



**Axial-Lead and Soldering Star Capacitors**

**B41694**

**Low ESR – Up to 140 °C**

**B41794**

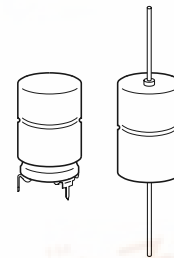
**SIKOREL®**

**Applications**

- For automotive applications with high EMV requirements

**Features**

- Very high ripple current capability
- Very low ESR, down to  $-55\text{ °C}$
- High vibration resistance
- High reliability up to  $140\text{ °C} / 1000\text{ h}$
- Shelf life up to 15 years



KAL0573-K

**Construction**

- Charge-discharge proof, polar
- Aluminum case with insulating sleeve
- Negative pole connected to case

**Terminals**

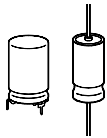
- Axial leads, welded to ensure perfect electrical contact
- Also available with soldering stars

**Taping and packing**

- Axial-lead capacitors will be delivered in pallet package.  
Capacitors with  $d \times l \leq 16 \times 30\text{ mm}$  are also available taped on reel.
- Solder-star capacitors are packed in cardboard.

For details on taping and packing, refer to page 342.





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**Specifications and characteristics in brief**

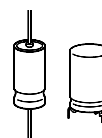
Rated voltage $U_R$	25 and 40 VDC				
Surge voltage $U_S$	$1,15 \cdot U_R$				
Rated capacitance $C_R$	330 ... 1 500 $\mu\text{F}$				
Capacitance tolerance	– 10/+ 30 % $\triangleq$ Q				
Leakage current $I_L$ (5 min, 20 °C)	$I_L \leq 0,006 \mu\text{A} \cdot \left( \frac{C_R}{\mu\text{F}} \cdot \frac{U_R}{\text{V}} \right) + 4 \mu\text{A}$				
Self-inductance $ESL^1$ )	Diameter $d$	12 mm	14 mm	16 mm	18 mm
	Length / Terminal	Approx. $ESL$ (nH)			
	25 mm axial / solder star	— / —	22 / 6	26 / 7	— / —
	30 mm axial / solder star	21 / 6	24 / 7	29 / 8	34 / 10
39 mm axial / solder star	— / —	— / —	33 / 9	38 / 11	
Useful life 140 °C; $U_R$ ; $I_{-R}$ 125 °C; $U_R$ ; $I_{-R}$ 85 °C; $U_R$ ; $I_{-max}$ 40 °C; $U_R$ ; $2,1 \cdot I_{-R}$	> 1 000 h	Requirements:			
	> 3 000 h > 8 000 h > 200 000 h	$\Delta C/C$	$\leq \pm 30$ % of initial value		
		$ESR$	$\leq 3$ times initial specified limit		
		$I_L$	$\leq$ initial specified limit		
		Failure percentage:	$\leq 0,5$ %		
		Failure rate:	$\leq 10$ fit ( $\leq 10 \cdot 10^{-9}/\text{h}$ )		
		(for definition "fit", refer to chapter "Quality", page 62)			
Voltage endurance test 125 °C; $U_R$	2 000 h	Post test requirements:			
		$\Delta C/C$	$\leq \pm 10$ % of initial value		
		$ESR$	$\leq 1,3$ % initial specified limit		
		$I_L$	$\leq$ initial specified limit		
Vibration resistance	To IEC 60068–2–6, test Fc: displacement amplitude 1,5 mm, at 10 Hz to 2 kHz, acceleration max. 20 g, duration $3 \times 2$ h				
IEC climatic category	To IEC 60068–1: 55/125/56 (– 55 °C/+ 125 °C/56 days damp heat test)				
Detail specification	Similar to CECC 30301-802				
Sectional specification	IEC 60384–4				

1) If optimum circuit design is used, the values are lower by 30 %.



