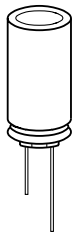
Long-life grade capacitors
Low impedance



KAL0707-F

Applications

- For use in output circuits of switch-mode power supplies of compact design
- For professional industrial electronics, telecommunications and data processing equipment

Features

- Very low impedance at high frequency
- Very low equivalent series resistance *ESR*
- High ripple current capability
- Wide temperature range
- Extended endurance test

Construction

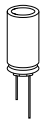
- Radial leads
- Charge-discharge proof, polar
- Aluminum case with insulating sleeve
- Minus pole marking on the insulating sleeve
- Case with safety vent
- Stand off rubber seal

Delivery mode

Special terminal configurations and packing:

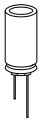
- Bulk
- Taped, Ammo pack
- Cut
- Kinked
- PAPR (protection against polarity reversal)

Refer to page 503 for further details and ordering example.



Specifications and characteristics in brief

Rated voltage U_R Surge voltage U_S	6,3 … 50 VDC 1,15 · U_R	
Rated capacitance C_R Capacitance tolerance	100 … 4 700 µF ± 20 % ≙ M	
Useful life 105 °C; U_R; $I_{\sim R}$ 105 °C; U_R; $I_{\sim R}$ 105 °C; U_R; $I_{\sim R}$	 > 3 000 h for d = 8 mm > 5 000 h for d = 10 mm > 7 000 h for d ≥ 12,5 mm	Requirements: $\Delta C/C$ ≤ ± 40 % of initial value tan δ ≤ 3 times initial specified limit I_L ≤ initial specified limit Failure percentage: ≤ 1 % Failure rate: ≤ 100 fit (≤ 100 · 10^{-9}/h) (for definiton “fit”, refer to chapter *“Quality”*, page 62)
Voltage endurance test 105 °C; U_R	 3 000 h for d = 8 mm 5 000 h for d = 10 mm 7 000 h for d ≥ 12,5 mm	Post test requirements: ΔC/C ≤ ± 30 % of initial value tan δ ≤ 3 times initial specified limit I_L ≤ initial specified limit
Vibration resistance	To IEC 68068-2-6, test Fc: displacement amplitude 0,75 mm, frequency range 10 … 2000 Hz, acceleration max.10 g, duration 3 × 2 h	
IEC climatic category	To IEC 60068-1: 55/105/56 (– 55 °C/+ 105 °C/56 days damp heat test)	
Sectional specification	IEC 60384-4	



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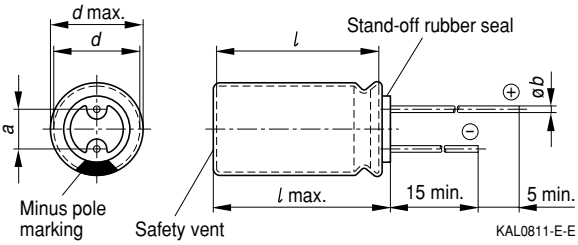
Extended Useful Life – 105 °C

Dimensional drawing



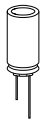
Dimensions and weights

Dimensions (mm)				Approx. weight
$d \times l$	$d_{max} \times l_{max}$	$a \pm 0{,}5$	b	g
8 × 11	8,5 × 12	3,5	0,60 ± 0,05	1,0
10 × 12,5	10,5 × 13,5	5,0	0,60 ± 0,05	1,6
10 × 16	10,5 × 17	5,0	0,60 ± 0,05	1,9
10 × 20	10,5 × 22	5,0	0,60 ± 0,05	2,6
12,5 × 25	13 × 27	5,0	0,60 ± 0,05	4,5
16 × 20	16,5 × 22	7,5	0,80 ± 0,05	5,5
16 × 25	16,5 × 27	7,5	0,80 ± 0,05	7,5
16 × 31,5	16,5 × 33,5	7,5	0,80 ± 0,05	7,8
18 × 31,5	18,5 × 32,5	7,5	0,80 ± 0,1	11
18 × 35	18,5 × 36	7,5	0,80 ± 0,1	13
18 × 40	18,5 × 41	7,5	0,80 ± 0,1	16

Overview of available types

U_R (VDC)	6,3	10	16	25	35	50
C_R (µF)	Case dimensions $d \times l$ (mm)					
100				8 × 11	10 × 12,5	10 × 16
220			8 × 11	10 × 12,5	10 × 16	10 × 20
330	8 × 11	8 × 11	10 × 12,5	10 × 16	10 × 20	12,5 × 25
470	10 × 12,5	10 × 16	10 × 16	10 × 20	12,5 × 25	16 × 25
1 000	10 × 16	10 × 20	10 × 20	12,5 × 25	16 × 25	18 × 31,5
2 200	12,5 × 25	12,5 × 25	16 × 25	16 × 31,5	18 × 35	
3 300	16 × 20	16 × 25	18 × 31,5	18 × 35	18 × 40	
4 700	16 × 25	16 × 31,5	18 × 40	18 × 40		

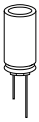
The capacitance and voltage ratings listed above are available in smaller cases upon request. Other capacitance and voltage ratings are available upon request.



