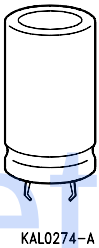
LL grade
For universal application


KAL0274-A

Construction

- Charge-discharge proof, polar
- Aluminum case, fully insulated
- Snap-in solder pins to hold component in place on PC-board
- Minus pole marking on case surface
- Minus pole not insulated from case

Terminals

- Standard version with 2 terminals
  2 lengths available: 6,3 and 4,5 mm
- 3 terminals (terminal arrangement ensures correct insertion)

Features

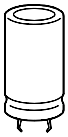
- High reliability and high ripple current capability
- Low equivalent series resistance R_{ESR}
- High *CU* product, i.e. extremely compact
- Different case sizes available for each capacitance value

Applications

- Switch-mode power supplies in industrial and entertainment electronics

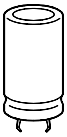
Specifications and characteristics in brief

Rated voltage U_R	160 … 450 V–
Surge voltage U_S	1,15 · U_R (for $U_R \leq$ 250 V–) 1,10 · U_R (for $U_R \geq$ 385 V–)
Rated capacitance C_R	47 … 2 200 µF
Capacitance tolerance	± 20 % ≙ M
Useful life 40 °C, U_R 85 °C, U_R; $I_{\sim R}$	 > 200 000 h (1,4 · $I_{\sim R,85°C}$) > 10 000 h
Failure percentage	≤ 1 % (during useful life)
Failure rate	≤ 50 fit (≤ 50 · 10^{-9}/h)
Voltage endurance test	5 000 h, 85 °C (at U_R)
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 ≤ 400 V–: 40/085/56 (–40 °C/+85 °C, 56 days damp heat test) 420 V–, 450 V–: 25/085/56 (–25 °C/+85 °C, 56 days damp heat test)

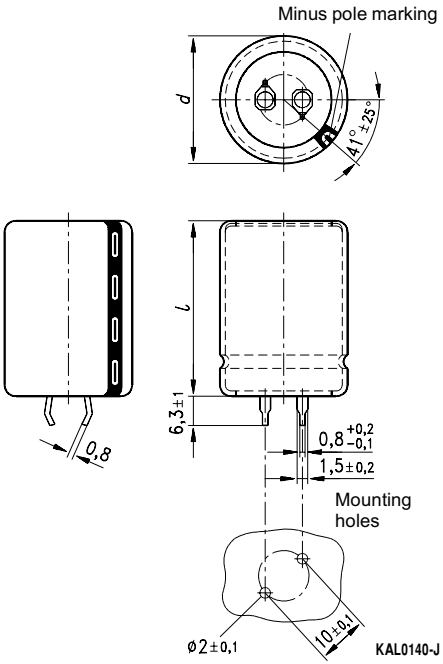


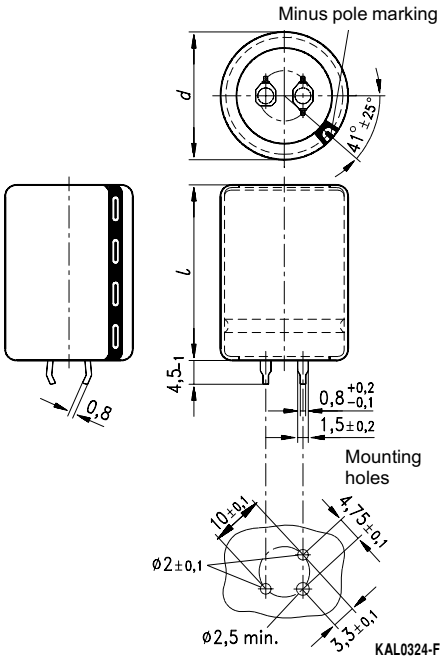
Specifications and characteristics in brief

Detail specification Sectional specification	similar to CECC 30 301-811 IEC 384–4
Vibration resistance	in accordance with IEC 68–2–6, test Fc: displacement amplitude 0,35 mm, frequency range 10 … 55 Hz, acceleration max. 5 *g*, duration 3 × 2 h



Dimensional drawings



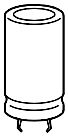


Snap-in terminals, standard (length 6,3 ± 1 mm). Also available in a shorter version with a length of 4,5 – 1 mm. For packing mode and ordering example see next page.

Dimensions (mm) d + 1	l ± 2	Approx. weight (g)	Packing units (pieces)
22	25	9	160
22	30	12	160
22	35	15	160
22	40	18	160
25	25	13	130
25	30	17	130
25	35	19	130
25	40	22	130

Snap-in capacitors are also available with 3 terminals.
For packing mode and ordering example see next page.

