

LL grade
For professional industrial electronics equipment

- Construction

 - Charge-discharge proof, polar
 - Aluminum case with insulating sleeve
 - Negative pole connected to case
 - Axial leads, welded to ensure perfect electrical contact

- Features

 - High reliability and long useful life
 - Can be operated at temperatures of up to 105 °C¹⁾
 - High parametric stability
 - High ripple current capability

- Applications

 - Professional industrial electronics equipment
 - For filtering, coupling and pulse circuits
 - Automotive electronics

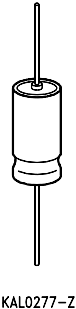
Tape packaging

Capacitors with $d \leq 16$ mm are also available on tape.

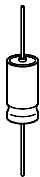
Refer to [page 420](#) for information on tapes and examples on how to order them.

Specifications and characteristics in brief

	B 41 588		B 43 588	
Rated voltage U_R	10 to 100 V–		160 to 350 V–	
Surge voltage U_S	$1,15 \cdot U_R$		$1,15 \cdot U_R$ (for $U_R \leq 250$ V–) $1,10 \cdot U_R$ (for $U_R = 350$ V–)	
Rated capacitance C_R	4,7 to 4 700 μ F		1 to 220 μ F	
Capacitance tolerance	– 10/+ 50 % $\triangleq$ T		– 10/+ 50 % $\triangleq$ T	
Useful life	$d \leq 8,5$ mm	$d \geq 10$ mm	$d \leq 8,5$ mm	$d \geq 10$ mm
40 °C, U_R	> 200 000 h ($1,3 \cdot I_{-R,85^\circ C}$)	> 200 000 h ($2,0 \cdot I_{-R,85^\circ C}$)	> 200 000 h ($1,3 \cdot I_{-R,85^\circ C}$)	> 200 000 h ($1,7 \cdot I_{-R,85^\circ C}$)
85 °C, U_R ; I_{-max}	> 6 000 h	> 10 000 h	> 6 000 h	> 8 000 h
Failure percentage	$\leq 0,5$ % (during useful life)		$\leq 0,5$ % (during useful life)	
Failure rate (1 fit = $1 \cdot 10^{-9}$ /h)	$d \leq 8,5$ mm: ≤ 50 fit $d \geq 10$ mm: ≤ 20 fit		$d \leq 8,5$ mm: ≤ 50 fit $d \geq 10$ mm: ≤ 20 fit	
Voltage endurance test	5 000 h, 85 °C (at U_R)			



1) Operation at 105 °C and 0,6 $I_{-max,85^\circ C}$ permissible for a total of 500 h.



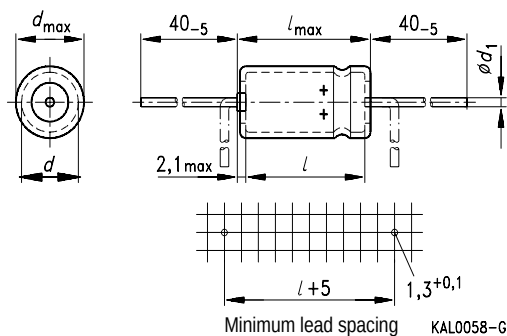
B 41 588
B 43 588

Specifications and characteristics in brief

	B 41 588				B 43 588						
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}	d (mm)	6,5	8,5	10	12	14	16	18	21	25	
	l (mm)	15,5	15,5	25	30	30	30	39,5	40	40	
	L_{ESL} approx. (nH)	14	17	35	37	38	45	57	30	34	
IEC climatic category	in accordance with IEC 68-1 40/085/56 (–40 °C/+85 °C, 56 days damp heat test)										
Detail specification	similar to CECC 30 301-801										
Sectional specification	IEC 384-4										
Vibration resistance	in accordance with IEC 68-2–6, test Fc: displacement amplitude 0,35 mm, frequency range 10 to 55 Hz, acceleration max. 5 g, duration 3 × 2 h										