Technical data and ordering codes

U_R VDC	C_R 120 Hz 20 °C µF	Case dimensions $d \times l$ mm	$I_{L,\,max}$ 5 min 20 °C µA	tan δ_{max} 120 Hz 20 °C	ESR_{max} 120 Hz 20 °C Ω	Z_{max} 100 kHz 20 °C Ω	$I_{\sim R}$ 100 kHz 105 °C mA	Ordering code[1)]
6,3	330	8 × 11	21	0,26	1,31	0,300	360	B41888A2337M00*
	470	10 × 12,5	30	0,26	0,92	0,180	600	B41888A2477M00*
	1 000	10 × 16	63	0,26	0,43	0,120	750	B41888A2108M00*
	2 200	12,5 × 25	139	0,28	0,21	0,060	1 300	B41888A2228M00*
	3 300	16 × 20	208	0,30	0,15	0,045	1 450	B41888A2338M00*
	4 700	16 × 25	296	0,32	0,11	0,038	1 900	B41888A2478M00*
10	330	8 × 11	33	0,22	1,11	0,200	440	B41888A3337M00*
	470	10 × 16	47	0,22	0,78	0,150	640	B41888A3477M00*
	1 000	10 × 20	100	0,22	0,36	0,068	1 120	B41888A3108M00*
	2 200	12,5 × 25	220	0,24	0,18	0,038	1 620	B41888A3228M00*
	3 300	16 × 25	330	0,26	0,13	0,030	1 700	B41888A3338M00*
	4 700	16 × 31,5	470	0,28	0,10	0,026	2 210	B41888A3478M00*
16	220	8 × 11	35	0,16	1,21	0,200	530	B41888A4227M00*
	330	10 × 12,5	53	0,16	0,80	0,120	640	B41888A4337M00*
	470	10 × 16	75	0,16	0,56	0,090	840	B41888A4477M00*
	1 000	10 × 20	160	0,16	0,27	0,050	1 340	B41888A4108M00*
	2 200	16 × 25	352	0,18	0,14	0,030	1 800	B41888A4228M00*
	3 300	18 × 31,5	528	0,20	0,10	0,024	2 310	B41888A4338M00*
	4 700	18 × 40	752	0,22	0,08	0,020	2 790	B41888A4478M00*
25	100	8 × 11	25	0,14	2,32	0,200	340	B41888A5107M00*
	220	10 × 12,5	55	0,14	1,06	0,120	510	B41888A5227M00*
	330	10 × 16	83	0,14	0,70	0,084	830	B41888A5337M00*
	470	10 × 20	118	0,14	0,49	0,065	1 080	B41888A5477M00*
	1 000	12,5 × 25	250	0,14	0,23	0,040	1 690	B41888A5108M00*
	2 200	16 × 31,5	550	0,16	0,12	0,024	2 310	B41888A5228M00*
	3 300	18 × 35	825	0,18	0,09	0,018	2 740	B41888A5338M00*
	4 700	18 × 40	1 175	0,20	0,07	0,015	3 090	B41888A5478M00*

1) * = “0” for bulk version.
For taping versions, other lead configurations and packing information see page 503.



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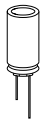
Extended Useful Life – 105 °C

Technical data and ordering codes

U_R VDC	C_R 120 Hz 20 °C µF	Case dimensions $d \times l$ mm	$I_{L,\,max}$ 5 min 20 °C µA	tan δ_{max} 120 Hz 20 °C	ESR_{max} 120 Hz 20 °C Ω	Z_{max} 100 kHz 20 °C Ω	$I_{\sim R}$ 100 kHz 105 °C mA	Ordering code[1)]
35	100	10 × 12,5	35	0,12	1,99	0,160	500	B41888A7107M00*
	220	10 × 16	77	0,12	0,90	0,084	820	B41888A7227M00*
	330	10 × 20	116	0,12	0,60	0,065	1 090	B41888A7337M00*
	470	12,5 × 25	165	0,12	0,42	0,052	1 300	B41888A7477M00*
	1 000	16 × 25	350	0,12	0,20	0,034	1 960	B41888A7108M00*
	2 200	18 × 35	770	0,14	0,11	0,018	2 850	B41888A7228M00*
	3 300	18 × 40	1 155	0,16	0,08	0,015	3 150	B41888A7338M00*
50	100	10 × 16	50	0,10	1,66	0,160	640	B41888A6107M00*
	220	10 × 20	110	0,10	0,75	0,100	1 050	B41888A6227M00*
	330	12,5 × 25	165	0,10	0,50	0,070	1 400	B41888A6337M00*
	470	16 × 25	235	0,10	0,35	0,065	1 240	B41888A6477M00*
	1 000	18 × 31,5	500	0,10	0,17	0,034	2 310	B41888A6108M00*

1) * = “0” for bulk version.
For taping versions, other lead configurations and packing information see page 503.

