

**Long-life grade capacitors**  
**Low impedance**

**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**

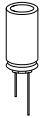
Special terminal configurations and packing:

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

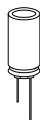
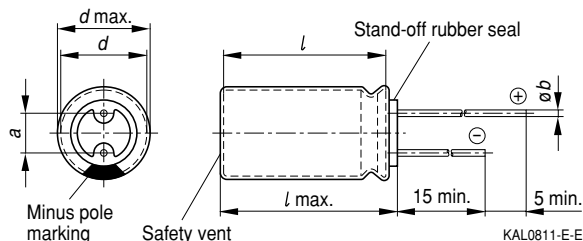
Refer to page 503 for further details and ordering example.



KAL0707-F


**Specifications and characteristics in brief**

Rated voltage $U_R$	6,3 ... 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; $U_R$ ; $I_{-R}$ 105 °C; $U_R$ ; $I_{-R}$	> 3 000 h for $d = 8$ mm > 5 000 h for $d = 10$ mm > 7 000 h for $d \geq 12,5$ 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 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 $d \geq 12,5$ mm	Post test requirements: $\Delta C/C \leq \pm 30 \%$ of initial value $\tan \delta \leq 3$ times initial specified limit $I_L \leq$ 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 $3 \times 2$ 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	


**B41888**
**Extended Useful Life – 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 × 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**

$U_R$	$C_R$ 120 Hz 20 °C μF	Case dimensions $d \times l$ mm	$I_{L, \max}$ 5 min 20 °C μA	$\tan \delta_{\max}$ 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 <sup>1)</sup>
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*
25	4 700	18 × 40	752	0,22	0,08	0,020	2 790	B41888A4478M00*
	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.

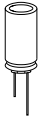
For taping versions, other lead configurations and packing information see page 503.


**B41888**
**Extended Useful Life – 105 °C**
**Technical data and ordering codes**

$U_R$	$C_R$ 120 Hz 20 °C VDC $\mu\text{F}$	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>
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.

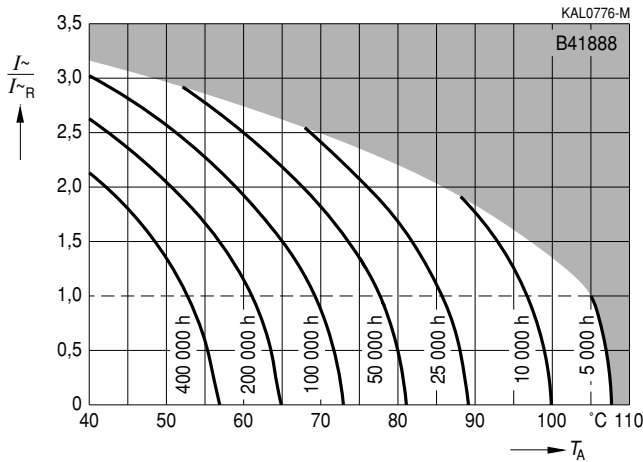


**Useful life**

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

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

$d = 10 \text{ mm}$

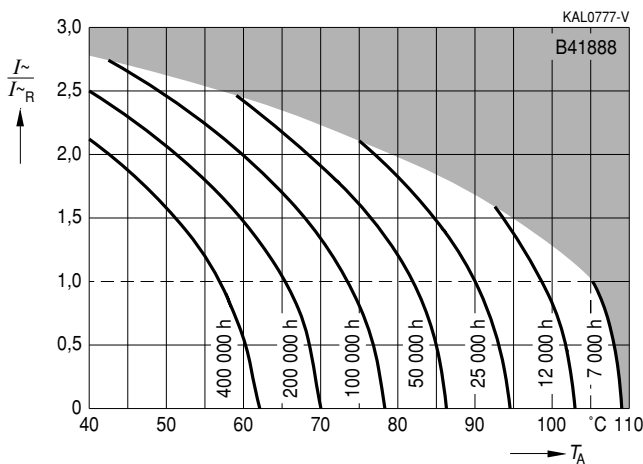


**Useful life**

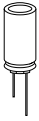
depending on ambient temperature  $T_A$  under ripple current operating conditions<sup>1)</sup>

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

$d \geq 12,5 \text{ mm}$



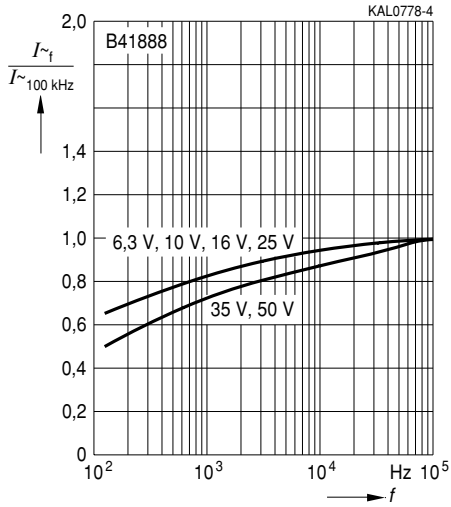
1) Refer to page 40 for an explanation on how to interpret the useful life graphs.



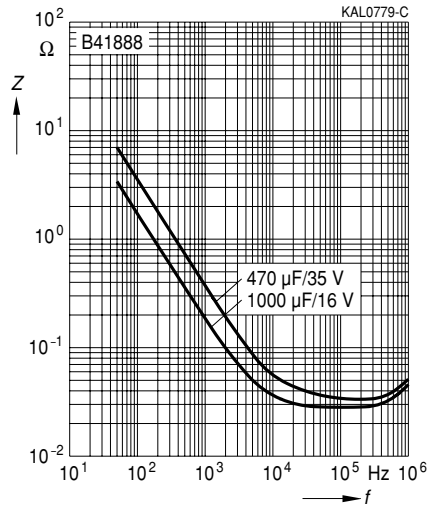
**B41888**

**Extended Useful Life – 105 °C**

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



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



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