

## SIKOREL®

### Applications

- For compact design in automotive applications

### Features

- High ripple current capability
- High vibration resistance
- Very low ESR at low temperature, down to – 55 °C
- Compact and small design
- High reliability

### Construction

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

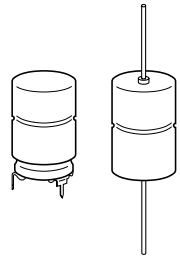
### Terminals

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

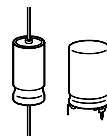
### Taping and packing

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

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

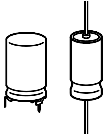


KAL0573-K


**Specifications and characteristics in brief**

Rated voltage $U_R$	25 and 40 VDC					
Surge voltage $U_S$	$1,15 \cdot U_R$					
Rated capacitance $C_R$	470 ... 3 300 $\mu$ F					
Capacitance tolerance	– 10/+ 30 % $\triangle$ 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 $l$	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 125 °C; $U_R$ ; $I_{-R}$ 85 °C; $U_R$ ; $I_{-max}$ 40 °C; $U_R$ ; $2,9 \cdot I_{-R}$	> 3 000 h	<b>Requirements:</b> $\Delta C/C$ $\leq \pm 30$ % 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)				
	> 15 000 h					
> 200 000 h						
Voltage endurance test 125 °C, $U_R$	2 000 h	<b>Post test requirements:</b>				
		$\Delta C/C$	$\leq \pm 10$ % 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 %.

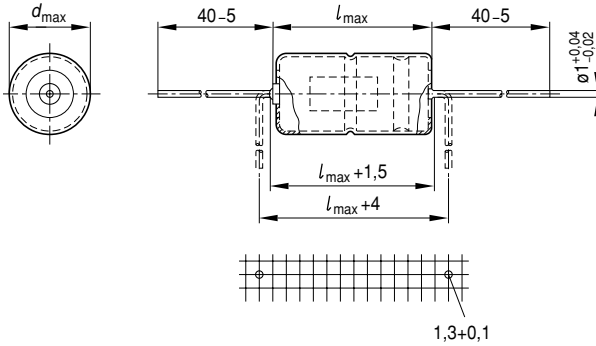


B41696 / B41796

Low ESR, Compact – 125 °C

## Dimensional drawings

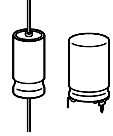
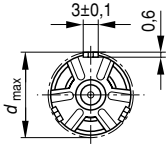
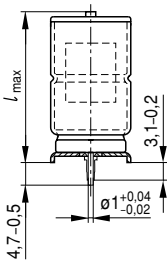
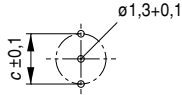
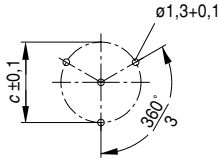
### Axial-lead capacitor



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
18 × 39	18,5 × 40	14,7	160	—

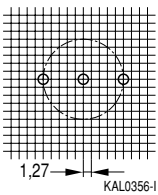
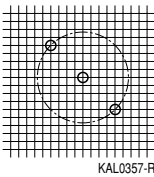
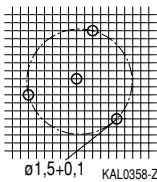
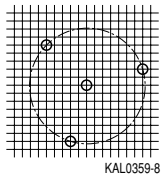

**Soldering star capacitors**

 Mounting holes  
 $d = 12 \text{ mm} \dots 14 \text{ mm}$ 

 Mounting holes  
 $d = 16 \text{ mm} \dots 18 \text{ mm}$ 


Soldering star is connected to the negative pole

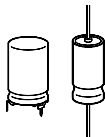
KAL0525-1-E

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:

 $d = 12 \text{ mm}$ 

 $d = 14 \text{ mm}$ 

 $d = 16 \text{ mm}$ 

 $d = 18 \text{ mm}$ 

**Dimensions, weights and packing units**

$d \times l$ mm	$d_{\text{max}} \times l_{\text{max}}$ 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
18 × 39	19,5 × 41,5	18,5	15,4	200


