

EKT

Bipolar, Endurance 1.000h to 1.500h at 105°C
 Rated voltage range: 40V to 100V, Nominal capacitance range: 2,2µF to 100µF
 Size range: Ø 10,0 x 12,7mm to Ø 16,5 x 36,5mm
 RoHS compliant
 Special types on request



Specifications

		Characteristics											
Temperature range	- 40°C to +105°C												
Rated voltage range	40V to 100V												
Capacitance tolerance	±15%, other on request												(at 20°C, 100Hz)
Leakage current I_{ra}	$I_{ra}=0,025 \cdot C_R \cdot V_R$ or 5µA at $C_R \cdot V_R \leq 1.000$, whichever is greater $I_{ra}=0,015 \cdot C_R \cdot V_R + 10\mu A$ at $C_R \cdot V_R > 1.000$ (at 20°C, 5 minutes, applies in both directions) (I_{ra} [µA], C_R : Rated capacitance [µF], V_R : Rated voltage range [V])												
Dissipation factor $\tan \delta$ (D.F.)	Rated voltage (V_R)	40V	63V	100V									
	$\tan \delta_{max}$	0,095	0,090	0,085	(at 20°C, 1kHz)								
Impedance Z frequency-and temperature behavior $Z = \frac{\text{Table value}}{C_R}$ based on 1µF	V_R	temper- ature [°C]	Z [$\Omega \cdot \mu F$]										
			Frequency [kHz]										
			0,05	0,1	0,2	0,5	1	2	5	10	20	50	100
	40V	20	4 000	2 000	1 000	400	220	100	40	22	15	8	6
		- 25	4 000	2 000	1 000	480	270	160	95	70	58	51	50
		- 40	4 400	2 200	1 200	550	360	320	280	250	230	210	190
	63V	20	4 000	2 000	1 000	400	210	100	40	21	14	8	6
		- 25	4 000	2 000	1 000	480	260	140	80	60	50	49	46
		- 40	4 400	2 200	1 200	550	340	290	240	210	190	170	155
	100V	20	4 000	2 000	1 000	400	200	100	40	20	13	8	6
		- 25	4 000	2 000	1 000	480	250	125	65	50	44	42	42
		- 40	4 400	2 200	1 200	550	320	260	200	170	150	140	130
	Endurance	The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 1.000 hours to 1.500 hours at 105°C.											
	Capacitance change		$\Delta C/C0 \leq \pm 20\%$										
	D.F. ($\tan \delta$)		$\Delta \tan \delta \leq +200\%$ of the initial specification value										
	Leakage current (I_{ra})		$I_{ra} \leq$ 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 105°C without voltage applied.												
	Capacitance change		$\Delta C/C0 \leq \pm 20\%$										
	D.F. ($\tan \delta$)		$\Delta \tan \delta \leq +200\%$ of the initial specification value										
	Leakage current (I_{ra})		$I_{ra} \leq +200\%$ of the initial specification value										
Surge voltage test	The capacitors shall be subjected to 1.000 cycles each consisting of charging with the specified surge voltage for 30(±5) seconds through a protective resistor ($R=0,1/C_R$) and open-circuiting for 330 seconds at 105°C. The following specifications shall be satisfied when the capacitors are restored to 20°C.												
	Rated voltage (V_R)		40V		63V		100V						
	Surge voltage (V_S)		46V		72,5V		115V						
	Appearance		No significant damage										
	Capacitance change		$\Delta C/C0 \leq \pm 10\%$										
	D.F. ($\tan \delta$)		$\Delta \tan \delta \leq$ the initial specified value										
	Leakage current (I_{ra})		$I_{ra} \leq$ the initial specified value										

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ISO 9001

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Aluminum electrolytic capacitors for Audio frequency applications, Low ESR, Low voltage, Insulated, Bipolar/ Non-polarized, Endurance at least 1.000h to 1.500h at +105°C

EKT

Generic specification:
DIN EN 60384-1

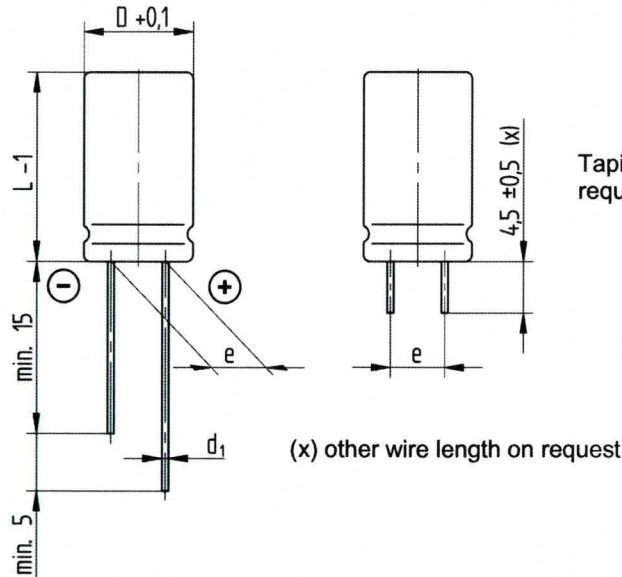
Sectional specification:
DIN EN 60384-4
without quality assessment