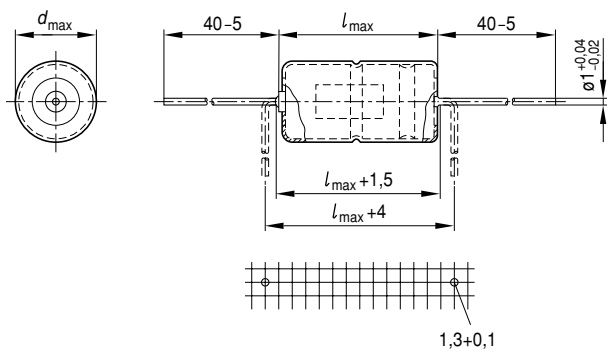
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Low ESR – Up to 140 °C



**Dimensional drawings**

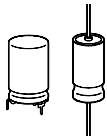
**Axial-lead capacitors**



KAL0524-S

**Dimensions, weights and packing units**

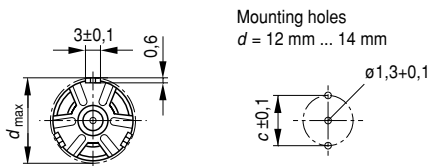
$d \times l$ mm	$d_{max} \times l_{max}$ mm	Approx. weight g	Packing units (pieces)	
			Pallet	Reel
12 × 30	12,5 × 30,5	5,1	288	450
14 × 25	14,5 × 25,5	5,7	200	350
16 × 30	16,5 × 30,5	8,9	180	250
16 × 39	16,5 × 40	11,7	180	—
18 × 30	18,5 × 30,5	11,1	160	—
18 × 39	18,5 × 40	14,7	160	—



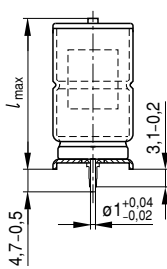
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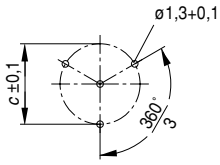
**Soldering star capacitors**



Mounting holes  
d = 12 mm ... 14 mm



Mounting holes  
d = 16 mm ... 18 mm

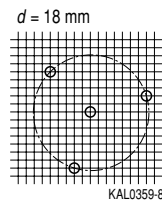
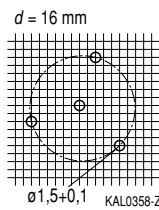
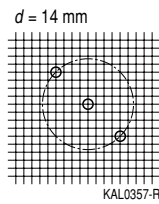
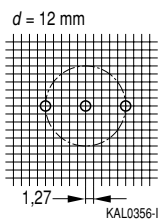


Soldering star is connected to the negative pole

KAL0525-1-E

The PC-board hole arrangement specified above is based on circular arcs.

If, however, the mounting holes have to be matched to a standard drilling raster, a spacing of 1,27 mm (1/20") has proved to be sufficiently accurate if the following arrangements are used:



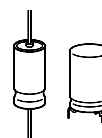
**Dimensions, weights and packing units**

$d \times l$ mm	$d_{max} \times l_{max}$ mm	$c \pm 0,1$ mm	Approx. weight g	Packing units pieces
12 × 30	13,5 × 32	12,5	5,4	480
14 × 25	15,5 × 27	14,5	6,1	480
16 × 30	17,5 × 32	16,5	9,4	300
16 × 39	17,5 × 41,5	16,5	12,2	200
18 × 30	19,5 × 32	18,5	11,8	300
18 × 39	19,5 × 41,5	18,5	15,4	200



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**Overview of available types**

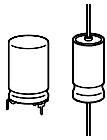
$U_R$ (VDC)	25	40
$C_R$ ( $\mu$ F)	Case dimensions $d \times l$ (mm)	
330		12 $\times$ 30
470	14 $\times$ 25	
1 000	16 $\times$ 30	18 $\times$ 30
1 500	16 $\times$ 39	18 $\times$ 39

