

**Long-life grade capacitors
for professional applications**

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
- High reliability and long useful life
- Wide temperature range

Construction

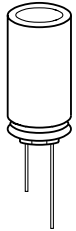
- Radial leads
- Charge-discharge proof, polar
- Aluminum case with insulating sleeve
- Minus pole marking on the insulating sleeve
- Case with safety vent
- Stand off rubber seal

Delivery mode

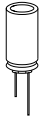
Special terminal configurations and packing:

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

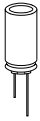
Refer to page 503 for further details and ordering example.



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Specifications and characteristics in brief

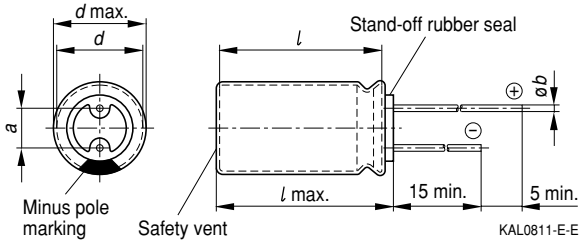
Rated voltage U_R	10 ... 50 VDC	
Surge voltage U_S	$1,15 \cdot U_R$	
Rated capacitance C_R	100 ... 4 700 μ F	
Capacitance tolerance	$\pm 20 \% \triangleq M$	
Useful life 105 °C; U_R ; I_{-R} 105 °C; U_R ; I_{-R}	> 3 000 h for $d = 8$ mm > 5 000 h for $d \geq 10$ mm	Requirements: $\Delta C/C \leq \pm 40 \%$ of initial value $\tan \delta \leq 3$ times initial specified limit $I_L \leq$ initial specified limit Failure percentage: $\leq 1 \%$ Failure rate: ≤ 100 fit ($\leq 100 \cdot 10^{-9}/h$) (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 $d \geq 10$ mm	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
IEC climatic category	To IEC 60068-1: 55/105/56 (– 55 °C/+105 °C/56 days damp heat test)	
Sectional specification	IEC 60384-4	
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	



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Very Low Impedance – 105 °C

Dimensional drawing



Dimensions and weights

Dimensions (mm)				Approx. weight g
$d \times l$	$d_{max} \times l_{max}$	$a \pm 0,5$	b	
8 × 11	8,5 × 12	3,5	0,60 ± 0,05	1,0
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

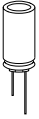
U_R (VDC)	10	16	25	35	50
C_R (µF)	Case dimensions $d \times l$ (mm)				
100			8 × 11	8 × 11	10 × 16
220		8 × 11	10 × 16	10 × 16	10 × 20
330	8 × 11	10 × 16	10 × 16	10 × 20	12,5 × 25
470	10 × 16	10 × 16	10 × 20	10 × 20	16 × 20
1 000	10 × 20	10 × 20	12,5 × 25	16 × 25	18 × 31,5
2 200	12,5 × 25	16 × 20	16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

Other capacitance and voltage ratings are available upon request.


Technical data and ordering codes

U_R	C_R	Case dimensions	$I_{L, \max}$	$\tan \delta_{\max}$	ESR_{\max}	Z_{\max}	I_{-R}	Ordering code ¹⁾
VDC	120 Hz 20 °C μF	$d \times l$ mm	5 min 20 °C μA	120 Hz 20 °C	120 Hz 20 °C Ω	100 kHz 20 °C Ω	100 kHz 105 °C mA	
10	330	8 × 11	33	0,19	0,95	0,170	440	B41858A3337M00*
	470	10 × 16	47	0,19	0,67	0,120	640	B41858A3477M00*
	1 000	10 × 20	100	0,19	0,31	0,062	1 120	B41858A3108M00*
	2 200	12,5 × 25	220	0,21	0,16	0,034	1 620	B41858A3228M00*
	3 300	16 × 20	330	0,23	0,12	0,030	1 700	B41858A3338M00*
	4 700	16 × 31,5	470	0,25	0,09	0,024	2 210	B41858A3478M00*
16	220	8 × 11	35	0,16	1,21	0,120	530	B41858A4227M00*
	330	10 × 16	53	0,16	0,80	0,100	640	B41858A4337M00*
	470	10 × 16	75	0,16	0,56	0,084	840	B41858A4477M00*
	1 000	10 × 20	160	0,16	0,27	0,050	1 340	B41858A4108M00*
	2 200	16 × 20	352	0,18	0,14	0,030	1 800	B41858A4228M00*
	3 300	16 × 31,5	528	0,20	0,10	0,024	2 310	B41858A4338M00*
25	100	8 × 11	25	0,14	2,32	0,180	340	B41858A5107M00*
	220	10 × 16	55	0,14	1,06	0,120	620	B41858A5227M00*
	330	10 × 16	83	0,14	0,70	0,084	830	B41858A5337M00*
	470	10 × 20	118	0,14	0,49	0,062	1 080	B41858A5477M00*
	1 000	12,5 × 25	250	0,14	0,23	0,034	1 690	B41858A5108M00*
	2 200	16 × 31,5	550	0,16	0,12	0,024	2 310	B41858A5228M00*
35	100	8 × 11	35	0,12	1,99	0,120	500	B41858A7107M00*
	220	10 × 16	77	0,12	0,90	0,084	820	B41858A7227M00*
	330	10 × 20	116	0,12	0,60	0,062	1 090	B41858A7337M00*
	470	10 × 20	165	0,12	0,42	0,052	1 200	B41858A7477M00*
	1 000	16 × 25	350	0,12	0,20	0,030	1 960	B41858A7108M00*
	2 200	18 × 35	770	0,14	0,11	0,018	2 850	B41858A7228M00*
50	100	10 × 16	50	0,10	1,66	0,130	640	B41858A6107M00*
	220	10 × 20	110	0,10	0,75	0,080	1 050	B41858A6227M00*
	330	12,5 × 25	165	0,10	0,50	0,062	1 400	B41858A6337M00*
	470	16 × 20	235	0,10	0,35	0,048	1 240	B41858A6477M00*
	1 000	18 × 31,5	500	0,10	0,17	0,030	2 310	B41858A6108M00*

