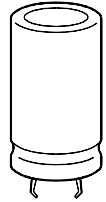


Long-life grade capacitors

Applications

- High-reliability equipment in automotive power electronics, e.g. integrated starter alternator
- Applications with highest ripple current load at high frequencies



Features

- Outstanding high reliability and long useful life
- Outstanding ripple current capability optimized for high frequencies
- Can be operated at temperature up to 150 °C
- Vibration resistance 20 g upon request
- Overload protection (safety vent)

Construction

- Charge-discharge proof, polar
- Aluminum case, fully insulated
- Snap-in solder pins to hold component in place on PC-board
- Minus pole marking on case surface
- Minus pole not insulated from case

Terminals

- 3 terminals: length 4,5 mm
(terminal arrangement ensures correct insertion)



Specifications and characteristics in brief

Rated voltage U_R	25 ... 63 VDC	
Surge voltage U_S	$1,15 \cdot U_R$	
Rated capacitance C_R	800 ... 3300 μF	
Capacitance tolerance	$\pm 20 \% \triangleq \text{M}$	
Leakage current I_L (5 min, 20 °C)	$I_L \leq 0,006 \mu\text{A} \cdot \left(\frac{C_R}{\mu\text{F}} \cdot \frac{U_R}{\text{V}} \right)^{0,7} + 4 \mu\text{A}$	
Self-inductance ESL	15 nH	
Useful life 40 °C; U_R ; $2,1 \cdot I_{-R}$ 85 °C; U_R ; $2,1 \cdot I_{-R}$ 125 °C; U_R ; I_{-R} 150 °C; U_R ; $0,5 \cdot I_{-R}$	> 500 000 h > 30 000 h > 10 000 h > 1 000 h	Requirements: $\Delta C/C \leq \pm 30 \%$ of initial value $ESR \leq 3$ times initial specified limit $I_L \leq$ initial specified limit Failure percentage: $\leq 0,5 \%$ Failure rate: $\leq 10 \text{ fit } (\leq 10 \cdot 10^{-9}/\text{h})$ (for definiton "fit", refer to chapter "Quality", page 62)
Voltage endurance test 125 °C; U_R	2000 h	Post test requirements: $\Delta C/C \leq \pm 10 \%$ of initial value $ESR \leq 1,3$ 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 Hz to 2 kHz, acceleration max. 10 g, duration $3 \times 2 \text{ h}$ Vibration resistance 20 g upon request	
IEC climatic category	To IEC 60068-1: 55/125/56 (– 55 °C/+ 125 °C/56 days damp heat test)	
Detail specification	Similar to CECC 30301-809	
Sectional specification	IEC 60384-4	



Automotive – Up to 150 °C

Technical drawing of the KAL0324-F component, showing three views: top, side, and mounting details.

Top View: Shows a circular component with diameter d . It features two circular mounting holes with diameter $\varnothing 2 \pm 0,1$. A "Minus pole marking" is indicated near the holes. The distance between the centers of the mounting holes is $10 \pm 0,1$. The angle between the centerline and the line connecting the center to the mounting holes is $41^\circ \pm 25'$.

Side View: Shows the component's profile with length l . The mounting holes have a diameter of $0,8^{+0,2}_{-0,1}$ and a depth of $1,5 \pm 0,2$. The distance from the top surface to the center of the mounting holes is $4,5 \pm 1$. The mounting holes are spaced $4,75 \pm 0,1$ apart.

Mounting Details: Shows the component's footprint with mounting holes. The distance between the centers of the mounting holes is $10 \pm 0,1$. The distance from the centerline to the center of the mounting holes is $4,75 \pm 0,1$. The mounting holes have a diameter of $\varnothing 2,5 \text{ min.}$ and a depth of $3,5 \pm 0,1$.

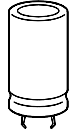
Other Dimensions: The component has a width of $0,8$ and a mounting hole diameter of $0,8^{+0,2}_{-0,1}$.

Part Number: KAL0324-F

Dimensions (mm)		Approx. weight (g)	Packing units (pieces)
$d + 1$	$l \pm 2$		
22	40	18	160
25	40	22	130

A photograph of an open cardboard box filled with numerous black, cylindrical components, likely capacitors or batteries, arranged in a grid. The box is made of brown cardboard and has a white label on the front left side. The lid of the box is open, showing the interior. The components are small and uniform in size and shape.