**Case dimensions and ordering codes**

$U_R$ VDC	$C_R$ $\mu$ F	Case dim. $d \times l$ mm	Ordering code		Soldering star
			Axial pallet package	Axial reel	
25	470	14 $\times$ 25	B41694A5477Q007	B41694A5477Q009	B41794A5477Q000
	1 000	16 $\times$ 30	B41694A5108Q007	B41694A5108Q009	B41794A5108Q000
	1 500	16 $\times$ 39	B41694A5158Q007		B41794A5158Q000
40	330	12 $\times$ 30	B41694A7337Q007	B41694A7337Q009	B41794A7337Q000
	1 000	18 $\times$ 30	B41694A7108Q007		B41794A7108Q000
	1 500	18 $\times$ 39	B41694A7158Q007		B41794A7158Q000

**Technical data**

$C_R$ 100 Hz 20 °C $\mu$ F	$ESR_{typ}$ 100 Hz 20 °C m $\Omega$	$ESR_{max}$ 100 Hz 20 °C m $\Omega$	$ESR_{max}$ 100 Hz -40 °C $\Omega$	$ESR_{max}$ 10 kHz 20 °C m $\Omega$	$Z_{max}$ 100 kHz 20 °C m $\Omega$	$I_{~max}$ 10 kHz 40 °C A	$I_{~max}$ 10 kHz 85 °C A	$I_{~R}$ 10 kHz 125 °C A
<b>25 VDC</b>								
470	110	170	0,9	70	65	5,90	5,15	2,25
1 000	55	90	0,5	40	38	8,20	7,15	3,15
1 500	40	60	0,4	28	26	11,20	9,80	4,30
<b>40 VDC</b>								
330	130	210	0,9	70	67	6,30	5,45	2,40
1 000	50	85	0,4	35	33	8,50	7,40	3,25
1 500	35	60	0,3	25	24	11,50	10,00	4,45

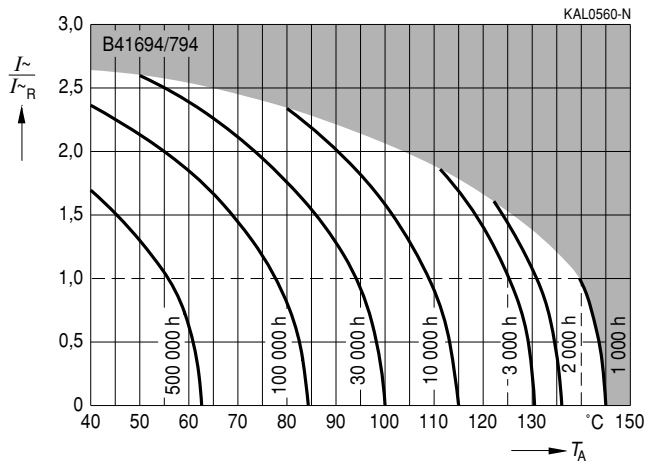


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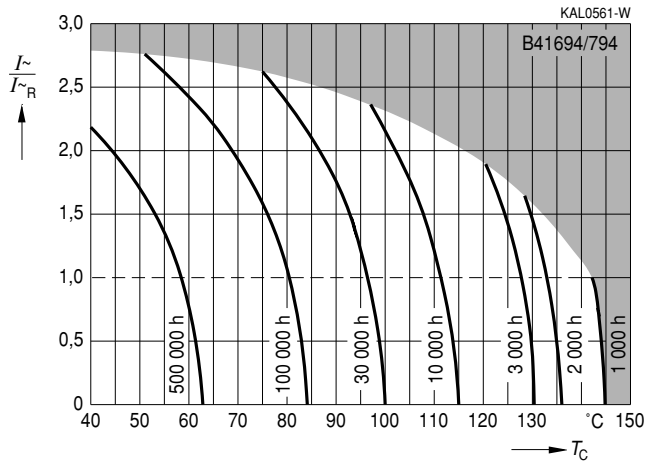
**Useful life**

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  $U_R^{1)}$

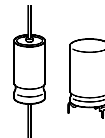


1) Refer to page 40 for an explanation on how to interpret the useful life graphs.

