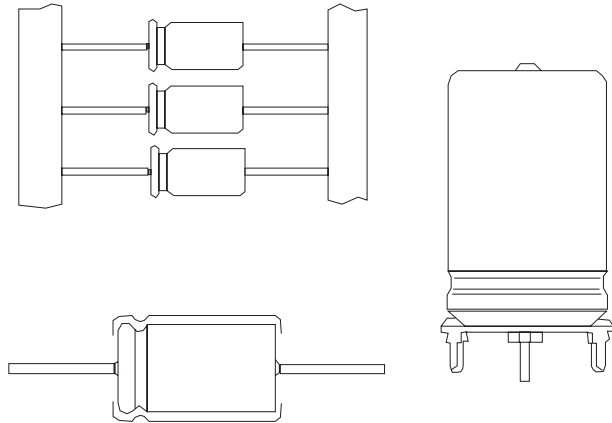


Aluminum Electrolytic Capacitors Axial Capacitor Style EBC/EGC Solder Ring Termination as EGC03


FEATURES

- Polarized aluminum electrolytic capacitor
- High ripple current capability
- Very long lifetime
- Charge/discharge proof
- Extended temperature range: 105°C
- Solder ring available

APPLICATIONS

- Industrial and automotive electronics, audio/video, telecommunication, power supply units
- Coupling, smoothing, filtering, buffering and timing

MAIN SPECIFICATIONS					
ITEM	UNIT	LOW VOLTAGE		HIGH VOLTAGE	
Nominal Case Size (D x L)	mm	6.5 x 18 to 10 x 25	12 x 25 to 30 x 45	6.5 x 18 to 10 x 25	12 x 25 to 30 x 45
Rated Capacitance Range	μF	4.7 - 470	100 - 10000	1 - 22	10 - 470
Capacitance Tolerance	%	- 10 / +50			
Rated Voltage Range	V	16 to 100		160 to 350	160 to 400
Category Temperature Range	°C	- 40 to + 105			
Endurance Test at 105°C	h	2000			
Useful Life at 105°C and I _R applied	h	3000	5000	3000	4000
Useful Life at 85°C and I _R applied	h	11000	18000	11000	14000
Useful Life at 40°C and I _R applied	h	330000	560000	330000	450000
Shelf Life (0V, 105°C)	h	100			
Failure Rate (0,8 U _R , 40°C)	10 ⁻⁹ /h	≤ 14	≤ 8	≤ 14	≤ 10
Based on Sectional Specifications		IEC 60384-4, EN130300			
Detail Specifications		CECC 30301-003, CECC 30301-801 DIN 45910 Part 123, without quality assessment			
Climatic Category	IEC 60 068 DIN 40040	40/105/56 GMF			