Dimensions (mm) d + 1	l ± 2	Approx. weight (g)	Packing units (pieces)
30	25	17	80
30	30	23	80
30	35	29	80
30	40	36	80
30	45	41	80
30	50	47	80
35	35	36	60
35	40	41	60
35	45	57	60
35	50	72	60



Packing of snap-in capacitors

For ecological reasons the packing is pure cardboard. Components can be withdrawn (in full or in part) in the correct position for insertion.

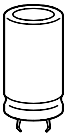
Ordering codes

Snap-in terminals Version	Identification in 3rd block of ordering code
Standard terminals (6,3 ± 1) mm	-M
Short terminals (4,5 –1) mm	-M7
3 terminals	-M2

Ordering example:

B43501-A3107-M7 } snap-in capacitor with short terminals

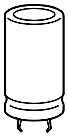
B43501-A3107-M2 } snap-in capacitor with 3 terminals



Overview of available types

U_R (V–)	160	200	250	385	400	420	450
C_R (µF)	Case dimensions $d \times l$ (mm)						
47							22 × 25
68				22 × 25	22 × 25		22 × 30 25 × 25
100				22 × 30 25 × 25	22 × 30 25 × 25	22 × 30 25 × 25	22 × 40 25 × 30 30 × 25
120					22 × 35	25 × 30	
150			22 × 25	22 × 40 25 × 30	22 × 40 30 × 25	22 × 40 25 × 35	25 × 40 30 × 30
180					30 × 30	25 × 30 30 × 33	30 × 35
220	22 × 25	22 × 25	22 × 30 25 × 25	25 × 40 30 × 30	25 × 40 30 × 35	25 × 40 30 × 35	30 × 40
270					30 × 35	30 × 35 35 × 30	30 × 45
330	22 × 30	22 × 30 25 × 25	22 × 40 25 × 30	30 × 40	30 × 45	30 × 45 35 × 35	35 × 40
390					30 × 50	30 × 50	
470	22 × 35	22 × 40 30 × 25	25 × 40 30 × 30	35 × 40	35 × 45	35 × 45	35 × 50
560				35 × 45	35 × 50	35 × 50	
680	25 × 35	25 × 40 30 × 30	30 × 40				
1 000	30 × 35	30 × 40 35 × 35	35 × 40				
1 500	30 × 45	35 × 45					
2 200	35 × 50						

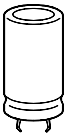
The capacitance and voltage ratings listed above are available in different cases upon request. Other voltage and capacitance ratings are also available upon request.



Technical data and ordering codes

U_R	C_R	Case dimensions $d \times l$	$R_{ESR, typ}$ 100 Hz 20 °C	$R_{ESR, max}$ 100 Hz 20 °C	Z_{max} 10 kHz 20 °C	$I_{\sim max}$ 100 Hz 40 °C	$I_{\sim R}$ [1] 100 Hz 85 °C	Ordering code [2]
V–	µF	mm	mΩ	mΩ	mΩ	A	A	Short code
B43501-								
160	220	22 × 25	530	910	730	2,4	1,1	-A1227-M
	330	22 × 30	360	610	490	3,2	1,4	-A1337-M
	470	22 × 35	250	430	350	4,0	1,8	-A1477-M
	680	25 × 35	180	300	240	5,2	2,4	-A1687-M
	1 000	30 × 35	120	200	160	6,9	3,1	-A1108-M
	1 500	30 × 45	80	140	120	9,2	4,2	-A1158-M
	2 200	35 × 50	60	91	80	13	5,8	-A1228-M
200	220	22 × 25	380	610	490	2,4	1,1	-A2227-M
	330	22 × 30	260	410	330	3,2	1,4	-A2337-M
	330	25 × 25	260	410	330	3,2	1,5	-J2337-M
	470	22 × 40	180	290	240	4,2	1,9	-A2477-M
	470	30 × 25	180	290	350	4,2	1,9	-J2477-M
	680	25 × 40	130	200	160	5,5	2,5	-A2687-M
	680	30 × 30	130	200	160	5,4	2,4	-J2687-M
	1 000	30 × 40	83	140	120	7,2	3,3	-A2108-M
	1 000	35 × 35	83	140	120	7,6	3,5	-J2108-M
	1 500	35 × 45	56	90	80	10	4,6	-A2158-M
250	150	22 × 25	560	890	800	2,0	0,91	-B2157-M
	220	22 × 30	380	610	500	2,6	1,2	-B2227-M
	220	25 × 25	380	610	490	2,6	1,2	-K2227-M
	330	22 × 40	260	410	330	3,5	1,6	-B2337-M
	330	25 × 30	260	410	330	3,4	1,6	-K2337-M
	470	25 × 40	180	290	240	4,5	2,1	-B2477-M
	470	30 × 30	180	290	240	4,5	2,0	-K2477-M
	680	30 × 40	130	200	160	5,9	2,7	-B2687-M
	1 000	35 × 40	83	140	120	8,0	3,6	-B2108-M

