



Axial-Lead and Soldering Star Capacitors

B41695

Compact – Up to 150 °C

B41795

SIKOREL®

Applications

- Compact design for automotive applications

Features

- 150 °C operating temperature up to 55 V
- High ripple current capability
- High vibration resistance
- Long useful life
- Miniaturized design
- Optimized CU value
- Shelf life up to 15 years

Construction

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

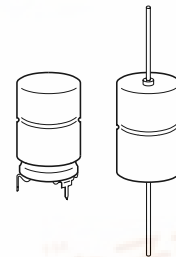
Terminals

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

Taping and packing

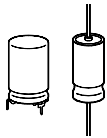
- Axial-lead capacitors will be delivered in pallet package.
Capacitors with $d \times l \leq 16 \times 30$ mm are also available taped on reel.
- Solder-star capacitors are packed in cardboard..

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



KAL0573-K





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Specifications and characteristics in brief

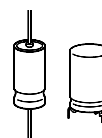
Rated voltage U_R	25 ... 63 VDC					
Surge voltage U_S	$1,15 \cdot U_R$					
Rated capacitance C_R	220 ... 2 200 μ F					
Capacitance tolerance	– 10/+ 30 % \triangleq Q					
Leakage current I_L (5 min, 20 °C)	$I_L \leq 0,006 \mu\text{A} \cdot \left(\frac{C_R}{\mu\text{F}} \cdot \frac{U_R}{\text{V}} \right) + 4 \mu\text{A}$					
Self-inductance ESL^1	Diameter d	12 mm	14 mm	16 mm	18 mm	
	Length 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 150 °C; U_{op} ; 0,5 I_{-R}^* 140 °C; U_R ; I_{-R} 125 °C; U_R ; I_{-R} 85 °C; U_R ; I_{-max} 40 °C; U_R ; 2,1 $\cdot I_{-R}$ *) U_{op} , see useful life graph, page 322	> 1 000 h > 1 000 h > 3 000 h > 8 000 h > 200 000 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: ≤ 10 fit ($\leq 20 \cdot 10^{-9}/h$) (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 $ESR \leq 1,3\%$ of 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 3×2 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 %.



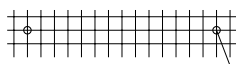
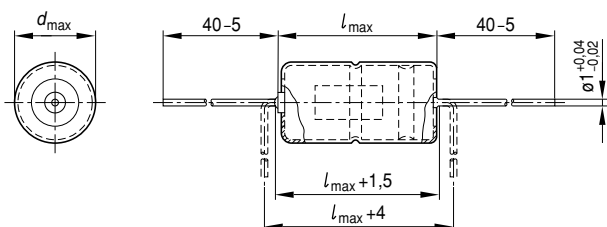
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Dimensional drawings

Axial-lead capacitor

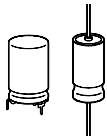


1,3+0,1

KAL0524-S

Dimensions, weights and packing units

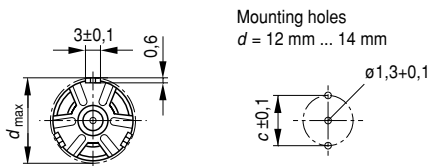
$d \times l$ mm	$d_{\max} \times l_{\max}$ mm	Approx. weight g	Packing units (pieces)	
			Pallet	Reel
12 × 30	12,5 × 30,5	5,1	288	450
14 × 30	14,5 × 30,5	6,8	200	350
16 × 30	16,5 × 30,5	8,9	180	250
18 × 30	18,5 × 30,5	11,1	160	—
18 × 39	18,5 × 40	14,7	160	—



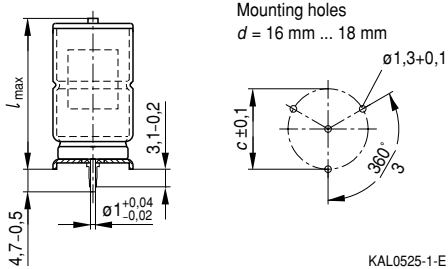
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Soldering star capacitors



