

SIKOREL® 125

Long-life grade capacitors



KAL0574-T

Applications

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

Features

- Outstanding ripple current capability
- Optimized for high frequencies
- Optimized design for bottom cooling
- Low profile
- Vibration resistance 30 g upon request
- Stud mounting upon request
- Shelf life up to 10 years
- All-welded construction ensures reliable electrical contact

Construction

- Charge-discharge proof, polar
- Aluminum case without insulating sleeve (for bottom cooling)
- Poles with screw terminal connections
- Mounting with ring clips or clamps



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	3 900 to 20 000 μF	
Capacitance tolerance	$\pm 20 \% \triangleq \text{M}$	
Leakage current I_L (5 min, 20 °C)	$I_L \leq 0,3 \mu\text{A} \cdot \left(\frac{C_R}{\mu\text{F}} \cdot \frac{U_R}{\text{V}} \right)^{0,7} + 4 \mu\text{A}$	
Self-inductance ESL	Approx. 13 nH	
Useful life	Requirements: 125 °C, U_R; $I_{\sim R}$ > 2 500 h 85 °C, U_R; $I_{\sim \text{max}}$ > 15 000 h 40 °C, U_R; $3,4 \cdot I_{\sim R}$ > 200 000 h $\Delta C/C \leq \pm 45 \%$ of initial value $ESR \leq 3$ times initial specified limit $I_L \leq$ initial specified limit Failure percentage: $\leq 1 \%$ Failure rate: $\leq 20 \text{ fit} (\leq 20 \cdot 10^{-9}/\text{h})$ (for definiton "fit", refer to chapter "Quality", page 62)	
Voltage endurance test 125 °C; U_R ; $I_{\sim R}$	2 000 h	Post test requirements: $\Delta C/C \leq \pm 15 \%$ 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 to 55 Hz, acceleration max. 10 g, duration $3 \times 2 \text{ h}$ Vibration resistance up to 30 g upon request	
IEC climatic category	To IEC 60068-1: 55/125/56 (– 55 °C/+ 125 °C/56 days damp heat test)	
Detail specifications	Similar to CECC 30301-803, CECC 30301-807	
Sectional specification	IEC 60384-4	

Ripple current capability

Due to the ripple current capability of the contact elements, the following current upper limits must not be exceeded:

$$I_{\sim \text{max}} = 50 \text{ A}$$

In case of additional thermal cooling:

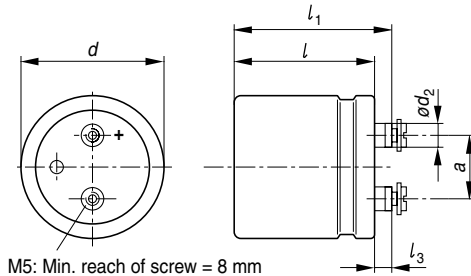
$$I_{\sim \text{max}} = 55 \text{ A}$$



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Automotive – 125 °C

Dimensional drawing



Positive pole marking: +

KAL0824-B-E

Stud mounting upon request

Dimensions, weights and packing units

Terminal	Dimensions (mm)						Approx. weight (g)	Packing unit pieces
	$d +0/-0,4$	$l \pm 0,8$	$l_1 \pm 0,8$	$l_3 +0,2/-1$	$d_2 \pm 0,2$	$a +0,2/-0,4$		
M 5	50,9	39,5	46,1	7,0	8,2	22,2	115	22
M 5	50,9	49,5	56,1	7,0	8,2	22,2	135	22

For ecological reasons the packing is pure cardboard.

