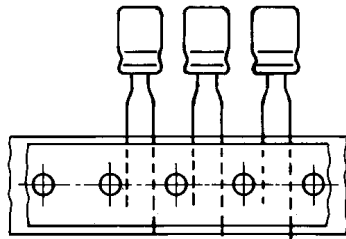
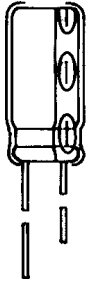


Aluminum Electrolytic Capacitors, Radial Style



FEATURES

- Polarized Al electrolytic capacitor
- Small dimensions, high C•U product
- Extremely low impedance and R_{ESR} values
- Very high AC rating
- Extremely long lifetime
- High temperature range

APPLICATIONS

- Industrial electronics, telecommunication systems, audio / video systems
- Highly professional switching power supply units
- Smoothing, filtering
- Portable and mobile units

MAIN SPECIFICATIONS							
Nominal Case Size (D x L)	[mm]	5 x 11.5 to 8 x 12	8 x 15 to 10 x 12.5	10 x 16 to 10 x 20	10 x 25 to ¹⁾ 12.5 x 20	12.5 x 25 to 12.5 x 30	12.5 x 35 to 16 x 40
Rated Capacitance Range	[μ F]	10 to 8200					
Capacitance Tolerance	[%]	± 20					
Rated Voltage Range	[V]	10 to 63					
Category Temperature Range	[$^{\circ}$ C]	-55 to 105					
Endurance Test at Upper Category Temperature	[h]	2000		3000		5000	
Lifetime at 105 $^{\circ}$ C and I_R	[h]	3000	4000	6000	7000	8000	10000
Lifetime at 85 $^{\circ}$ C and I_R	[h]	12000	16000	24000	28000	32000	40000
Lifetime at 40 $^{\circ}$ C and I_R	[h]	270000	360000	500000	500000	500000	500000
Sectional Specifications		IEC 384-4, CECC 30300, LL grade					
Climatic Category IEC 68 DIN 40040		55 / 105 / 56 FMF					
Failure Rate		[10 ⁻⁹ /h]			≤ 5		

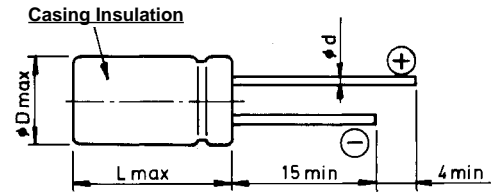
¹⁾ and dim 16 x 20



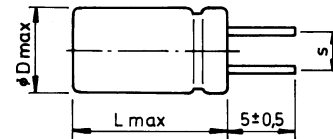
DIMENSIONS						
Nominal Size D x L [in millimeters]						
C_R [μF]	RATED VOLTAGE					
	10	16	25	35	50	63
10						5 x 11.5
15						5 x 15
18					5 x 11.5	6.3 x 11.5
27				5 x 11.5	5 x 15	
33						6.3 x 15
39			5 x 11.5	5 x 15	6.3 x 11.5	
47						8 x 12
56		5 x 11.5	5 x 15	6.3 x 11.5	6.3 x 15	10 x 12.5
68					8 x 12	8 x 15 10 x 16
82	5 x 11.5	5 x 15	6.3 x 11.5	6.3 x 15	8 x 15 10 x 12.5	8 x 20
100	5 x 15					
120		6.3 x 11.5	6.3 x 15	8 x 12 10 x 12.5	8 x 20 10 x 16	10 x 20
150			8 x 12			10 x 25
180	6.3 x 11.5	6.3 x 11.5	10 x 12.5	8 x 15	10 x 20	10 x 30
220	6.3 x 15		8 x 15	8 x 20 10 x 16	10 x 25	12.5 x 20
270		8 x 12 10 x 12.5				12.5 x 25
330	8 x 12	8 x 15	8 x 20 10 x 16	10 x 20	10 x 30 12.5 x 20	16 x 20
390	10 x 12.5			10 x 25		12.5 x 30
470	8 x 15	8 x 20 10 x 16	10 x 20		12.5 x 25 16 x 25	12.5 x 35
560			10 x 25	10 x 30 12.5 x 20	12.5 x 30	12.5 x 40
680	8 x 20 10 x 16	10 x 20		12.5 x 25	12.5 x 35 16 x 20	16 x 30
820		10 x 25 12.5 x 20	10 x 30	16 x 25	12.5 x 40	16 x 35
1000	10 x 20		12.5 x 25	12.5 x 30 16 x 20	16 x 30	16 x 40
1200	10 x 25	10 x 30 12.5 x 20		12.5 x 35 16 x 25	16 x 35	
1500	10 x 30	12.5 x 25	12.5 x 30 16 x 20	12.5 x 40	16 x 40	
1800	12.5 x 20		12.5 x 35 16 x 25	16 x 30		
2200	12.5 x 25	12.5 x 30 16 x 20	12.5 x 40	16 x 35		
2700	12.5 x 30	12.5 x 35 16 x 25	16 x 30	16 x 40		
3300	12.5 x 35 16 x 20	12.5 x 40	16 x 35			
3900	12.5 x 40 16 x 25	16 x 30	16 x 40			
4700		16 x 35				
5600	16 x 30	16 x 40				
6800	16 x 35					
8200	16 x 40					

