

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

Applications

- Circuits that requires very high ambient temperature environments and heavy duty services
- Telecommunications
- Industrial
- Automotive
- Military
- Power supplies
- Smoothing circuits
- Control circuits
- High-temperature environments

Features

- High ripple current capability
- High reliability and long useful life
- Wide temperature range up to 140 °C

Construction

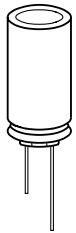
- Radial leads
- Charge-discharge proof, polar
- Aluminum case with insulating sleeve
- Minus pole marking on the insulating sleeve
- Case with safety vent
- Stand off rubber seal

Delivery mode

Special terminal configuratiosn and packing:

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

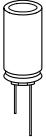
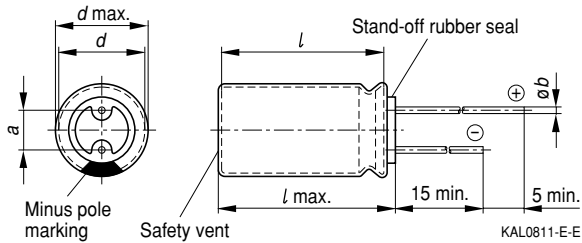
Refer to page 503 for further details and ordering example.



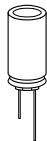
KAL0707-F


B41867
140 °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	4,7 ... 4 700 μ F	
Capacitance tolerance	$\pm 20 \% \triangleq M$	
Useful life 140 °C; U_R ; I_R	> 1 500 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: ≤ 10 fit ($\leq 10 \cdot 10^{-9}/h$) (for definition "fit", refer to chapter "Quality", page 62)
Voltage endurance test 140 °C; U_R	1 000 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: 55/140/56 (– 55 °C/+ 140 °C/56 days damp heat test)	
Sectional specification	IEC 60384-4	


Dimensional drawing

Dimensions and weights

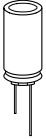
Dimensions (mm)				Approx. weight g
$d \times l$	$d_{max} \times l_{max}$	$a \pm 0,5$	b	
10 × 16	10,5 × 17	5,0	$0,60 \pm 0,05$	1,9
10 × 20	10,5 × 22	5,0	$0,60 \pm 0,05$	2,6
12,5 × 25	13 × 27	5,0	$0,60 \pm 0,05$	4,5
16 × 20	16,5 × 22	7,5	$0,80 \pm 0,05$	5,5
16 × 25	16,5 × 27	7,5	$0,80 \pm 0,05$	7,5
16 × 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 × 40	20,5 × 42	10	$0,80 \pm 0,1$	20


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140 °C
Overview of available types

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

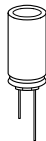
The capacitance and voltage ratings listed above are available in smaller cases upon request.

Other voltage and capacitance ratings are also available upon request.


Technical data and ordering codes

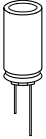
U_R	C_R 120 Hz 20 °C μF	Case dimensions $d \times l$ mm	I_L 5 min 20 °C μA	$\tan \delta_{\max}$ 120 Hz 20 °C	ESR_{\max} 120 Hz 20 °C Ω	$I_{\sim R}$ 120 Hz 140 °C mA	Ordering code ¹⁾
10	220	10 × 16	22	0,24	1,8	180	B41867A3227M00*
	330	10 × 20	33	0,24	1,2	240	B41867A3337M00*
	470	12,5 × 25	47	0,24	0,85	350	B41867A3477M00*
	1 000	12,5 × 25	100	0,24	0,40	520	B41867A3108M00*
	2 200	16 × 31,5	220	0,26	0,20	870	B41867A3228M00*
	3 300	18 × 31,5	330	0,28	0,14	1000	B41867A3338M00*
	4 700	18 × 35	470	0,30	0,10	1200	B41867A3478M00*
16	100	10 × 16	16	0,20	3,3	130	B41867A4107M00*
	220	10 × 20	35	0,20	1,5	210	B41867A4227M00*
	330	12,5 × 25	53	0,20	1,0	325	B41867A4337M00*
	470	12,5 × 25	75	0,20	0,71	380	B41867A4477M00*
	1 000	16 × 25	160	0,20	0,33	580	B41867A4108M00*
	2 200	18 × 31,5	352	0,22	0,17	950	B41867A4228M00*
	3 300	18 × 40	528	0,24	0,12	1300	B41867A4338M00*
	4 700	20 × 40	752	0,26	0,09	1650	B41867A4478M00*
25	100	10 × 16	25	0,17	2,8	140	B41867A5107M00*
	220	10 × 20	55	0,17	1,3	265	B41867A5227M00*
	330	12,5 × 25	83	0,17	0,85	370	B41867A5337M00*
	470	16 × 20	118	0,17	0,60	445	B41867A5477M00*
	1 000	16 × 25	250	0,17	0,28	590	B41867A5108M00*
	2 200	18 × 40	550	0,19	0,14	1055	B41867A5228M00*
	3 300	20 × 40	825	0,21	0,11	1550	B41867A5338M00*
35	100	12,5 × 25	35	0,14	2,3	200	B41867A7107M00*
	220	12,5 × 25	77	0,14	1,1	300	B41867A7227M00*
	330	16 × 25	116	0,14	0,70	410	B41867A7337M00*
	470	16 × 31,5	165	0,14	0,49	540	B41867A7477M00*
	1 000	18 × 31,5	350	0,14	0,23	750	B41867A7108M00*
	2 200	20 × 40	770	0,16	0,12	1250	B41867A7228M00*

