

**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**

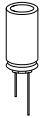
Special terminal configurations and packing:

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

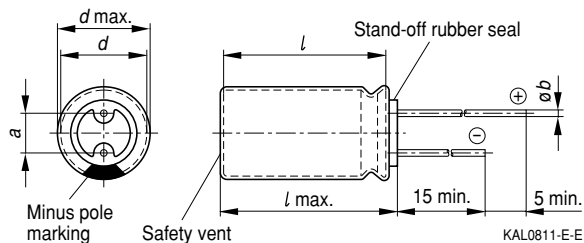
Refer to page 503 for further details and ordering example.



KAL0707-F


**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 $\mu$ 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: $\leq 100$ fit ( $\leq 100 \cdot 10^{-9}/h$ ) (for definition "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 $3 \times 2$ h	


**B41858**
**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**

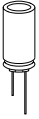
$U_R$ (VDC)	10	16	25	35	50
$C_R$ (µF)	Case dimensions $d \times l$ (mm)				
100			8 × 11	8 × 11	10 × 16
220		8 × 11	10 × 16	10 × 16	10 × 20
330	8 × 11	10 × 16	10 × 16	10 × 20	12,5 × 25
470	10 × 16	10 × 16	10 × 20	10 × 20	16 × 20
1 000	10 × 20	10 × 20	12,5 × 25	16 × 25	18 × 31,5
2 200	12,5 × 25	16 × 20	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 <sup>1)</sup>
VDC	120 Hz 20 °C $\mu\text{F}$	$d \times l$ mm	5 min 20 °C $\mu\text{A}$	120 Hz 20 °C	120 Hz 20 °C $\Omega$	100 kHz 20 °C $\Omega$	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.



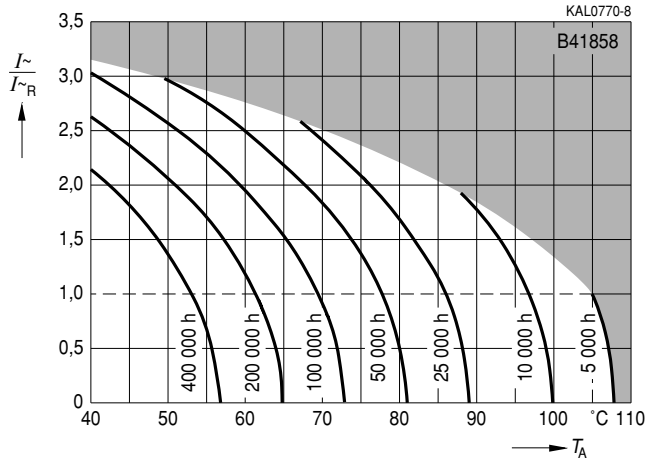
**B41858**

**Very Low Impedance – 105 °C**

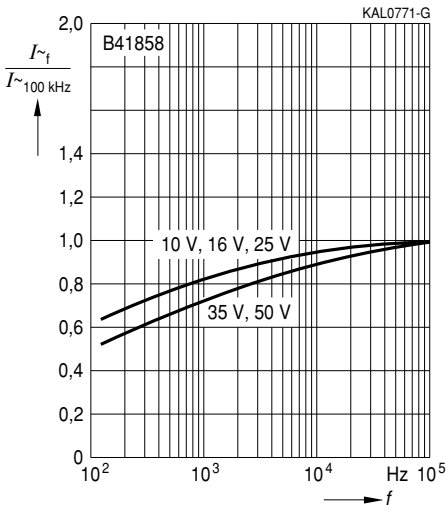
**Useful life**

depending on ambient temperature  $T_A$  under ripple current operating conditions<sup>1)</sup>

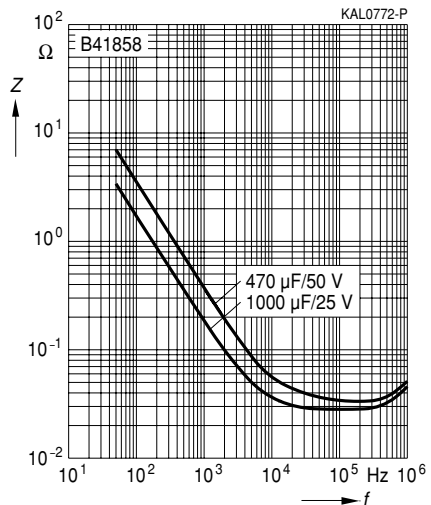
$U_R = 10 \dots 50$  VDC



**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**

© EPCOS AG 2002. Vervielfältigung, Veröffentlichung, Verbreitung und Verwertung dieser Broschüre und ihres Inhalts ohne ausdrückliche Genehmigung der EPCOS AG nicht gestattet.

Bestellungen unterliegen den vom ZVEI empfohlenen Allgemeinen Lieferbedingungen für Erzeugnisse und Leistungen der Elektroindustrie, soweit nichts anderes vereinbart wird.

Diese Broschüre ersetzt die vorige Ausgabe.

Fragen über Technik, Preise und Liefermöglichkeiten richten Sie bitte an den Ihnen nächstgelegenen Vertrieb der EPCOS AG oder an unsere Vertriebsgesellschaften im Ausland. Bauelemente können aufgrund technischer Erfordernisse Gefahrstoffe enthalten. Auskünfte darüber bitten wir unter Angabe des betreffenden Typs ebenfalls über die zuständige Vertriebsgesellschaft einzuholen.

**Published by EPCOS AG**

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

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

© EPCOS AG 2002. Reproduction, publication and dissemination of this brochure and the information contained therein without EPCOS' prior express consent is prohibited.

Purchase orders are subject to the General Conditions for the Supply of Products and Services of the Electrical and Electronics Industry recommended by the ZVEI (German Electrical and Electronic Manufacturers' Association), unless otherwise agreed.

This brochure replaces the previous edition.

For questions on technology, prices and delivery please contact the Sales Offices of EPCOS AG or the international Representatives.

Due to technical requirements components may contain dangerous substances. For information on the type in question please also contact one of our Sales Offices.