Accessories

The following items are included in the delivery package, but are not fastened to the capacitors:

	Thread	Toothed washers	Screws/Nuts	Maximum torque
For terminals	M 5	A 5,1 DIN 6797	Cylinder-head screw M 5 × 8 DIN 84-4.8	2 Nm
	M 6	A 6,4 DIN 6797	Cylinder-head screw M 6 × 12 DIN 85-4.8	2,5 Nm

The following must be ordered separately:

Ring clips

B44030 (cf. page 169)

Insulating parts

B44020 (cf. page 166)



Overview of available types

U_R (VDC)	25	40	55	63
C_R (μF)	Case dimensions $d \times l$ (mm)			
3 900				50,9 × 39,5
4 700			50,9 × 39,5	
6 000				50,9 × 49,5
7 500		50,9 × 39,5	50,9 × 49,5	
12 000	50,9 × 39,5	50,9 × 49,5		
20 000	50,9 × 49,5			

Case dimensions and ordering codes

U_R VDC	C_R μF	Case dimensions $d \times l$ mm	Ordering code
25	12 000	50,9 × 39,5	B41754A5129M000
	20 000	50,9 × 49,5	B41754A5209M000
40	7 500	50,9 × 39,5	B41754A7758M000
	12 000	50,9 × 49,5	B41754A7129M000
55	4 700	50,9 × 39,5	B41754A0478M000
	7 500	50,9 × 49,5	B41754A0758M000
63	3 900	50,9 × 39,5	B41754A8398M000
	6 000	50,9 × 49,5	B41754A8608M000


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Automotive – 125 °C
Technical data

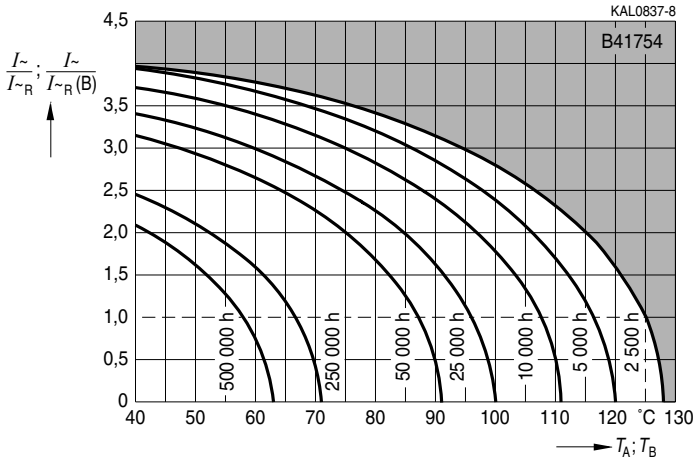
C_R	ESR_{typ} 100 Hz 20 °C μF	ESR_{max} 100 Hz 20 °C $m\Omega$	ESR_{max} 100 Hz -40 °C $m\Omega$	ESR_{max} 10 kHz 20 °C $m\Omega$	Z_{max} 10 kHz 20 °C $m\Omega$	$I_{\sim max}(B)$ 10 kHz 85 °C A	$I_{\sim max}(B)$ 10 kHz 105 °C A	$I_{\sim R}$ 10 kHz 125 °C A	$I_{\sim R}(B)$ 10 kHz 125 °C A
25 VDC									
12 000	21	36	234	27	28	50 ¹⁾	50 ¹⁾	7,6	20
20 000	14	24	156	18	19	50 ¹⁾	50 ¹⁾	8,5	21
40 VDC									
7 500	21	36	234	27	28	50 ¹⁾	50 ¹⁾	7,6	20
12 000	15	25	162	18	19	50 ¹⁾	50 ¹⁾	8,5	21
55 VDC									
4 700	23	39	234	28	30	50 ¹⁾	50 ¹⁾	7,6	20
7 500	17	29	174	23	24	50 ¹⁾	50 ¹⁾	8,5	21
63 VDC									
3 900	23	39	234	28	30	50 ¹⁾	50 ¹⁾	7,6	20
6 000	17	29	174	23	24	50 ¹⁾	50 ¹⁾	8,5	21

1) Max. 50 A due to max. terminal load
55 A in case of additional terminal cooling



Useful life

depending on ambient temperature T_A (for natural cooling) and versus temperature of case base T_B (for base cooling) under ripple current operating conditions at $U_R^{1)}$