DIMENSIONS AND LEAD CONFIGURATION

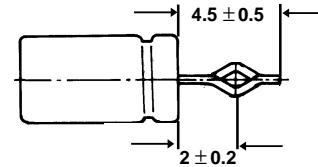
$5 \leq \text{ØD} \leq 16$ Long leads EKC 00...



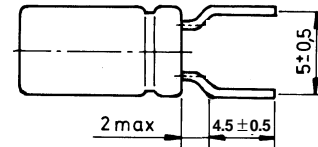
$5 \leq \text{ØD} \leq 16$ Shortened leads
(S = 2 / 2.5 / 3.5 / 5 / 7.5mm) EKC 05...



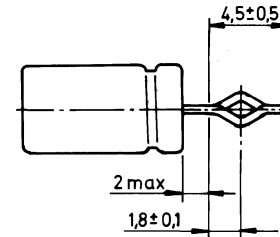
$10 \leq \text{ØD} \leq 16$ Leads shortened and formed
(S = 5 / 7.5mm) EKC 06...



$5 \leq \text{ØD} \leq 8$ Leads bent open, shortened
(S = 5mm) EKC 09...



$5 \leq \text{ØD} \leq 8$ Leads bent open,
shortened and formed
(S = 5mm) EKC 06...



Leads are solder-coated steel
Safety vent for $\text{ØD} \geq 8\text{mm}$

DIMENSIONS [in millimeters]			
NOMINAL SIZE D x L	MAXIMUM SIZE D _{max.} x L _{max.}	LEAD ød ± 0.05	LEAD SPACING S ± 0.5
5 x 11.5	5.5 x 13	0.5	2.0
5 x 15	5.5 x 16.5	0.5	2.0
6.3 x 11.5	6.8 x 13	0.5	2.5
6.3 x 15	6.8 x 16.5	0.5	2.5
8 x 12	8.5 x 13.5	0.6	3.5
8 x 15	8.5 x 16.5	0.6	3.5
8 x 20	8.5 x 21.5	0.6	3.5
10 x 12.5	10.5 x 14	0.6	5.0
10 x 16	10.5 x 17.5	0.6	5.0
10 x 20	10.5 x 21.5	0.6	5.0
10 x 25	10.5 x 26.5	0.6	5.0

