

Aluminum electrolytic capacitors

Snap-in capacitors

Series/Type: B43545

Date: August 2018

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EPCOS AG is a TDK Group Company.

Long-life grade capacitors

Applications

- Frequency converters
- Solar inverters
- Uninterruptible power supplies
- Professional power supplies
- Medical appliances

Features

- Outstanding ripple current capability
- Base cooling available upon request for case sizes with diameters of 30 to 35 mm and lengths of 35 to 55 mm
- Long useful life
- Very high CV product, compact
- High reliability
- Extremely improved performance at high frequencies
- Outstanding low ESR at operating conditions above 50 °C
- Optimized internal thermal resistance
- Capacitors with all insulation versions pass the needle flame test according to IEC 60695-11-5 for all flame exposure times up to 120 s
- RoHS-compatible

Construction

- Charge/discharge-proof, polar
- Aluminum case, fully insulated with PET or PVC
- Version with additional PET insulation cap on terminal side available for insulating the capacitor from the PCB
- Snap-in solder pins to hold component in place on PC-board
- Minus pole marking on case surface
- Minus pole not insulated from case
- Overload protection by safety vent on the case wall

Terminals

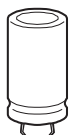
- Standard version with 2 terminals,
2 lengths available: 6.3 and 4.5 mm
- 3 terminals to ensure correct insertion: length 4.5 mm




Specifications and characteristics in brief

Rated voltage V_R	400 ... 500 V DC														
Surge voltage V_S	$1.10 \cdot V_R$														
Rated capacitance C_R	68 ... 820 μ F														
Capacitance tolerance	$\pm 20\% \triangleq M$														
Dissipation factor $\tan \delta$ (20 °C, 120 Hz)	$V_R = 400$ V DC: $\tan \delta \leq 0.15$ $V_R \geq 450$ V DC: $\tan \delta \leq 0.20$														
Leakage current I_{leak} (5 min, 20 °C)	$I_{leak} \leq 0.3 \mu A \cdot \left(\frac{C_R}{\mu F} \cdot \frac{V_R}{V} \right)^{0.7} + 4 \mu A$														
Self-inductance ESL	Approx. 20 nH														
Useful life ¹⁾ 105 °C; V_R ; $I_{AC,R}$	> 5000 h	Requirements: $ \Delta C/C \leq 20\%$ of initial value $\tan \delta \leq 2$ times initial specified limit $I_{leak} \leq$ initial specified limit													
Voltage endurance test 105 °C; V_R	2000 h	Post test requirements: $ \Delta C/C \leq 10\%$ of initial value $\tan \delta \leq 1.3$ times initial specified limit $I_{leak} \leq$ initial specified limit													
Vibration resistance test	To IEC 60068-2-6, test Fc: Frequency range 10 Hz ... 55 Hz, displacement amplitude 0.35 mm, acceleration max. 5 g, duration 3×2 h. Capacitor mounted by its body which is rigidly clamped to the work surface.														
Characteristics at low temperature	Max. impedance ratio at 100 Hz	<table border="1"> <thead> <tr> <th>V_R</th> <th>400 V</th> <th>450 V</th> <th>500 V</th> </tr> </thead> <tbody> <tr> <td>$Z_{-25^\circ C} / Z_{20^\circ C}$</td> <td>3</td> <td>5</td> <td>7</td> </tr> <tr> <td>$Z_{-40^\circ C} / Z_{20^\circ C}$</td> <td>7</td> <td>10</td> <td>20</td> </tr> </tbody> </table>	V_R	400 V	450 V	500 V	$Z_{-25^\circ C} / Z_{20^\circ C}$	3	5	7	$Z_{-40^\circ C} / Z_{20^\circ C}$	7	10	20	
V_R	400 V	450 V	500 V												
$Z_{-25^\circ C} / Z_{20^\circ C}$	3	5	7												
$Z_{-40^\circ C} / Z_{20^\circ C}$	7	10	20												
IEC climatic category	To IEC 60068-1: $V_R \leq 450$: 40/105/56 (–40 °C/+105 °C/56 days damp heat test) $V_R = 500$: 25/105/56 (–25 °C/+105 °C/56 days damp heat test) The capacitors can be operated in the temperature range of –40 °C but the impedance at –40 °C must be taken into consideration.														
Sectional specification	IEC 60384-4														

1) Refer to chapter "General technical information, 5 Useful life" on how to interpret useful life.