Mounting holes
d = 12 mm ... 14 mm



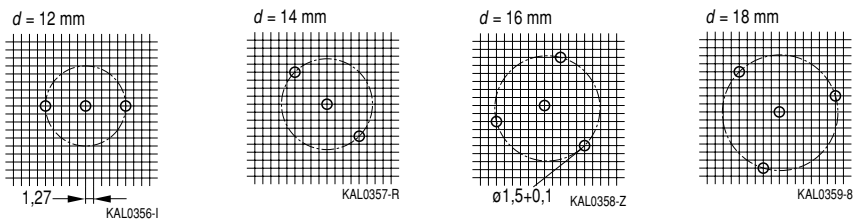
Mounting holes
d = 16 mm ... 18 mm

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:



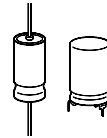
Dimensions, weights and packing units

$d \times l$ 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 × 30	15,5 × 32	14,5	7,2	480
16 × 30	17,5 × 32	16,5	9,4	300
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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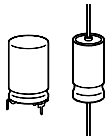


Overview of available types

U_R (VDC)	25	40	63
C_R (μ F)	Case dimensions $d \times l$ (mm)		
220			12 \times 30
470		12 \times 30	16 \times 30
680	12 \times 30		
1 000	14 \times 25	16 \times 30	18 \times 39
2 200	18 \times 30	18 \times 39	

Case dimensions and ordering codes

U_R VDC	C_R μ F	Case dim. $d \times l$ mm	Ordering code		
			Axial pallet package	Axial reel	Soldering star
25	680	12 \times 30	B41695A5687Q007	B41695A5687Q009	B41795A5687Q000
	1 000	14 \times 25	B41695A5108Q007	B41695A5108Q009	B41795A5108Q000
	2 200	18 \times 30	B41695A5228Q007		B41795A5228Q000
40	470	12 \times 30	B41695A7477Q007	B41695A7477Q009	B41795A7477Q000
	1 000	16 \times 30	B41695A7108Q007	B41695A7108Q009	B41795A7108Q000
	2 200	18 \times 39	B41695A7228Q007		B41795A7228Q000
63	220	12 \times 30	B41695A8227Q007	B41695A8277Q009	B41795A8227Q000
	470	16 \times 30	B41695A8477Q007	B41695A8477Q009	B41795A8477Q000
	1 000	18 \times 39	B41695A8108Q007		B41795A8108Q000



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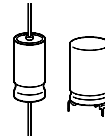
Technical data

C_R 100 Hz 20 °C μF	ESR_{typ} 100 Hz 20 °C mΩ	ESR_{max} 100 Hz 20 °C mΩ	ESR_{max} 100 Hz -40 °C Ω	ESR_{max} 10 kHz 20 °C mΩ	Z_{max} 100 kHz 20 °C mΩ	$I_{\sim max}$ 10 kHz 40 °C A	$I_{\sim max}$ 10 kHz 85 °C A	$I_{\sim R}$ 10 kHz 125 °C A	$I_{\sim max}$ 10 kHz 150 °C A (*)
25 VDC									
680	230	380	2,80	295	270	3,30	2,85	1,25	0,62
1 000	160	260	1,90	210	200	3,70	3,20	1,40	0,70
2 200	80	130	0,95	105	100	6,25	5,40	2,35	1,17 (*) at 20 V
40 VDC									
470	210	350	3,40	240	225	3,65	3,15	1,40	0,70
1 000	110	170	1,70	125	120	5,50	4,80	2,10	1,05
2 200	60	90	0,80	60	60	9,00	7,80	3,40	1,70 (*) at 35 V
63 VDC									
220	280	460	3,80	255	240	3,45	3,00	1,30	0,65
470	140	220	2,10	130	120	5,30	4,60	2,00	1,00
1 000	70	110	1,00	70	60	8,90	7,70	3,35	1,67 (*) at 55 V



