×20	0.15	420	ESMG251E□□820MN20S
	100	16×31.5	0.20	515	ESMG251E□□101MLN3S
	100	20×25	0.15	490	ESMG251E□□101MN25S
	120	20×25	0.15	530	ESMG251E□□121MN25S
	180	20×30	0.15	680	ESMG251E□□181MN30S
	220	18×40	0.20	825	ESMG251E□□221MM40S
	220	20×35	0.15	780	ESMG251E□□221MN35S
	220	22×30	0.15	820	ESMG251E□□221MP30S
	270	20×40	0.15	880	ESMG251E□□271MN40S
	270	22×35	0.15	880	ESMG251E□□271MP35S
	330	22×40	0.15	1,060	ESMG251E□□331MP40S

WV (Vdc)	Cap (μF)	Case size φDXL(mm)	tanδ	Rated ripple current (mArms/ 85℃,120Hz)	Part No.
315	47	20×20	0.15	310	ESMG3B1E□□470MN20S
	68	20×25	0.15	400	ESMG3B1E□□680MN25S
	82	20×25	0.15	440	ESMG3B1E□□820MN25S
	100	20×30	0.15	500	ESMG3B1E□□101MN30S
	120	20×30	0.15	550	ESMG3B1E□□121MN30S
	180	20×40	0.15	720	ESMG3B1E□□181MN40S
	180	22×35	0.15	720	ESMG3B1E□□181MP35S
	220	22×40	0.15	810	ESMG3B1E□□221MP40S
350	1.0	6.3×11	0.24	22	ESMG351E□□1R0MF11D
	2.2	8×11.5	0.24	38	ESMG351E□□2R2MHB5D
	3.3	8×11.5	0.24	46	ESMG351E□□3R3MHB5D
	4.7	10×12.5	0.24	65	ESMG351E□□4R7MJC5S
	10	10×20	0.24	115	ESMG351E□□100MJ20S
	22	12.5×20	0.24	185	ESMG351E□□220MK20S
	33	16×25	0.24	275	ESMG351E□□330ML25S
	47	16×25	0.24	325	ESMG351E□□470ML25S
	47	20×20	0.15	310	ESMG351E□□470MN20S
	68	20×25	0.15	400	ESMG351E□□680MN25S
	100	18×31.5	0.24	530	ESMG351E□□101MMN3S
	100	20×30	0.15	500	ESMG351E□□101MN30S
	120	20×35	0.15	560	ESMG351E□□121MN35S
400	1.0	6.3×11	0.24	22	ESMG401E□□1R0MF11D
	2.2	8×11.5	0.24	38	ESMG401E□□2R2MHB5D
	3.3	10×12.5	0.24	54	ESMG401E□□3R3MJC5S
	4.7	10×16	0.24	71	ESMG401E□□4R7MJ16S
	10	10×20	0.24	115	ESMG401E□□100MJ20S
	22	12.5×25	0.24	205	ESMG401E□□220MK25S
	33	16×25	0.24	275	ESMG401E□□330ML25S
	33	20×20	0.15	260	ESMG401E□□330MN20S
	47	16×31.5	0.24	350	ESMG401E□□470MLN3S
	56	20×25	0.15	350	ESMG401E□□560MN25S
	68	20×30	0.15	420	ESMG401E□□680MN30S
	100	20×35	0.15	520	ESMG401E□□101MN35S
	100	22×30	0.15	520	ESMG401E□□101MP30S
	120	20×40	0.15	580	ESMG401E□□121MN40S
	120	22×35	0.15	580	ESMG401E□□121MP35S
450	2.2	10×12.5	0.24	32	ESMG451E□□2R2MJC5S
	3.3	10×16	0.24	44	ESMG451E□□3R3MJ16S
	4.7	10×20	0.24	56	ESMG451E□□4R7MJ20S
	10	12.5×20	0.24	91	ESMG451E□□100MK20S
	22	16×25	0.24	165	ESMG451E□□220ML25S
	22	20×20	0.20	180	ESMG451E□□220MN20S
	33	16×31.5	0.24	215	ESMG451E□□330MLN3S
	33	20×25	0.20	240	ESMG451E□□330MN25S
	47	16×35.5	0.24	265	ESMG451E□□470MLP1S
	47	20×25	0.20	290	ESMG451E□□470MN25S
	56	20×30	0.20	320	ESMG451E□□560MN30S
	68	20×35	0.20	370	ESMG451E□□680MN35S
	68	22×30	0.20	370	ESMG451E□□680MP30S
	82	20×40	0.20	420	ESMG451E□□820MN40S
	82	22×35	0.20	420	ESMG451E□□820MP35S
	100	22×40	0.20	470	ESMG451E□□101MP40S

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

SMG Series

◆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 (Vdc) \ 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℃ rise.
When long life performance is required in actual use, the rms ripple current has to be reduced.