

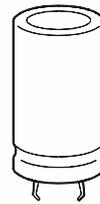


**Snap-In Capacitors** **B41505**  
**Excellent Performance – 105 °C** **B43505**

**Long-life grade capacitors**

**Applications**

- Frequency converters
- Professional switch-mode power supplies in industrial electronics and in data processing equipment
- Switch-mode power supplies in entertainment electronics



KAL0274-A

**Features**

- High reliability
- Outstanding ripple current capability
- Low equivalent series resistance *ESR*
- Different case sizes available for each capacitance value

**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
- Overload protection (safety vent)

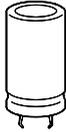
**Terminals**

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

**Specifications and characteristics in brief**

	B41505	B43505
Rated voltage $U_R$	10 ... 100 VDC	200 ... 450 VDC
Surge voltage $U_S$	$1,15 \cdot U_R$	$1,15 \cdot U_R$ (for $U_R \leq 250$ VDC) $1,10 \cdot U_R$ (for $U_R \geq 400$ VDC)
Rated capacitance $C_R$	560 ... 33 000 $\mu$ F	100 ... 1 500 $\mu$ F
Capacitance tolerance	$\pm 20\% \triangleq M$	$\pm 20\% \triangleq M$
Dissipation factor $\tan \delta$ (20°C, 120 Hz)	max. $\tan \delta = 0,80$ ; $U_R = 10$ VDC max. $\tan \delta = 0,60$ ; $U_R = 16$ VDC max. $\tan \delta = 0,45$ ; $U_R = 25$ VDC max. $\tan \delta = 0,40$ ; $U_R = 35$ VDC max. $\tan \delta = 0,30$ ; $U_R = 50$ VDC max. $\tan \delta = 0,20$ ; $U_R = 63 \dots 100$ VDC	$\tan \delta \leq 0,15$ for $U_R \leq 400$ VDC $\tan \delta \leq 0,20$ for $U_R = 450$ VDC
Leakage current $I_L$ (5 min, 20°C)	$I_L \leq 0,3 \mu A \cdot \left( \frac{C_R}{\mu F} \cdot \frac{U_R}{V} \right)^{0,7} + 4 \mu A$	





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Self-inductance <i>ESL</i>	Approx. 20 nH	
Useful life		
105 °C; $U_R$ ; $I_{\sim R}$	> 5 000 h	> 5 000 h
85 °C; $U_R$ ; $I_{\sim \max}$	> 12 000 h	> 11 000 h
40 °C; $U_R$ ; $2,1 \cdot I_{\sim R}$	> 250 000 h	> 200 000 h
Requirements:	$\Delta C/C \leq \pm 45\%$ of initial value $\tan \delta \leq 3$ times initial spec. limit $I_L \leq$ initial specified limit  Failure percentage: $\leq 1\%$ Failure rate: $\leq 50$ fit ( $\leq 50 \cdot 10^{-9}/h$ ) (for definiton "fit", refer to chapter "Quality", page 62)	$\Delta C/C \leq \pm 30\%$ of initial value $\tan \delta \leq 3$ times initial spec. limit $I_L \leq$ initial specified limit
Load life test		
105 °C; $U_R$ ; $I_{\sim R}$	5 000 h	4 000 h
Post test requirements:	$\Delta C/C \leq \pm 20\%$ of initial value $\tan \delta \leq 2$ times initial spec. limit $I_L \leq$ initial specified limit	$\Delta C/C \leq \pm 20\%$ of initial value $\tan \delta \leq 2$ times initial spec. limit $I_L \leq$ initial specified limit
Voltage endurance test		
85 °C; $U_R$	2 000 h	2 000 h
Post test requirements:	$\Delta C/C \leq \pm 15\%$ of initial value $\tan \delta \leq 1,3$ times spec. limit $I_L \leq$ initial specified limit	$\Delta C/C \leq \pm 10\%$ of initial value $\tan \delta \leq 1,3$ times spec. limit $I_L \leq$ initial specified limit
Vibration resistance	To IEC 68-2-6, test Fc: displacement amplitude 0,35 mm, frequency range 10 ... 55 Hz, acceleration max. 5 g, duration $3 \times 2$ h	
IEC climatic category	To IEC 60068-1: $U_R \leq 400$ VDC: 40/105/56 (– 40 °C/+ 105 °C/56 days damp heat test) $U_R = 450$ VDC: 25/105/56 (– 25 °C/+ 105 °C/56 days damp heat test)	
Detail specification	—	Similar to CECC 30301-809
Sectional specification	IEC 60384-4	IEC 60384-4