DIMENSIONS [in millimeters]			
NOMINAL SIZE D x L	MAXIMUM SIZE D _{max.} x L _{max.}	LEAD ød ± 0.05	LEAD SPACING S ± 0.5
10 x 30	10.5 x 31.5	0.6	5.0
12.5 x 20	13 x 21.5	0.6	5.0
12.5 x 25	13 x 26.5	0.6	5.0
12.5 x 30	13 x 31.5	0.6	5.0
12.5 x 35	13 x 36.5	0.6	5.0
12.5 x 40	13 x 41.5	0.6	5.0
16 x 20	16.5 x 21.5	0.8	7.5
16 x 25	16.5 x 26.5	0.8	7.5
16 x 30	16.5 x 31.5	0.8	7.5
16 x 35	16.5 x 36.5	0.8	7.5
16 x 40	16.5 x 41.5	0.8	7.5



TECHNICAL AND ORDERING INFORMATION

If not indicated otherwise the following test conditions apply to all electrical parameters:

Ta=20°C, p=80-120 kPa, RH=45-75%

- C_R Rated capacitance at 120Hz
- U_R Rated voltage
- tan δ Max. dissipation factor at 120Hz
- Z Max. impedance at 100KHz
- I_R Rated alternating current at 100KHz and upper category temperature

Ordering example:

EKC 150 μF / 25V, ± 20%, Size: 8mm x 12mm
 Leads: long
 Ordering code: EKC00PT315E00

Leads: short (5 ± 0.5)
 Ordering code: EKC 05...

Leads: bent open, shortened
 Ordering code: EKC 09...

Leads: bent open, shortened and formed
 Ordering code: EKC 06...

ELECTRICAL CHARACTERISTICS, WEIGHT AND ORDERING CODE								
CAP. 120Hz CR [μF]	RATED VOLTAGE UR [V]	DIMENSIONS D x L [mm]	DISSIPATION FACTOR 120Hz	IMPEDANCE 100KHz 20°C [Ω]	IMPEDANCE 100KHz -10°C [Ω]	RATED CURRENT IR 100KHz, 105°C [mA]	WEIGHT [g]	ORDERING CODE
82	10	5.0 x 11.5	0.19	0.75	1.5	163	0.5	EKC00AB282C00
100	10	5 x 15	0.19	0.50	1.0	225	0.6	EKC00AF310C00
180	10	6.3 x 11.5	0.19	0.35	0.70	273	0.8	EKC00BB318C00
220	10	6.3 x 15	0.19	0.25	0.50	390	0.9	EKC00BF322C00
330	10	8 x 12	0.19	0.17	0.34	445	1.1	EKC00PT333C00
390	10	10 x 12.5	0.19	0.12	0.24	625	1.5	EKC00DC339C00
470	10	8 x 15	0.19	0.13	0.26	555	1.3	EKC00PF347C00
680	10	8 x 20	0.19	0.095	0.19	740	1.8	EKC00PE368C00
680	10	10 x 16	0.19	0.084	0.17	825	2.0	EKC00DD368C00
1000	10	10 x 20	0.19	0.062	0.13	1040	2.5	EKC00DE410C00
1200	10	10 x 25	0.19	0.052	0.11	1260	3.0	EKC00DG412C00
1500	10	10 x 30	0.20	0.044	0.088	1440	3.5	EKC00DJ415C00
1800	10	12.5 x 20	0.21	0.046	0.092	1340	3.8	EKC00FE418C00
2200	10	12.5 x 25	0.21	0.034	0.068	1690	4.5	EKC00FG422C00
2700	10	12.5 x 30	0.22	0.030	0.060	1950	5.5	EKC00FJ427C00
3300	10	12.5 x 35	0.24	0.024	0.048	2220	6.0	EKC00FU433C00
3300	10	16 x 20	0.24	0.038	0.076	1630	6.0	EKC00JE433C00
3900	10	12.5 x 40	0.25	0.022	0.044	2390	7.0	EKC00FK439C00
3900	10	16 x 25	0.25	0.028	0.056	2070	7.0	EKC00JG439C00
5600	10	16 x 30	0.28	0.025	0.050	2350	9.0	EKC00JJ456C00
6800	10	16 x 35	0.31	0.022	0.044	2550	11.0	EKC00JU468C00
8200	10	16 x 40	0.33	0.018	0.036	2900	13.0	EKC00JK482C00