**B41696 / B41796**
**Low ESR, Compact – 125 °C**
**Overview of available types**

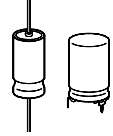
$U_R$ (VDC)	25	40
$C_R$ ( $\mu$ F)	Case dimensions $d \times l$ (mm)	
470		12 × 30
680	12 × 30	
1 000	14 × 25	16 × 30
2 200		18 × 39
3 300	18 × 39	

**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	680	12 × 30	B41696A5687Q007	B41696A5687Q009	B41796A5687Q000
	1 000	14 × 25	B41696A5108Q007	B41696A5108Q009	B41796A5108Q000
	3 300	18 × 39	B41696A5338Q007		B41796A5338Q000
40	470	12 × 30	B41696A7477Q007	B41696A7477Q009	B41796A7477Q000
	1 000	16 × 30	B41696A7108Q007	B41696A7108Q009	B41796A7108Q000
	2 200	18 × 39	B41696A7228Q007		B41796A7228Q000

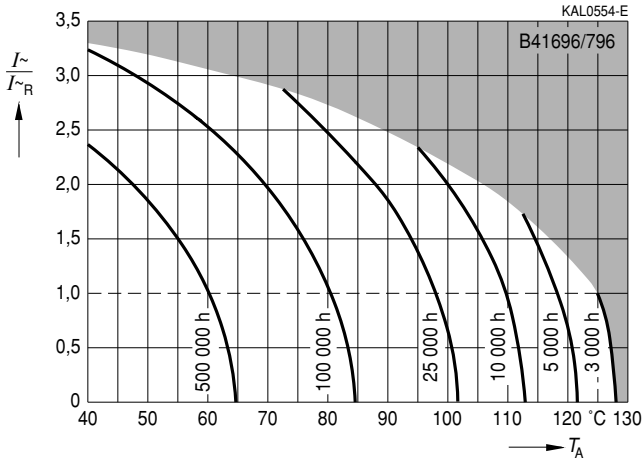
**Technical data**

$C_R$ 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 $\Omega$	$I_{\sim max}$ 10 kHz 40 °C A	$I_{\sim max}$ 10 kHz 85 °C A	$I_{\sim R}$ 10 kHz 125 °C A
<b>25 VDC</b>								
680	110	170	1,20	95	90	5,40	4,25	1,60
1 000	80	120	0,65	70	68	5,70	4,50	1,70
3 300	30	45	0,20	25	24	11,50	9,20	3,50
<b>40 VDC</b>								
470	110	180	0,90	75	72	5,80	4,60	1,75
1 000	60	90	0,45	45	44	8,00	6,30	2,40
2 200	30	50	0,20	25	24	11,50	9,20	3,50



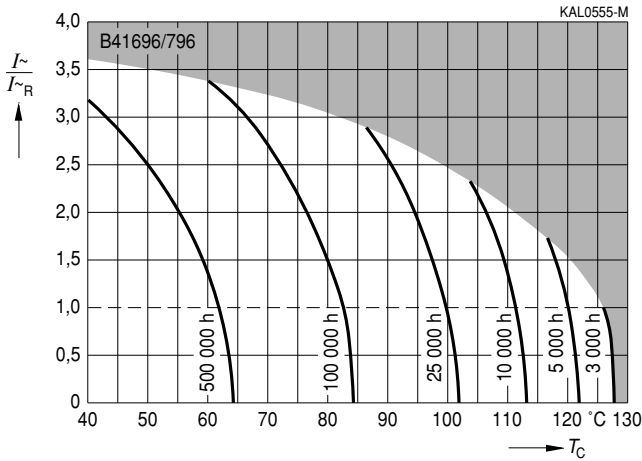
**Useful life**

depending on ambient temperature  $T_A$  under ripple current operating conditions at  $U_R^{1)}$