VALUES AND DIMENSIONS

Nominal size (D x L) in mm

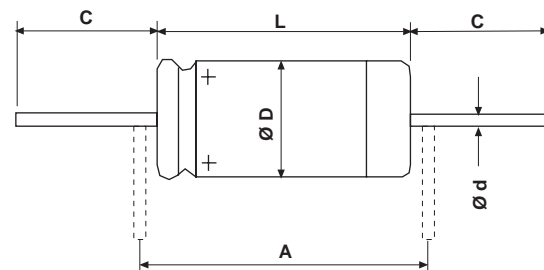
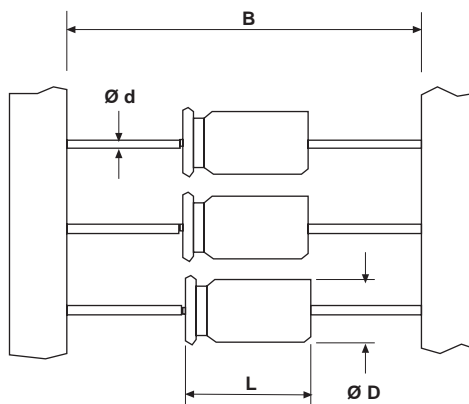
CAP [μ F]	RATED VOLTAGE U_R [V]									
	16	25	40	63	100	160	250	350	385	400
1								6,5 x 18		
2.2		EBC				6,5 x 18	8 x 18	8 x 18		
4.7				6,5 x 18	6,5 x 18	8 x 18	10 x 18	10 x 18		
10			6,5 x 18	8 x 18	8 x 18	10 x 18	10 x 25		12 x 25	12 x 25
22		6,5 x 18	8 x 18	8 x 18	10 x 18	10 x 25	12 x 25		12 x 30	12 x 30
47	6,5 x 18	8 x 18	8 x 18	10 x 18	10 x 25	12 x 30	16 x 30		16 x 40	18 x 40
100	8 x 18	10 x 18	10 x 18	12 x 25	12 x 30	16 x 40	18 x 40		21 x 40	25 x 40
220	10 x 18	10 x 25	12 x 25	12 x 30	18 x 40	21 x 40	25 x 40		30 x 45	30 x 45
470	10 x 25	12 x 25	16 x 30	16 x 40	25 x 40	25 x 45	30 x 45			
1000	12 x 30	16 x 30	18 x 40	21 x 40	25 x 50					
2200	16 x 40	21 x 40	25 x 40	30 x 40						
4700	21 x 40	25 x 45	30 x 45							
6800	25 x 45	30 x 40								
10000	30 x 40									

Special values and dimensions on request

AXIAL STYLE: DIMENSIONS, WEIGHT, PACKAGING QUANTITIES AND ORDERING CODE															
NOMINAL CASE SIZE			Ø d mm	C mm	Ø D MAX. mm	L MAX. mm	A MIN. mm	B mm	WEIGHT APPROX. g	PACKAGING, ENDING OF ORDERING CODE, QUANTITIES					
Ø D mm	x	L mm								BULK IN BOX		TAPED ON REEL		TAPED AMMO	
										code	pcs.	code	pcs.	code	pcs.
6.5	x	18	0.8		6.9	18.5	25	73,0 ± 1,6	1.3			..A0V	1000	..B0V	1000
8	x	18	0.8		8.5	18.5	25	73,0 ± 1,6	1.7			..A0V	500	..B0V	500
10	x	18	0.8		10.5	18.5	25	73,0 ± 1,6	2.5			..A0V	500	..B0V	500
10	x	25	0.8		10.5	25.0	30	73,0 ± 1,6	3.3			..A0V	500	..B0V	500
12	x	25	0.8	40 -5	12.5	26.5	30	73,0 ± 1,6	4	..00B	800	..A0B	450	..B0B	700
12	x	30	0.8	40 -5	12.5	31.5	35	73,0 ± 1,6	6	..00B	800	..A0B	450	..B0B	700
16	x	30	0.8	40 -5	16.5	30.0	35	73,0 ± 1,6	8	..00B	204	..A0B	250	..B0B	400
16	x	40	0.8	40 -5	16.5	40.0	45		11	..00B	150	n.a.		n.a.	
18	x	40	0.8	40 -5	18.5	40.5	45		15	..00B	120	n.a.		n.a.	
21	x	40	0.8	40 -5	21.5	41.0	45		21	..00B	100	n.a.		n.a.	
25	x	40	0.8	40 -5	25.5	41.0	45		31	..00B	60	n.a.		n.a.	
25	x	45	0.8	40 -5	25.5	47.0	51		38	..00B	60	n.a.		n.a.	
25	x	50	0.8	40 -5	25.5	51.0	55		44	..00B	50	n.a.		n.a.	
30	x	40	1.0	40 -5	30.5	41.0	45		46	..00B	40	n.a.		n.a.	
30	x	45	1.0	40 -5	30.5	47.0	51		54	..00B	30	n.a.		n.a.	

Axial style capacitors are insulated.

