

**Long-life grade capacitors for telecommunications
and automotive electronics**

Applications

- High-reliability equipment in industrial and automotive electronics
- High-temperature environments

Features

- High reliability and long useful life
- High ripple current capability
- Wide temperature range up to 125 °C

Construction

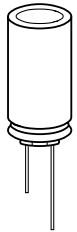
- Charge-discharge proof, polar
- Aluminum case with insulating sleeve
- Minus pole marking on the insulating sleeve
- Stand off rubber seal
- Case with safety vent

Delivery mode

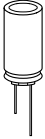
Special terminal configurations and packing:

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

Refer to page 503 for further details and ordering example.



KAL0707-F

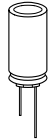
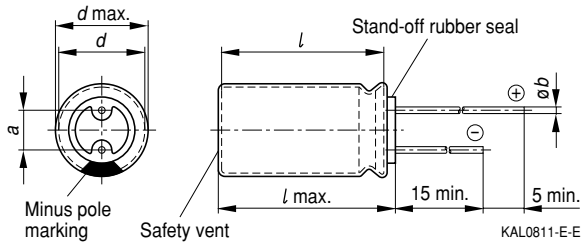


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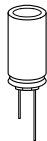
125 °C

Specifications and characteristics in brief

Rated voltage U_R	10 ... 63 VDC	
Surge voltage U_S	$1,15 \cdot U_R$	
Rated capacitance C_R	0,47 ... 4 700 μ F	
Capacitance tolerance	$\pm 20 \% \triangleq M$	
Useful life 125 °C; U_R ; I_{-R} 85 °C; U_R ; I_{-R} 40 °C; U_R ; I_{-R}	> 2 000 h > 40 000 h > 500 000 h	Requirements: $\Delta C/C \leq \pm 35 \%$ of initial value $\tan \delta \leq 3$ times initial specified limit $I_L \leq$ initial specified limit Failure percentage: $\leq 1 \%$ Failure rate: ≤ 40 fit ($\leq 40 \cdot 10^{-9}/h$) (for definition "fit", refer to chapter "Quality", page 62)
Voltage endurance test 125 °C; U_R	2 000 h	Post test requirements: $\Delta C/C \leq \pm 30 \%$ of initial value $\tan \delta \leq 2$ times initial specified limit $I_L \leq$ initial specified limit
Vibration resistance	To IEC 60068-2-6, 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: 55/125/56 (– 55 °C/+ 125 °C/56 days damp heat test)	
Sectional specification	IEC 60384-4	

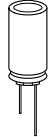

Dimensional drawing

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	$0,60 \pm 0,05$	1,0
10 × 12,5	10,5 × 13,5	5,0	$0,60 \pm 0,05$	1,6
10 × 16	10,5 × 17	5,0	$0,60 \pm 0,05$	1,9
10 × 20	10,5 × 22	5,0	$0,60 \pm 0,05$	2,6
12,5 × 25	13 × 27	5,0	$0,60 \pm 0,05$	4,5
16 × 25	16,5 × 27	7,5	$0,80 \pm 0,05$	7,5
16 × 31,5	16,5 × 33,5	7,5	$0,80 \pm 0,05$	7,8
18 × 31,5	18,5 × 32,5	7,5	$0,80 \pm 0,1$	11
18 × 35	18,5 × 36	7,5	$0,80 \pm 0,1$	13
18 × 40	18,5 × 41	7,5	$0,80 \pm 0,1$	16
20 × 35	20,5 × 37	10	$0,80 \pm 0,1$	18
20 × 40	20,5 × 42	10	$0,80 \pm 0,1$	20


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125 °C
Overview of available types

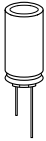
U_R (VDC)	10	16	25	35	50	63
C_R (μ F)	Case dimensions $d \times l$ (mm)					
0,47					8 × 11	
1,0					8 × 11	
2,2					8 × 11	
3,3					8 × 11	
4,7					8 × 11	
10					8 × 11	
22				10 × 12,5	10 × 16	
33			10 × 12,5	10 × 12,5	10 × 16	
47		8 × 11	10 × 12,5	10 × 16	10 × 16 10 × 20	10 × 20
100	10 × 12,5	10 × 16	10 × 16 10 × 20	10 × 16 12,5 × 25	10 × 20 12,5 × 25	12,5 × 25
220	10 × 12,5 10 × 20	10 × 20 12,5 × 25	10 × 20 12,5 × 25	10 × 20 16 × 25	12,5 × 25	12,5 × 25
330	10 × 16 12,5 × 25	10 × 20 12,5 × 25	10 × 20 16 × 25	12,5 × 25	16 × 25	16 × 25
470	10 × 16 12,5 × 25	10 × 20 16 × 25	12,5 × 25	12,5 × 25	16 × 25	16 × 25
1 000	10 × 20	12,5 × 25	16 × 25	16 × 31,5	18 × 31,5	18 × 31,5
2 200	16 × 25	16 × 31,5	18 × 31,5	18 × 40		
3 300	16 × 31,5	18 × 31,5	18 × 40	20 × 40		
4 700	18 × 31,5	18 × 35	20 × 35			

Other voltage and capacitance ratings are also available upon request.


