

LL grade
Especially high volumetric efficiency

Construction

- Charge-discharge proof, polar
- Aluminum case, fully insulated
- Overload protection by preset break point in case
- Negative pole brought out to solder pin, but not insulated from case

Terminals

- Solder pin mounting on printed circuit boards, pins fit standardized spacings on PCB
- 4 snap-in terminals (6,3 mm and 4,5 mm length)

Features

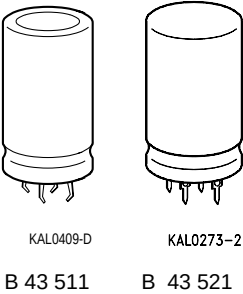
- Outstanding ripple current capability
- Extremely small dimensions, i.e. especially high volumetric efficiency
- Many different case sizes
- Pinning ensures correct insertion

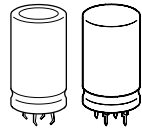
Applications

- For frequency converters
- For switch-mode power supplies in industrial and consumer electronics

Specifications and characteristics in brief

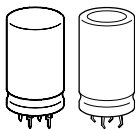
Rated voltage U_R	350 to 450 V–
Surge voltage U_S	$1,1 \cdot U_R$
Rated capacitance C_R	390 ... 2 200 μF
Capacitance tolerance	$\pm 20 \% \triangleq \text{M}$
Useful life	
40 °C, U_R	$> 200\,000 \text{ h } (1,6 \cdot I_{R,85^\circ\text{C}})$
85 °C, U_R ; I_{R}	$> 12\,000 \text{ h}$
Failure percentage	$\leq 1 \%$ (during useful life)
Failure rate	$\leq 40 \text{ fit}$ ($\leq 40 \cdot 10^{-9}/\text{h}$)
Voltage endurance test	3 000 h, 85 °C (at U_R)





Specifications and characteristics in brief

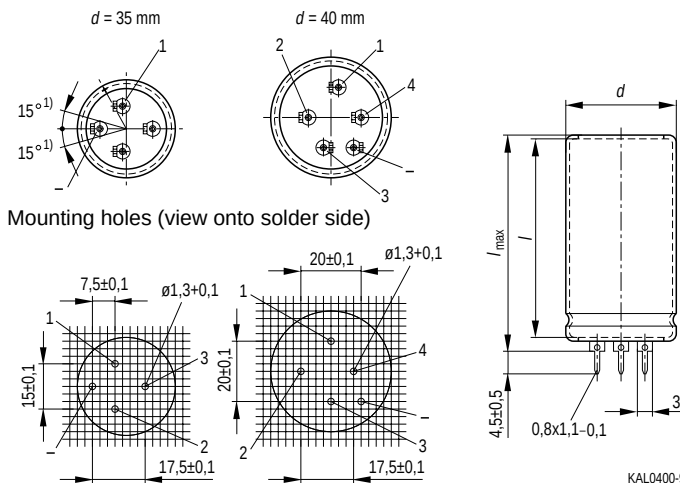
Leakage current I_{lka} (5 min, 20 °C)	$I_{lka} \leq 0,3 \mu A \cdot \left(\frac{C_R}{\mu F} \cdot \frac{U_R}{V} \right)^{0,7} + 4 \mu A$
Self-inductance L_{ESL}	approx. 20 nH
IEC climatic category	in accordance with IEC 68–1 $\leq 400 V$ –: 40/085/56 (–40 °C/+85 °C, 56 days damp heat test) $450 V$ –: 25/085/56 (–25 °C/+85 °C, 56 days damp heat test)
Detail specification	similar to CECC 30 301-805
Sectional specification	IEC 384–4
Vibration resistance	in accordance with IEC 68–2–6, test Fc: frequency range 10 ... 55 Hz, duration 3×2 h displacement amplitude 0,35 mm, acceleration max. 5 g



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Dimensional drawings

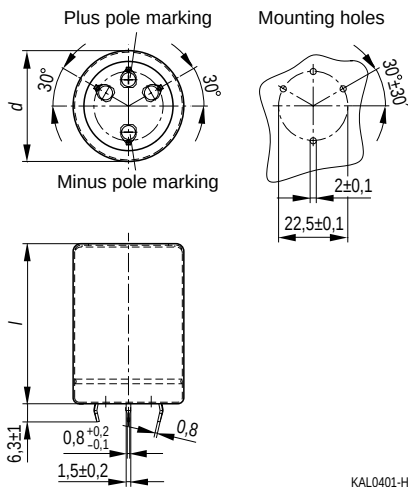
Solder pins



Pole markings: Plus: 1; Minus: –

All pin holes must be drilled into the PC-board, since the unconnected pins serve as mountings. These pins must be soldered to isolated pads or pads with the same potential as the negative pole.

