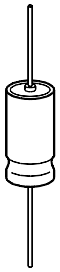
For professional industrial electronics equipment



KAL0277–Z

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 °C[1)]
- High parametric stability
- High ripple current capability

Applications

- Professional industrial electronics equipment
- For filtering, coupling and pulse circuits
- Automotive electronics
- 450-V versions for electronic ballasts available upon request

Datasheet.Live

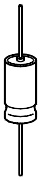
Tape packaging

Capacitors with $d \leq 16$ mm are also available on tape.
Refer to page 305 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 · U_R		1,15 · U_R (for $U_R \leq 250$ V–) 1,10 · U_R (for U_R = 350 V–)	
Rated capacitance C_R	4,7 to 4 700 µF		1 to 220 µF	
Capacitance tolerance	– 10/+ 50 % ≙ T		– 10/+ 50 % ≙ 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 · $I_{\sim R,85°C}$)	> 200 000 h (2,0 · $I_{\sim R,85°C}$)	> 200 000 h (1,3 · $I_{\sim R,85°C}$)	> 200 000 h (1,7 · $I_{\sim R,85°C}$)
85 °C, U_R; $I_{\sim max}$	> 6 000 h	> 10 000 h	> 6 000 h	> 8 000 h
Failure percentage	≤ 0,5 % (during useful life)		≤ 0,5 % (during useful life)	
Failure rate (1 fit = 1 · 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	

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

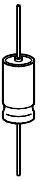


Specifications and characteristics in brief

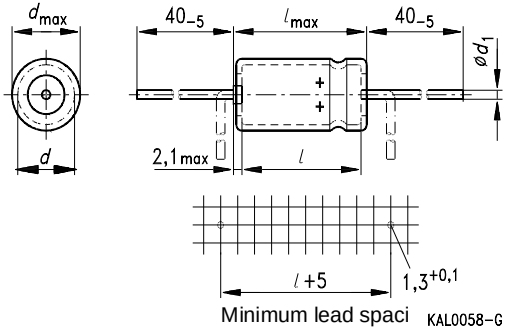
	B 41 588	B 43 588
Voltage endurance test	5 000 h, 85 °C (at U_R)	
Leakage current I_{lka} (5 min, 20 °C)	$C_R \cdot U_R \leq 1\,000\ \mu C$: $I_{lka} \leq 0{,}01\ \mu A \cdot \left(\frac{C_R}{\mu F} \cdot \frac{U_R}{V}\right)$ or 1 µA (the larger value applies) $1\,000\ \mu C \leq C_R \cdot U_R < 470\,000\ \mu C$: $I_{lka} \leq 0{,}006\ \mu A \cdot \left(\frac{C_R}{\mu F} \cdot \frac{U_R}{V}\right) + 4\ \mu A$	

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 specifications	similar to CECC 30 301-801 (similar to CECC 30 301-003, DIN 45 910 part 123)
Sectional specifications	IEC 384-4 (DIN 45 910 part 12)
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



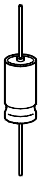
Outline drawing



Dimensions (mm)			Approximate
$d \times l$	$d_{max} \times l_{max}$	Lead wire diameter d_1	weight (g)
6,5 × 15,5	7,0 × 17	0,6	1,1
8,5 × 15,5	9,0 × 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	–



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 × 17,5	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				

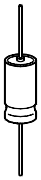
Type B 43 588

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 smaller cases upon request. Other voltage and capacitance ratings are also available upon request.

Upon request we also supply special versions with rated voltages of up to 450 V–, surge voltages of up to 600 V– and capacitance ratings of 6,8 µF, 10 µF, 15 µF, 22 µF (e. g. for electronic ballast applications).

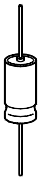
Temperature range – 40 … + 85 °C/+ 105 °C.



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	$I_{\sim R}$ 100 Hz 40 °C	$I_{\sim max}$ 100 Hz 85 °C	Ordering code[1]
V–	µF	mm	Ω	Ω	Ω	A	A	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
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

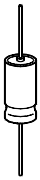
1) For instructions on how to determine ordering codes, refer to page 283.