ELECTRICAL CHARACTERISTICS, WEIGHT AND ORDERING CODE								
CAP. 120Hz CR [μF]	RATED VOLTAGE UR [V]	DIMENSIONS D x L [mm]	DISSIPATION FACTOR 120Hz	IMPEDANCE 100KHz 20°C [Ω]	IMPEDANCE 100KHz -10°C [Ω]	RATED CURRENT IR 100KHz, 105°C [mA]	WEIGHT [g]	ORDERING CODE
56	16	5 x 11.5	0.16	0.75	1.5	163	0.5	EKC00AB256D00
82	16	5 x 15	0.16	0.50	1.0	225	0.6	EKC00AF282D00
120	16	6.3 x 11.5	0.16	0.35	0.70	273	0.8	EKC00BB312D00
180	16	6.3 x 15	0.16	0.25	0.50	390	0.9	EKC00BF318D00
270	16	8 x 12	0.16	0.17	0.34	445	1.1	EKC00PT327D00
270	16	10 x 12.5	0.16	0.12	0.24	625	1.5	EKC00DC327D00
330	16	8 x 15	0.16	0.13	0.26	555	1.3	EKC00PF333D00
470	16	8 x 20	0.16	0.095	0.19	740	1.8	EKC00PE347D00
470	16	10 x 16	0.16	0.084	0.17	825	2.0	EKC00DD347D00
680	16	10 x 20	0.16	0.062	0.13	1040	2.5	EKC00DE368D00
820	16	10 x 25	0.16	0.052	0.11	1260	3.0	EKC00DG382D00
1200	16	10 x 30	0.16	0.044	0.088	1440	3.5	EKC00DJ412D00
1200	16	12.5 x 20	0.16	0.046	0.092	1340	3.8	EKC00FE412D00
1500	16	12.5 x 25	0.17	0.034	0.068	1690	4.5	EKC00FG415D00
2200	16	12.5 x 30	0.18	0.030	0.060	1950	5.5	EKC00FJ422D00
2200	16	16 x 20	0.18	0.038	0.076	1630	6.0	EKC00JE422D00
2700	16	12.5 x 35	0.19	0.024	0.048	2200	6.0	EKC00FU427D00
2700	16	16 x 25	0.19	0.028	0.056	2070	7.0	EKC00JG427D00
3300	16	12.5 x 40	0.21	0.022	0.044	2390	7.0	EKC00FK433D00
3900	16	16 x 30	0.22	0.025	0.050	2350	9.0	EKC00JJ439D00
4700	16	16 x 35	0.23	0.022	0.044	2550	11.0	EKC00JU447D00
5600	16	16 x 40	0.25	0.018	0.036	2900	13.0	EKC00JK456D00
39	25	5 x 11.5	0.14	0.75	1.5	163	0.5	EKC00AB239E00
56	25	5 x 15	0.14	0.50	1.0	225	0.6	EKC00AF256E00
82	25	6.3 x 11.5	0.14	0.35	0.70	273	0.8	EKC00BB282E00
120	25	6.3 x 15	0.14	0.25	0.50	390	0.9	EKC00BF312E00
150	25	8 x 12	0.14	0.17	0.34	445	1.1	EKC00PT315E00
180	25	10 x 12.5	0.14	0.12	0.24	625	1.5	EKC00DC318E00
220	25	8 x 15	0.14	0.13	0.26	555	1.3	EKC00PF322E00
330	25	8 x 20	0.14	0.095	0.19	740	1.8	EKC00PE333E00
330	25	10 x 16	0.14	0.084	0.17	825	2.0	EKC00DD333E00
470	25	10 x 20	0.14	0.062	0.13	1040	2.5	EKC00DE347E00
560	25	10 x 25	0.14	0.052	0.11	1260	3.0	EKC00DG356E00
820	25	10 x 30	0.14	0.044	0.088	1440	3.5	EKC00DJ382E00
820	25	12.5 x 20	0.14	0.046	0.092	1340	3.8	EKC00FE382E00
1000	25	12.5 x 25	0.14	0.034	0.068	1690	4.5	EKC00FG410E00
1500	25	12.5 x 30	0.15	0.030	0.060	1950	5.5	EKC00FJ415E00
1500	25	16 x 20	0.15	0.038	0.076	1630	6.0	EKC00JE415E00
1800	25	12.5 x 35	0.16	0.024	0.048	2200	6.0	EKC00FU418E00
1800	25	16 x 25	0.16	0.028	0.056	2070	7.0	EKC00JG418E00
2200	25	12.5 x 40	0.17	0.022	0.044	2390	7.0	EKC00FK422E00
2700	25	16 x 30	0.18	0.025	0.050	2350	9.0	EKC00JJ427E00
3300	25	16 x 35	0.19	0.022	0.044	2550	11.0	EKC00JU433E00
3900	25	16 x 40	0.20	0.018	0.036	2900	13.0	EKC00JK439E00