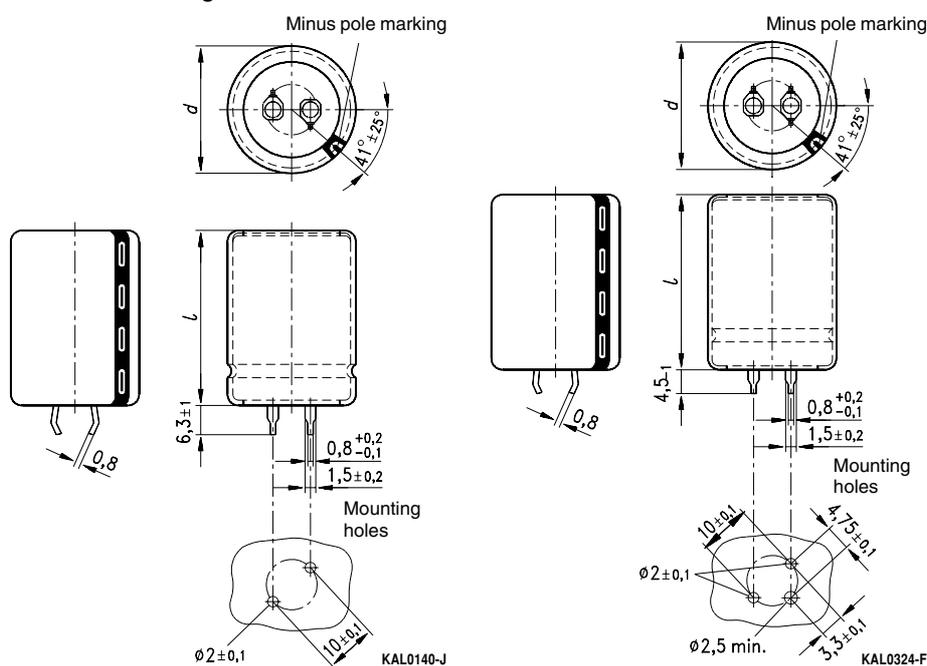


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**Dimensional drawings**



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

Snap-in capacitors are also available with 3 terminals (length  $4,5 - 1$  mm). For packing mode and ordering example see next page.

Dimensions (mm)		Approx. weight (g)	Packing units (pieces)
$d + 1$	$l \pm 2$		
22	25	9	160
22	30	12	160
22	35	15	160
22	40	18	160
22	45	20	160
<hr/>			
25	25	13	130
25	30	17	130
25	35	19	130
25	40	22	130
25	45	25	130

Dimensions (mm)		Approx. weight (g)	Packing units (pieces)
$d + 1$	$l \pm 2$		
30	25	20	80
30	30	23	80
30	35	29	80
30	40	36	80
30	45	41	80
30	50	46	80
<hr/>			
35	25	25	60
35	30	31	60
35	35	37	60
35	40	44	60
35	45	52	60
35	50	59	60



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### 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	M000
Short terminals (4,5 – 1) mm	M007
3 terminals (4,5 – 1) mm	M002

Ordering example:

B43505A9107M007 } snap-in capacitor with short terminals  
B43505A9107M002 } snap-in capacitor with 3 terminals



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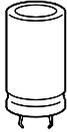


**Overview of available types**

**Type B 41 505**

$U_R$ (VDC)	10	16	25	35	50	63	80	100
$C_R$ (μF)	Case dimensions $d \times l$ (mm)							
560								25 × 25
680								22 × 35
1 000						22 × 25	25 × 25	25 × 35 30 × 30
1 200							30 × 25	
1 500						22 × 35	25 × 35	30 × 40
2 200				22 × 25	22 × 35	25 × 35 30 × 30	30 × 35	30 × 50
3 300				22 × 30 25 × 25	25 × 35	30 × 40	35 × 35	35 × 50
4 700			22 × 30 25 × 25	22 × 40	30 × 35	35 × 35	35 × 45	
6 800	22 × 25	22 × 30	25 × 30	25 × 40	30 × 50	35 × 50		
10 000	22 × 30	25 × 30	25 × 40	30 × 40	35 × 45			
15 000	22 × 40	25 × 40	30 × 40	35 × 40				
18 000				35 × 45				
22 000	30 × 35	30 × 40						
33 000	30 × 45							