Technical data and ordering codes

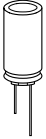
U_R	C_R 120 Hz 20 °C μF	Case dimensions $d \times l$ mm	I_L 5 min 20 °C μA	$\tan \delta_{\max}$ 120 Hz 20 °C	ESR_{\max} 120 Hz 20 °C Ω	$I_{\sim R}$ 120 Hz 125 °C mA	Ordering code ¹⁾
10	100	10 × 12,5	10	0,20	3,3	130	B41866A3107M00*
	220	10 × 12,5	22	0,20	1,5	180	B41866F3227M00*
	220	10 × 20	22	0,20	1,5	240	B41866A3227M00*
	330	10 × 16	33	0,20	1,0	260	B41866F3337M00*
	330	12,5 × 25	33	0,20	1,0	290	B41866A3337M00*
	470	10 × 16	47	0,20	0,71	275	B41866F3477M00*
	470	12,5 × 25	47	0,20	0,71	380	B41866A3477M00*
	1 000	10 × 20	100	0,20	0,33	460	B41866F3108M00*
	2 200	16 × 25	220	0,22	0,17	900	B41866F3228M00*
	3 300	16 × 31,5	330	0,24	0,12	1150	B41866F3338M00*
4 700	18 × 31,5	470	0,26	0,09	1280	B41866F3478M00*	
16	47	8 × 11	7,5	0,17	6,0	90	B41866A4476M00*
	100	10 × 16	16	0,17	2,8	165	B41866A4107M00*
	220	10 × 20	35	0,17	1,3	250	B41866F4227M00*
	220	12,5 × 25	35	0,17	1,3	290	B41866A4227M00*
	330	10 × 20	53	0,17	0,85	275	B41866F4337M00*
	330	12,5 × 25	53	0,17	0,85	385	B41866A4337M00*
	470	10 × 20	75	0,17	0,60	300	B41866F4477M00*
	470	16 × 25	75	0,17	0,60	480	B41866A4477M00*
	1 000	12,5 × 25	160	0,17	0,28	640	B41866F4108M00*
	2 200	16 × 31,5	352	0,19	0,14	1100	B41866F4228M00*
	3 300	18 × 31,5	528	0,21	0,11	1250	B41866F4338M00*
	4 700	18 × 35	752	0,23	0,08	1550	B41866F4478M00*
25	33	10 × 12,5	8,3	0,17	8,5	90	B41866A5336M00*
	47	10 × 12,5	12	0,17	6,0	110	B41866A5476M00*
	100	10 × 16	25	0,17	2,8	190	B41866F5107M00*
	100	10 × 20	25	0,17	2,8	210	B41866A5107M00*
	220	10 × 20	55	0,17	1,3	250	B41866F5227M00*
	220	12,5 × 25	55	0,17	1,3	360	B41866A5227M00*
	330	10 × 20	83	0,17	0,85	275	B41866F5337M00*
	330	16 × 25	83	0,17	0,85	450	B41866A5337M00*
	470	12,5 × 25	118	0,17	0,60	440	B41866F5477M00*
	1 000	16 × 25	250	0,17	0,28	850	B41866F5108M00*
	2 200	18 × 31,5	550	0,19	0,14	1260	B41866F5228M00*
	3 300	18 × 40	825	0,21	0,11	1450	B41866F5338M00*
	4 700	20 × 35	1175	0,23	0,08	2300	B41866F5478M00*