Dimensional drawing

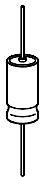


Dimensions (mm) $d \times l$	$d_{\max} \times l_{\max}$	Lead wire diameter d_1	Approximate weight (g)
6,5 × 15,5	7 × 17	0,6	1,1
8,5 × 15,5	9 × 17		1,8
10 × 25	10,5 × 26,5		3,2
12 × 30	12,5 × 32	0,8	5,4
14 × 30	14,5 × 32		7,5
16 × 30	16,5 × 32		9,3
18 × 39,5	18,5 × 40,3		14
21 × 40	21,5 × 41,5		18
25 × 40	25,5 × 41,5		26

Packing units

Case dimensions $d \times l$ (mm)	Bulk PU (pcs.)	Reel packing PU (pcs./reel)
6,5 × 15,5	2000	1300
8,5 × 15,5	1500	1000
10 × 25	900	600
12 × 30	600	450
14 × 30	400	350
16 × 30	350	250
18 × 39,5	250	—
21 × 40	200	—
25 × 40	150	—

Not for new design. For new design see types B 41 683/43 683, [page 389](#)



B 41 588

B 43 588

Overview of available types

Type B 41 588

U_R (V-)	10	16	25	40	63	100
C_R (μF)	Case dimensions $d \times l$ (mm)					
4,7					6,5 × 15,5	8,5 × 15,5
10				6,5 × 15,5	8,5 × 15,5	8,5 × 15,5
22				8,5 × 15,5	8,5 × 15,5	10 × 25
47	6,5 × 15,5	8,5 × 15,5	8,5 × 15,5	8,5 × 15,5	10 × 25	12 × 30
100	8,5 × 15,5	8,5 × 15,5	10 × 25	10 × 25	12 × 30	16 × 30
220	10 × 25	10 × 25	12 × 30	12 × 30	16 × 30	18 × 39,5
470	12 × 30	12 × 30	14 × 30	16 × 30	21 × 40	25 × 40
1 000	14 × 30	16 × 30	18 × 39,5	21 × 40	25 × 40	
2 200	18 × 39,5	18 × 39,5	21 × 40	25 × 40		
4 700	25 × 40	25 × 40				

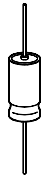
Type B 43 588

U_R (V-)	160	250	350
C_R (μF)	Case dimensions $d \times l$ (mm)		
1,0			6,5 × 15,5
2,2	6,5 × 15,5	8,5 × 15,5	8,5 × 15,5
4,7	8,5 × 15,5	10 × 25	10 × 25
10	10 × 25	10 × 25	12 × 30
22	12 × 30	14 × 30	14 × 30
47	14 × 30	16 × 30	18 × 39,5
100	18 × 39,5	21 × 40	25 × 40
220	25 × 40		

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

Not for new design.

For new design see types B 41 683 (10...100 V) and B 43 683 (160...450 V), [page 389](#)

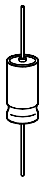


Technical data and ordering codes

U_R	C_R	Case dimensions $d \times l$ mm	$R_{ESR, typ}$ 100 Hz 20 °C Ω	$R_{ESR, max}$ 100 Hz 20 °C Ω	Z_{max} 10 kHz 20 °C Ω	I_{max} 100 Hz 40 °C A	I_R 100 Hz 85 °C A	Ordering code ¹⁾
V-	μF							Short code
B41588-								
10	47	6,5 × 15,5	2,0	5,0	0,88	0,29	0,10	-D3476-T90
	100	8,5 × 15,5	0,95	2,4	0,43	0,49	0,17	-D3107-T90
	220	10 × 25	0,43	1,1	0,21	0,83	0,28	-E3227-T90
	470	12 × 30	0,20	0,50	0,11	1,6	0,55	-C3477-T
	1 000	14 × 30	0,10	0,25	0,07	2,5	0,85	-E3108-T
	2 200	18 × 39,5	0,06	0,14	0,05	4,1	1,4	-C3228-T
	4 700	25 × 40	0,05	0,07	0,05	5,5	1,9	-A3478-T
16	47	8,5 × 15,5	1,6	4,0	0,82	0,34	0,12	-C4476-T90
	100	8,5 × 15,5	0,75	1,9	0,40	0,52	0,18	-D4107-T90
	220	10 × 25	0,36	0,90	0,20	0,96	0,33	-D4227-T90
	470	12 × 30	0,18	0,45	0,11	1,7	0,57	-D4477-T
	1 000	16 × 30	0,10	0,25	0,06	2,7	0,92	-M4108-T
	2 200	18 × 39,5	0,06	0,12	0,05	4,1	1,4	-D4228-T
	4 700	25 × 40	0,05	0,06	0,05	5,5	1,9	-A4478-T
25	47	8,5 × 15,5	1,3	3,3	0,78	0,41	0,14	-D5476-T90
	100	10 × 25	0,60	1,5	0,38	0,70	0,24	-E5107-T90
	220	12 × 30	0,28	0,70	0,19	1,3	0,46	-L5227-T
	470	14 × 30	0,16	0,40	0,10	1,9	0,64	-E5477-T
	1 000	18 × 39,5	0,10	0,19	0,06	3,2	1,1	-D5108-T
	2 200	21 × 40	0,06	0,10	0,05	4,5	1,6	-A5228-T