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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**Overview of available types**

**Type B 43 505**

$U_R$ (VDC)	200	250	400	450
$C_R$ ( $\mu$ F)	Case dimensions $d \times l$ (mm)			
100			25 × 30	22 × 45 30 × 30
150			25 × 40 30 × 30	25 × 45 30 × 35
220	22 × 30	25 × 30	30 × 40 35 × 30	30 × 45 35 × 35
330	22 × 40	25 × 40 30 × 30	30 × 50 35 × 40	35 × 50
390			35 × 45	35 × 50
470	25 × 40 30 × 30	30 × 35	35 × 50	
680	30 × 40	30 × 45		
1 000	35 × 45	35 × 45		
1 500	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.



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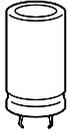
Technical data and ordering codes

$U_R$	$C_R$	Case dimensions	$ESR_{typ}$	$Z_{max}$	$I_{\sim max}$	$I_{\sim max}$	$I_{\sim R}^{1)}$	Ordering code <sup>2)</sup>
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 105 °C A	
<b>B41505</b>								
10	6 800	22 × 25	98	78	4,2	2,8	1,4	B41505A3688M000
	10 000	22 × 30	70	56	5,4	3,6	1,8	B41505A3109M000
	15 000	22 × 40	49	39	6,9	4,6	2,3	B41505A3159M000
	22 000	30 × 35	35	28	9,0	6,0	3,0	B41505A3229M000
	33 000	30 × 45	25	20	12	7,8	3,9	B41505A3339M000
16	6 800	22 × 30	61	49	5,4	3,6	1,8	B41505A4688M000
	10 000	25 × 30	45	36	6,6	4,4	2,2	B41505A4109M000
	15 000	25 × 40	32	26	8,4	5,6	2,8	B41505A4159M000
	22 000	30 × 40	23	18	11	7,0	3,5	B41505A4229M000
25	4 700	22 × 30	71	57	4,8	3,2	1,6	B41505A5478M000
	4 700	25 × 25	71	57	4,8	3,2	1,6	B41505F5478M000
	6 800	25 × 30	54	43	5,7	3,8	1,9	B41505A5688M000
	10 000	25 × 40	40	32	7,5	5,0	2,5	B41505A5109M000
	15 000	30 × 40	29	23	9,6	6,4	3,2	B41505A5159M000
35	2 200	22 × 25	113	90	3,3	2,2	1,1	B41505A7228M000
	3 300	22 × 30	75	60	4,5	3,0	1,5	B41505A7338M000
	3 300	25 × 25	75	60	4,5	3,0	1,5	B41505F7338M000
	4 700	22 × 40	60	48	5,7	3,8	1,9	B41505A7478M000
	6 800	25 × 40	46	37	6,9	4,6	2,3	B41505A7688M000
	10 000	30 × 40	35	28	8,7	5,8	2,9	B41505A7109M000
	15 000	35 × 40	25	20	11	7,6	3,8	B41505A7159M000
	18 000	35 × 45	23	18	13	8,6	4,3	B41505A7189M000
50	2 200	22 × 35	113	90	4,2	2,8	1,4	B41505A6228M000
	3 300	25 × 35	75	60	5,4	3,6	1,8	B41505A6338M000
	4 700	30 × 35	56	45	6,6	4,4	2,2	B41505A6478M000
	6 800	30 × 50	44	35	8,7	5,8	2,9	B41505A6688M000
	10 000	35 × 45	33	26	11	7,2	3,6	B41505A6109M000

1) 120 Hz conversion factor of ripple current:  $I_{\sim} (120 \text{ Hz}) = 1,03 \cdot I_{\sim} (100 \text{ Hz})$

2) Ordering code for standard terminals (6,3 mm).

To determine the ordering code for short terminals (4,5 mm) and 3 terminals (4,5 mm) see page 258.