Operating temperature range:
- 40°C to +105°C

Climatic category:
40/105/56

Capacitance range:
±15%
(other on request, e.g. ±10%)

Surge voltage V_S :
 $V_S = 1,15 \cdot V_R$



Taping specifications on request

Dimensions (mm)			
D	10,0	12,5	16,5
d ₁ wire Ø	0,6	0,8(*)	0,8
e ±0,5	5,0	5,0	7,5
Endurance at least			
Ambient temperature	Ø 10,0 mm	Ø 12,5 mm	Ø 16,5 mm
≤ +40°C	100.000h	100.000h	150.000h
+85°C	4.000h	4.000h	6.000h
+105°C	1.000h	1.000h	1.500h

(*) 0,6 mm on request

Dimensions Overview D x L			
Capacitance C_R [µF]	Rated voltage V_R [V]		
	40	63	100
2,2	10,0 x 12,7	10,0 x 12,7	10,0 x 16,5
3,3	10,0 x 12,7	10,0 x 16,5	10,0 x 16,5
4,7	10,0 x 12,7	10,0 x 21,0	12,5 x 21,0
6,8	10,0 x 16,5	12,5 x 21,0	12,5 x 21,0
10	10,0 x 21,0	12,5 x 21,0	12,5 x 25,0
15	12,5 x 21,0	12,5 x 25,0	16,5 x 26,0
22	12,5 x 21,0	16,5 x 26,0	16,5 x 30,0
33	12,5 x 25,0	16,5 x 26,0	16,5 x 36,5
47	16,5 x 26,0	16,5 x 36,5	16,5 x 36,5
68	16,5 x 26,0	16,5 x 36,5	
100	16,5 x 36,5		

Technical specifications

Rated capacitance C_R [μF]	Rated voltage V_R [V]	AC voltage [V]	Size D x L [mm]	$\tan \delta$ 1kHz +20°C (max)	ESR [Ω] 1kHz +20°C (max)	Z [Ω] 10kHz +20°C (max)	Weight [g]	Ordering information for FROLYT electrolytic capacitors
2,2	40	15	10,0 x 12,7	0,095	6,90	10,00	1,8	Series Rated capacitance/ Rated voltage Capacitance tolerance Dimensions (Diameter x Length) Additional requirements Ordering example: EKT 10 μF 63V, $\pm 15\%$, 12,5 x 21,0mm, cut 4,5mm
3,3	40	15	10,0 x 12,7	0,095	4,60	6,70	1,8	
4,7	40	15	10,0 x 12,7	0,095	3,20	4,70	1,8	
6,8	40	15	10,0 x 16,5	0,095	2,20	3,20	2,3	
10	40	15	10,0 x 21,0	0,095	1,50	2,20	3,1	
15	40	15	12,5 x 21,0	0,080	0,85	1,50	3,5	
22	40	15	12,5 x 21,0	0,080	0,58	1,00	4,5	
33	40	15	12,5 x 25,0	0,080	0,38	0,67	5,5	
47	40	15	16,5 x 26,0	0,080	0,27	0,47	8,0	
68	40	15	16,5 x 26,0	0,080	0,19	0,32	10,0	
100	40	15	16,5 x 36,5	0,080	0,13	0,22	13,0	
2,2	63	23	10,0 x 12,7	0,090	6,50	9,50	1,8	
3,3	63	23	10,0 x 16,5	0,090	4,30	6,40	2,3	
4,7	63	23	10,0 x 21,0	0,090	3,00	4,50	3,1	
6,8	63	23	12,5 x 21,0	0,090	2,10	3,10	3,5	
10	63	23	12,5 x 21,0	0,090	1,40	2,10	4,5	
15	63	23	12,5 x 25,0	0,070	0,74	1,40	5,5	
22	63	23	16,5 x 26,0	0,070	0,50	0,95	10,0	
33	63	23	16,5 x 26,0	0,070	0,34	0,64	13,0	
47	63	23	16,5 x 36,5	0,070	0,24	0,45	16,0	
68	63	23	16,5 x 36,5	0,070	0,16	0,30	16,0	
2,2	100	35	10,0 x 16,5	0,085	6,10	9,10	2,3	
3,3	100	35	10,0 x 16,5	0,085	4,10	6,10	3,1	
4,7	100	35	12,5 x 21,0	0,085	2,90	4,30	3,5	
6,8	100	35	12,5 x 21,0	0,085	2,00	2,90	4,5	
10	100	35	12,5 x 25,0	0,085	1,35	2,00	5,5	
15	100	35	16,5 x 26,0	0,065	0,69	1,30	10,0	
22	100	35	16,5 x 30,0	0,065	0,47	0,91	13,0	
33	100	35	16,5 x 36,5	0,065	0,31	0,61	16,0	
47	100	35	16,5 x 36,5	0,065	0,21	0,42	16,0	

