

**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**

- Low equivalent series resistance *ESR*
- Low impedance
- High ripple current capability

**Construction**

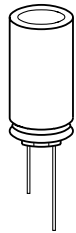
- Radial leads
- Charge-discharge proof, polar
- Aluminum case with insulating sleeve
- Minus pole marking on insulating sleeve
- Case with safety vent
- Stand off rubber seal

**Delivery mode**

Special terminal configurations and packing:

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

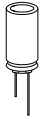
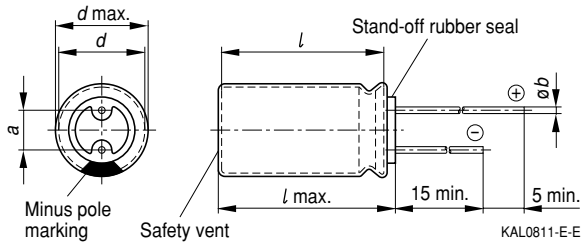
Refer to page 503 for further details and ordering example.



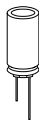
KAL0707-F


**B41856**
**Low Impedance – 105 °C**
**Specifications and characteristics in brief**

Rated voltage $U_R$	6,3 ... 100 VDC	
Surge voltage $U_S$	$1,15 \cdot U_R$	
Rated capacitance $C_R$	22 ... 4 700 $\mu\text{F}$	
Capacitance tolerance	$\pm 20 \% \triangleq M$	
Useful life 105 °C; $U_R$ ; $I_{-R}$	> 4 000 h	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 ( $\leq 100 \cdot 10^{-9}/\text{h}$ ) (for definition "fit", refer to chapter "Quality", page 62)
Voltage endurance test 105 °C; $U_R$	2 000 h	Post test requirements: $\Delta C/C \leq \pm 20 \%$ 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 ... 2 000 Hz, acceleration max. 10 g, duration $3 \times 2$ h	
IEC climatic category	To IEC 60068-1: 40/105/56 (– 40 °C/+ 105 °C/56 days damp heat test)	
Sectional specification	IEC 60384-4	


**Dimensional drawings**

**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


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**Overview of available types**

$U_R$ (VDC)	6,3	10	16	25	35	50	63	100
$C_R$ ( $\mu$ F)	Case dimensions $d \times l$ (mm)							
22								10 ×12,5
33								10 ×16
47							10 ×12,5	10 ×20
100					8×11	10 ×12,5	10 ×20	12,5×25
220			8×11	10 ×12,5	10×12,5	10 ×16	12,5×25	16 ×31,5
330		8 ×11		10 ×12,5	10×16	10 ×20	12,5×25	18 ×31,5
470		10 ×12,5	10×16		10×20	12,5×25	16 ×25	18 ×35
1 000		10 ×16	10×20	12,5×25	16×20	16 ×25	18 ×35	
1 500	10×20							
2 200		12,5×25	16×20	16 ×25	16×31,5	18 ×40		
3 300		16 ×20	16×25	16 ×31,5	18×35			
4 700		16 ×25	16×31,5	18 ×35				

Other capacitance and voltage ratings are available upon request.


**Technical data and ordering codes**

$U_R$	$C_R$ 120 Hz 20 °C $\mu\text{F}$	Case dimensions $d \times l$ mm	$I_{L, \max}$ 5 min 20 °C $\mu\text{A}$	$\tan \delta_{\max}$ 120 Hz 20 °C	$ESR_{\max}$ 120 Hz 20 °C $\Omega$	$Z_{\max}$ 100 kHz 20 °C $\Omega$	$I_{\sim R}$ 100 kHz 105 °C mA	Ordering code <sup>1)</sup>
6,3	1 500	10 × 20	95	0,22	0,24	0,044	1 200	B41856A2158M00*
10	330	8 × 11	99	0,20	1,01	0,340	310	B41856A3337M00*
	470	10 × 12,5	141	0,20	0,71	0,340	370	B41856A3477M00*
	1 000	10 × 16	300	0,20	0,33	0,170	640	B41856A3108M00*
	2 200	12,5 × 25	660	0,22	0,17	0,090	1 000	B41856A3228M00*
	3 300	16 × 20	990	0,24	0,12	0,069	1 250	B41856A3338M00*
	4 700	16 × 25	1 410	0,26	0,09	0,046	1 400	B41856A3478M00*
16	220	8 × 11	106	0,16	1,21	0,340	328	B41856A4227M00*
	470	10 × 16	226	0,16	0,56	0,230	480	B41856A4477M00*
	1 000	10 × 20	480	0,16	0,27	0,140	800	B41856A4108M00*
	2 200	16 × 20	1 056	0,18	0,14	0,069	1 150	B41856A4228M00*
	3 300	16 × 25	1 584	0,20	0,10	0,046	1 400	B41856A4338M00*
	4 700	16 × 31,5	2 256	0,22	0,08	0,040	1 750	B41856A4478M00*
25	220	10 × 12,5	165	0,14	1,06	0,340	328	B41856A5227M00*
	330	10 × 12,5	248	0,14	0,70	0,230	480	B41856A5337M00*
	1 000	12,5 × 25	750	0,14	0,23	0,090	1 000	B41856A5108M00*
	2 200	16 × 25	1 650	0,16	0,12	0,046	1 400	B41856A5228M00*
	3 300	16 × 31,5	2 475	0,18	0,09	0,040	1 750	B41856A5338M00*
	4 700	18 × 35	3 555	0,20	0,07	0,036	2 000	B41856A5478M00*
35	100	8 × 11	105	0,12	1,99	0,340	328	B41856A7107M00*
	220	10 × 12,5	231	0,12	0,90	0,230	480	B41856A7227M00*
	330	10 × 16	347	0,12	0,60	0,170	640	B41856A7337M00*
	470	10 × 20	494	0,12	0,42	0,140	800	B41856A7477M00*
	1 000	16 × 20	1 050	0,12	0,20	0,069	1 150	B41856A7108M00*
	2 200	16 × 31,5	2 310	0,14	0,11	0,040	1 750	B41856A7228M00*
	3 300	18 × 35	3 465	0,16	0,08	0,036	2 000	B41856A7338M00*

Preferred types

1) \* = "0" for bulk version..