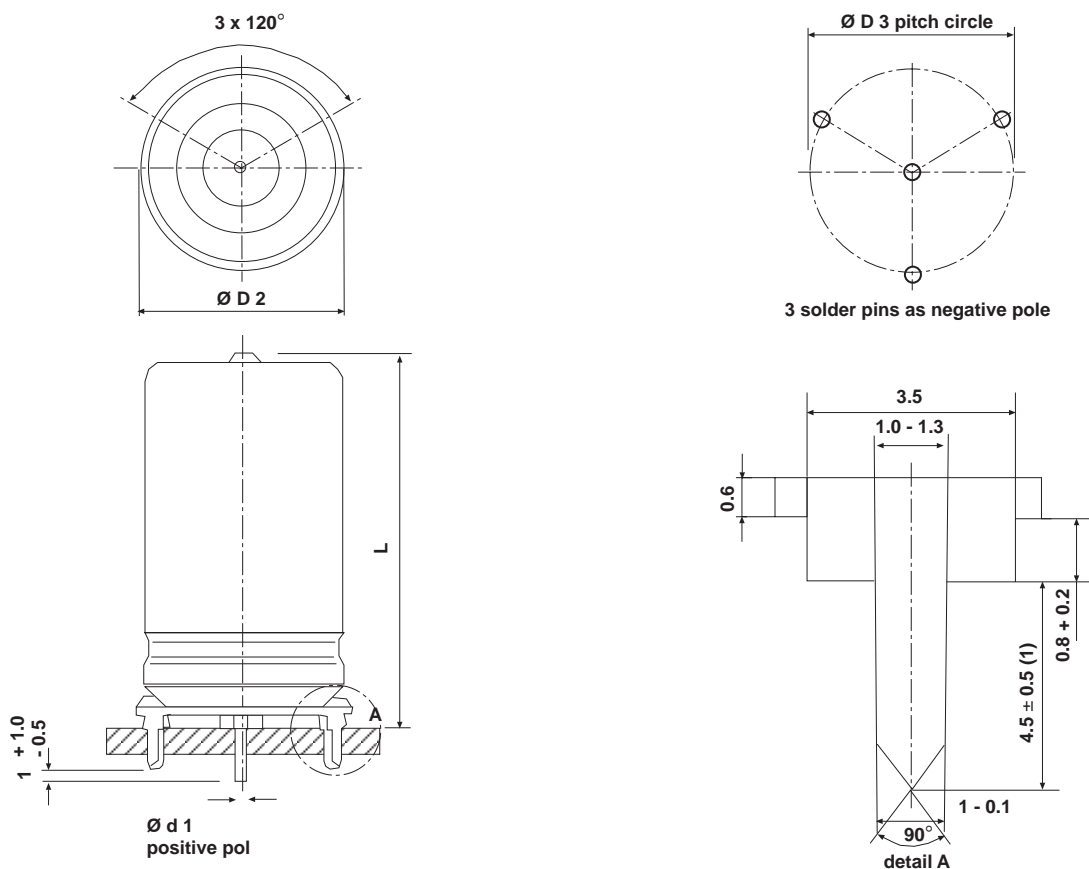
n.a. = not available



MOUNTING RING STYLE: DIMENSIONS, WEIGHT, PACKAGING QUANTITIES AND ORDERING CODE

NOMINAL CASE SIZE			Ø D1	Ø D2 MAX.	ØD3 ± 0.2	L MAX.	WEIGHT APPROX. g	STARTING OF ORDERING CODE	ENDING OF ORDERING CODE			PACKAGING QUANTITY pcs.
Ø D mm	x	L mm							KIND OF INSULATION			
			mm	mm	mm	mm		CODE	NO	SLEEVE	FULL	
16	x	30	1.0	17.2	16.5	32	12	EGC03..	..00B	..01B	..02B	504
16	x	40	1.0	17.2	16.5	42	13	EGC03..	..00B	..01B	..02B	336
18	x	40	1.0	19.2	18.5	42	19	EGC03..	..00B	..01B	..02B	286
21	x	40	1.0	22.2	21.5	42	24	EGC03..	..00B	..01B	..02B	220
25	x	40	1.0	26.2	25.5	42	28	EGC03..	..00B	..01B	..02B	144
25	x	45	1.0	26.2	25.5	48	33	EGC03..	..00B	..01B	..02B	144
25	x	50	1.0	26.2	25.5	53	40	EGC03..	..00B	..01B	..02B	144
30	x	40	1.0	31.2	30.5	42	42	EGC03..	..00B	..01B	..02B	112
30	x	45	1.0	31.2	30.5	48	46	EGC03..	..00B	..01B	..02B	112

Packaging in styrofoam pallets



EGC 03..