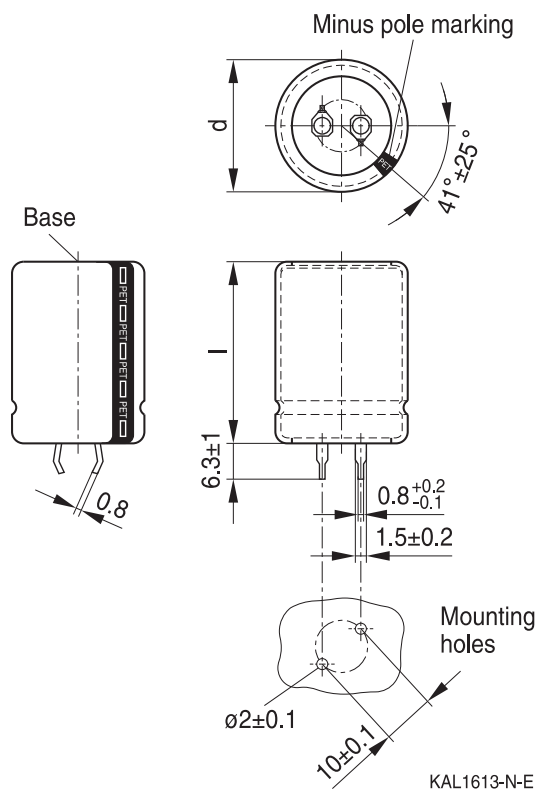


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Outstanding ripple current, compact – 105 °C

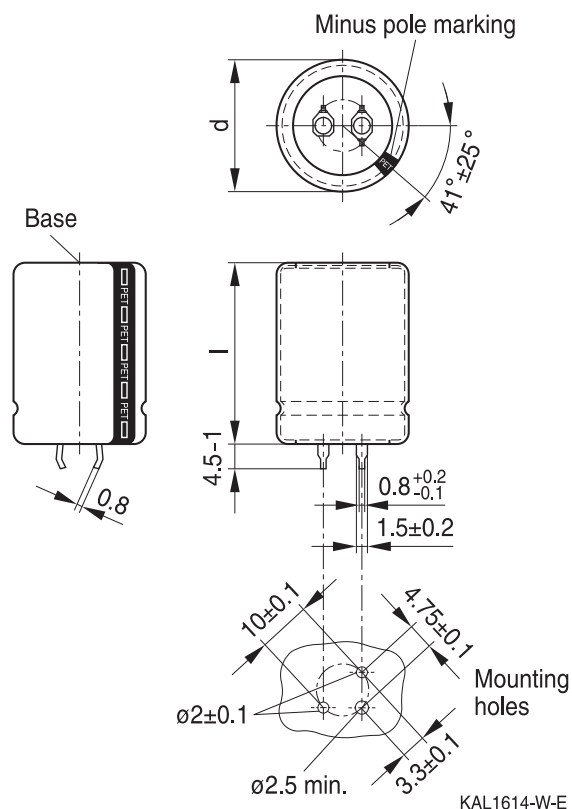
Dimensional drawings

Snap-in capacitors with standard insulation (PET or PVC)