Not for new design. For new design see type B 41 683 (10...100 V), [page 389](#)

1) To obtain the required ordering code, prefix the type number to the short code. E. g.: B41588-D3476-T90



B 41 588 B 43 588

Technical data and ordering codes

U_R	C_R	Case dimensions $d \times l$ mm	$R_{ESR, typ}$ 100 Hz 20 °C Ω	$R_{ESR, max}$ 100 Hz 20 °C Ω	Z_{max} 10 kHz 20 °C Ω	I_{max} 100 Hz 40 °C A	I_R 100 Hz 85 °C A	Ordering code ¹⁾
V-	μF							Short code
B41588-								
40	10	6,5 × 15,5	5,0	13	3,3	0,17	0,06	-D7106-T90
	22	8,5 × 15,5	2,2	5,5	1,5	0,32	0,11	-D7226-T90
	47	8,5 × 15,5	1,0	2,5	0,72	0,46	0,16	-E7476-T90
	100	10 × 25	0,50	1,3	0,36	0,81	0,28	-E7107-T90
	220	12 × 30	0,25	0,63	0,18	1,4	0,49	-D7227-T
	470	16 × 30	0,13	0,33	0,10	2,2	0,77	-M7477-T
	1 000	21 × 40	0,07	0,16	0,06	4,0	1,4	-D7108-T
	2 200	25 × 40	0,04	0,08	0,05	5,9	2,0	-A7228-T
63	4,7	6,5 × 15,5	9,5	24	6,5	0,15	0,05	-K8475-T90
	10	8,5 × 15,5	4,0	10	3,1	0,23	0,08	-K8106-T90
	22	8,5 × 15,5	1,8	4,5	1,4	0,35	0,12	-K8226-T90
	47	10 × 25	0,80	2,0	0,67	0,64	0,22	-K8476-T90
	100	12 × 30	0,40	1,0	0,33	1,1	0,38	-J8107-T
	220	16 × 30	0,18	0,45	0,17	1,9	0,65	-B8227-T
	470	21 × 40	0,10	0,25	0,09	3,3	1,1	-J8477-T
	1 000	25 × 40	0,05	0,12	0,06	5,3	1,8	-A8108-T
100	4,7	8,5 × 15,5	7,0	18	6,0	0,17	0,06	-C9475-T90
	10	8,5 × 15,5	3,0	7,5	2,8	0,26	0,09	-D9106-T90
	22	10 × 25	1,3	3,3	1,3	0,52	0,18	-D9226-T90
	47	12 × 30	0,60	1,5	0,62	0,90	0,31	-D9476-T
	100	16 × 30	0,32	0,80	0,31	1,4	0,49	-E9107-T
	220	18 × 39,5	0,16	0,40	0,15	2,4	0,83	-D9227-T
	470	25 × 40	0,09	0,23	0,09	4,1	1,4	-A9477-T

Not for new design. For new design see type B 41 683 (10 ... 100 V), [page 389](#)

