

General-purpose grade

Applications

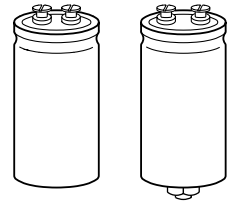
- Uninterruptible power supplies
- Frequency converters
- Professional power supplies

Features

- Compact, i. e. high CU product
- High reliability and ripple current capability
- All-welded construction ensures reliable electrical contact
- Version with optimized construction for base cooling (2-pad solution) available
- Version with low-inductance design available
- Self-extinguishing electrolyt

Construction

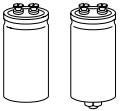
- Charge-discharge proof, polar
- Aluminum case with insulating sleeve
- Poles with screw terminal connections
- Mounting with ring clips, clamps or threaded stud
- The bases of types with threaded stud and $d \leq 76,9$ mm are not insulated, types with $d = 91$ mm have fully insulated bases



B43455

KAL0567-B

B43457



B43455 / B43457

Standard – 85 °C

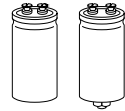
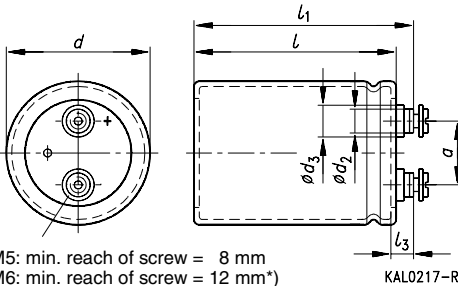
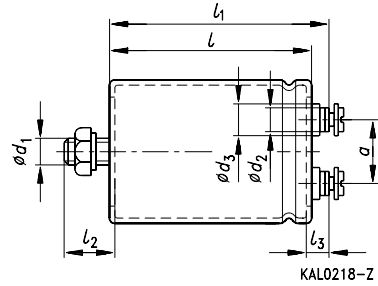
Specifications and characteristics in brief

Rated voltage U_R	350 ... 450 VDC	
Surge voltage U_S	$1,10 \cdot U_R$ (for $U_R \geq 350$ VDC)	
Rated capacitance C_R	470 ... 12 000 μ F	
Capacitance tolerance	$\pm 20 \% \triangleq M$	
Leakage current I_L (5 min, 20 °C)	$I_L \leq 0,3 \mu A \cdot \left(\frac{C_R}{\mu F} \cdot \frac{U_R}{V} \right)^{0,7} + 4 \mu A$	
Self-inductance ESL	Approx. 20 nH Capacitors with low-inductance design: $d \geq 64,3$ mm: approx. 13 nH	
Useful life 85 °C; U_R ; $I_{\sim R}$ 40 °C; U_R ; $1,5 \cdot I_{\sim R}$	> 10 000 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: $\leq 1 \%$ Failure rate: ≤ 40 fit ($\leq 40 \cdot 10^{-9}/h$) (for definition "fit", refer to chapter "Quality", page 62)
Voltage endurance test 85 °C; U_R	2 000 h	Post test requirements: $\Delta C/C \leq \pm 10 \%$ of initial value $ESR \leq 1,3$ times initial specified limit $I_L \leq$ initial specified limit
Vibration resistance	To IEC 60068-2-6, test Fc: displacement amplitude 0,75 mm, frequency range 10 to 55 Hz, acceleration max. 10 g, duration 3×2 h	
IEC climatic category	To IEC 60068-1: 25/085/56 (– 25 °C/+ 85 °C/56 days damp heat test)	
Detail specifications	Similar to CECC 30301-803, CECC 30301-807	
Sectional specification	IEC 60384-4	

Ripple current capability

Due to the ripple current capability of the contact elements, the following current upper limits must not be exceeded:

Capacitor diameter	51,6 mm	64,3 mm	76,9 mm	91,0 mm
$I_{\sim max}$	30 A	40 A	50 A	70 A


Dimensional drawings
Type B43455
 Ring clip/clamp mounting

Type B43457
 Threaded stud mounting


M5: min. reach of screw = 8 mm
 M6: min. reach of screw = 12 mm*)
 *) 8 mm for low-inductance design

Positive pole marking: +

The base of types with threaded stud and $d = 91$ mm is fully insulated (the lengths l and l_1 are increased by 0,5 mm in these cases). For types with threaded stud and $d \leq 76$ mm the base is not insulated. Also refer to the notes on mounting given on page 168.

Screw terminals with UNF threads are available upon request.