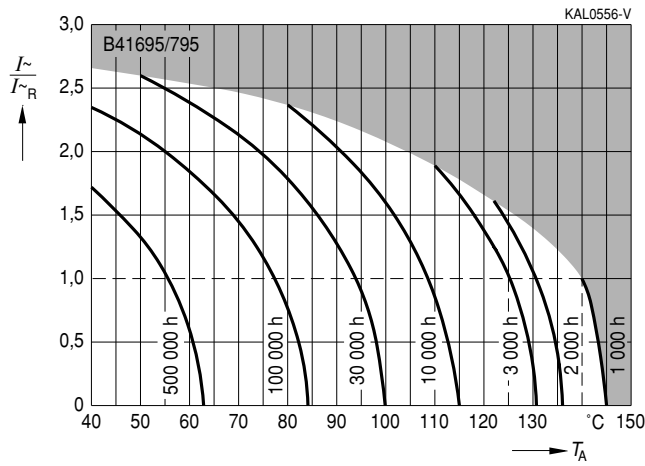
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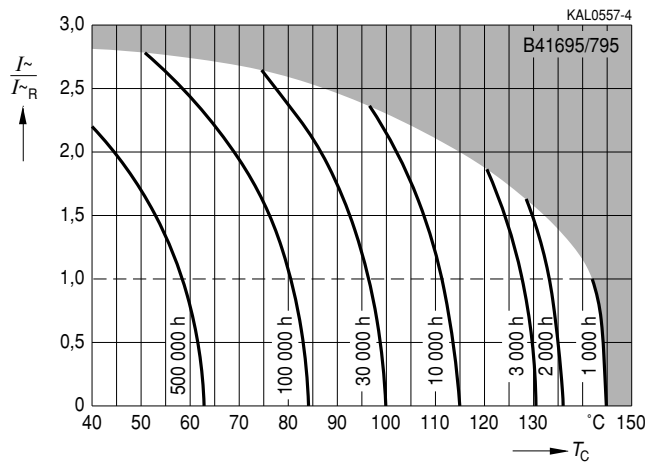
Useful life

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

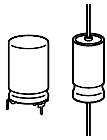


Useful life

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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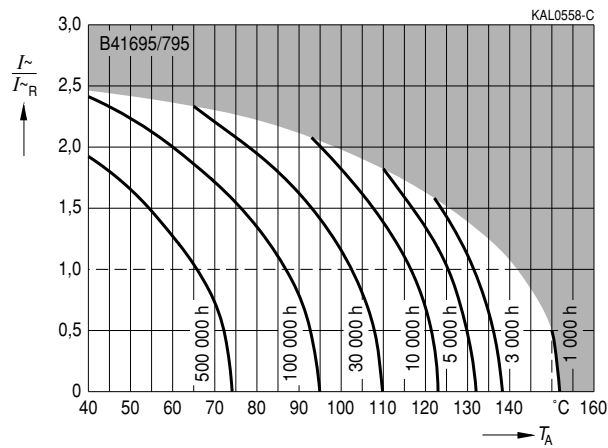
Useful life

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

$U_R = 25 \text{ V}: U_{op} \leq 20 \text{ V}$

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

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



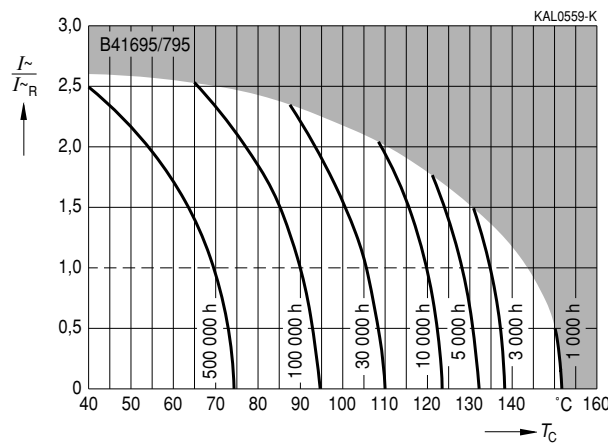
Useful life

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

$U_R = 25 \text{ V}: U_{op} \leq 20 \text{ V}$

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

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

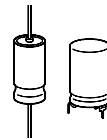


1) Refer to page 40 for an explanation on how to interpret the useful life graphs.