1) To obtain the required ordering code, prefix the type number to the short code. E. g.: B41588-D7106-T90

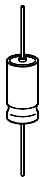


Technical data and ordering codes

U_R	C_R	Case dimensions $d \times l$ mm	$R_{ESR, typ}$ 100 Hz 20 °C Ω	$R_{ESR, max}$ 100 Hz 20 °C Ω	Z_{max} 10 kHz 20 °C Ω	I_{max} 100 Hz 40 °C A	I_R 100 Hz 85 °C A	Ordering code ¹⁾
V-	μF							Short code
B43588-								
160	2,2	6,5 × 15,5	36	80	33	0,07	0,02	-C1225-T90
	4,7	8,5 × 15,5	17	38	15	0,12	0,04	-D1475-T90
	10	10 × 25	8,0	18	7,2	0,19	0,07	-D1106-T90
	22	12 × 30	3,6	8,0	3,3	0,38	0,13	-C1226-T
	47	14 × 30	1,7	3,8	1,6	0,59	0,20	-D1476-T
	100	18 × 39,5	0,80	1,8	0,75	1,1	0,38	-D1107-T
	220	25 × 40	0,40	0,80	0,35	2,0	0,68	-A1227-T
250	2,2	8,5 × 15,5	29	72	31	0,09	0,03	-C2225-T90
	4,7	10 × 25	14	24	14	0,15	0,05	-C2475-T90
	10	10 × 25	6,4	16	6,8	0,24	0,08	-D2106-T90
	22	14 × 30	2,9	7,2	3,1	0,45	0,15	-D2226-T
	47	16 × 30	1,4	3,4	1,5	0,70	0,24	-M2476-T
	100	21 × 40	0,60	1,5	0,70	1,4	0,47	-D2107-T
350	1,0	6,5 × 15,5	48	120	64	0,06	0,02	-D4105-T90
	2,2	8,5 × 15,5	22	55	29	0,10	0,04	-D4225-T90
	4,7	10 × 25	10	25	14	0,17	0,06	-D4475-T90
	10	12 × 30	4,8	12	6,4	0,33	0,11	-D4106-T
	22	14 × 30	2,2	5,5	2,9	0,51	0,18	-E4226-T
	47	18 × 39,5	1,0	2,5	1,4	1,0	0,34	-D4476-T
	100	25 × 40	0,50	1,3	0,67	1,7	0,59	-A4107-T

Not for new design. For new design see type B 43 683 (160 ... 450 V), [page 389](#)

1) To obtain the required ordering code, prefix the type number to the short code. E. g.: B43588-C1225-T90