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	$I_{\sim R}$ 100 Hz 40 °C	$I_{\sim max}$ 100 Hz 85 °C	Ordering code[1]
V–	µF	mm	Ω	Ω	Ω	A	A	Short code
B41588-								
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
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

1) For instructions on how to determine ordering codes, refer to page 283.



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	$I_{\sim R}$ 100 Hz 40 °C	$I_{\sim max}$ 100 Hz 85 °C	Ordering code[1]
V–	µF	mm	Ω	Ω	Ω	A	A	Short code
B43588-								
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

Upon request we also supply special versions with rated voltages of up to 450 V–, surge voltages of up to 600 V– and capacitance ratings of 6,8 µF, 10 µF, 15 µF, 22 µF (e. g. for electronic ballast applications).

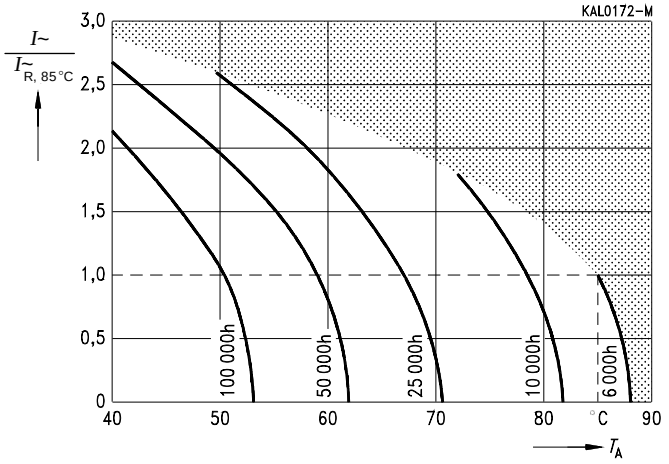
Temperature range – 40 … + 85 °C/+ 105 °C.

1) To obtain the required ordering code, prefix the type number to the short code. E. g.: B43588-C4105-T
B41588-... (U_R = 10 to 100 V–)
B43588-... (U_R = 160 to 350 V–)

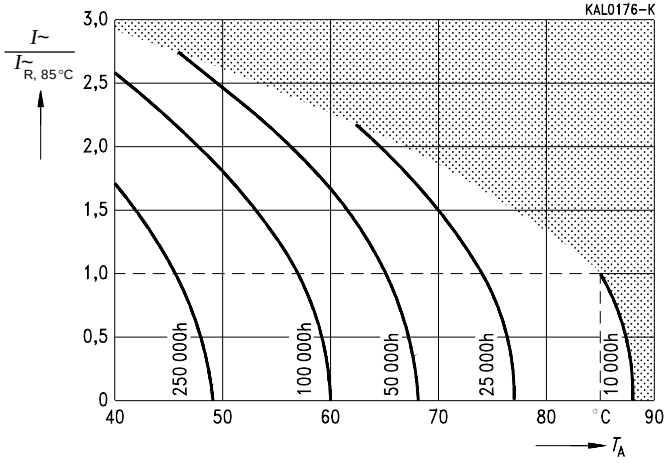
Useful life

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

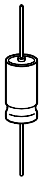
U_R = 10 to 350 V– ($d \leq 8{,}5$ mm)



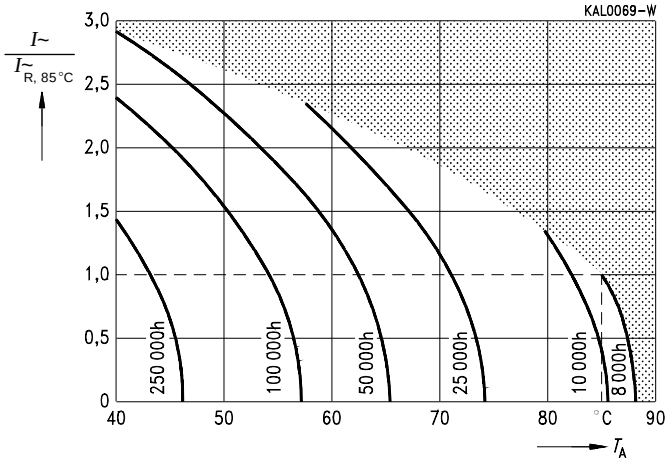
U_R = 10 to 100 V– ($d \geq 10$ mm)