Dimensions and weights

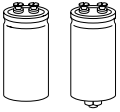
Ter- minal	Dimensions (mm) with insulating sleeve										Approx. wt. (g)
	d	$l \pm 1$	$l_1 \pm 1$	$l_2 \begin{smallmatrix} +0 \\ -1 \end{smallmatrix}$	l_3	d_1	d_2 max	d_3 max	$a \begin{smallmatrix} +0,2 \\ -0,4 \end{smallmatrix}$		
M 5	51,6 +0/-0,8	80,7	87,2	17	7,0 +0,2/-1	M 12	8,2	13,5	22,2	220	
M 5	51,6 +0/-0,8	105,7	112,2	17	7,0 +0,2/-1	M 12	8,2	13,5	22,2	280	
M 5	64,3 +0/-0,8	105,7	112,2	17	7,0 +0,2/-1	M 12	8,2	13,5	28,5	440	
M 6	76,9 +0/-0,7	105,7	111,5	17	6,4 +1,1/-0,8	M 12	17,7	17,7	31,7	540	
M 6	76,9 +0/-0,7	143,2	149,0	17	6,4 +1,1/-0,8	M 12	17,7	17,7	31,7	840	
M 6	76,9 +0/-0,7	220,7	226,5	17	6,4 +1,1/-0,8	M 12	17,7	17,7	31,7	1300	
M 6	91,0 +0/-2	97,0	103,3	17	6,4 +1,1/-0,8	M 12	17,7	17,7	31,7	750	
M 6	91,0 +0/-2	144,5	149,8	17	6,4 +1,1/-0,8	M 12	17,7	17,7	31,7	1200	
M 6	91,0 +0/-2	191,0	196,3	17	6,4 +1,1/-0,8	M 12	17,7	17,7	31,7	1700	
M 6	91,0 +0/-2	221,0	226,3	17	6,4 +1,1/-0,8	M 12	17,7	17,7	31,7	1900	

Dimensions are also valid for 2-pad solution and low-inductance design.

Packing

For ecological reasons the packing is pure cardboard.

Capacitor diameter d	Packing units (pieces)	Capacitor diameter d	Packing units (pieces)
51,6 mm	22	76,9 mm	12
64,3 mm	15	91,0 mm	8



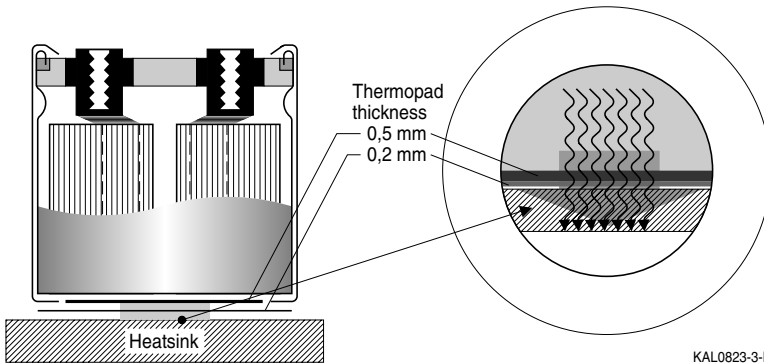
B43455 / B43457

Standard – 85 °C

Special designs

- Low-inductance design
- 2-pad solution

Design for optimized connection of the capacitor to the heatsink when using base cooling. This version is available for capacitors without threaded stud and for diameters $\geq 64,3$ mm (cf. $I_{-R}(B)$ in table “Technical data and ordering codes” and useful life graphs).



KAL0823-3-E

Ordering codes:

Design	Identification in 3rd block of ordering code	Remark
Low inductance (13 nH)	M003	For capacitors with diameter $d \geq 64,3$ mm
2-pad solution	M006	For capacitors with diameter $d \geq 64,3$ mm and without threaded stud

Accessories

The following items are included in the delivery package, but are not fastened to the capacitors:

	Thread	Toothed washers	Screws/Nuts	Maximum torque
For terminals	M 5	A 5,1 DIN 6797	Cylinder-head screw M 5 \times 8 DIN 84-4.8	2 Nm
	M 6	A 6,4 DIN 6797	Cylinder-head screw M 6 \times 12 DIN 85-4.8	2,5 Nm
For mounting	M 12	J 12,5 DIN 6797	Hex nut BM 12 DIN 439	10 Nm

The following must be ordered separately:

Ring clips

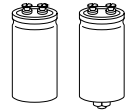
B44030 (cf. page 169)

Clamps for capacitors with $d \geq 64,3$ mm

B44030 (cf. page 173)

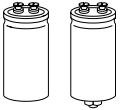
Insulating parts

B44020 (cf. page 166)


