

## SIKOREL®

### Applications

- Excellent reliable design for automotive applications

### Features

- High operating temperature capability
- Low ESR
- Extremely high reliability
- Outstanding parametric stability
- High ripple current capability
- High vibration resistance
- Long useful life
- Shelf life up to 15 years

### Construction

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

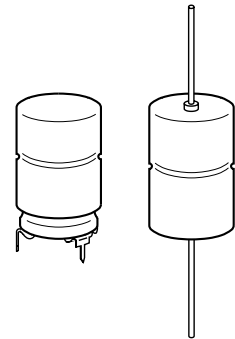
### Terminals

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

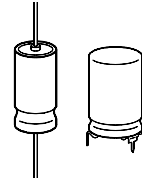
### Taping and packing

- 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.

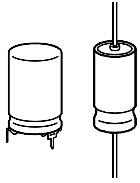


KAL0573-K


**Specifications and characteristics in brief**

Rated voltage $U_R$	25 ... 100 VDC					
Surge voltage $U_S$	$1,15 \cdot U_R$					
Rated capacitance $C_R$	100 ... 1 500 $\mu$ 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; $U_R$ ; 0,5 $I_{\sim R}$ 125 °C; $U_R$ ; $I_{\sim R}$ 85 °C; $U_R$ ; $I_{\sim \text{max}}$ 40 °C; $U_R$ ; 2,1 $\cdot I_{\sim R}$	25...90 VDC	100 VDC	Requirements:			
	> 1 000 h	> 1 000 h <sup>*)</sup>	$\Delta C/C$	$\leq \pm 30$ % of initial value		
	> 5 000 h	> 3 000 h	$ESR$	$\leq 3$ times of initial specified limit		
	> 15 000 h	> 8 000 h	$I_L$	$\leq$ initial specified limit		
	> 200 000 h	> 200 000 h	Failure percentage:	$\leq 0,5$ %		
		<sup>*)</sup> for 140 °C	Failure rate:	$\leq 10$ fit ( $\leq 10 \cdot 10^{-9}/\text{h}$ ) (for definiton "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 $\times$ 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 %.