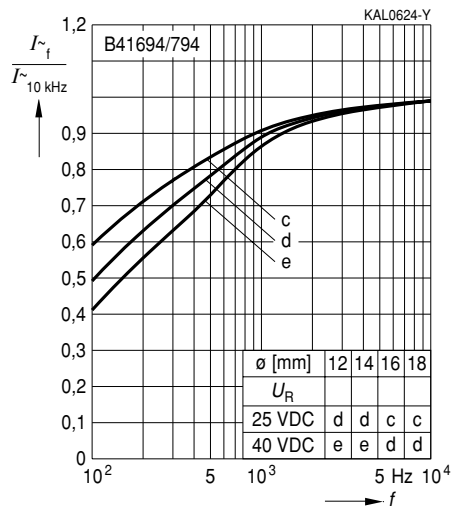


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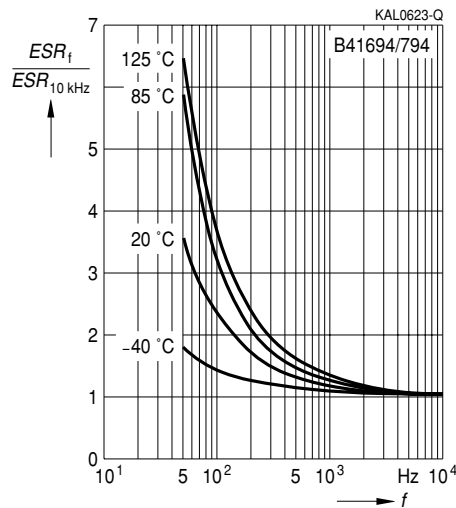
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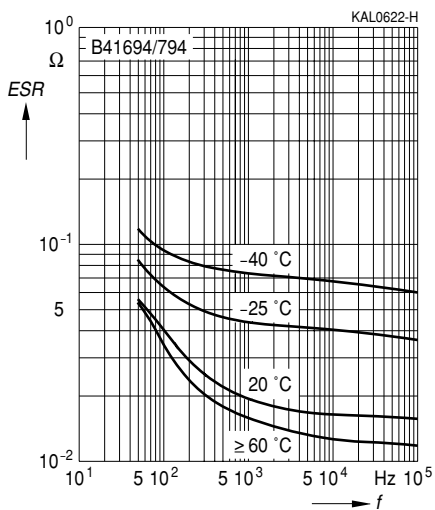
**Frequency factor of permissible ripple current  $I_{\sim}$  versus frequency  $f$**



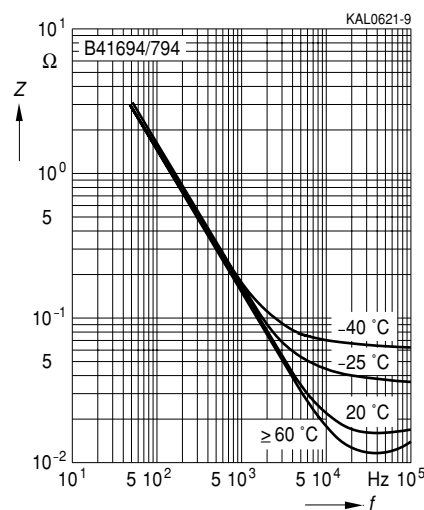
**Frequency characteristics of ESR at different temperatures**  
Typical behavior



**Equivalent series resistance ESR versus frequency at different temperatures**  
Typical behavior for 1 000  $\mu$ F/40 V



**Impedance Z versus frequency  $f$  at different temperatures**  
Typical behavior for 1 000  $\mu$ F/40 V



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