Overview of available types

U_R (VDC)	350	400	450
C_R (μF)	Case dimensions $d \times l$ (mm)		
470			51,6 × 80,7
1 000	51,6 × 80,7	51,6 × 80,7	51,6 × 80,7
1 500	51,6 × 105,7	51,6 × 105,7	64,3 × 105,7
2 200	51,6 × 105,7	64,3 × 105,7	64,3 × 105,7
3 300	64,3 × 105,7	76,9 × 105,7	76,9 × 143,2
4 700	76,9 × 105,7	76,9 × 143,2 91,0 × 97,0	76,9 × 220,7 91,0 × 144,5
6 000	76,9 × 143,2	76,9 × 220,7	76,9 × 220,7
6 800	76,9 × 143,2	91,0 × 144,5	
8 200	91,0 × 144,5		91,0 × 221,0
10 000	91,0 × 144,5	91,0 × 191,0	
12 000	91,0 × 191,0	91,0 × 221,0	

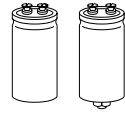
The capacitance and voltage ratings listed above are available in different cases upon request. Other voltage and capacitance ratings are also available upon request.


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Standard – 85 °C
Technical data and ordering codes

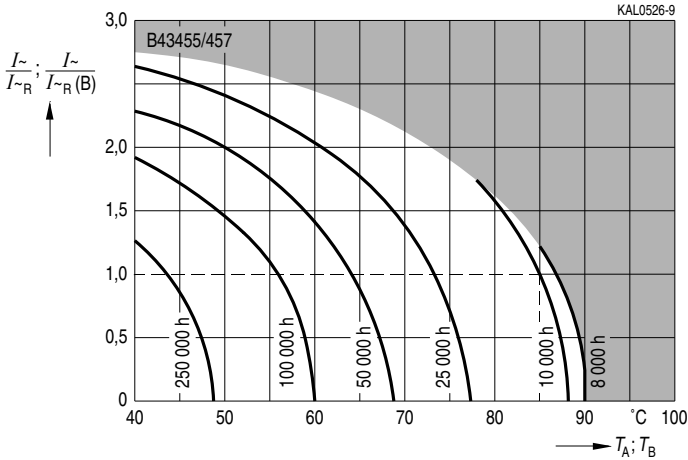
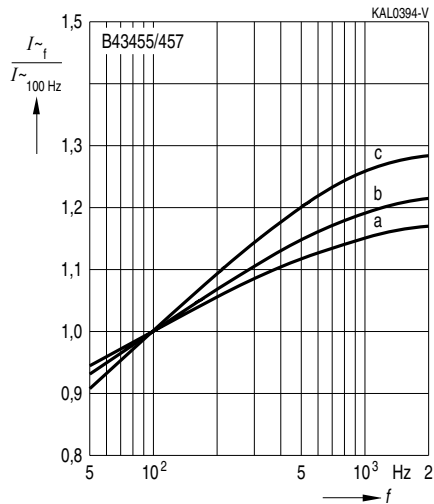
U_R	C_R	Case dimensions	ESR_{max}	Z_{max}	$I_{~max}$	$I_{~max}$	$I_{~R}$	$I_{~R(B)}$	Ordering code ¹⁾
VDC	100 Hz 20 °C μF	$d \times l$ mm	100 Hz 20 °C mΩ	10 kHz 20 °C mΩ	100 Hz 40 °C A	100 Hz 85 °C A	100 Hz 85 °C A	100 Hz 85 °C A	
350	1 000	51,6 × 80,7	129	140	13	5,4	4,5	7,8	B4345*A4108M000
	1 500	51,6 × 105,7	93	110	16	7,0	5,8	9,2	B4345*A4158M000
	2 200	51,6 × 105,7	72	63	20	8,5	7,1	13	B4345*B4228M000
	3 300	64,3 × 105,7	48	43	23	9,8	8,2	14	B4345*B4338M000 ²⁾
	4 700	76,9 × 105,7	38	35	28	12	10	19	B4345*B4478M000 ²⁾
	6 000	76,9 × 143,2	32	30	32	14	12	19	B4345*A4608M000 ²⁾
	6 800	76,9 × 143,2	27	27	36	16	13	22	B4345*A4688M000 ²⁾
	8 200	91,0 × 144,5	23	23	42	18	15	26	B4345*A4828M000 ²⁾
	10 000	91,0 × 144,5	20	22	48	21	17	31	B4345*B4109M000 ²⁾
	12 000	91,0 × 191,0	17	21	54	23	20	30	B4345*A4129M000 ²⁾
	400	1 000	51,6 × 80,7	129	140	13	5,2	4,8	8,9
1 500		51,6 × 105,7	93	110	17	6,8	6,2	11	B4345*A9158M000
2 200		64,3 × 105,7	72	63	21	8,4	7,6	13	B4345*A0228M000 ²⁾
3 300		76,9 × 105,7	54	48	23	8,5	8,5	16	B4345*A0338M000 ²⁾
4 700		76,9 × 143,2	41	37	29	11	11	17	B4345*A0478M000 ²⁾
4 700		91,0 × 97,0	41	37	30	13	11	23	B4345*K0478M000 ²⁾
6 000		76,9 × 220,7	32	30	35	15	13	17	B4345*A0608M000 ²⁾
6 800		91,0 × 144,5	38	35	39	17	14	24	B4345*A0688M000 ²⁾
10 000		91,0 × 191,0	26	26	50	22	18	28	B4345*A0109M000 ²⁾
12 000		91,0 × 221,0	22	22	58	25	21	31	B4345*A0129M000 ²⁾
450		470	51,6 × 80,7	390	420	7,0	3,1	2,6	4,1
	1 000	51,6 × 80,7	180	200	12	5,1	4,2	8,6	B4345*B5108M000
	1 500	64,3 × 105,7	120	130	16	6,9	5,8	9,4	B4345*A5158M000 ²⁾
	2 200	64,3 × 105,7	81	70	18	7,9	6,6	12	B4345*B5228M000 ²⁾
	3 300	76,9 × 143,2	54	48	25	11	9,1	14	B4345*A5338M000 ²⁾
	4 700	76,9 × 220,7	42	39	31	14	11	15	B4345*A5478M000 ²⁾
	4 700	91,0 × 144,5	42	39	31	14	11	19	B4345*J5478M000 ²⁾
	6 000	76,9 × 220,7	33	31	38	17	14	19	B4345*A5608M000 ²⁾
	8 200	91,0 × 221,0	24	24	48	21	18	25	B4345*A5828M000 ²⁾