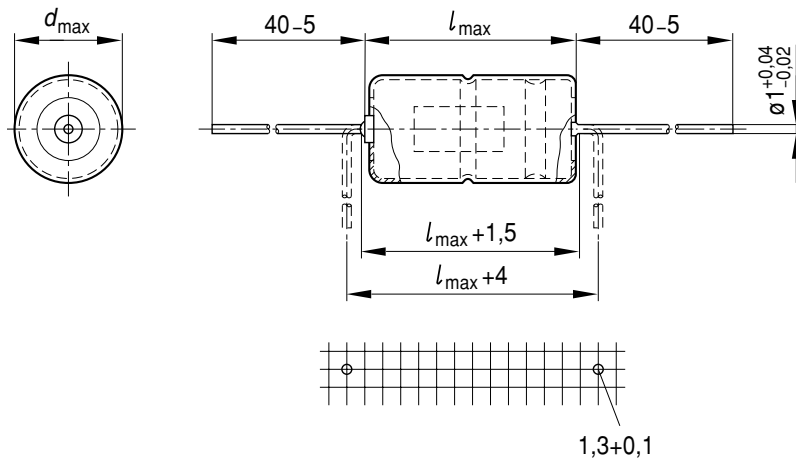


B41693 / B41793

Up to 150 °C

## Dimensional drawings

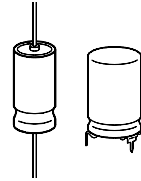
### Axial-lead capacitor



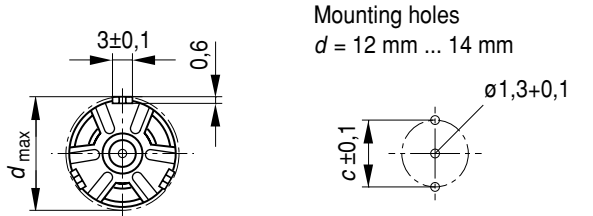
KAL0524-S

### Dimensions, weights and packing units

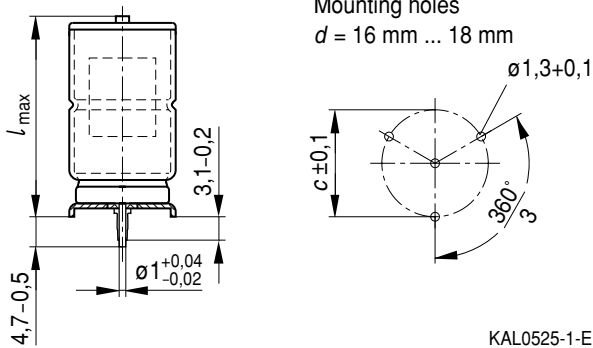
$d \times l$ mm	$d_{\max} \times l_{\max}$ mm	Approx. weight g	Packing units (pieces)	
			Pallet	Reel
12 × 30	12,5 × 30,5	5,1	288	450
14 × 25	14,5 × 25,5	5,7	200	350
14 × 30	14,5 × 30,5	6,8	200	350
16 × 25	16,5 × 25,5	7,4	180	250
16 × 30	16,5 × 30,5	8,9	180	250
16 × 39	16,5 × 40	11,7	180	—
18 × 30	18,5 × 30,5	11,1	160	—
18 × 39	18,5 × 40	14,7	160	—



### Soldering star capacitors



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



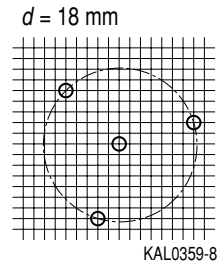
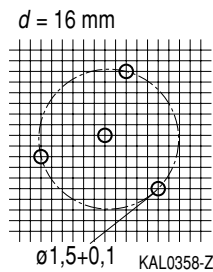
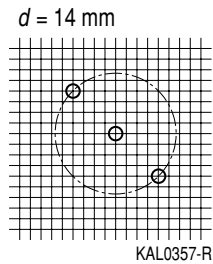
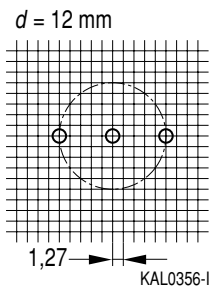
Mounting holes  
 $d = 16 \text{ mm} \dots 18 \text{ mm}$

Soldering star is connected to the negative pole

KAL0525-1-E

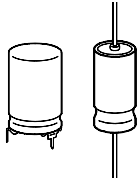
The PC-board hole arrangement specified above is based on circular arcs.

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:



### Dimensions, weights and packing units

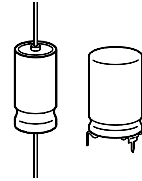
$d \times l$ mm	$d_{\max} \times l_{\max}$ mm	$c \pm 0,1$ mm	Approx. weight g	Packing units pieces
12 × 30	13,5 × 32	12,5	5,4	480
14 × 25	15,5 × 27	14,5	6,1	480
14 × 30	15,5 × 32	14,5	7,2	480
16 × 25	17,5 × 27	16,5	7,9	300
16 × 30	17,5 × 32	16,5	9,4	300
16 × 39	17,5 × 41,5	16,5	12,2	200
18 × 30	19,5 × 32	18,5	11,8	300
18 × 39	19,5 × 41,5	18,5	15,4	200


**Overview of available types**

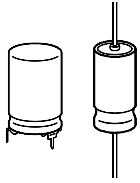
$U_R$ (VDC)	25	40	63	75	100
$C_R$ ( $\mu$ F)	Case dimensions $d \times l$ (mm)				
100			12 × 30	12 × 30	14 × 25
150					16 × 25
220			14 × 30	16 × 30	
330		12 × 30			18 × 39
470	14 × 25		16 × 39	18 × 39	
1 000	16 × 30	18 × 30			
1 500	16 × 39	18 × 39			