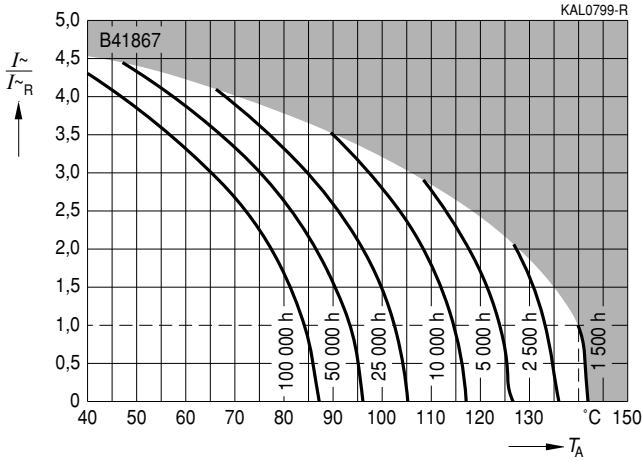
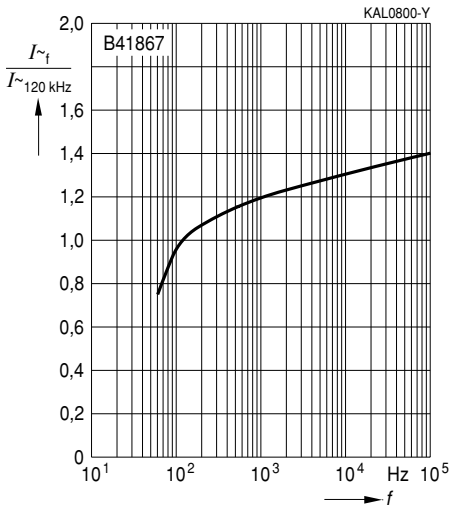
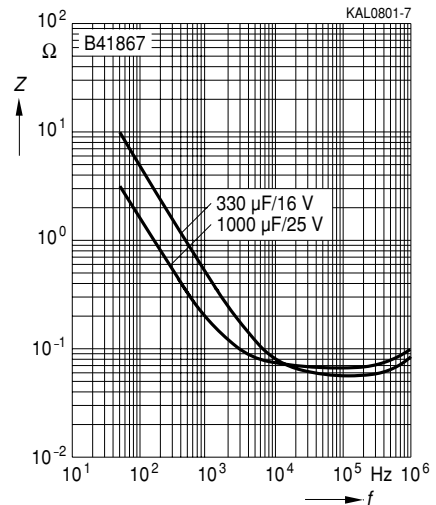
1) * = "0" for bulk version. For taping versions, other lead configurations and packing information see page 503.


B41867
140 °C
Technical data and ordering codes

U_R VDC	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 140 °C mA	Ordering code ¹⁾
50	4,7	10 × 16	5	0,12	42,3	35	B41867A6475M00*
	10	10 × 16	5	0,12	19,9	50	B41867A6106M00*
	22	10 × 16	11	0,12	9,0	80	B41867A6226M00*
	33	10 × 16	17	0,12	6,0	90	B41867A6336M00*
	47	10 × 20	24	0,12	4,2	130	B41867A6476M00*
	100	12,5 × 25	50	0,12	2,0	230	B41867A6107M00*
	220	16 × 25	110	0,12	0,90	380	B41867A6227M00*
	330	18 × 31,5	165	0,12	0,60	555	B41867A6337M00*
	470	18 × 35	235	0,12	0,42	700	B41867A6477M00*
1 000	18 × 40	500	0,12	0,20	1085	B41867A6108M00*	
63	47	10 × 20	30	0,12	4,2	130	B41867A8476M00*
	100	12,5 × 25	63	0,12	2,0	230	B41867A8107M00*
	220	16 × 25	139	0,12	0,90	380	B41867A8227M00*
	330	18 × 31,5	208	0,12	0,60	555	B41867A8337M00*
	470	18 × 35	296	0,12	0,42	700	B41867A8477M00*
	1 000	18 × 40	630	0,12	0,20	1085	B41867A8108M00*

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 conditions¹⁾
 $U_R = 10 \dots 50 \text{ VDC}$

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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