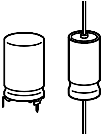


**Useful life**

depending on case temperature  $T_C$  under ripple current operating conditions at  $U_R^{1)}$



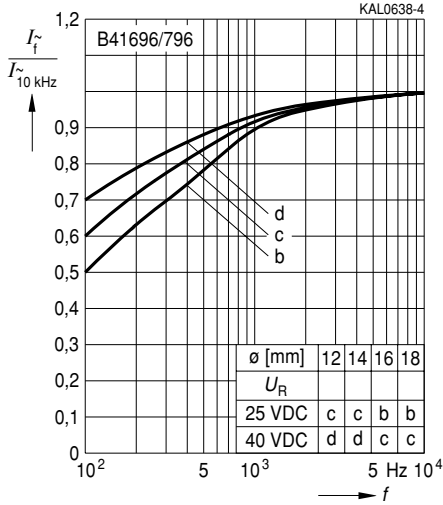
1) Refer to page 40 for an explanation on how to interpret the useful life graphs.



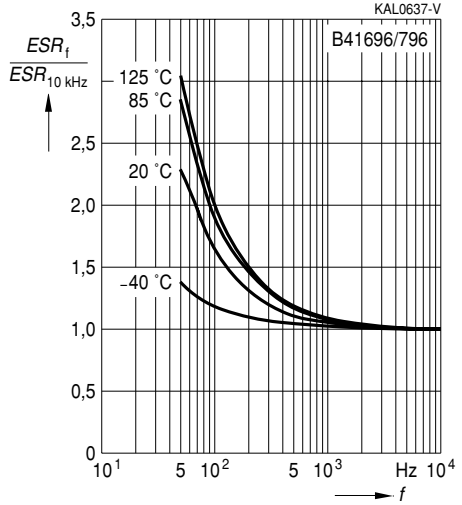
**B41696 / B41796**

**Low ESR, Compact – 125 °C**

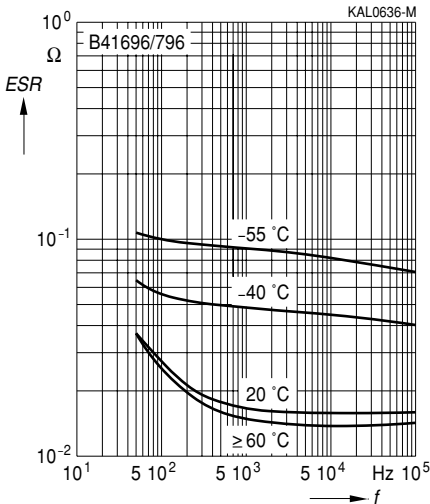
**Frequency factor of permissible ripple current  $I_{\tilde{r}}$  versus frequency  $f$**



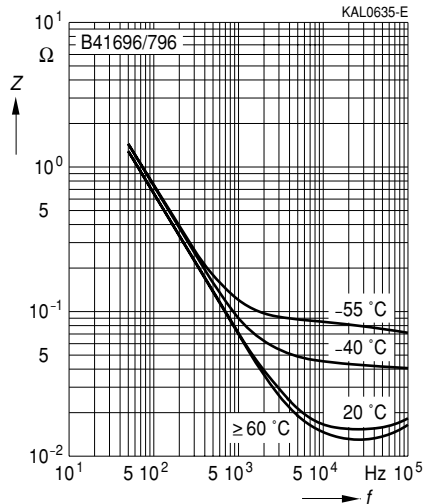
**Frequency characteristics of ESR at different temperatures typical behavior**



**Equivalent series resistance ESR versus frequency  $f$  at different temperatures Typical behavior for 2 200  $\mu$ F/40 V**



**Impedance Z versus frequency  $f$  at different temperatures Typical behavior for 2 200  $\mu$ F/40 V**



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