**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	470	14 × 25	B41693A5477Q007	B41693A5477Q009	B41793A5477Q000
	1 000	16 × 30	B41693A5108Q007	B41693A5108Q009	B41793A5108Q000
	1 500	16 × 39	B41693A5158Q007		B41793A5158Q000
40	330	12 × 30	B41693A7337Q007	B41693A7337Q009	B41793A7337Q000
	1 000	18 × 30	B41693A7108Q007		B41793A7108Q000
	1 500	18 × 39	B41693A7158Q007		B41793A7158Q000
63	100	12 × 30	B41693A8107Q007	B41693A8107Q009	B41793A8107Q000
	220	14 × 30	B41693A8227Q007	B41693A8277Q009	B41793A8227Q000
	470	16 × 39	B41693A8477Q007		B41793A8477Q000
75	100	12 × 30	B41693A0107Q007	B41693A0107Q009	B41793A0107Q000
	220	16 × 30	B41693A0227Q007	B41693A0227Q009	B41793A0227Q000
	470	18 × 39	B41693A0477Q007		B41793A0477Q000
100	100	14 × 25	B41693A9107Q007	B41693A9107Q009	B41793A9107Q000
	150	16 × 25	B41693A9157Q007	B41693A9157Q009	B41793A9157Q000
	330	18 × 39	B41693A9337Q007		B41793A9337Q000


**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
<b>25 VDC</b>									
470	200	320	1,90	190	180	3,80	3,55	1,60	0,80
1 000	90	150	0,90	100	92	6,00	5,50	2,50	1,25
1 500	60	100	0,60	70	65	8,30	7,70	3,45	1,72
<b>40 VDC</b>									
330	250	400	2,50	200	190	3,80	3,55	1,60	0,80
1 000	80	130	0,70	80	76	7,60	6,10	2,75	1,37
1 500	55	90	0,50	55	52	9,20	8,50	3,80	1,90
<b>63 VDC</b>									
100	500	800	3,30	280	270	3,30	3,00	1,35	0,67
220	230	380	1,70	135	130	4,90	4,60	2,05	1,02
470	110	170	0,90	68	65	8,20	7,60	3,40	1,70
<b>75 VDC</b>									
100	420	700	3,00	225	220	3,60	3,35	1,50	0,75
220	200	330	1,50	115	110	5,70	5,20	2,35	1,17
470	90	150	0,70	60	56	9,20	8,50	3,80	1,90
<b>100 VDC</b>									
100	430	900	3,40	300	270	3,80	3,30	1,45	—
150	280	550	2,10	200	180	4,65	4,00	1,75	—
330	120	250	1,00	90	80	8,80	7,60	3,35	—



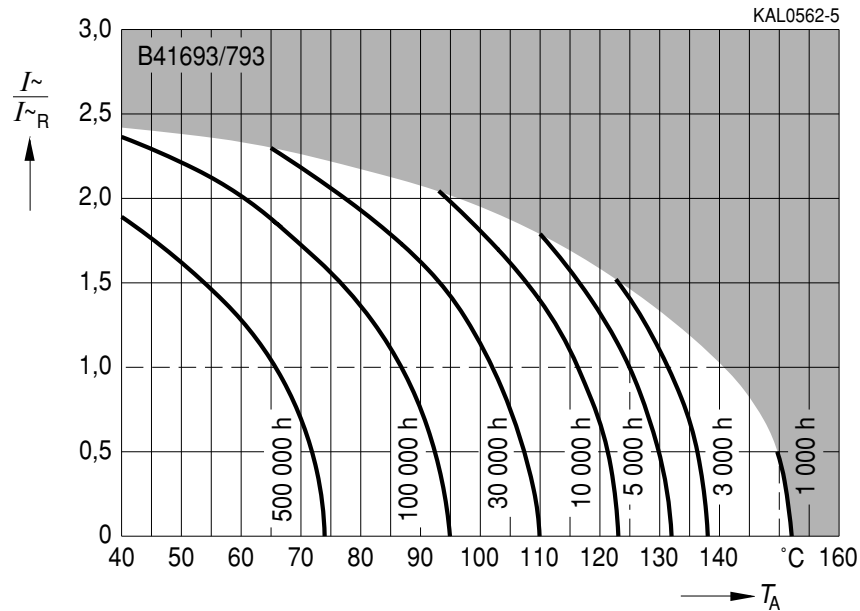
**B41693 / B41793**

**Up to 150 °C**

### Useful life

depending on ambient temperature  $T_A$  under ripple current operating conditions<sup>1)</sup>