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$U_R$	$C_R$ 100 Hz 20 °C VDC $\mu\text{F}$	Case dimensions $d \times l$ mm	$ESR_{\text{typ}}$ 100 Hz 20 °C $\text{m}\Omega$	$Z_{\text{max}}$ 10 kHz 20 °C $\text{m}\Omega$	$I_{\sim\text{max}}$ 100 Hz 40 °C A	$I_{\sim\text{max}}$ 100 Hz 85 °C A	$I_{\sim R^1}$ 100 Hz 105 °C A	Ordering code <sup>2)</sup>
63	1000	22 × 25	199	159	3,0	2,0	1,0	B41505A8108M000
	1500	22 × 35	133	106	4,2	2,8	1,4	B41505A8158M000
	2200	25 × 35	90	72	5,1	3,4	1,7	B41505A8228M000
	2200	30 × 30	106	85	5,4	3,6	1,8	B41505F8228M000
	3300	30 × 40	70	56	6,9	4,6	2,3	B41505A8338M000
	4700	35 × 35	56	45	8,1	5,4	2,7	B41505A8478M000
	6800	35 × 50	39	31	11	7,2	3,6	B41505A8688M000
80	1000	25 × 25	166	133	3,9	2,6	1,3	B41505A0108M000
	1200	30 × 25	138	110	4,5	3,0	1,5	B41505A0128M000
	1500	25 × 35	111	89	5,4	3,6	1,8	B41505A0158M000
	2200	30 × 35	75	60	6,0	4,0	2,0	B41505A0228M000
	3300	35 × 35	60	48	8,4	5,6	2,8	B41505A0338M000
	4700	35 × 45	42	34	10	6,8	3,4	B41505A0478M000
100	560	25 × 25	237	190	3,0	2,0	1,0	B41505A9567M000
	680	22 × 35	195	156	3,6	2,4	1,2	B41505A9687M000
	1000	25 × 35	133	106	4,2	2,8	1,4	B41505A9108M000
	1000	30 × 30	133	106	4,5	3,0	1,5	B41505F9108M000
	1500	30 × 40	88	70	5,7	3,8	1,9	B41505A9158M000
	2200	30 × 50	75	60	6,9	4,6	2,3	B41505A9228M000
	3300	35 × 50	50	40	9,0	6,0	3,0	B41505A9338M000

1) 120 Hz conversion factor of ripple current:  $I_{\sim} (120 \text{ Hz}) = 1,03 \cdot I_{\sim} (100 \text{ Hz})$

2) Ordering code for standard terminals (6,3 mm).

To determine the ordering code for short terminals (4,5 mm) and 3 terminals (4,5 mm) see page 258.



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Technical data and ordering codes

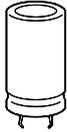
$U_R$	$C_R$	Case dimensions	$ESR_{typ}$	$Z_{max}$	$I_{\sim max}$	$I_{\sim max}$	$I_{\sim R}^{1)}$	Ordering code <sup>2)</sup>
VDC	100 Hz 20 °C $\mu F$	$d \times l$ mm	100 Hz 20 °C m $\Omega$	10 kHz 20 °C m $\Omega$	100 Hz 40 °C A	100 Hz 85 °C A	100 Hz 105 °C A	
<b>B43305</b>								
200	220	22 × 30	580	700	2,9	1,9	0,96	B43505E2227M000
	330	22 × 40	390	470	4,0	2,6	1,3	B43505E2337M000
	470	25 × 40	280	330	5,1	3,4	1,7	B43505E2477M000
	470	30 × 30	280	330	5,1	3,3	1,7	B43505G2477M000
	680	30 × 40	190	230	6,7	4,4	2,2	B43505E2687M000
	1 000	35 × 45	130	160	9,4	6,2	3,1	B43505E2108M000
	1 500	35 × 50	90	110	12	7,8	3,9	B43505E2158M000
250	220	25 × 30	580	700	3,2	2,1	1,0	B43505A2227M000
	330	25 × 40	390	470	4,3	2,8	1,4	B43505A2337M000
	330	30 × 30	390	470	4,2	2,8	1,4	B43505C2337M000
	470	30 × 35	280	330	5,3	3,5	1,8	B43505A2477M000
	680	30 × 45	190	230	7,0	4,6	2,3	B43505A2687M000
	1 000	35 × 45	130	160	9,4	6,2	3,1	B43505A2108M000
400	100	25 × 30	880	1090	2,1	1,4	0,70	B43505A9107M000
	150	25 × 40	590	730	2,9	1,9	0,95	B43505A9157M000
	150	30 × 30	590	730	2,9	1,9	0,94	B43505C9157M000
	220	30 × 40	400	500	3,8	2,5	1,3	B43505A9227M000
	220	35 × 30	400	500	3,8	2,5	1,3	B43505C9227M000
	330	30 × 50	270	330	5,1	3,3	1,7	B43505A9337M000
	330	35 × 40	270	330	5,2	3,4	1,7	B43505C9337M000
	390	35 × 45	230	280	5,9	3,8	1,9	B43505A9397M000
	470	35 × 50	190	240	6,7	4,4	2,2	B43505A9477M000
450	100	22 × 45	1360	1600	2,3	1,5	0,75	B43505A5107M000
	100	30 × 30	1360	1600	2,3	1,5	0,76	B43505C5107M000
	150	25 × 45	910	1070	3,0	2,0	1,0	B43505A5157M000
	150	30 × 35	910	1070	3,0	2,0	0,99	B43505C5157M000
	220	30 × 45	620	730	4,0	2,6	1,3	B43505A5227M000
	220	35 × 35	620	730	4,0	2,7	1,3	B43505C5227M000
	330	35 × 50	410	490	5,6	3,7	1,8	B43505A5337M000
	390	35 × 50	350	410	6,1	4,0	2,0	B43505A5397M000