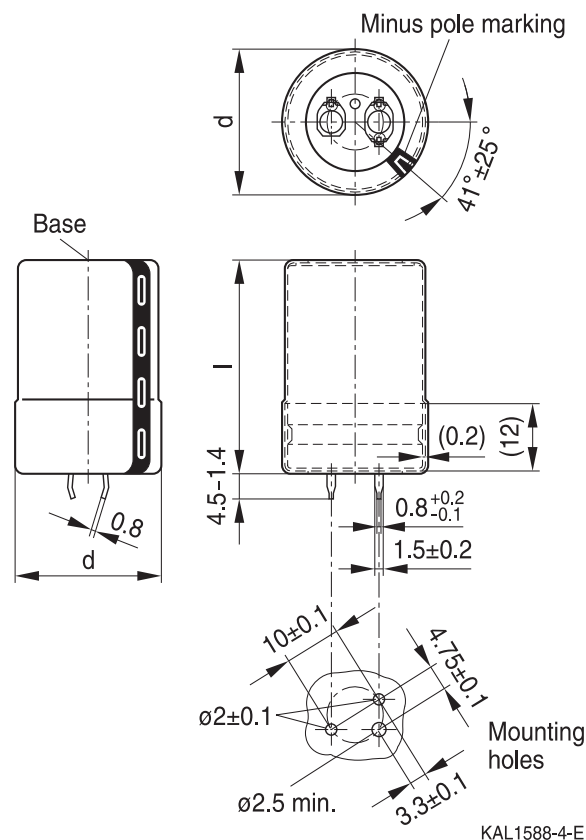
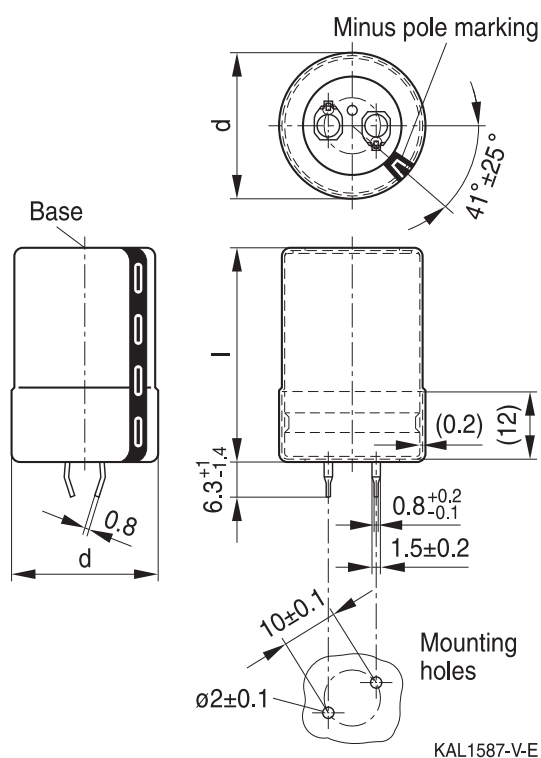
Snap-in terminals, length (6.3 ± 1) mm. Also available in a shorter version with a length of ($4.5 - 1$) mm. PET insulation is marked with "PET" on the sleeve. Safety vent on the case wall.

Dimensions (mm)		Approx. weight (g)	Packing units (pcs.)
$d + 1$	$l \pm 2$		
25	25	13	130
25	30	17	130
25	35	19	130
25	40	22	130
25	45	25	130
25	50	29	130
25	55	32	130



Snap-in capacitors are also available with 3 terminals (length ($4.5 - 1$) mm). PET insulation is marked with "PET" on the sleeve. Safety vent on the case wall.

Dimensions (mm)		Approx. weight (g)	Packing units (pcs.)
$d + 1$	$l \pm 2$		
30	25	17	80
30	30	23	80
30	35	29	80
30	40	36	80
30	45	41	80
30	50	46	80
30	55	53	80
35	25	22	60
35	30	29	60
35	35	36	60
35	40	41	60
35	45	56	60
35	50	70	60
35	55	81	60

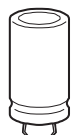

Snap-in capacitors with PVC insulation and PET insulation cap on terminal side


Snap-in terminals, length (6.3 +1/-1.4) mm. Also available in a shorter version with a length of (4.5 -1.4) mm. PET insulation cap is positioned under the insulation sleeve. Safety vent on the case wall.

Snap-in capacitors are also available with 3 terminals (length (4.5 -1.4) mm). PET insulation cap is positioned under the insulation sleeve. Safety vent on the case wall.

Dimensions (mm)		Approx. weight (g)	Packing units (pcs.)
d +1.4	l +2.2/-2		
25	25	13	115
25	30	17	115
25	35	19	115
25	40	22	115
25	45	25	115
25	50	29	115
25	55	32	115

Dimensions (mm)		Approx. weight (g)	Packing units (pcs.)
d +1.4	l +2.2/-2		
30	25	17	80
30	30	23	80
30	35	29	80
30	40	36	80
30	45	41	80
30	50	46	80
30	55	53	80
35	25	22	60
35	30	29	60
35	35	36	60
35	40	41	60
35	45	56	60
35	50	70	60
35	55	81	60



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Outstanding ripple current, compact – 105 °C

Packing of snap-in capacitors



For ecological reasons the packing is pure cardboard.