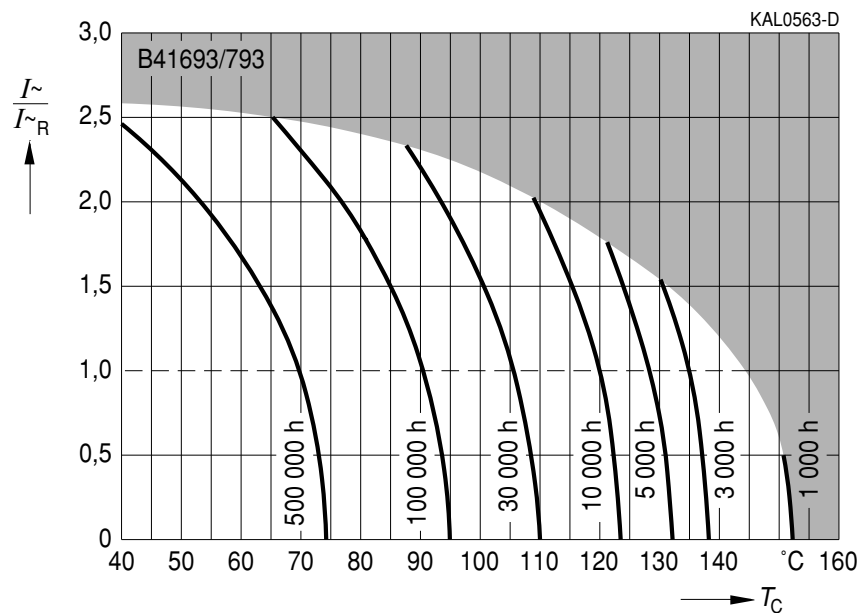
$U_R < 100 \text{ V}$  or  $U_R = 100 \text{ V}$  and operating voltage  $U_{op} \leq 90 \text{ V}$



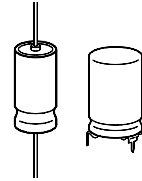
### Useful life

depending on case temperature  $T_C$  under ripple current operating conditions<sup>1)</sup>

$U_R < 100 \text{ V}$  or  $U_R = 100 \text{ V}$  and operating voltage  $U_{op} \leq 90 \text{ V}$



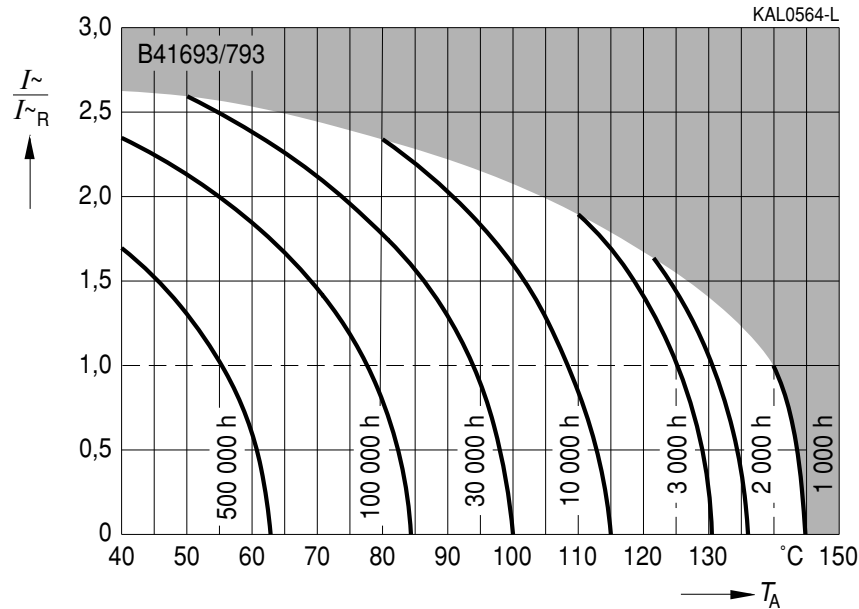
1) Refer to page 40 for an explanation on how to interpret the useful life graphs.