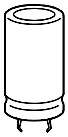
1) 120 Hz conversion factor of ripple current: $I\sim$ (120 Hz) = 1,03 · $I\sim$ (100 Hz)
2) To obtain the required ordering code, prefix the type number to the short code. E. g.: B43501-A1227-M



Technical data and ordering codes

U_R	C_R	Case dimensions $d \times l$	$R_{ESR, typ}$ 100 Hz 20 °C	$R_{ESR, max}$ 100 Hz 20 °C	Z_{max} 10 kHz 20 °C	$I_{\sim max}$ 100 Hz 40 °C	$I_{\sim R}$[1] 100 Hz 85 °C	Ordering code [2]
V–	µF	mm	mΩ	mΩ	mΩ	A	A	Short code
B43501-								
385	68	22 × 25	980	1960	1570	1,3	0,61	-A3686-M
	100	22 × 30	670	1330	1070	1,7	0,79	-A3107-M
	100	25 × 25	670	1330	1070	1,8	0,80	-B3107-M
	150	22 × 40	450	890	720	2,4	1,1	-A3157-M
	150	25 × 30	450	890	720	2,3	1,0	-B3157-M
	220	25 × 40	310	610	490	3,1	1,4	-A3227-M
	220	30 × 30	310	610	490	3,1	1,4	-B3227-M
	330	30 × 40	210	410	330	4,1	1,9	-A3337-M
	470	35 × 40	150	290	240	5,5	2,5	-A3477-M
	560	35 × 45	120	240	200	6,2	2,8	-A3567-M
400	68	22 × 25	980	1960	1570	1,3	0,61	-A9686-M
	100	22 × 30	670	1330	1070	1,7	0,79	-A9107-M
	100	25 × 25	670	1330	1070	1,8	0,80	-B9107-M
	120	22 × 35	560	1100	890	2,0	0,92	-A9127-M
	150	22 × 40	450	890	720	2,4	1,1	-A9157-M
	150	30 × 25	450	890	720	2,4	1,1	-B9157-M
	180	30 × 30	370	740	600	2,7	1,2	-A9187-M
	220	25 × 40	310	610	490	3,1	1,4	-A9227-M
	220	30 × 35	310	610	490	3,2	1,5	-B9227-M
	270	30 × 35	250	490	400	3,5	1,6	-A9277-M
	330	30 × 45	210	410	330	4,3	2,0	-A9337-M
	390	30 × 50	180	340	280	4,8	2,2	-A9397-M
	470	35 × 45	150	290	240	5,7	2,6	-A9477-M
	560	35 × 50	120	240	200	6,4	2,9	-A9567-M

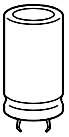
1) 120 Hz conversion factor of ripple current: $I\sim$ (120 Hz) = 1,03 · $I\sim$ (100 Hz)
2) To obtain the required ordering code, prefix the type number to the short code. E. g.: B43501-A3227-M