For taping versions, other lead configurations and packing information see page 503


**B41856**
**Low Impedance – 105 °C**
**Technical data and ordering codes**

$U_R$	$C_R$	Case dimensions	$I_{L, \max}$	$\tan \delta_{\max}$	$ESR_{\max}$	$Z_{\max}$	$I_{\sim R}$	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	
50	100	10 × 12,5	150	0,10	1,66	0,400	270	B41856A6107M00*
	220	10 × 16	330	0,10	0,75	0,220	500	B41856A6227M00*
	330	10 × 20	495	0,10	0,50	0,180	640	B41856A6337M00*
	470	12,5 × 25	705	0,10	0,35	0,160	800	B41856A6477M00*
	1 000	16 × 25	1 500	0,10	0,17	0,060	1 200	B41856A6108M00*
	2 200	18 × 35	3 300	0,12	0,09	0,042	1 700	B41856A6228M00*
63	47	10 × 12,5	89	0,08	2,82	0,70	280	B41856A8476M00*
	100	10 × 20	189	0,08	1,33	0,40	500	B41856A8107M00*
	220	12,5 × 25	416	0,08	0,60	0,23	850	B41856A8227M00*
	330	12,5 × 25	624	0,08	0,40	0,20	890	B41856A8337M00*
	470	16 × 25	888	0,08	0,28	0,10	1 400	B41856A8477M00*
	1 000	18 × 35	1 890	0,08	0,13	0,070	1 900	B41856A8108M00*
100	22	10 × 12,5	66	0,07	5,28	0,70	280	B41856A9226M00*
	33	10 × 16	99	0,07	3,52	0,42	480	B41856A9336M00*
	47	10 × 20	141	0,07	2,47	0,35	550	B41856A9476M00*
	100	12,5 × 25	300	0,07	1,16	0,18	850	B41856A9107M00*
	220	16 × 31,5	660	0,07	0,53	0,13	1 400	B41856A9227M00*
	330	18 × 31,5	990	0,07	0,35	0,085	1 700	B41856A9337M00*
	470	18 × 35	1 410	0,07	0,25	0,062	2 000	B41856A9477M00*

Preferred types

1) \* = "0" for bulk version.

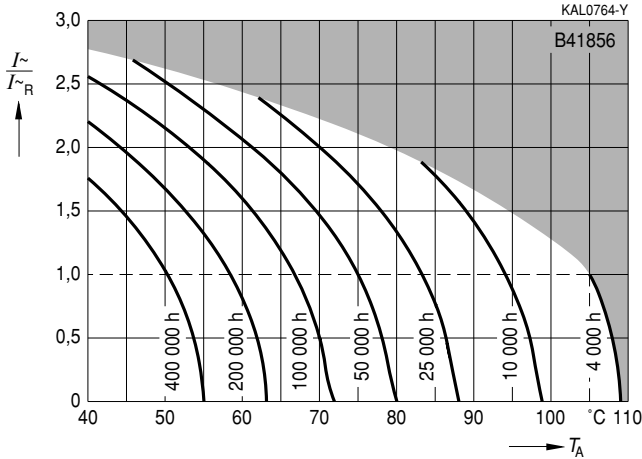
For taping versions, other lead configurations and packing information see page 503.



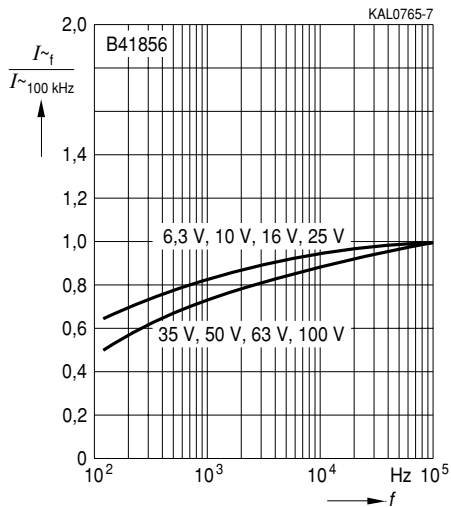
**Useful life**

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

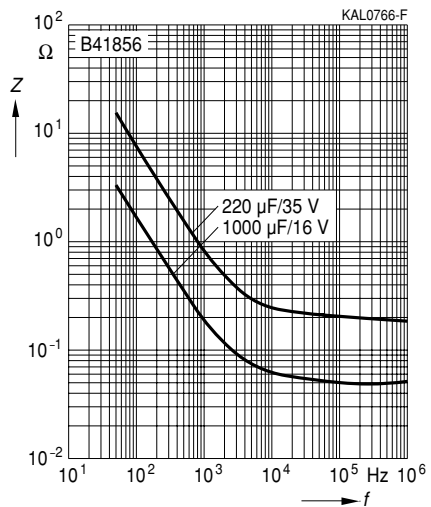
$U_R = 6,3 \dots 50 \text{ VDC}$



**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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