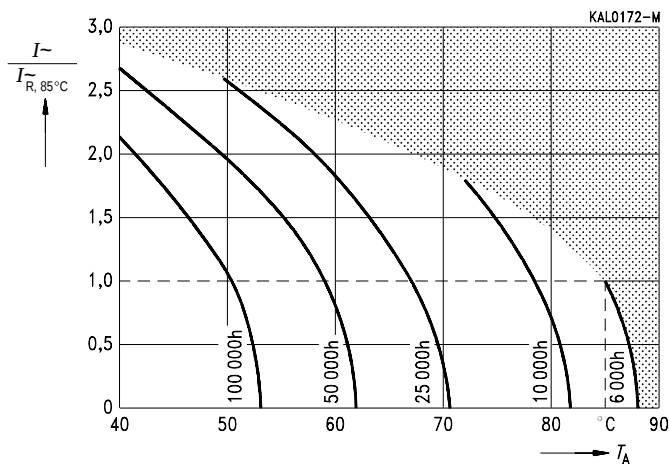


B 41 588
B 43 588

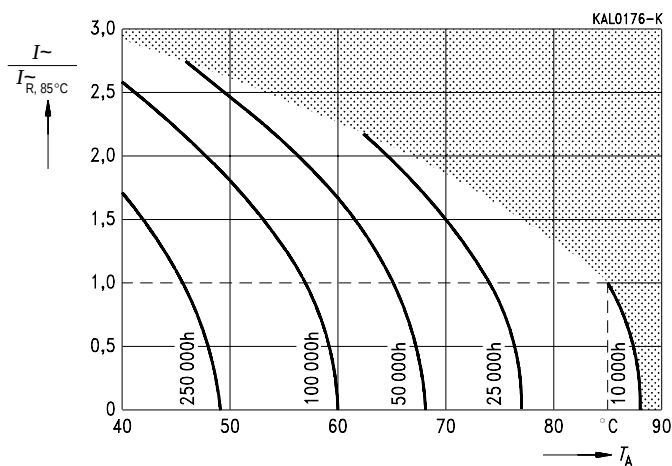
Useful life

versus ambient temperature T_A under ripple current operating conditions¹⁾

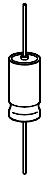
$U_R = 10$ to 350 V– ($d \leq 8,5$ mm)



$U_R = 10$ to 100 V– ($d \geq 10$ mm)



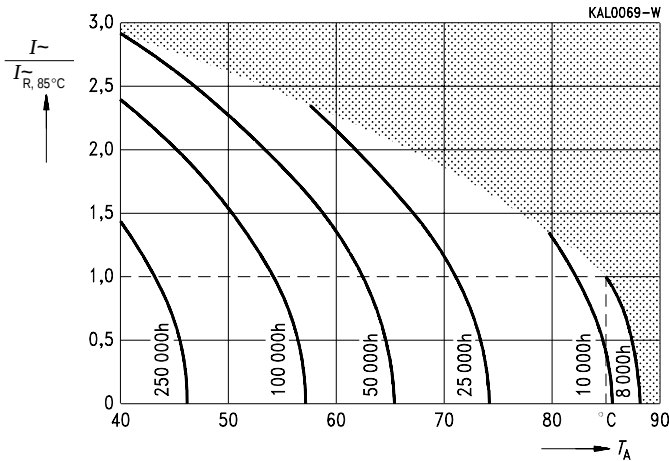
¹⁾ Refer to [page 34](#) for an explanation on how to interpret the useful life graphs.



Useful life

versus ambient temperature T_A under ripple current operating conditions¹⁾

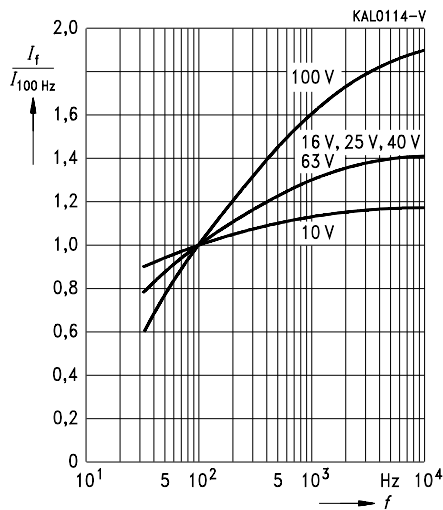
$U_R = 160$ to 350 V– ($d \geq 10$ mm)