■ Preferred types

1) 120 Hz conversion factor of ripple current:  $I_{\sim} (120 \text{ Hz}) = 1,03 \cdot I_{\sim} (100 \text{ Hz})$

2) Ordering code for standard terminals (6,3 mm).

To determine the ordering code for short terminals (4,5 mm) and 3 terminals (4,5 mm) see page 258.



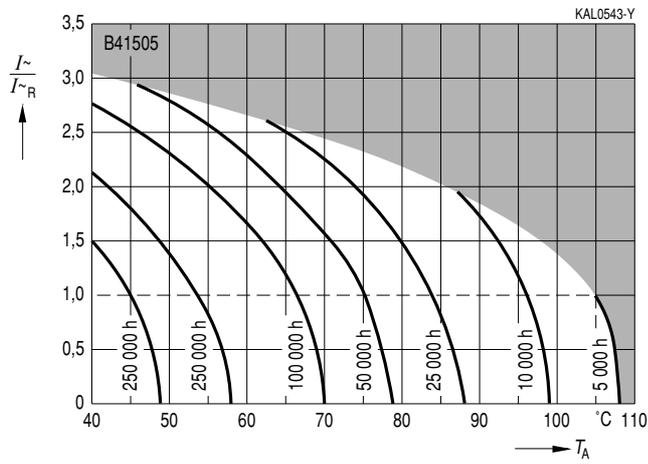
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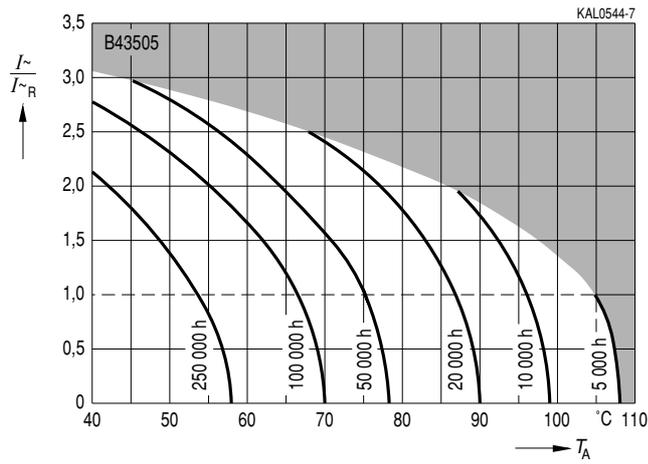
**Useful life**