Ordering codes for terminal styles and insulation features

Identification in 3rd block of ordering code

Snap-in capacitors

Terminal version	Insulation version		
	PVC	PET	PVC plus PET cap
Standard terminals 6.3 mm	M000	M060	M080
Short terminals 4.5 mm	M007	M067	M087
3 terminals 4.5 mm	M002	M062	M082

Ordering examples:

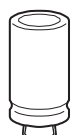
- B43545A5107M007 } snap-in capacitor with short terminals and PVC insulation
- B43545A5107M062 } snap-in capacitor with 3 terminals and PET insulation
- B43545A5107M080 } snap-in capacitor with standard terminals and PVC insulation with additional PET insulation cap on terminal side



Overview of available types

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

V_R (V DC)	400	450	500
	Case dimensions $d \times l$ (mm)		
C_R (μF)			
68			25 × 25
82		25 × 25	25 × 30
100		25 × 30	25 × 35 30 × 25
120	25 × 25	25 × 35 30 × 25	25 × 35 30 × 30
150	25 × 30	25 × 40 30 × 30	25 × 45 30 × 35 35 × 25
180	25 × 35 30 × 25	25 × 45 30 × 35 35 × 25	25 × 50 30 × 35 35 × 30
220	25 × 35 30 × 30	25 × 50 30 × 35 35 × 30	25 × 55 30 × 40 35 × 35
270	25 × 45 30 × 35 35 × 25	30 × 45 35 × 35	30 × 50 35 × 40
330	25 × 50 30 × 35 35 × 30	30 × 50 35 × 40	30 × 55 35 × 45
390	25 × 55 30 × 40 35 × 35	30 × 55 35 × 45	35 × 50
470	30 × 50 35 × 40	35 × 50	35 × 55
560	30 × 55 35 × 40	35 × 55	
680	35 × 50		
820	35 × 55		



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Outstanding ripple current, compact – 105 °C

Technical data and ordering codes

C_R 100 Hz 20 °C μF	Case dimensions $d \times l$ mm	ESR_{typ} 100 Hz 20 °C $\text{m}\Omega$	ESR_{typ} 300 Hz 60 °C $\text{m}\Omega$	Z_{max} 10 kHz 20 °C $\text{m}\Omega$	$I_{\text{AC,max}}$ 100 Hz 60 °C A	$I_{\text{AC,max}}$ 100 Hz 85 °C A	$I_{\text{AC,R}}$ 100 Hz 105 °C A	Ordering code (composition see below)
$V_R = 400 \text{ V DC}$								
120	25 × 25	500	160	700	2.23	1.64	0.88	B43545A9127M0*#
150	25 × 30	400	130	550	2.60	1.92	1.04	B43545A9157M0*#
180	25 × 35	330	110	460	2.96	2.19	1.18	B43545A9187M0*#
180	30 × 25	330	100	460	3.12	2.31	1.24	B43545B9187M0*#
220	25 × 35	270	90	380	3.36	2.48	1.33	B43545A9227M0*#
220	30 × 30	270	85	370	3.58	2.64	1.42	B43545B9227M0*#
270	25 × 45	220	70	310	3.96	2.93	1.58	B43545A9277M0*#
270	30 × 35	220	70	300	4.12	3.04	1.64	B43545B9277M0*#
270	35 × 25	220	75	310	4.15	3.06	1.65	B43545C9277M0*#
330	25 × 50	180	60	260	4.58	3.39	1.82	B43545A9337M0*#
330	30 × 35	180	55	250	4.69	3.46	1.86	B43545B9337M0*#
330	35 × 30	180	60	260	4.79	3.54	2.03	B43545C9337M0*#
390	25 × 55	160	50	220	5.19	3.84	2.07	B43545A9397M0*#
390	30 × 40	150	50	210	5.30	3.91	2.24	B43545B9397M0*#
390	35 × 35	150	50	220	5.38	3.98	2.28	B43545C9397M0*#
470	30 × 50	130	40	180	6.11	4.51	2.59	B43545A9477M0*#
470	35 × 40	130	40	180	6.11	4.52	2.59	B43545B9477M0*#
560	30 × 55	110	34	150	6.95	5.13	2.94	B43545A9567M0*#
560	35 × 40	110	36	160	6.80	5.02	2.87	B43545B9567M0*#
680	35 × 50	90	30	130	7.87	5.82	3.33	B43545A9687M0*#
820	35 × 55	75	26	110	8.99	6.64	3.80	B43545A9827M0*#