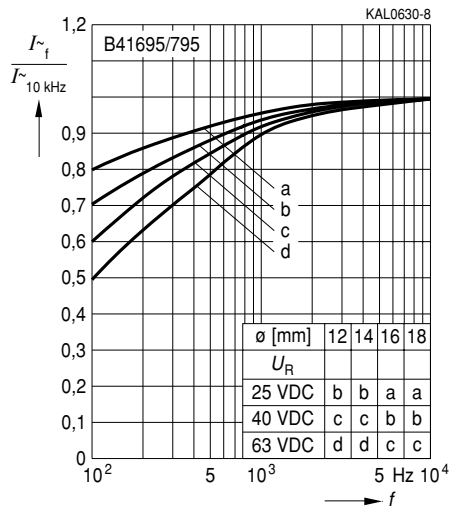


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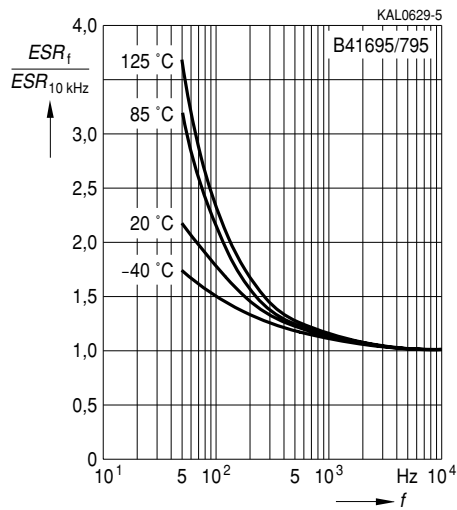
Compact – Up to 150 °C



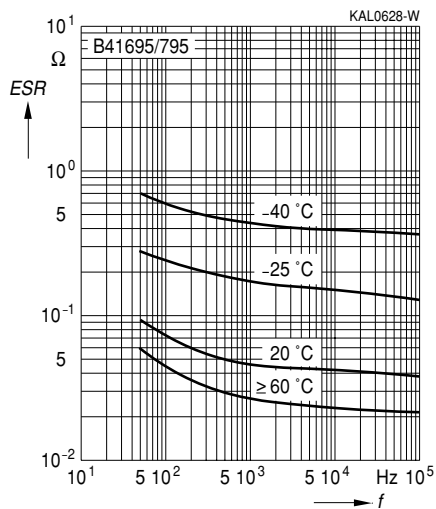
Frequency factor of permissible ripple current I_{\sim} versus frequency f



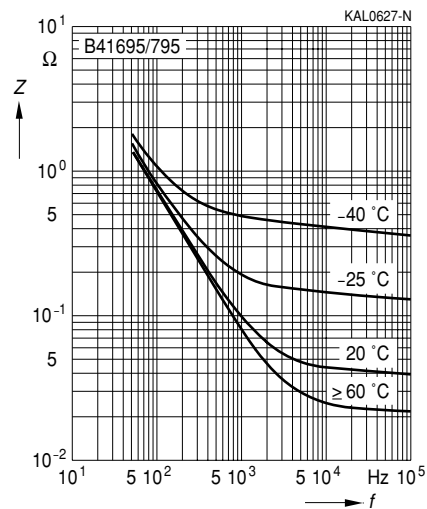
Frequency characteristics of ESR at different temperatures
Typical behavior



Equivalent series resistance ESR versus frequency at different temperatures
Typical behavior for 2 200 μ F/40 V



Impedance Z versus frequency f at different temperatures
Typical behavior for 2 200 μ F/40 V



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