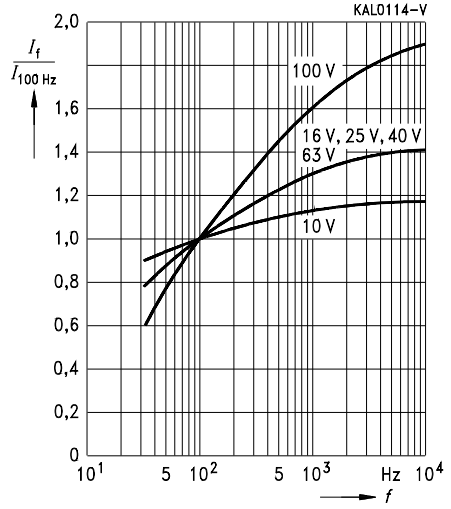
1) Refer to page 34 for an explanation on how to interpret the useful life graphs.



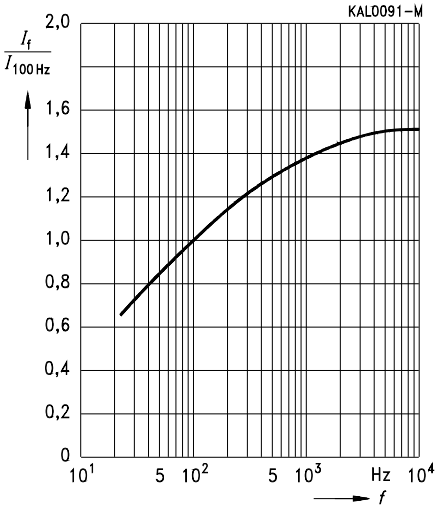
Useful life
versus ambient temperature T_A under ripple current operating conditions[1)]
U_R = 160 to 350 V– ($d \geq 10$ mm)



Permissible ripple current *I*~
versus frequency *f*
$U_R \leq 100$ V–

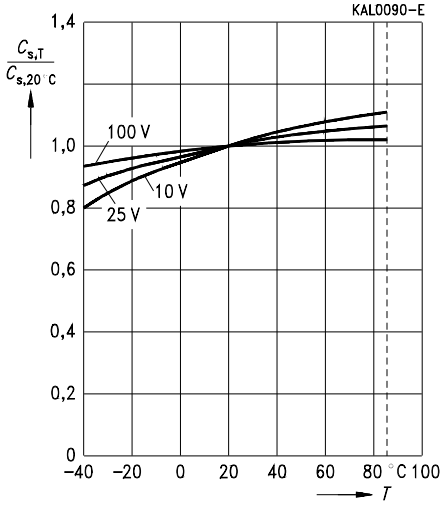


Permissible ripple current *I*~
versus frequency *f*
$U_R \geq 160$ V–

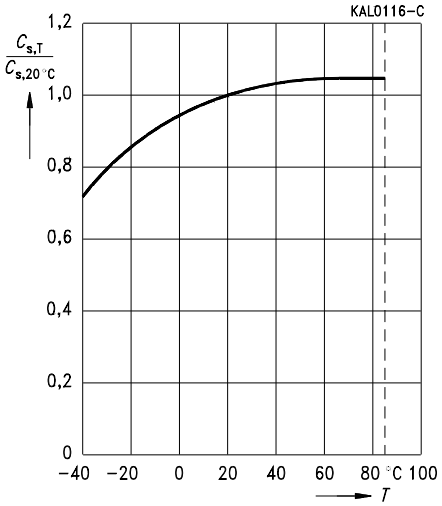


1) Refer to page 34 for an explanation on how to interpret the useful life graphs.