Composition of ordering code

* = Insulation feature

0 = PVC insulation

6 = PET insulation

8 = PVC insulation with additional PET insulation
cap on terminal side

= Terminal style

0 = snap-in standard terminals (6.3 mm)

2 = snap-in 3 terminals (4.5 mm)

7 = snap-in short terminals (4.5 mm)


Technical data and ordering codes

C_R 100 Hz 20 °C μF	Case dimensions $d \times l$ mm	ESR_{typ} 100 Hz 20 °C $\text{m}\Omega$	ESR_{typ} 300 Hz 60 °C $\text{m}\Omega$	Z_{max} 10 kHz 20 °C $\text{m}\Omega$	$I_{\text{AC,max}}$ 100 Hz 60 °C A	$I_{\text{AC,max}}$ 100 Hz 85 °C A	$I_{\text{AC,R}}$ 100 Hz 105 °C A	Ordering code (composition see below)
$V_R = 450 \text{ V DC}$								
82	25 × 25	1110	290	1680	1.73	1.33	0.71	B43545B5826M0*#
100	25 × 30	910	240	1370	2.06	1.52	0.82	B43545A5107M0*#
120	25 × 35	760	200	1140	2.34	1.73	0.94	B43545B5127M0*#
120	30 × 25	750	190	1140	2.47	1.81	0.98	B43545A5127M0*#
150	25 × 40	610	160	920	2.74	2.02	1.09	B43545A5157M0*#
150	30 × 30	600	150	910	2.86	2.10	1.14	B43545B5157M0*#
180	25 × 45	500	130	770	3.13	2.30	1.25	B43545A5187M0*#
180	30 × 35	500	130	760	3.24	2.38	1.29	B43545B5187M0*#
180	35 × 25	510	130	770	3.32	2.44	1.32	B43545C5187M0*#
220	25 × 50	410	110	630	3.63	2.67	1.45	B43545A5227M0*#
220	30 × 35	410	110	630	3.70	2.72	1.47	B43545B5227M0*#
220	35 × 30	410	110	630	3.82	2.81	1.62	B43545C5227M0*#
270	30 × 45	330	85	510	4.31	3.17	1.83	B43545A5277M0*#
270	35 × 35	340	90	510	4.37	3.22	1.85	B43545B5277M0*#
330	30 × 50	270	70	420	4.98	3.66	2.11	B43545A5337M0*#
330	35 × 40	280	70	420	5.02	3.69	2.13	B43545B5337M0*#
390	30 × 55	230	60	350	5.64	4.15	2.39	B43545A5397M0*#
390	35 × 45	230	60	360	5.63	4.14	2.39	B43545B5397M0*#
470	35 × 50	190	50	300	6.41	4.72	2.72	B43545A5477M0*#
560	35 × 55	160	45	250	7.28	5.35	3.08	B43545A5567M0*#

Composition of ordering code

* = Insulation feature

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6 = PET insulation

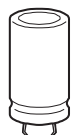
8 = PVC insulation with additional PET insulation
cap on terminal side

= Terminal style

0 = snap-in standard terminals (6.3 mm)

2 = snap-in 3 terminals (4.5 mm)

7 = snap-in short terminals (4.5 mm)



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Outstanding ripple current, compact – 105 °C