For ecological reasons the packing is pure cardboard. Components can be withdrawn (in full or in part) in the correct position for insertion.



Overview of available types

U_R (VDC)	25	40	55	63
C_R (μF)	Case dimensions $d \times l$ (mm)			
800				22 × 40
1 100			22 × 40	25 × 40
1 500		22 × 40	25 × 40	
2 000		25 × 40		
2 500	22 × 40			
3 300	25 × 40			



B41607

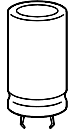
Automotive – Up to 150 °C

Case dimensions and ordering codes

U_R	C_R	Case dim. $d \times l$	Ordering code
VDC	μF	mm	3 terminals
25	2 500	22 × 40	B41607A4258M002
	3 300	25 × 40	B41607A4338M002
40	1 500	22 × 40	B41607A7158M002
	2 000	25 × 40	B41607A7208M002
55	1 100	22 × 40	B41607A0118M002
	1 500	25 × 40	B41607A0158M002
63	800	22 × 40	B41607A8807M002
	1 100	25 × 40	B41607A8118M002

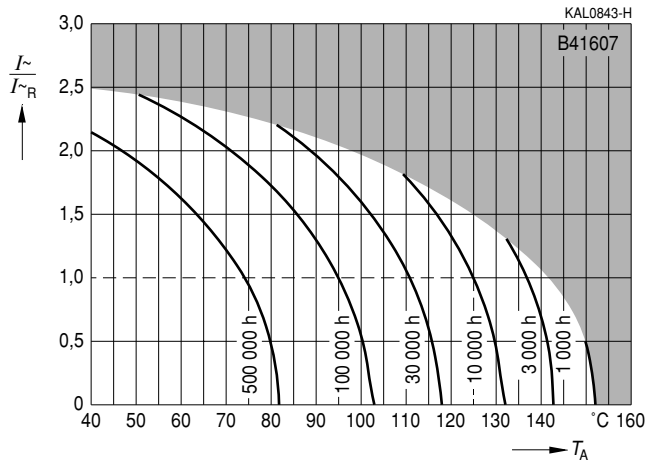
Technical data

C_R 100 Hz 20 °C μF	Case dim. $d \times l$ mm	ESR_{typ} 100 Hz 20 °C m Ω	ESR_{max} 100 Hz 20 °C m Ω	ESR_{max} 100 Hz – 40 °C m Ω	ESR_{max} 10 kHz 20 °C m Ω	Z_{max} 100 kHz 20 °C m Ω	$I_{\sim max}$ 10 kHz 105 °C A	$I_{\sim R}$ 10 kHz 125 °C A	$I_{\sim max}$ 10 kHz 150 °C A
25 VDC									
2 500	22 × 40	25	35	115	26	25	9,9	5,6	2,8
3 300	25 × 40	20	28	80	18	17	13,5	7,6	3,8
40 VDC									
1 500	22 × 40	35	48	115	26	25	9,8	5,5	2,7
2 000	25 × 40	26	36	80	18	17	13,4	7,6	3,8
55 VDC									
1 100	22 × 40	40	55	115	26	25	9,7	5,5	2,7
1 500	25 × 40	30	42	80	18	17	13,4	7,5	3,7
63 VDC									
800	22 × 40	45	62	115	26	25	9,6	5,4	2,7
1 100	25 × 40	32	45	80	18	17	13,3	7,4	3,7



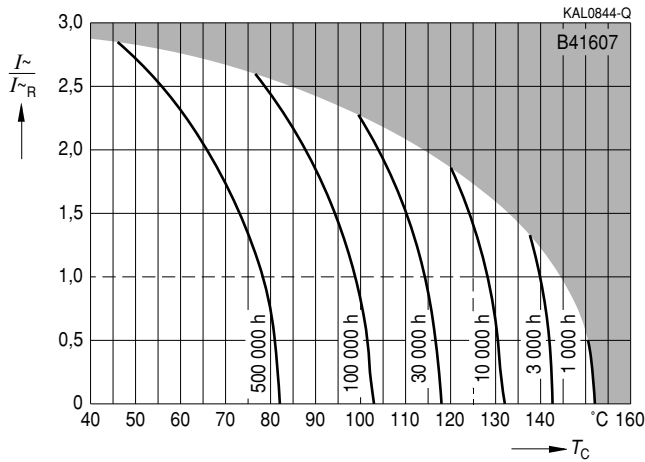
Useful life

depending on ambient temperature T_A under ripple current operating conditions at U_R ¹⁾