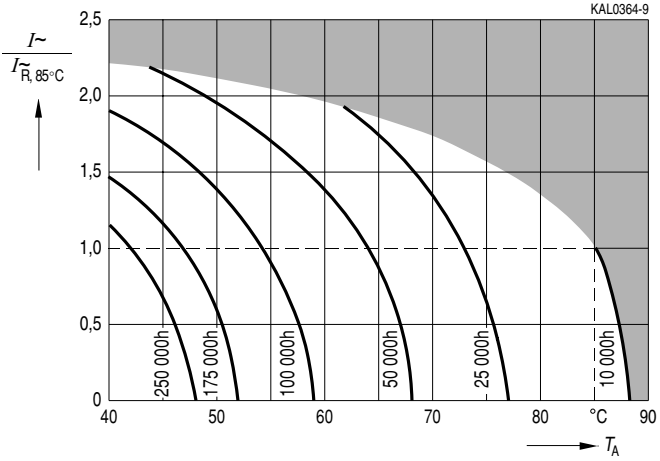
Technical data and ordering codes

U_R	C_R	Case dimensions $d \times l$	$R_{ESR, typ}$ 100 Hz 20 °C	$R_{ESR, max}$ 100 Hz 20 °C	Z_{max} 10 kHz 20 °C	$I_{\sim max}$ 100 Hz 40 °C	$I_{\sim R}$ [1] 100 Hz 85 °C	Ordering code [2]
V–	µF	mm	mΩ	mΩ	mΩ	A	A	Short code
B43501-								
420	100	22 × 30	1330	1990	1600	1,74	0,79	-A0107-M
	100	25 × 25	1330	1990	1600	1,77	0,80	-E0107-M
	120	22 × 30	1110	1660	1330	2,06	0,94	-A0127-M
	150	22 × 40	890	1330	1070	2,37	1,08	-A0157-M
	150	25 × 35	890	1330	1070	2,44	1,11	-E0157-M
	180	25 × 35	740	1110	890	2,67	1,21	-A0187-M
	180	30 × 30	740	1110	890	2,76	1,26	-E0187-M
	220	25 × 40	610	910	730	3,11	1,41	-A0227-M
	220	30 × 35	610	910	730	3,22	1,46	-E0227-M
	270	30 × 35	500	740	590	3,57	1,62	-A0277-M
	270	35 × 30	500	740	590	3,76	1,71	-E0277-M
	330	30 × 45	410	610	490	4,32	1,96	-A0337-M
	330	35 × 35	410	610	490	4,37	1,98	-E0337-M
	390	30 × 50	350	520	410	4,89	2,22	-A0397-M
	470	35 × 45	290	430	340	5,69	2,58	-A0477-M
	560	35 × 50	240	360	290	6,45	2,93	-A0567-M
450	47	22 × 25	2830	4240	3400	1,1	0,51	-A5476-M
	68	22 × 30	1960	2930	2350	1,4	0,65	-A5686-M
	68	25 × 25	1960	2930	2350	1,5	0,66	-B5686-M
	100	22 × 40	1330	1990	1600	1,9	0,88	-A5107-M
	100	25 × 30	1330	1990	1600	1,9	0,86	-B5107-M
	100	30 × 25	1330	1990	1600	1,9	0,90	-C5107-M
	150	25 × 40	890	1330	1070	2,6	1,2	-A5157-M
	150	30 × 30	890	1330	1070	2,5	1,1	-B5157-M
	180	30 × 35	750	1100	890	2,9	1,3	-A5187-M
	220	30 × 40	610	910	730	3,4	1,5	-A5227-M
	270	30 × 45	500	740	600	3,9	1,8	-A5277-M
	330	35 × 40	410	610	490	4,6	2,1	-A5337-M
	470	35 × 50	290	430	350	5,9	2,7	-A5477-M

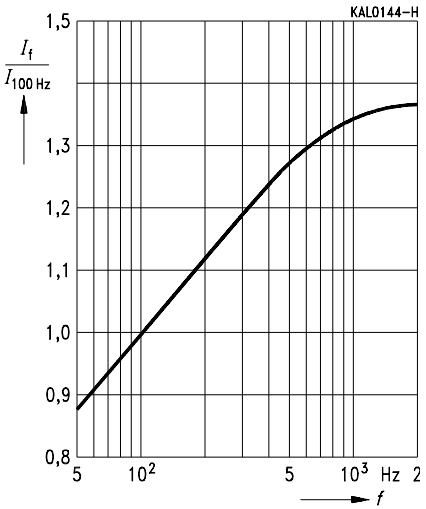
1) 120 Hz conversion factor of ripple current: $I\sim$ (120 Hz) = 1,03 · $I\sim$ (100 Hz)
2) To obtain the required ordering code, prefix the type number to the short code. E. g.: B43501-A3227-M



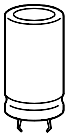
Useful life
versus ambient temperature T_A under ripple current operating conditions [1)]



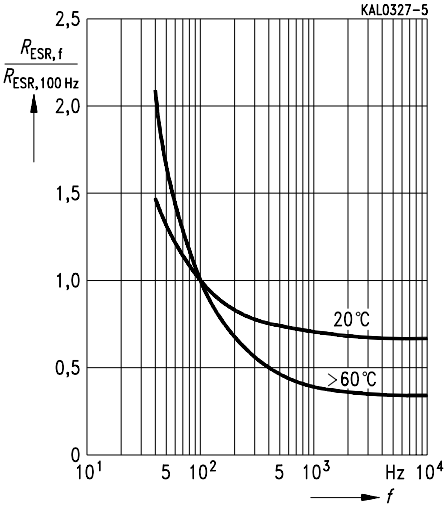
Permissible ripple current *I*~
versus frequency *f*



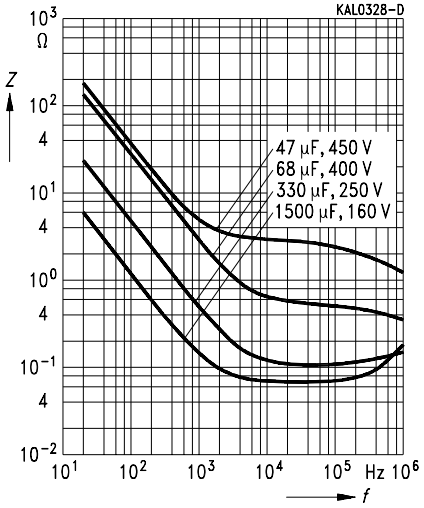
1) Refer to page 31 for an explanation on how to interpret the useful life graphs.



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



Impedance Z
versus frequency f
Typical behavior



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