ELECTRICAL CHARACTERISTICS, WEIGHT AND ORDERING CODE

CAP. 120Hz CR [μF]	RATED VOLTAGE UR [V]	DIMENSIONS D x L [mm]	DISSIPATION FACTOR 120Hz	IMPEDANCE 100KHz 20°C [Ω]	IMPEDANCE 100KHz -10°C [Ω]	RATED CURRENT IR 100KHz, 105°C [mA]	WEIGHT [g]	ORDERING CODE
27	35	5 x 11.5	0.12	0.75	1.5	163	0.5	EKC00AB227F00
39	35	5 x 15	0.12	0.50	1.0	225	0.6	EKC00AF239F00
56	35	6.3 x 11.5	0.12	0.35	0.70	273	0.8	EKC00BB256F00
82	35	6.3 x 15	0.12	0.25	0.50	390	0.9	EKC00BF282F00
120	35	8 x 12	0.12	0.17	0.34	445	1.1	EKC00PT312F00
120	35	10 x 12.5	0.12	0.12	0.24	625	1.5	EKC00DC312F00
180	35	8 x 15	0.12	0.13	0.26	555	1.3	EKC00PF318F00
220	35	8 x 20	0.12	0.095	0.19	740	1.8	EKC00PE322F00
220	35	10 x 16	0.12	0.084	0.17	825	2.0	EKC00DD322F00
330	35	10 x 20	0.12	0.062	0.13	1040	2.5	EKC00DE333F00
390	35	10 x 25	0.12	0.052	0.11	1260	3.0	EKC00DG339F00
560	35	10 x 30	0.12	0.044	0.088	1440	3.5	EKC00DJ356F00
560	35	12.5 x 20	0.12	0.046	0.092	1340	3.8	EKC00FE356F00
680	35	12.5 x 25	0.12	0.034	0.068	1690	4.5	EKC00FG368F00
1000	35	12.5 x 30	0.12	0.030	0.060	1950	5.5	EKC00FJ410F00
1000	35	16 x 20	0.12	0.038	0.076	1630	6.0	EKC00JE410F00
1200	35	12.5 x 35	0.12	0.024	0.048	2200	6.0	EKC00FU412F00
1200	35	16 x 25	0.12	0.028	0.056	2070	7.0	EKC00JG412F00
1500	35	12.5 x 40	0.13	0.022	0.044	2390	7.0	EKC00FK415F00
1800	35	16 x 30	0.14	0.025	0.050	2350	9.0	EKC00JJ418F00
2200	35	16 x 35	0.15	0.022	0.044	2550	11.0	EKC00JU422F00
2700	35	16 x 40	0.16	0.018	0.036	2900	13.0	EKC00JK427F00
18	50	5 x 11.5	0.10	1.20	2.40	129	0.5	EKC00AB218H00
27	50	5 x 15	0.10	0.80	1.60	180	0.6	EKC00AF227H00
39	50	6.3 x 11.5	0.10	0.54	1.10	219	0.8	EKC00BB239H00
56	50	6.3 x 15	0.10	0.34	0.68	310	0.9	EKC00BF256H00
68	50	8 x 12	0.10	0.30	0.60	340	1.1	EKC00PT268H00
82	50	8 x 15	0.10	0.20	0.40	470	1.3	EKC00PF282H00
82	50	10 x 12.5	0.10	0.20	0.40	480	1.5	EKC00DC282H00
120	50	8 x 20	0.10	0.14	0.28	610	1.8	EKC00PE312H00
120	50	10 x 16	0.10	0.13	0.26	755	2.0	EKC00DD312H00
180	50	10 x 20	0.10	0.088	0.18	945	2.5	EKC00DE318H00
220	50	10 x 25	0.10	0.073	0.15	1150	3.0	EKC00DG322H00
330	50	10 x 30	0.10	0.054	0.11	1260	3.5	EKC00DJ333H00
330	50	12.5 x 20	0.10	0.059	0.12	1190	3.8	EKC00FE333H00
470	50	12.5 x 25	0.10	0.044	0.088	1490	4.5	EKC00FG347H00
560	50	12.5 x 30	0.10	0.039	0.078	1720	5.5	EKC00FJ356H00
680	50	12.5 x 35	0.10	0.033	0.066	1890	6.0	EKC00FU368H00
680	50	16 x 20	0.10	0.050	0.10	1420	6.0	EKC00JE368H00
820	50	12.5 x 40	0.10	0.029	0.058	2030	7.0	EKC00FK382H00
820	50	16 x 25	0.10	0.034	0.068	1880	7.0	EKC00JG382H00
1000	50	16 x 30	0.10	0.030	0.060	2150	9.0	EKC00JJ410H00
1200	50	16 x 35	0.10	0.027	0.054	2320	11.0	EKC00JU412H00
1500	50	16 x 40	0.11	0.024	0.048	2540	13.0	EKC00JK415H00