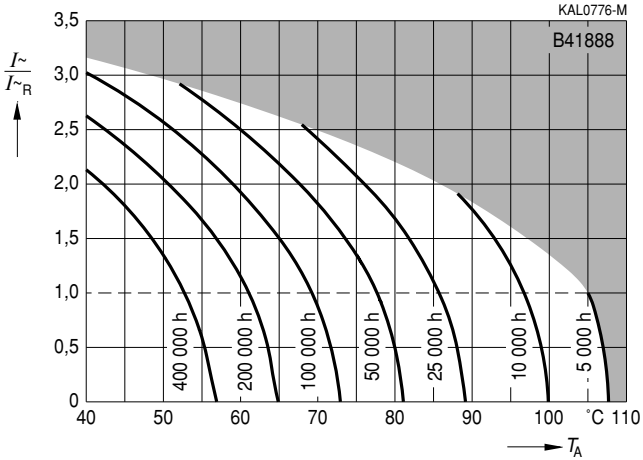


Useful life

depending on ambient temperature T_A under ripple current operating conditions[1)]

U_R = 6,3 ... 50 VDC

d = 10 mm

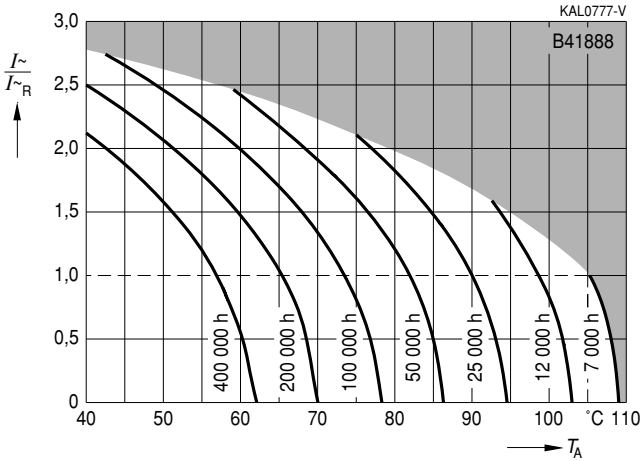


Useful life

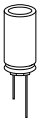
depending on ambient temperature T_A under ripple current operating conditions[1)]

U_R = 6,3 ... 50 VDC

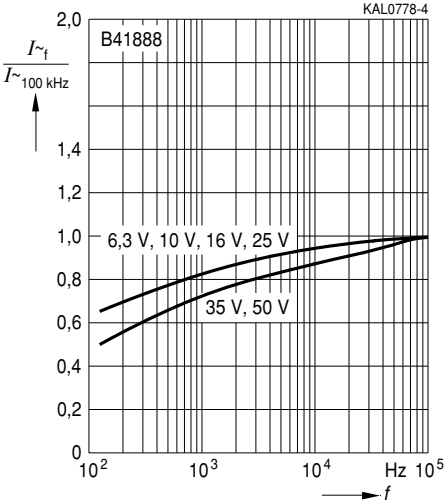
$d \geq$ 12,5 mm



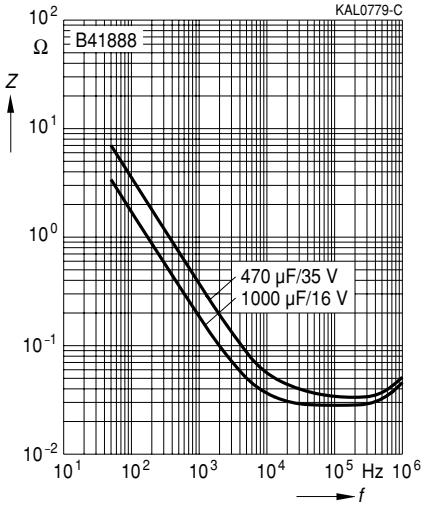
1) Refer to page 40 for an explanation on how to interpret the useful life graphs.



Frequency factor of permissible ripple current *I~*
versus frequency *f*



Impedance Z
versus frequency *f*
Typical behavior at 20 °C



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Unternehmenskommunikation, Postfach 80 17 09, 81617 München, DEUTSCHLAND
☎ ++49 89 636 09, FAX (0 89) 636-2 26 89

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