1) * "5" = for capacitors with ring clip/clamp mounting
"7" = for capacitors with threaded stud

2) For 2-pad solution (types without threaded stud) and for low-inductance design, see page 120.

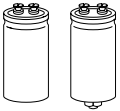

Useful life

depending on ambient temperature T_A (for natural cooling) and versus temperature of case base T_B (for base cooling) under ripple current operating conditions¹⁾


Frequency factor of permissible ripple current I_{-r} versus frequency f


d (mm)	51,6	64,3	76,9	91,0
Curve	c	b	a	c

¹⁾ The ripple current refers to I_{-R} for natural cooling or to $I_{-R(B)}$ for base cooling, respectively. Refer to page 40 for an explanation on how to interpret the useful life graphs.

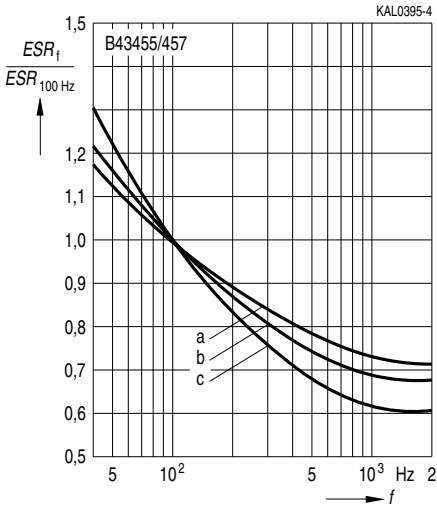


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Standard – 85 °C

Frequency characteristics of ESR

Typical behavior

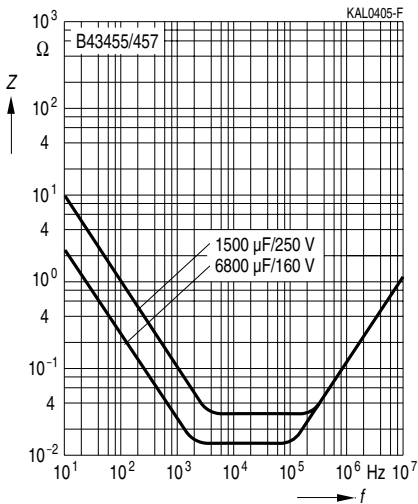


<i>d</i> (mm)	51,6	64,3	76,9	91,0
Curve	c	b	a	a

Impedance Z

versus frequency *f*

Typical behavior at 20 °C



Herausgegeben von EPCOS AG

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Published by EPCOS AG

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