Cases of mounting ring style capacitors are not insulated.
Insulation on request.

specification of bore fit according
to DIN 40810 ($\varnothing 1.3 + 0.1$)

(1) pin length for mounting rings
 $\varnothing 21, 25$ and 30 is 3.1 ± 0.2



ORDERING INFORMATION AND EXAMPLE

The following table gives the ordering number for standard version = axial leads, in bulk.

The 5th place of ordering code refers to termination style:
 EGC00.. 0 = axial leads
 EGC03.. 3 = mounting ring with solder pins

The 12th place of ordering code refers to packaging for axial lead capacitors:

EBC00HD310J... = EBC 100µF 63V 12 x 25
 EBC00HD310J00B 0 = in bulk (box)
 EBC00HD310JA0B A = taped on reel
 EBC00HD310JB0B B = taped ammo

Please see tables “Axial Style” and “Mounting Ring Style” for available versions.

MEASURING CONDITIONS AND FORMULA LEGEND

T_a = 20°C, p = 86-106 kPa, RH = 45-75%

- T_a Ambient temperature
- T_{UC} Upper category temperature
- RH Relative humidity
- P Ambient pressure
- C_R Rated capacitance at 100Hz
- U_R Rated voltage
- tan δ Dissipation factor at 100Hz
- R_{ESR} Equivalent series resistance at 100Hz
- Z Impedance at 10kHz
- I_R Rated alternating current (rms), 100Hz, upper category temperature

ELECTRICAL CHARACTERISTICS AND ORDERING CODE							
CAP 100 Hz C _R [µF]	RATED VOLTAGE U _R [V]	DIMENSION D x L [mm]	TAN δ 100Hz MAX.	R _{ESR} 100Hz MAX. [Ω]	Z 10kHz MAX. [Ω]	I _R 100Hz T _{UC} [A]	ORDERING NO.
47	16	6.5 x 18	0.14	4.7	2.6	0.095	EBC00DL247D00V
100	16	8 x 18	0.14	2.2	1.2	0.15	EBC00FL310D00V
220	16	10 x 18	0.14	1.0	0.55	0.25	EBC00GL322D00V
470	16	10 x 25	0.14	0.47	0.26	0.45	EBC00GD347D00V
1000	16	12 x 30	0.14	0.22	0.14	0.89	EBC00HE410D00B
2200	16	16 x 40	0.15	0.11	0.055	1.6	EGC00KG422D00B
4700	16	21 x 40	0.15	0.05	0.040	2.2	EGC00MG447D00B
6800	16	25 x 45	0.20	0.05	0.035	2.7	EGC00NH468D00B
10000	16	30 x 40	0.32	0.05	0.035	2.5	EGC00PG510D00B
22	25	6.5 x 18	0.11	8.0	4.1	0.060	EBC00DL222E00V
47	25	8 x 18	0.11	3.7	1.9	0.11	EBC00FL247E00V
100	25	10 x 18	0.11	1.8	0.90	0.18	EBC00GL310E00V
220	25	10 x 25	0.11	0.80	0.40	0.34	EBC00GD322E00V
470	25	12 x 25	0.11	0.37	0.21	0.64	EBC00HD347E00B
1000	25	16 x 30	0.11	0.18	0.10	1.1	EGC00KE410E00B
2200	25	21 x 40	0.12	0.09	0.050	1.9	EGC00MG422E00B
4700	25	25 x 45	0.15	0.05	0.035	2.6	EGC00NH447E00B
6800	25	30 x 40	0.23	0.05	0.035	2.4	EGC00PG468E00B
10	40	6.5 x 18	0.10	16	7.5	0.046	EBC00DL210G00V
22	40	8 x 18	0.10	7.2	3.4	0.080	EBC00FL222G00V
47	40	8 x 18	0.09	3.0	1.6	0.12	EBC00FL247G00V
100	40	10 x 18	0.09	1.4	0.75	0.21	EBC00GL310G00V
220	40	12 x 25	0.08	0.58	0.28	0.46	EBC00HD322G00B
470	40	16 x 30	0.08	0.27	0.14	0.83	EGC00KE347G00B
1000	40	18 x 40	0.08	0.13	0.065	1.3	EGC00LG410G00B
2200	40	25 x 40	0.10	0.07	0.040	2.1	EGC00NG422G00B
4700	40	30 x 45	0.15	0.05	0.030	2.6	EGC00PH447G00B
4.7	63	6.5 x 18	0.07	24	12	0.038	EBC00DL147J00V
10	63	8 x 18	0.07	11	5.5	0.064	EBC00FL210J00V
22	63	8 x 18	0.07	5.1	2.5	0.10	EBC00FL222J00V
47	63	10 x 18	0.07	2.4	1.2	0.17	EBC00GL247J00V
100	63	12 x 25	0.07	1.1	0.45	0.29	EBC00HD310J00B
220	63	12 x 30	0.07	0.51	0.21	0.48	EBC00HE322J00B
470	63	16 x 40	0.07	0.24	0.10	0.88	EGC00KG347J00B