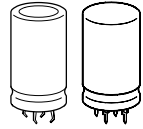
4 snap-in terminals



Standard snap-in terminals: length $(6,3 \pm 1)$ mm.
Also available with a length of $(4,5 - 1)$ mm.

For ordering example cf. [page 178](#)

Dimensions (mm)			Approx. weight (g)	Packing units (pieces)
$d+1$	$l \pm 2$	$l_{\max}$		
35	50	54	63	144
35	60	64	76	144
35	70	74	88	72
35	80	84	101	72
35	100	104	126	72
40	40	44	71	96
40	50	54	89	96
40	60	64	107	96
40	70	74	125	48
40	80	84	143	48
40	100	104	178	48
45	40	–	90	80
45	50	–	113	80
45	60	–	136	80
45	70	–	158	40
45	80	–	181	40
45	100	–	226	40

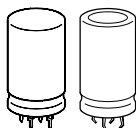


Overview of available types

U_R (V-)	350	400	450
C_R (μF)	Case dimensions $d \times l$ (mm)		
390			35 × 50 40 × 40
470		35 × 50 40 × 40	35 × 60 40 × 50 45 × 40
560	35 × 50	35 × 60 45 × 40	35 × 70 40 × 60
680	35 × 60 40 × 50	35 × 70 40 × 60 45 × 50	35 × 80 40 × 60 45 × 50
820	35 × 70 40 × 60	35 × 80 40 × 60	40 × 70 45 × 60
1 000	35 × 80 40 × 60 45 × 50	35 × 100 40 × 70 45 × 60	40 × 100 45 × 70
1 500	40 × 80 45 × 70	40 × 100 45 × 80	45 × 100
1 800		45 × 100	
2 200	45 × 100		

The capacitance and voltage ratings listed above are available in different cases upon request. Other voltage and capacitance ratings are also available upon request.

Capacitors with solder pins are only available in 35 and 40 mm case diameters.



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Technical data and ordering codes

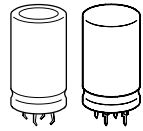
U_R	C_R	Case dimensions $d \times l$ mm	$R_{ESR, \max}$ 100 Hz 20 °C mΩ	$Z_{\max}$ 10 kHz 20 °C mΩ	$I_{\max}$ 100 Hz 40 °C A	I_R 100 Hz 85 °C A	Ordering code ¹⁾
V-	μF						Short code
B43511-, B43521-							
350	560	35 × 50	230	190	7,0	3,2	-A4567-M
	680	35 × 60	190	150	8,2	3,7	-A4687-M
	680	40 × 50	190	150	8,1	3,7	-C4687-M
	820	35 × 70	160	130	9,6	4,4	-A4827-M
	820	40 × 60	160	130	9,5	4,3	-C4827-M
	1 000	35 × 80	130	110	11	5,1	-A4108-M
	1 000	40 × 60	130	110	10	4,8	-C4108-M
	1 000	45 × 50	130	110	9,9	4,5	-E4108-M
	1 500	40 × 80	90	70	14	6,5	-A4158-M
	1 500	45 × 70	90	70	14	6,2	-C4158-M
	2 200	45 × 100	60	50	19	8,6	-A4228-M
400	470	35 × 50	280	220	6,4	2,9	-A9477-M
	470	40 × 40	280	220	6,2	2,8	-C9477-M
	560	35 × 60	230	190	7,5	3,4	-A9567-M
	560	45 × 40	230	190	6,9	3,1	-C9567-M
	680	35 × 70	190	150	8,7	4,0	-A9687-M
	680	40 × 60	190	150	8,7	3,9	-C9687-M
	680	45 × 50	190	150	8,1	3,7	-E9687-M
	820	35 × 80	160	130	10	4,6	-A9827-M
	820	40 × 60	160	130	9,5	4,3	-C9827-M
	1 000	35 × 100	130	110	12	5,6	-C9108-M
	1 000	40 × 70	130	110	11	5,1	-A9108-M
	1 000	45 × 60	130	110	11	4,8	-B9108-M
	1 500	40 × 100	90	70	16	7,2	-A9158-M
	1 500	45 × 80	90	70	14	6,5	-C9158-M
	1 800	45 × 100	80	60	17	7,8	-A9188-M

Capacitors with solder pins are only available in 35 and 40 mm case diameters.

1) To obtain the required ordering code, prefix the type number to the short code. E. g.: B43511-A4567-M
B43521-...(solder pins)

B43511-...(4 snap-in terminals, standard version with terminal length 6,3 mm).