Permissible ripple current $I_{\sim}$

versus frequency f

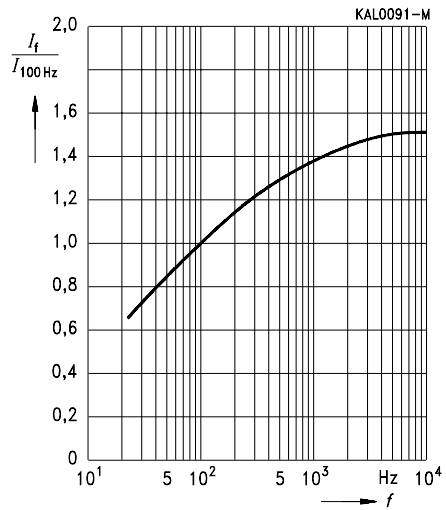
$U_R \leq 100$ V–



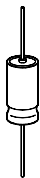
Permissible ripple current $I_{\sim}$

versus frequency f

$U_R \geq 160$ V–



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



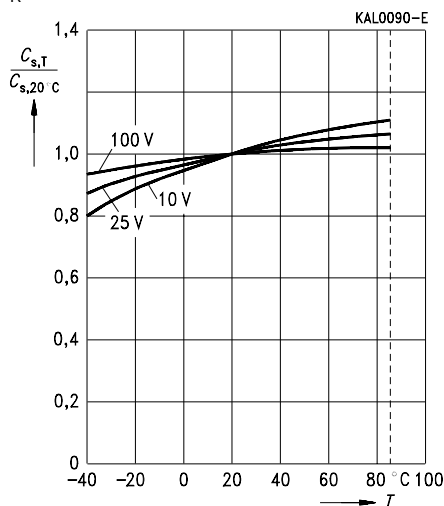
B 41 588

B 43 588

Series capacitance C_S at $f = 100$ Hz
versus temperature T

Typical behavior

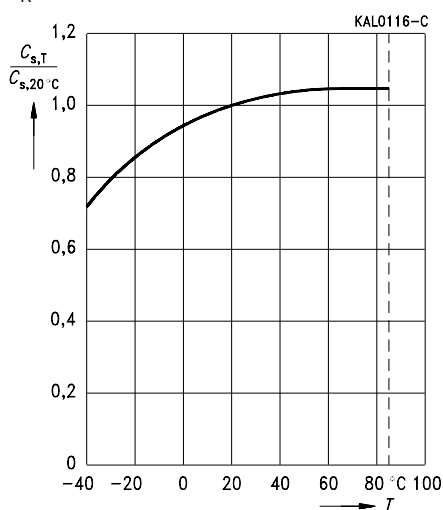
$U_R \leq 100$ V–



Series capacitance C_S at $f = 100$ Hz
versus temperature T

Typical behavior

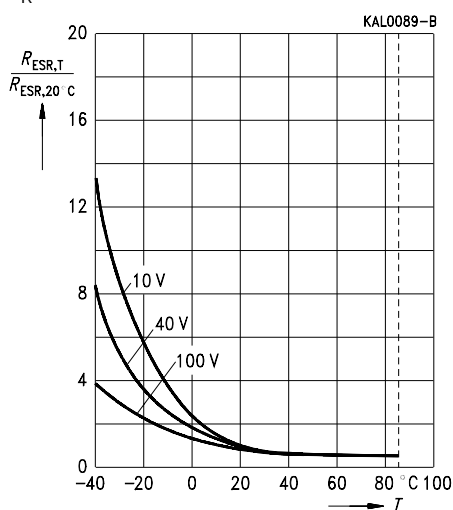
$U_R \geq 160$ V–



Equivalent series resistance R_{ESR}
at $f = 100$ Hz versus temperature T

Typical behavior

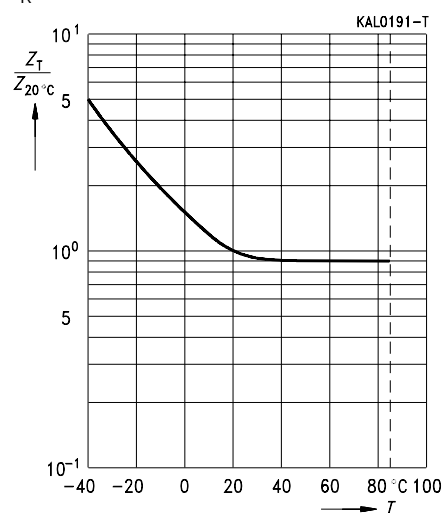
$U_R \leq 100$ V–

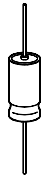


Impedance Z at $f = 100$ Hz