ELECTRICAL CHARACTERISTICS AND ORDERING CODE							
CAP 100 Hz C_R [μ F]	RATED VOLTAGE U_R [V]	DIMENSION D x L [mm]	TAN δ 100Hz MAX.	R_{ESR} 100Hz MAX. [Ω]	Z 10kHz MAX. [Ω]	I_R 100Hz T_{UC} [A]	ORDERING NO.
1000	63	21 x 40	0.07	0.11	0.055	1.4	EGC00MG410J00B
2200	63	30 x 40	0.11	0.080	0.045	2.0	EGC00PG422J00B
4.7	100	6.5 x 18	0.06	20	9.6	0.048	EBC00DL147L00V
10	100	8 x 18	0.06	9.5	4.5	0.073	EBC00FL210L00V
22	100	10 x 18	0.06	4.3	2.0	0.13	EBC00GL222L00V
47	100	10 x 25	0.06	2.0	1.0	0.22	EBC00GD247L00V
100	100	12 x 30	0.06	0.95	0.42	0.28	EBC00HE310L00B
220	100	18 x 40	0.06	0.43	0.20	0.54	EGC00LG322L00B
470	100	25 x 40	0.06	0.20	0.10	0.98	EGC00NG347L00B
1000	100	25 x 50	0.10	0.16	0.07	1.4	EGC00NJ410L00B
2.2	160	6.5 x 18	0.10	72	55	0.022	EBC00DL122M00V
4.7	160	8 x 18	0.10	34	26	0.037	EBC00FL147M00V
10	160	10 x 18	0.10	16	12	0.061	EBC00GL210M00V
22	160	10 x 25	0.10	7.2	5.5	0.12	EBC00GD222M00V
47	160	12 x 30	0.11	3.7	2.1	0.23	EBC00HE247M00B
100	160	16 x 40	0.11	1.8	1.0	0.42	EGC00KG310M00B
220	160	21 x 40	0.11	0.80	0.47	0.77	EGC00MG322M00B
470	160	25 x 45	0.11	0.37	0.23	1.3	EGC00NH347M00B
2.2	250	8 x 18	0.10	72	50	0.025	EBC00FL122N00V
4.7	250	10 x 18	0.10	34	23	0.037	EBC00GL147N00V
10	250	10 x 25	0.10	16	11	0.066	EBC00GD210N00V
22	250	12 x 25	0.08	5.8	2.8	0.16	EBC00HD222N00B
47	250	16 x 30	0.08	2.7	1.3	0.30	EGC00KE247N00B
100	250	18 x 40	0.08	1.3	0.62	0.50	EGC00LG310N00B
220	250	25 x 40	0.08	0.58	0.29	0.92	EGC00NG322N00B
470	250	30 x 45	0.08	0.27	0.15	1.4	EGC00PH347N00B
1	350	6.5 x 18	0.10	159	100	0.015	EBC00DL110O00V
2.2	350	8 x 18	0.10	72	45	0.025	EBC00FL122O00V
4.7	350	10 x 18	0.10	34	21	0.043	EBC00GL147O00V
10	385	12 x 25	0.08	13	5.8	0.10	EBC00HD210R00B
22	385	12 x 30	0.08	5.8	2.6	0.17	EBC00HE222R00B
47	385	16 x 40	0.08	2.7	1.2	0.31	EGC00KG247R00B
100	385	21 x 40	0.08	1.3	0.59	0.55	EGC00MG310R00B
220	385	30 x 45	0.08	0.58	0.28	1.0	EGC00PH322R00B
10	400	12 x 25	0.07	11	5.5	0.10	EBC00HD210X00B
22	400	12 x 30	0.07	5.1	2.5	0.17	EBC00HE222X00B
47	400	18 x 40	0.07	2.4	1.2	0.33	EGC00LG247X00B
100	400	25 x 40	0.08	1.3	0.57	0.60	EGC00NG310X00B
220	400	30 x 45	0.08	0.58	0.27	1.0	EGC00PH322X00B