**Useful life**

depending on temperature  $T_A$  under ripple current operating conditions<sup>1)</sup>

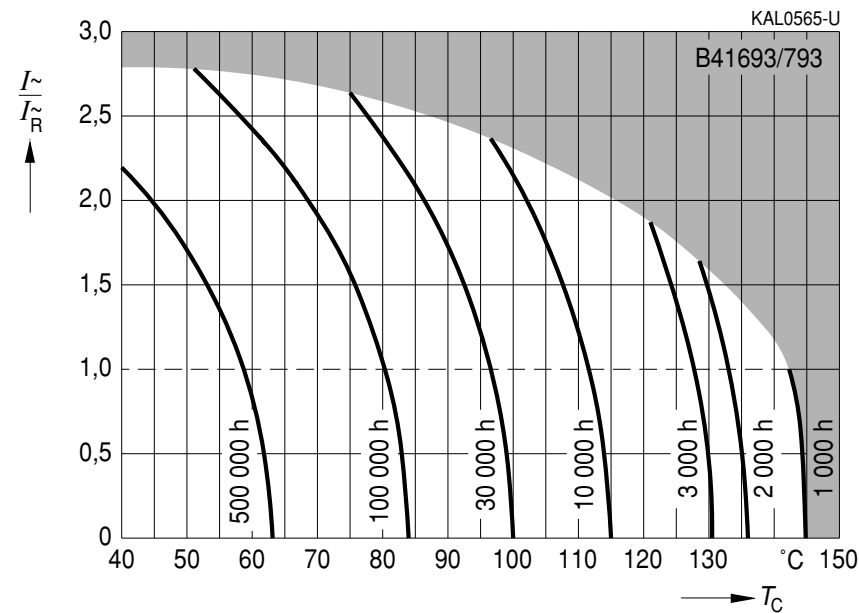
$U_R = 100 \text{ V}$



**Useful life**

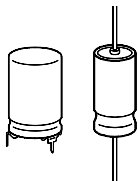
depending on case temperature  $T_C$  under ripple current operating conditions<sup>1)</sup>