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


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125 °C

U_R	C_R 120 Hz 20 °C μF	Case dimensions $d \times l$ mm	I_L 5 min 20 °C μA	$\tan \delta_{\max}$ 120 Hz 20 °C	ESR_{\max} 120 Hz 20 °C Ω	I_{-R} 120 Hz 125 °C mA	Ordering code ¹⁾
35	22	10 × 12,5	7,7	0,12	9,0	80	B41866A7226M00*
	33	10 × 12,5	12	0,12	6,0	95	B41866A7336M00*
	47	10 × 16	16	0,12	4,2	140	B41866A7476M00*
	100	10 × 16	35	0,12	2,0	190	B41866F7107M00*
	100	12,5 × 25	35	0,12	2,0	210	B41866A7107M00*
	220	10 × 20	77	0,12	0,90	250	B41866K7227M00*
	220	16 × 25	77	0,12	0,90	390	B41866A7227M00*
	330	12,5 × 25	116	0,12	0,60	370	B41866F7337M00*
	470	12,5 × 25	165	0,12	0,42	440	B41866F7477M00*
	1 000	16 × 31,5	350	0,12	0,20	830	B41866F7108M00*
	2 200	18 × 40	770	0,14	0,11	1350	B41866F7228M00*
	3 300	20 × 40	1155	0,16	0,08	2500	B41866F7338M00*
50	0,47	8 × 11	4,0	0,10	353	2	B41866A6474M00*
	1,0	8 × 11	4,0	0,10	166	7	B41866A6105M00*
	2,2	8 × 11	4,0	0,10	75	14	B41866A6225M00*
	3,3	8 × 11	4,0	0,10	50	23	B41866A6335M00*
	4,7	8 × 11	4,0	0,10	35	30	B41866A6475M00*
	10	8 × 11	5,0	0,10	17	48	B41866A6106M00*
	22	10 × 16	11	0,10	7,5	83	B41866A6226M00*
	33	10 × 16	17	0,10	5,0	100	B41866A6336M00*
	47	10 × 16	24	0,10	3,5	140	B41866F6476M00*
	47	10 × 20	24	0,10	3,5	145	B41866A6476M00*
	100	10 × 20	50	0,10	1,7	200	B41866F6107M00*
	100	12,5 × 25	50	0,10	1,7	275	B41866A6107M00*
	220	12,5 × 25	110	0,10	0,75	350	B41866F6227M00*
	330	16 × 25	165	0,10	0,50	490	B41866F6337M00*
470	16 × 25	235	0,10	0,35	520	B41866F6477M00*	
1 000	18 × 31,5	500	0,10	0,17	890	B41866F6108M00*	
63	47	10 × 20	24	0,10	3,5	155	B41866A8476M00*
	100	12,5 × 25	50	0,10	1,7	290	B41866A8107M00*
	220	12,5 × 25	110	0,10	0,75	380	B41866A8227M00*
	330	16 × 25	165	0,10	0,50	530	B41866A8337M00*
	470	16 × 25	235	0,10	0,35	700	B41866A8477M00*
	1 000	18 × 31,5	500	0,10	0,17	890	B41866A8108M00*

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



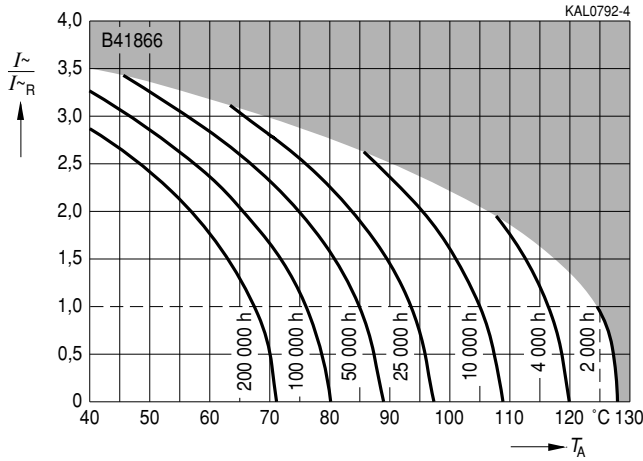
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125 °C

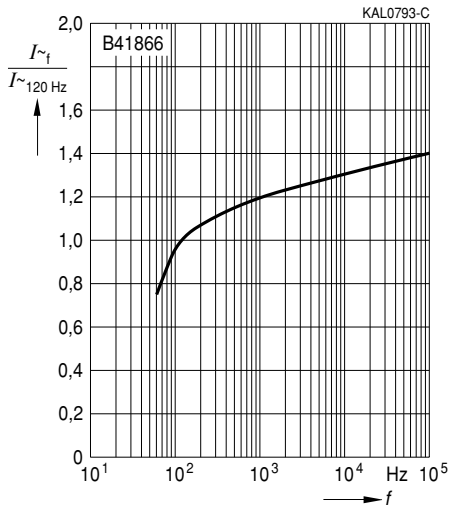
Useful life

depending on ambient temperature T_A under ripple current operating conditions¹⁾

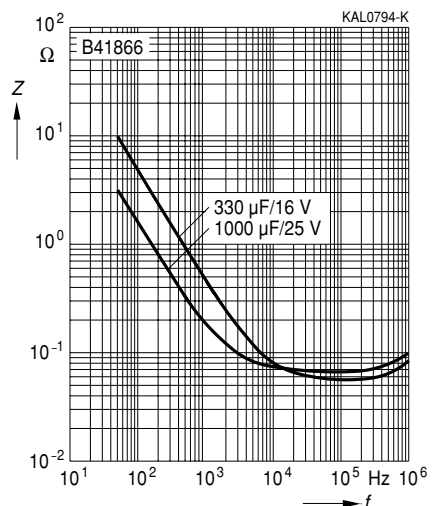
$U_R = 10 \dots 50$ VDC



Frequency factor of permissible ripple current I_{\sim} versus frequency f



Impedance Z versus frequency f
Typical behavior at 20 °C



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

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