ELECTRICAL CHARACTERISTICS, WEIGHT AND ORDERING CODE								
CAP. 120Hz CR [μF]	RATED VOLTAGE UR [V]	DIMENSIONS D x L [mm]	DISSIPATION FACTOR 120Hz	IMPEDANCE 100KHz 20°C [Ω]	IMPEDANCE 100KHz -10°C [Ω]	RATED CURRENT IR 100KHz, 105°C [mA]	WEIGHT [g]	ORDERING CODE
10	63	5.0 x 11.5	0.10	1.9	4.8	103	0.5	EKC00AB210J00
15	63	5 x 15	0.10	1.3	3.3	142	0.6	EKC00AF215J00
18	63	6.3 x 11.5	0.10	1.0	2.5	161	0.8	EKC00BB218J00
33	63	6.3 x 15	0.10	0.60	1.6	233	0.9	EKC00BF233J00
47	63	8 x 12	0.10	0.47	1.2	274	1.1	EKC00PT247J00
56	63	10 x 12.5	0.10	0.27	0.68	420	1.5	EKC00DC256J00
68	63	8 x 15	0.10	0.34	0.85	360	1.3	EKC00PF268J00
68	63	10 x 16	0.10	0.21	0.53	525	2.0	EKC00DD268J00
82	63	8 x 20	0.10	0.21	0.53	500	1.8	EKC00PE282J00
120	63	10 x 20	0.10	0.16	0.40	650	2.5	EKC00DE312J00
150	63	10 x 25	0.10	0.13	0.33	785	3.0	EKC00DG315J00
180	63	10 x 30	0.10	0.10	0.25	960	3.5	EKC00DJ318J00
220	63	12.5 x 20	0.10	0.11	0.28	870	3.8	EKC00FE322J00
270	63	12.5 x 25	0.10	0.074	0.19	1150	4.5	EKC00FG327J00
330	63	16 x 20	0.10	0.085	0.22	1100	6.0	EKC00JE333J00
390	63	12.5 x 30	0.10	0.068	0.17	1280	5.5	EKC00FJ339J00
470	63	12.5 x 35	0.10	0.063	0.16	1390	6.0	EKC00FU347J00
470	63	16 x 25	0.10	0.055	0.14	1480	7.0	EKC00JG347J00
560	63	12.5 x 40	0.10	0.051	0.13	1530	7.0	EKC00FK356J00
680	63	16 x 30	0.10	0.046	0.12	1720	9.0	EKC00JJ368J00
820	63	16 x 35	0.10	0.040	0.10	1910	11.0	EKC00JU382J00
1000	63	16 x 40	0.10	0.036	0.09	2070	13.0	EKC00JK410J00