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

$U_R \leq 100$  VDC



$U_R \geq 200$  VDC



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

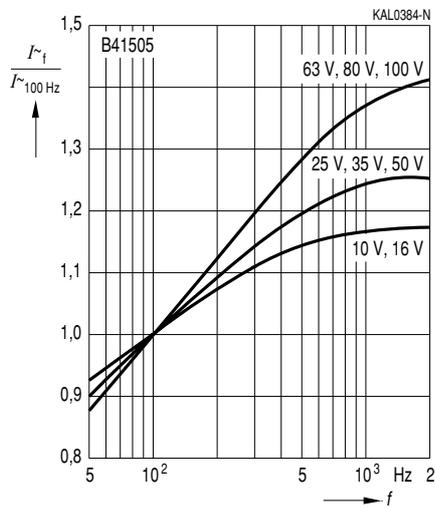


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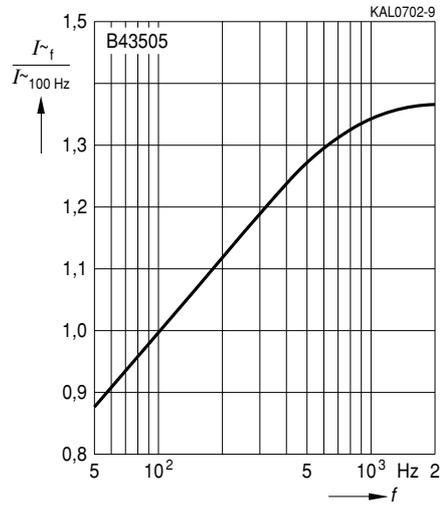
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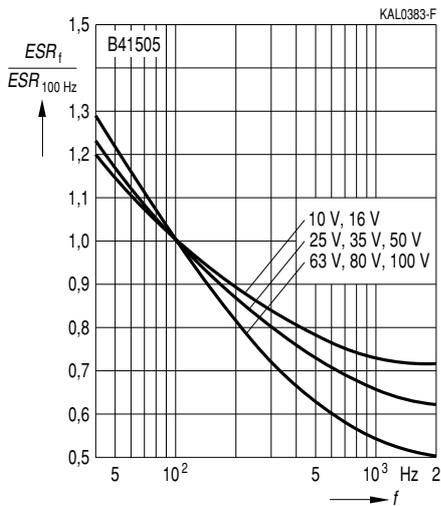
**Frequency factor of permissible ripple current  $I_{\sim}$  versus frequency  $f$**   
 $U_R \leq 100$  VDC



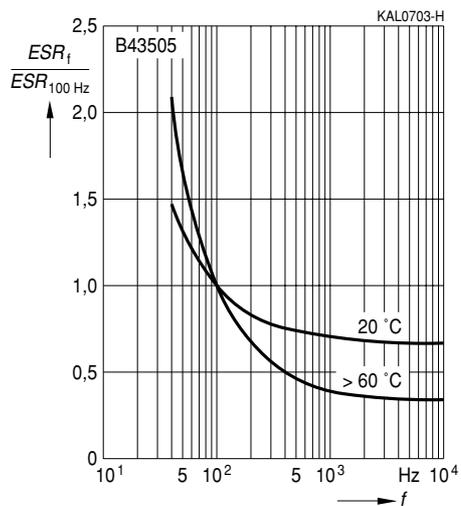
**Frequency factor of permissible ripple current  $I_{\sim}$  versus frequency  $f$**   
 $U_R \geq 200$  VDC

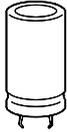


**Frequency characteristics of ESR**  
 Typical behavior  
 $U_R \leq 100$  VDC



**Frequency characteristics of ESR**  
 Typical behavior  
 $U_R \geq 200$  VDC

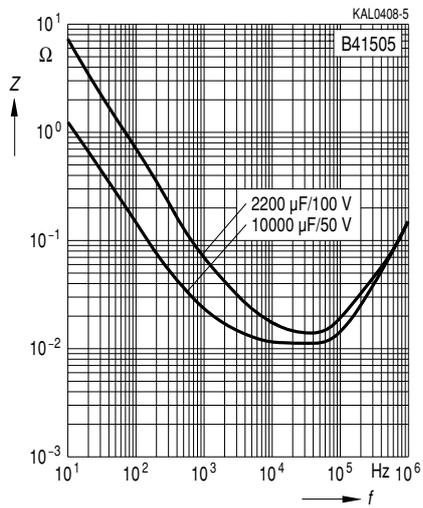




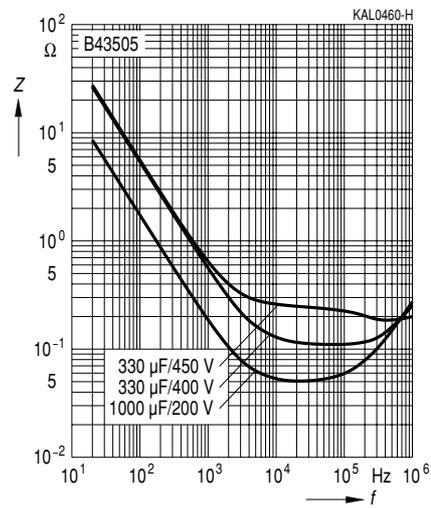
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**Impedance  $Z$**   
versus frequency  $f$   
Typical behavior at 20 °C  
 $U_R \leq 100$  VDC



**Impedance  $Z$**   
versus frequency  $f$   
Typical behavior at 20 °C  
 $U_R \geq 200$  VDC



**Herausgegeben von EPCOS AG**

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