Technical data and ordering codes

C_R 100 Hz 20 °C μF	Case dimensions $d \times l$ mm	ESR_{typ} 100 Hz 20 °C $\text{m}\Omega$	ESR_{typ} 300 Hz 60 °C $\text{m}\Omega$	Z_{max} 10 kHz 20 °C $\text{m}\Omega$	$I_{\text{AC,max}}$ 100 Hz 60 °C A	$I_{\text{AC,max}}$ 100 Hz 85 °C A	$I_{\text{AC,R}}$ 100 Hz 105 °C A	Ordering code (composition see below)
$V_R = 500 \text{ V DC}$								
68	25 × 25	1220	340	1810	1.43	1.22	0.61	B43545A6686M0*#
82	25 × 30	1010	280	1500	1.73	1.39	0.69	B43545A6826M0*#
100	25 × 35	830	230	1230	2.11	1.60	0.80	B43545A6107M0*#
100	30 × 25	820	220	1220	2.11	1.68	0.84	B43545B6107M0*#
120	25 × 35	690	190	1030	2.42	1.80	0.90	B43545A6127M0*#
120	30 × 30	690	180	1020	2.53	1.90	0.95	B43545B6127M0*#
150	25 × 45	550	150	820	2.87	2.14	1.07	B43545A6157M0*#
150	30 × 35	550	150	810	2.97	2.21	1.10	B43545B6157M0*#
150	35 × 25	550	150	820	3.06	2.27	1.13	B43545C6157M0*#
180	25 × 50	460	130	690	3.28	2.44	1.22	B43545A6187M0*#
180	30 × 35	460	120	680	3.34	2.48	1.24	B43545B6187M0*#
180	35 × 30	460	130	690	3.46	2.57	1.37	B43545C6187M0*#
220	25 × 55	380	100	560	3.81	2.83	1.41	B43545A6227M0*#
220	30 × 40	380	100	560	3.84	2.85	1.52	B43545B6227M0*#
220	35 × 35	380	100	560	3.96	2.94	1.57	B43545C6227M0*#
270	30 × 50	310	85	460	4.47	3.33	1.77	B43545A6277M0*#
270	35 × 40	310	85	460	4.53	3.37	1.80	B43545B6277M0*#
330	30 × 55	250	70	370	5.19	3.86	2.06	B43545A6337M0*#
330	35 × 45	250	70	380	5.20	3.86	2.06	B43545B6337M0*#
390	35 × 50	210	60	320	5.84	4.34	2.31	B43545A6397M0*#
470	35 × 55	180	50	270	6.66	4.95	2.64	B43545A6477M0*#

Composition of ordering code

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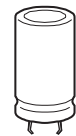
8 = PVC insulation with additional PET insulation
cap on terminal side

= Terminal style

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7 = snap-in short terminals (4.5 mm)



Useful life¹⁾

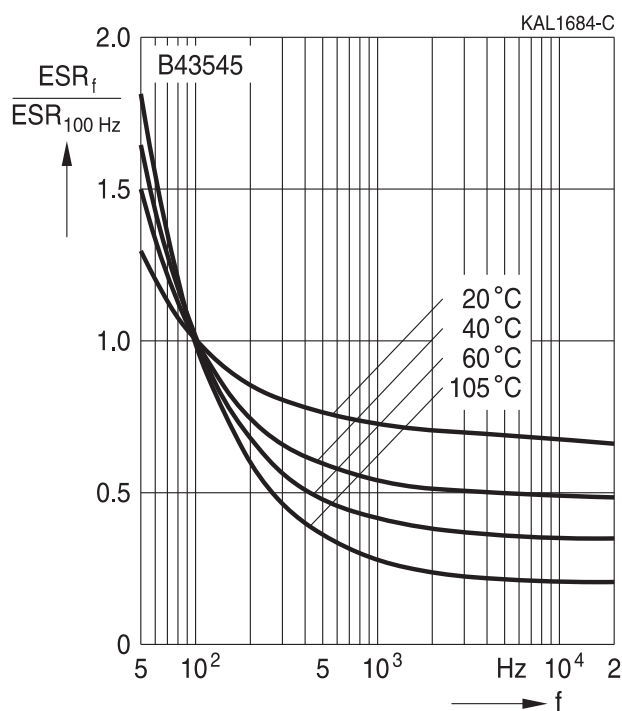
For useful life calculations, please use our web-based "AlCap Useful Life Calculation Tool", which can be found on the Internet under the following link:

http://www.epcos.com/designtools/alu_useful_life/Useful_life.swf

The AlCap Useful Life Calculation Tool provides calculations of useful life as well as additional data for selected capacitor types under operating conditions defined by the user.