$U_R = 100 \text{ V}$



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

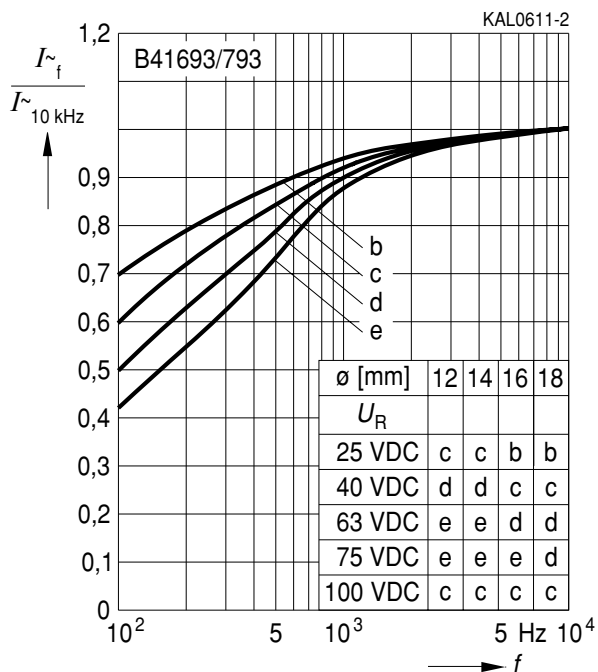




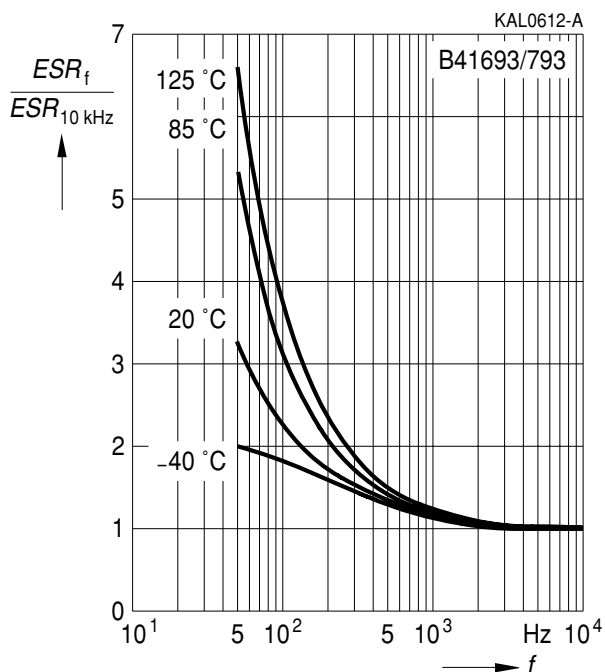
**B41693 / B41793**

**Up to 150 °C**

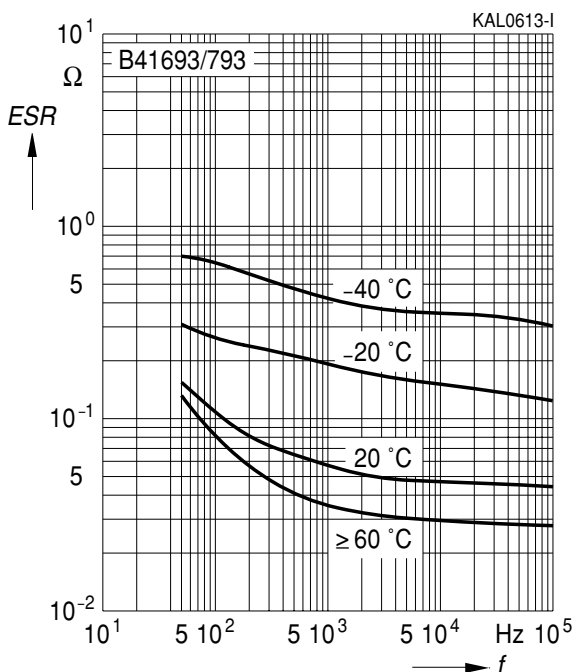
**Frequency factor of permissible ripple current  $I_{\sim}$  versus frequency  $f$**



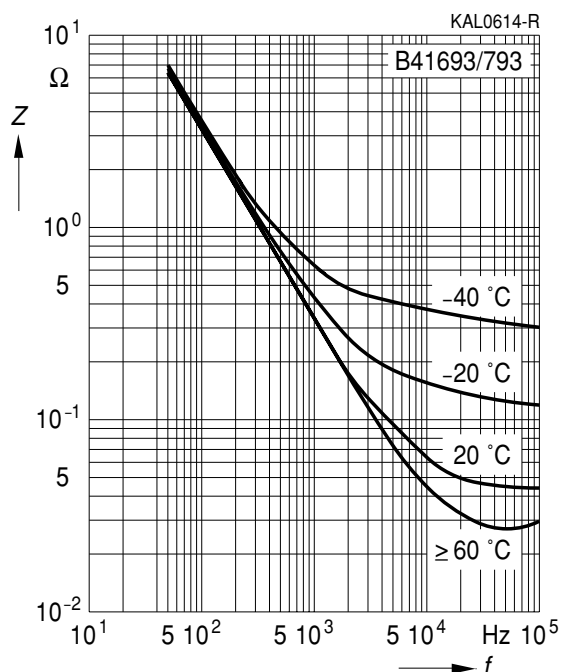
**Frequency characteristics of ESR at different temperatures**  
Typical behavior



**Equivalent series resistance ESR versus frequency  $f$  at different temperatures**  
Typical behavior for 470  $\mu$ F/63 V



**Impedance Z versus frequency  $f$  at different temperatures**  
Typical behavior for 470  $\mu$ F/63 V



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