versus temperature T

Typical behavior

$U_R \geq 160$ V–

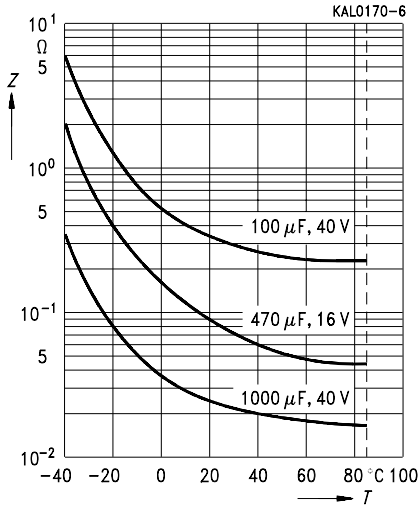




Impedance Z at $f = 10$ kHz
versus temperature T

Typical behavior

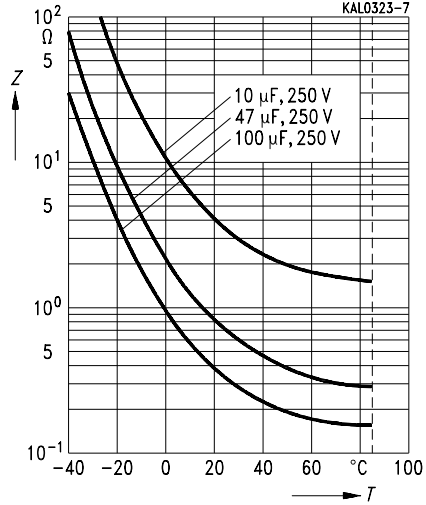
$U_R \leq 100$ V–



Impedance Z at $f = 10$ kHz
versus temperature T

Typical behavior

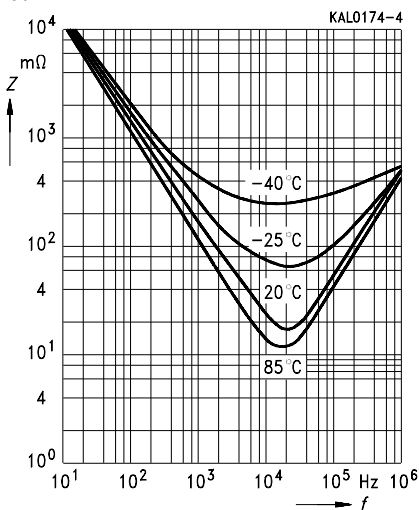
$U_R \geq 160$ V–



Impedance Z
versus frequency f

and temperature T for $1000 \mu\text{F}/40$ V–

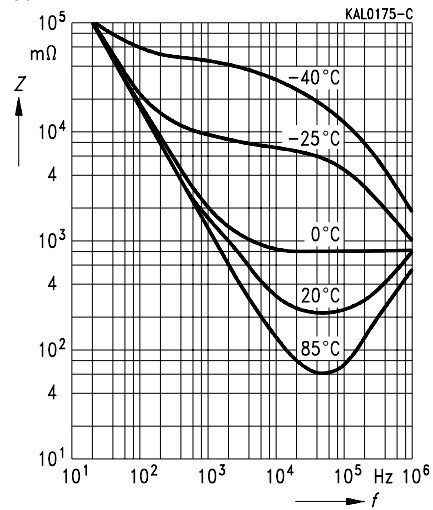
Typical behavior

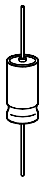


Impedance Z
versus frequency f

and temperature T for $100 \mu\text{F}/250$ V–

Typical behavior





B 41 588

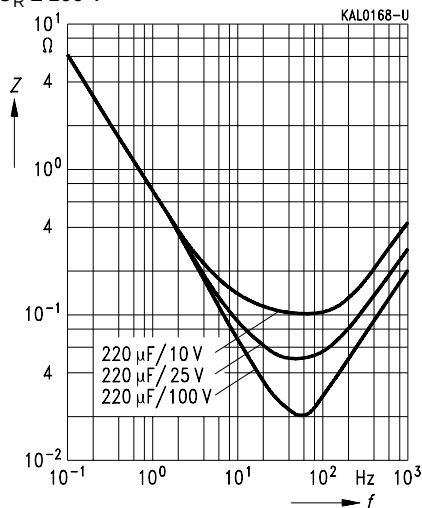
B 43 588

Impedance Z

versus frequency f

Typical values at 20 °C

$U_R \leq 100 \text{ V}$ –



Impedance Z

versus frequency f

Typical values at 20 °C

$U_R \geq 160 \text{ V}$ –