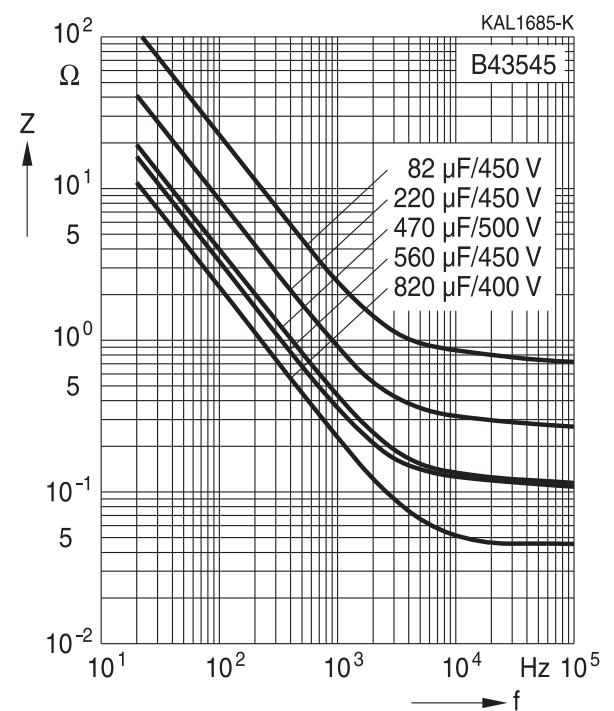
Frequency characteristics of ESR

Typical behavior

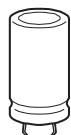


Impedance Z versus frequency f

Typical behavior at 20 °C



1) Refer to chapter "General technical information, 5 Useful life" on how to interpret useful life.



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Outstanding ripple current, compact – 105 °C

Cautions and warnings

Personal safety

The electrolytes used by EPCOS have been optimized both with a view to the intended application and with regard to health and environmental compatibility. They do not contain any solvents that are detrimental to health, e.g. dimethyl formamide (DMF) or dimethyl acetamide (DMAC).

Furthermore, some of the high-voltage electrolytes used by EPCOS are self-extinguishing.

As far as possible, EPCOS does not use any dangerous chemicals or compounds to produce operating electrolytes, although in exceptional cases, such materials must be used in order to achieve specific physical and electrical properties because no alternative materials are currently known. We do, however, restrict the amount of dangerous materials used in our products to an absolute minimum.

Materials and chemicals used in EPCOS aluminum electrolytic capacitors are continuously adapted in compliance with the EPCOS Corporate Environmental Policy and the latest EU regulations and guidelines such as RoHS, REACH/SVHC, GADSL, and ELV.

MDS (Material Data Sheets) are available on the EPCOS website for all types listed in the data book. MDS for customer specific capacitors are available upon request.

MSDS (Material Safety Data Sheets) are available for all of our electrolytes upon request.

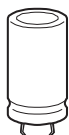
Nevertheless, the following rules should be observed when handling aluminum electrolytic capacitors: No electrolyte should come into contact with eyes or skin. If electrolyte does come into contact with the skin, wash the affected areas immediately with running water. If the eyes are affected, rinse them for 10 minutes with plenty of water. If symptoms persist, seek medical treatment. Avoid inhaling electrolyte vapor or mists. Workplaces and other affected areas should be well ventilated. Clothing that has been contaminated by electrolyte must be changed and rinsed in water.



Product safety

The table below summarizes the safety instructions that must be observed without fail. A detailed description can be found in the relevant sections of chapter "General technical information".

Topic	Safety information	Reference chapter "General technical information"
Polarity	Make sure that polar capacitors are connected with the right polarity.	1 "Basic construction of aluminum electrolytic capacitors"
Reverse voltage	Voltages of opposite polarity should be prevented by connecting a diode.	3.1.6 "Reverse voltage"
Mounting position of screw-terminal capacitors	Screw terminal capacitors must not be mounted with terminals facing down unless otherwise specified.	11.1. "Mounting positions of capacitors with screw terminals"
Robustness of terminals	The following maximum tightening torques must not be exceeded when connecting screw terminals: M5: 2.5 Nm M6: 4.0 Nm	11.3 "Mounting torques"
Mounting of single-ended capacitors	The internal structure of single-ended capacitors might be damaged if excessive force is applied to the lead wires. Avoid any compressive, tensile or flexural stress. Do not move the capacitor after soldering to PC board. Do not pick up the PC board by the soldered capacitor. Do not insert the capacitor on the PC board with a hole space different to the lead space specified.	11.4 "Mounting considerations for single-ended capacitors"
Soldering	Do not exceed the specified time or temperature limits during soldering.	11.5 "Soldering"
Soldering, cleaning agents	Do not allow halogenated hydrocarbons to come into contact with aluminum electrolytic capacitors.	11.6 "Cleaning agents"
Upper category temperature	Do not exceed the upper category temperature.	7.2 "Maximum permissible operating temperature"
Passive flammability	Avoid external energy, e.g. fire.	8.1 "Passive flammability"



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Outstanding ripple current, compact – 105 °C