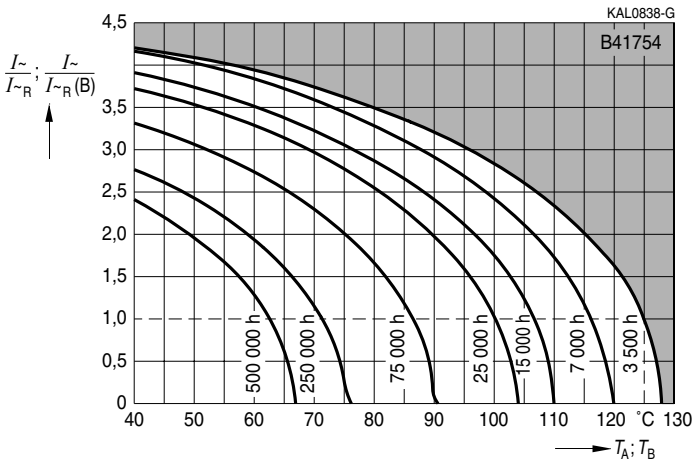
Depending on ambient temperature T_A (for natural cooling) and versus temperature of case base T_B (for base cooling) under ripple current operating conditions at $U_{op}^{1)}$

$U_R = 25 \text{ V}$: $U_{op} \leq 22 \text{ V}$

$U_R = 55 \text{ V}$: $U_{op} \leq 48 \text{ V}$

$U_R = 40 \text{ V}$: $U_{op} \leq 35 \text{ V}$

$U_R = 63 \text{ V}$: $U_{op} \leq 55 \text{ V}$



3500 h rated service life at 125 °C;

up to 500 h (accumulated) operating at 150 °C in discontinuous operation

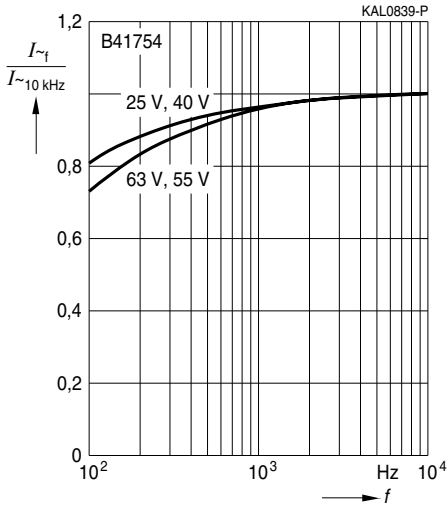
1) Refer to page 40 for an explanation on how to interpret the useful life graphs.



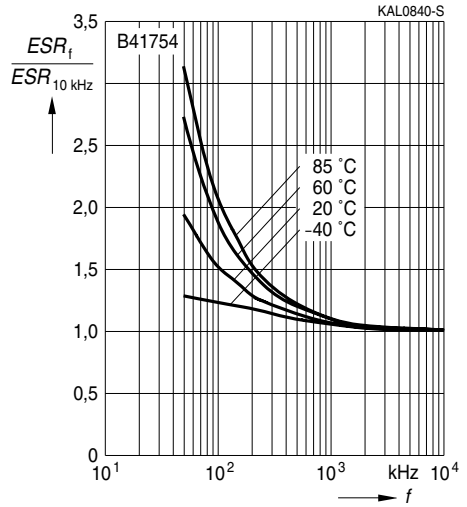
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Automotive – 125 °C

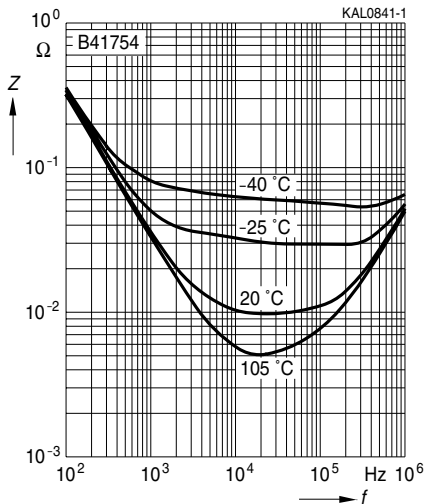
Frequency factor of permissible ripple current $I_{\sim}$ versus frequency f



Frequency characteristics of ESR typical behavior



Impedance Z at different temperatures T
Typical behavior for 3900 $\mu\text{F}/63 \text{ V}$



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