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



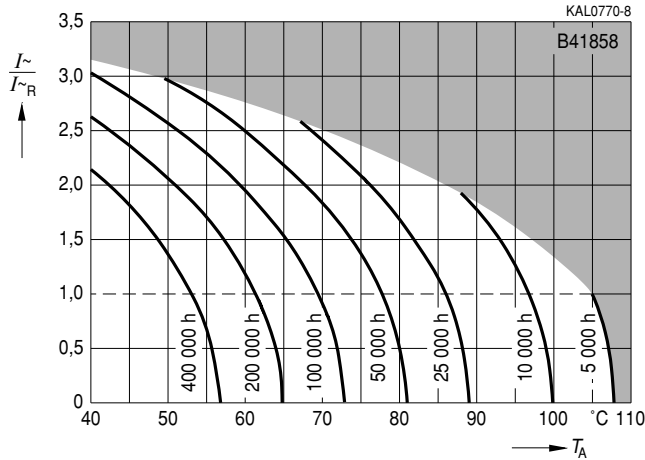
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Very Low Impedance – 105 °C

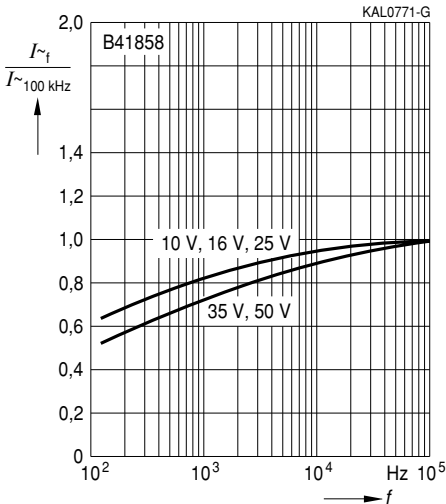
Useful life

depending on ambient temperature T_A under ripple current operating conditions¹⁾

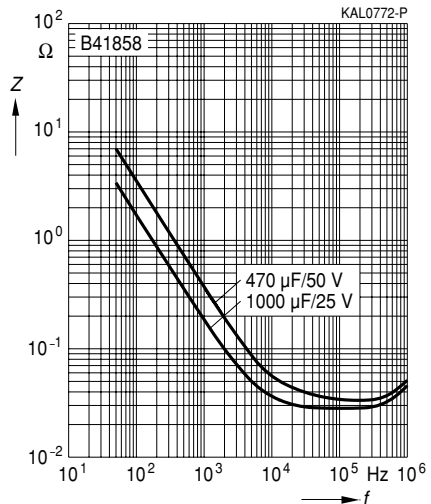
$U_R = 10 \dots 50$ VDC



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.

Herausgegeben von EPCOS AG

Unternehmenskommunikation, Postfach 80 17 09, 81617 München, DEUTSCHLAND

☎ ++49 89 636 09, FAX (0 89) 636-2 26 89

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Published by EPCOS AG

Corporate Communications, P.O. Box 80 17 09, 81617 Munich, GERMANY

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