Topic	Safety information	Reference chapter "General technical information"
Active flammability	Avoid overload of the capacitors.	8.2 "Active flammability"
Maintenance	Make periodic inspections of the capacitors. Before the inspection, make sure that the power supply is turned off and carefully discharge the capacitors. Do not apply excessive mechanical stress to the capacitor terminals when mounting.	10 "Maintenance"
Storage	Do not store capacitors at high temperatures or high humidity. Capacitors should be stored at +5 to +35 °C and a relative humidity of ≤ 75%.	7.3 "Shelf life and storage conditions"
		Reference chapter "Capacitors with screw terminals"
Breakdown strength of insulating sleeves	Do not damage the insulating sleeve, especially when ring clips are used for mounting.	"Screw terminals – accessories"

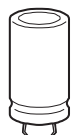
Display of ordering codes for EPCOS products

The ordering code for one and the same product can be represented differently in data sheets, data books, other publications and the website of EPCOS, or in order-related documents such as shipping notes, order confirmations and product labels. The varying representations of the ordering codes are due to different processes employed and do not affect the specifications of the respective products.

Detailed information can be found on the Internet under www.epcos.com/orderingcodes.


Symbols and terms

Symbol	English	German
C	Capacitance	Kapazität
C_R	Rated capacitance	Nennkapazität
C_S	Series capacitance	Serienkapazität
$C_{S,T}$	Series capacitance at temperature T	Serienkapazität bei Temperatur T
C_f	Capacitance at frequency f	Kapazität bei Frequenz f
d	Case diameter, nominal dimension	Gehäusedurchmesser, Nennmaß
d_{max}	Maximum case diameter	Maximaler Gehäusedurchmesser
ESL	Self-inductance	Eigeninduktivität
ESR	Equivalent series resistance	Ersatzserienwiderstand
ESR_f	Equivalent series resistance at frequency f	Ersatzserienwiderstand bei Frequenz f
ESR_T	Equivalent series resistance at temperature T	Ersatzserienwiderstand bei Temperatur T
f	Frequency	Frequenz
I	Current	Strom
I_{AC}	Alternating current (ripple current)	Wechselstrom
$I_{AC,RMS}$	Root-mean-square value of alternating current	Wechselstrom, Effektivwert
$I_{AC,f}$	Ripple current at frequency f	Wechselstrom bei Frequenz f
$I_{AC,max}$	Maximum permissible ripple current	Maximal zulässiger Wechselstrom
$I_{AC,R}$	Rated ripple current	Nennwechselstrom
I_{leak}	Leakage current	Reststrom
$I_{leak,op}$	Operating leakage current	Betriebsreststrom
l	Case length, nominal dimension	Gehäuselänge, Nennmaß
l_{max}	Maximum case length (without terminals and mounting stud)	Maximale Gehäuselänge (ohne Anschlüsse und Gewindebolzen)
R	Resistance	Widerstand
R_{ins}	Insulation resistance	Isolationswiderstand
R_{symm}	Balancing resistance	Symmetrierwiderstand
T	Temperature	Temperatur
ΔT	Temperature difference	Temperaturdifferenz
T_A	Ambient temperature	Umgebungstemperatur
T_C	Case temperature	Gehäusetemperatur
T_B	Capacitor base temperature	Temperatur des Gehäusebodens
t	Time	Zeit
Δt	Period	Zeitraum
t_b	Service life (operating hours)	Brauchbarkeitsdauer (Betriebszeit)



B43545

Outstanding ripple current, compact – 105 °C

Symbol	English	German
V	Voltage	Spannung
V_F	Forming voltage	Formierspannung
V_{op}	Operating voltage	Betriebsspannung
V_R	Rated voltage, DC voltage	Nennspannung, Gleichspannung
V_S	Surge voltage	Spitzenspannung
X_C	Capacitive reactance	Kapazitiver Blindwiderstand
X_L	Inductive reactance	Induktiver Blindwiderstand
Z	Impedance	Scheinwiderstand
Z_T	Impedance at temperature T	Scheinwiderstand bei Temperatur T
$\tan \delta$	Dissipation factor	Verlustfaktor
λ	Failure rate	Ausfallrate
ϵ_0	Absolute permittivity	Elektrische Feldkonstante
ϵ_r	Relative permittivity	Dielektrizitätszahl
ω	Angular velocity; $2 \cdot \pi \cdot f$	Kreisfrequenz; $2 \cdot \pi \cdot f$

Note

All dimensions are given in mm.

Important notes

The following applies to all products named in this publication:

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Important notes

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