Table for the calculation of the maximum 10 kHz impedance at low temperatures.

LOW TEMPERATURE BEHAVIOR										
Z (10kHz) [Ω] = TABULAR VALUE / C_R [μ F]										
T_a [$^{\circ}$ C]	RATED VOLTAGE U_R [V]									
	16	25	40	63	100	160	250	350	385	400
-25	2250	1500	850	600	450	1000	940	860	800	800
-40	5400	3600	2040	1440	1080	5000	4600	4200	4000	4000

The lower limit of the series resistance and impedance is determined by the ohmic part of the contact points and the foil resistance values. Therefore it will not always be possible to achieve calculated values below 0.05 Ω .

ADDITIONAL ELECTRICAL DATA		
PARAMETER	CONDITIONS	SPECIFICATION
Leakage current I_L	$U_R \leq 100V$; $U_{R'}$, 300s $U_R \geq 160V$; $U_{R'}$, 300s	$I_L/\mu A \leq 0.0015 \times C_R/\mu F \times U_R/V + 3$ $I_L/\mu A \leq 0.0150 \times C_R/\mu F \times U_R/V + 10$
Surge voltage U_S	$U_R \leq 100V$ $U_R \geq 160V$	$U_S = 1.15 \times U_R$ $U_S = 1.10 \times U_R$
Reverse voltage U_{rev}		$U_{rev} \leq 1V$

TEST PROCEDURES AND CRITERIA			
TEST	REFERENCE	PROCEDURE	CRITERION
Endurance	IEC 60384-4/ EN 130300 subclause 4.13	$T_A = 105^\circ C$; U_R applied; 2000h	- $15\% \leq \Delta C/C \leq 15\%$ - $\tan \delta \leq 1.3 \times \text{spec. limit}$ - $Z \leq 2 \times \text{spec. limit}$ - $I_L(300s) \leq \text{spec. limit}$
Useful life	CECC 30301 subclause 1.8.1	$T_A = 105^\circ C$; U_R and I_R applied; $16V \leq U_R \leq 100V$ cases 6.5 x 8 to 10 x 25: 3000h cases 12 x 25 to 30 x 45: 5000h $160V \leq U_R \leq 400V$ cases 6.5 x 8 to 10 x 25: 3000h cases 12 x 25 to 30 x 45: 4000h	- $45\% \leq \Delta C/C \leq 45\%$ - $\tan \delta \leq 3 \times \text{spec. limit}$ - $Z \leq 3 \times \text{spec. limit}$ - $I_L(300s) \leq \text{spec. limit}$ - no short circuit, no open circuit - total failure percentage $\leq 1\%$
Shelf life (storage at high temperature)	IEC 60384-4/ EN 130300 subclause 4.17	$T_A = 105^\circ C$; no voltage applied; 100h After test: U_R to be applied for 30 minutes 24h to 48h before measurement	- $15\% \leq \Delta C/C \leq 15\%$ - $\tan \delta \leq 1.3 \times \text{spec. limit}$ - $Z \leq 2 \times \text{spec. limit}$ - $I_L(300s) \leq 2 \times \text{spec. limit}$