For short-terminal version (length 4,5 mm), append code number "7" to the tolerance code. E. g.: B43511-A4567-M7)



Technical data and ordering codes

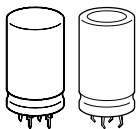
U_R	C_R	Case dimensions $d \times l$ mm	$R_{ESR, \max}$ 100 Hz 20 °C mΩ	$Z_{\max}$ 10 kHz 20 °C mΩ	$I_{\max}$ 100 Hz 40 °C A	I_R 100 Hz 85 °C A	Ordering code ¹⁾
V-	μF						Short code
B43511-, B43521-							
450	390	35 × 50	520	410	5,8	2,6	-A5397-M
	390	40 × 40	520	410	5,7	2,6	-C5397-M
	470	35 × 60	430	340	6,8	3,1	-A5477-M
	470	40 × 50	430	340	6,7	3,1	-C5477-M
	470	45 × 40	430	340	6,3	2,9	-E5477-M
	560	35 × 70	360	290	7,9	3,6	-A5567-M
	560	40 × 60	360	290	7,9	3,6	-C5567-M
	680	35 × 80	300	240	9,2	4,2	-A5687-M
	680	40 × 60	300	240	8,7	3,9	-C5687-M
	680	45 × 50	300	240	8,1	3,7	-E5687-M
	820	40 × 70	250	200	10	4,6	-A5827-M
	820	45 × 60	250	200	9,5	4,3	-C5827-M
	1 000	40 × 100	200	160	13	5,8	-A5108-M
	1 000	45 × 70	200	160	11	5,1	-C5108-M
	1 500	45 × 100	140	110	16	7,1	-A5158-M

Capacitors with solder pins are only available in 35 and 40 mm case diameters.

1) To obtain the required ordering code, prefix the type number to the short code. E. g.: B43511-A5379-M
B43521-...(solder pins)

B43511-...(4 snap-in terminals, standard version with terminal length 6,3 mm).

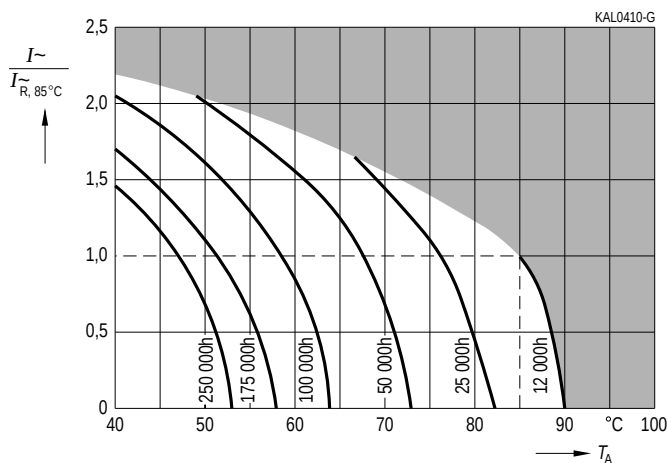
For short-terminal version (length 4,5 mm), append code number "7" to the tolerance code. E. g.: B43511-A5397-M7)



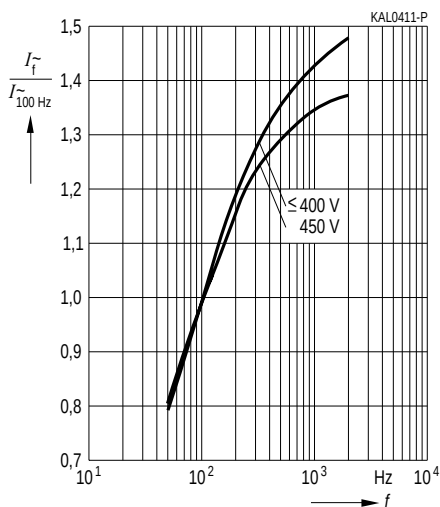
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Useful life

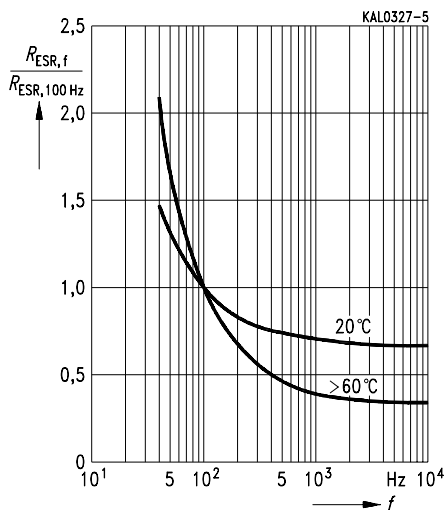
versus ambient temperature T_A under ripple current operating conditions ¹⁾



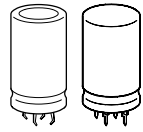
Permissible ripple current I_r versus frequency f



Equivalent series resistance R_{ESR} versus frequency f Typical behavior



¹⁾ Refer to [page 34](#) for an explanation on how to interpret the useful life graphs.



Impedance Z at $f = 10$ kHz
versus frequency f
Typical behavior