•10% capacitance tolerance on request

LEAKAGE CURRENT

Formula for the calculation of the maximum leakage current for acceptance tests I_L :
(Test conditions: C_R , 20°C, 2 minutes)

$$I_{L2} [\mu A] \leq 0.01 \cdot C_R [\mu F] \cdot U_R [V] \quad \text{or } 3 \mu A \quad (\text{whichever is greater})$$

OPERATING LIFE TABLE													
Interrelation between alternating current, ambient temperature and lifetime													
I / I _R (100 KHz)	SURFACE TEMPERATURE RISE ΔT _o [°C]	LIFETIME MULTIPLIER L VERSUS I / I _R and T _a											
		AMBIENT TEMPERATURE T _a [°C]											
		40	50	60	65	70	75	80	85	90	95	100	105
0.2	0.1	149	75	37	26	19	13	9.3	6.6	4.7	3.3	2.33	1.65
0.4	0.5	140	70	35	25	18	12	8.8	6.2	4.4	3.1	2.19	1.55
0.6	1.2	126	63	32	22	16	11	7.9	5.6	3.9	2.8	1.97	1.39
0.8	2.1	109	55	27	19	14	9.6	6.8	4.8	3.4	2.4	1.71	1.21
1.0	3.3	91	45	23	16	11	8.0	5.7	4.0	2.8	2.0	1.41	1.00
1.2	4.8	72	36	18	13	9.0	6.4	4.5	3.2	2.3	1.6	1.13	
1.4	6.5	55	27	14	9.7	6.9	4.9	3.4	2.4	1.7	1.2		
1.6	8.4	40	20	10	7.1	5.0	3.6	2.5	1.8	1.3			
1.8	11	28	14	7.1	5.0	3.5	2.5	1.8	1.2				
2.0	13	19	9.5	4.8	3.4	2.4	1.7	1.2					
2.2	16	12	6.1	3.1	2.2	1.5	1.1						
2.4	19	7.6	3.8	1.9	1.3								
2.6	22	4.5	2.3	1.1									
2.8	26	2.6	1.3										
3.0	30	1.4											

- I_R 100 KHz AC [A] at Upper Category Temperature T_{UC} taken from data sheet
- I User current [A] at 100KHz
- T_a Ambient temperature [°C] of electrolytic capacitor
- ΔT Surface Temperature rise [°C] of electrolytic capacitor caused by AC load
- L Lifetime multiplier

RIPPLE CURRENT MULTIPLIERS				
Frequency Multipliers				
Freq (Hz) \ Cap. [μF]	120	1k	10k	100k
10 ~ 180	0.40	0.75	0.90	1.00
220 ~ 560	0.50	0.85	0.94	1.00
680 ~ 1800	0.60	0.87	0.95	1.00
2200 ~ 3900	0.75	0.90	0.95	1.00
4700 ~ 8200	0.85	0.95	0.98	1.00