Useful life

depending on case temperature T_C under ripple current operating conditions at U_R ¹⁾



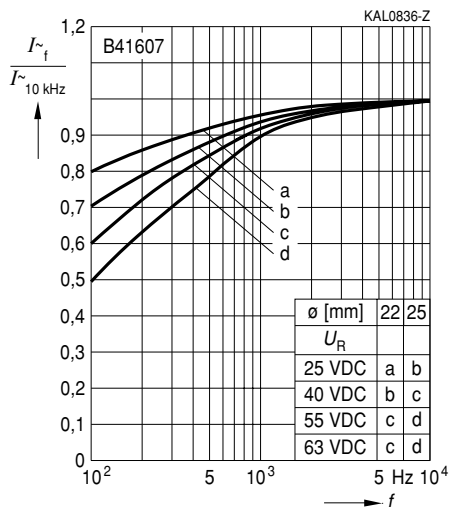
1) Refer to page 40 for an explanation on how to interpret the useful life graphs.



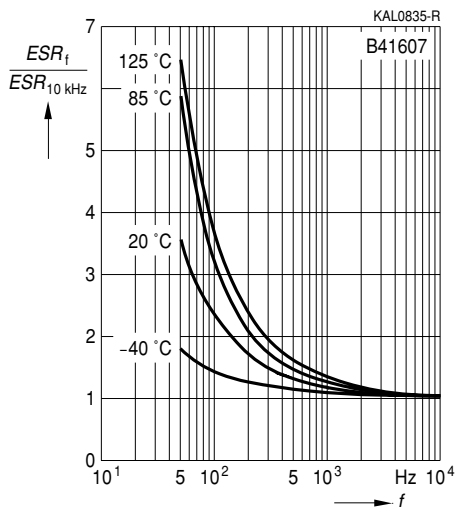
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Automotive – Up to 150 °C

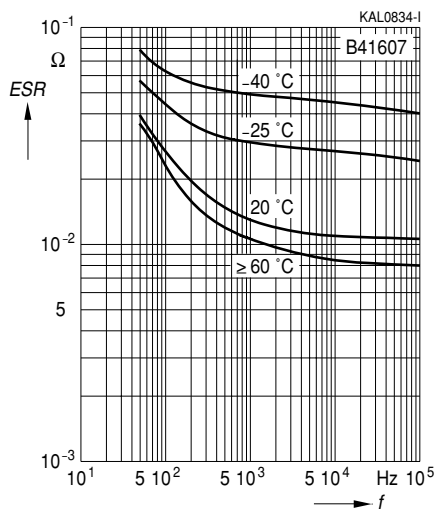
Frequency factor of permissible ripple current $I_{\sim}$ versus frequency f



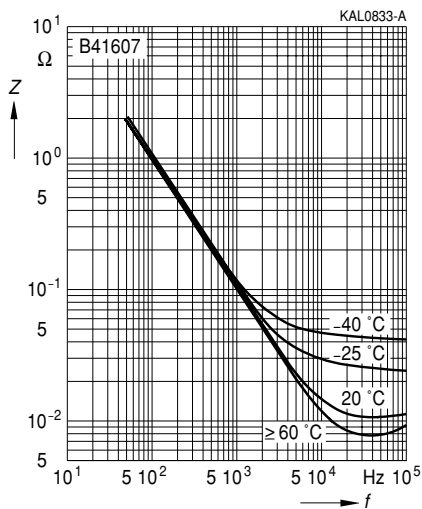
Frequency characteristics of ESR versus frequency f at different temperatures T
Typical behavior



Equivalent series resistance ESR versus frequency f at different temperatures T
Typical behavior for 1500 μ F/55 V



Impedance Z versus frequency f at different temperatures T
Typical behavior for 1500 μ F/55 V



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