OPERATING LIFE TABLE																				
Interrelation between alternating current load, ambient temperature and useful life																				
U_R ≤ 100V																				
Current ratio I/I _R (depending on frequency)							Multiplier L for useful life (depending on I/I _R and T _a)													
3.42	3.24	3.06	2.88	2.70	2.52	2.34	1.3	1.0	1.2	1.3	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.2	1.0
4.18	3.60	3.40	3.20	3.00	2.80	2.60	4.37	4.14	3.91	3.68	3.45	3.22	3.08	2.86	2.64	2.42	2.20	2.00	1.98	1.80
4.56	4.14	3.74	3.52	3.30	3.08	2.86	4.75	4.32	3.91	3.68	3.45	3.22	3.00	2.78	2.56	2.34	2.12	1.90	1.88	1.70
4.94	4.68	4.42	4.16	3.90	3.64	3.38	5.09	4.68	4.25	4.00	3.75	3.50	3.25	3.00	2.75	2.50	2.25	2.00	1.98	1.80
5.32	4.68	4.42	4.16	3.90	3.64	3.38	5.09	4.68	4.25	4.00	3.75	3.50	3.25	3.00	2.75	2.50	2.25	2.00	1.98	1.80
10 K	40	45	50	55	60	65	70	75	80	85	90	95	100	105	105	105	105	105	105	105
Frequency [Hz]							Ambient temperature T _a [°C]													
U_R > 100V																				
Current ratio I/I _R (depending on frequency)							Multiplier L for useful life (depending on I/I _R and T _a)													
3.23	3.06	2.89	2.72	2.55	2.38	2.21	1.3	1.0	1.2	1.3	1.0	1.1	1.1	1.1	1.1	1.1	1.0	1.2	1.0	1.06
3.80	3.60	3.40	3.20	3.00	2.80	2.60	4.41	4.18	3.94	3.72	3.48	3.25	3.02	2.78	2.55	2.32	2.10	1.88	1.86	1.70
4.71	4.46	4.22	4.00	3.75	3.50	3.25	4.94	4.68	4.42	4.16	3.90	3.64	3.38	3.12	2.86	2.60	2.34	2.12	1.90	1.88
5.09	4.68	4.42	4.16	3.90	3.64	3.38	5.09	4.68	4.25	4.00	3.75	3.50	3.25	3.00	2.75	2.50	2.25	2.00	1.98	1.80
5.32	4.68	4.42	4.16	3.90	3.64	3.38	5.09	4.68	4.25	4.00	3.75	3.50	3.25	3.00	2.75	2.50	2.25	2.00	1.98	1.80
10 K	40	45	50	55	60	65	70	75	80	85	90	95	100	105	105	105	105	105	105	105
Frequency [Hz]							Ambient temperature T _a [°C]													

- I_R [A] Rated ripple current (100Hz, rms) at upper category temperature, taken from data sheet
- I [A] User ripple current
- T_A [°C] Ambient temperature of capacitor
- L Useful life multiplier

Regard L as a function of ambient temperature (x-axis) and of current (y-axis); use the current-axis according to the frequency



Specifications are subject to change without notice.

All details in printed form are legally binding especially with respect to the provisions of §§463 and 480 II of the German Code of Civil Law after written confirmation only. The data indicated herein described the type of component and shall not be considered as assured characteristics.

The products listed in this catalog are not generally recommended for use in life support systems where a failure or malfunction of the component may directly threaten life or cause injury.

The user of products in such applications assumes all risks of such use and will agree to hold Vishay Intertechnology, Inc. and all the companies whose products are represented in this catalog, harmless against all damages.