By using the capacitors is important to observe that:

1. The sum of the DC voltage from the equations and the greatest value from the AC voltage cannot be greater than value for the DC rated voltage.
2. The greatest value of the AC voltage cannot be greater than 42VAC for $V_R = 40\text{V}$; 64VAC for $V_R = 63\text{V}$ and 100VAC for $V_R = 100\text{V}$. That is applied for frequencies between 50 to 100Hz. For other frequencies the table for current limitations should be used.
3. The AC current should be set, so that the temperature of the capacitors surface doesn't increase more than 15K. That is related to the ambient temperature $T_{\text{amb}} \leq 40^\circ\text{C}$.

Dissipation factor $\tan \delta$ at 20°C frequency behavior	V_R	Cap. [μF]	Frequency [kHz]								
			0,05	0,1	0,2	0,5	1	2	5	10	20
			40V	≤ 10	0,070	0,080	0,085	0,090	0,095	0,140	0,270
	> 10	0,050	0,060	0,065	0,070	0,080	0,130	0,240	0,400	0,720	
63V	≤ 10	0,065	0,075	0,080	0,085	0,090	0,130	0,240	0,350	0,640	
	> 10	0,045	0,050	0,060	0,065	0,070	0,120	0,220	0,350	0,640	
100V	≤ 10	0,060	0,070	0,075	0,080	0,085	0,120	0,230	0,320	0,560	
	> 10	0,040	0,045	0,050	0,060	0,065	0,110	0,210	0,320	0,560	

Equivalent resistance ESR at 20°C frequency behavior ESR = $\frac{\text{Table value}}{C_R}$ based on 1 μF	V_R	Cap. [μF]	Frequency [kHz]								
			0,05	0,1	0,2	0,5	1	2	5	10	20
						ESR [$\Omega \cdot \mu\text{F}$]					
40V	≤ 10		223	127	68	29	15	11	9	7	6
	> 10		159	96	52	22	13	10	8	7	6
63V	≤ 10		207	120	64	27	14	10	8	6	5
	> 10		143	80	48	21	11	10	7	6	5
100V	≤ 10		191	111	60	26	14	10	8	6	5
	> 10		127	72	40	19	10	9	7	5	5

Acceptable alternating current I~ at 85°C [mA]	V _R	Cap. [µF]	Frequency [kHz]							
			0,05	0,1	0,2	0,5	1	2	5	10
40V	2,2	10	20	39	59	82	95	110	130	130
	3,3	15	29	47	73	100	120	130	150	160
	4,7	21	41	56	87	120	140	160	180	190
	6,8	30	52	71	110	150	180	200	230	250
	10	44	68	93	140	200	230	260	300	320
	15	67	100	140	220	290	320	370	410	430
	22	98	140	190	300	390	430	510	550	580
	33	150	190	260	390	520	570	670	730	770
	47	190	240	330	510	670	740	860	950	1 000
	68	240	310	420	640	850	940	1 100	1 200	1 300
100	330	420	570	870	1 100	1 300	1 500	1 600	1 700	
63V	2,2	15	29	40	61	84	99	110	130	140
	3,3	23	37	51	79	110	130	150	170	180
	4,7	33	48	66	100	140	160	190	220	230
	6,8	48	63	86	130	180	210	250	290	310
	10	66	86	120	180	250	290	340	400	420
	15	100	140	180	270	370	400	470	530	550
	22	140	190	250	380	520	560	650	730	760
	33	200	260	340	520	710	760	890	1 000	1 000
	47	250	340	430	660	900	970	1 100	1 300	1 300
68	320	440	560	840	1 200	1 300	1 500	1 600	1 700	
100V	2,2	24	32	43	66	91	110	120	150	160
	3,3	32	42	57	87	120	140	160	200	210
	4,7	41	54	74	110	160	190	210	250	270
	6,8	56	74	100	150	210	250	290	340	370
	10	73	96	130	200	280	330	370	450	480
	15	130	170	230	320	440	480	550	630	670
	22	170	230	300	440	600	650	740	850	910
	33	220	300	400	580	780	850	970	1 100	1 200
47	290	380	510	740	1 000	1 100	1 300	1 400	1 500	

All information provided in printed form requires a written confirmation in order to be legally binding within the meaning of §§463 and 480 II BGB (German Civil Code). Hence, the given data imply exclusively a product description and are not to be understood as assured qualities.