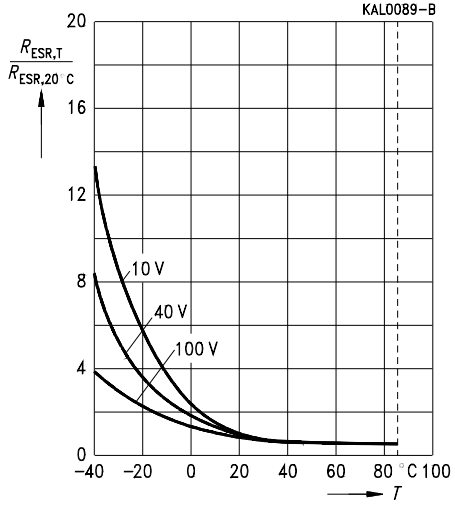
Series capacitance C_S at f = 100 Hz
versus temperature T
Typical behavior
$U_R \leq 100$ V–



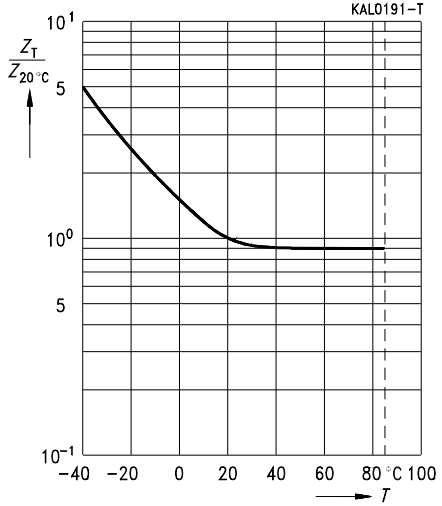
Series capacitance C_S at f = 100 Hz
versus temperature T
Typical behavior
$U_R \geq 160$ V–

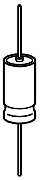


Equivalent series resistance R_{ESR}
at f = 100 Hz versus temperature T
Typical behavior
$U_R \leq 100$ V–

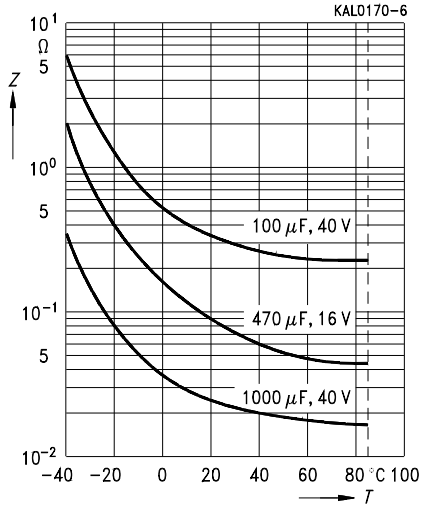


Impedance Z at f = 100 Hz
versus temperature T
Typical behavior
$U_R \geq 160$ V–

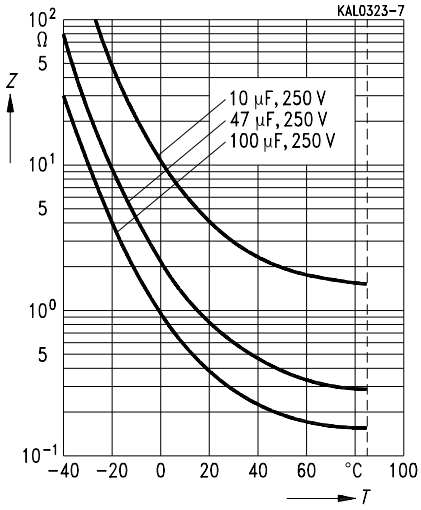




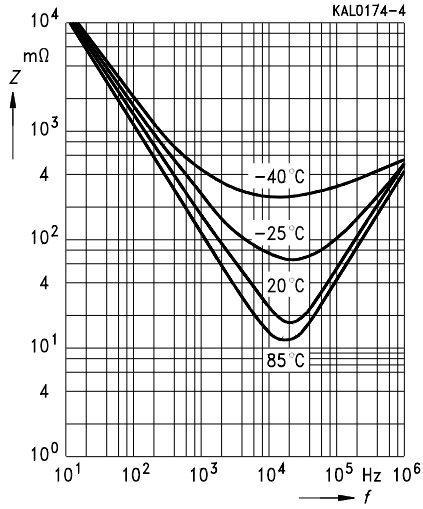
Impedance *Z* at $f = 10$ kHz
versus temperature T
Typical behavior
$U_R \leq 100$ V–



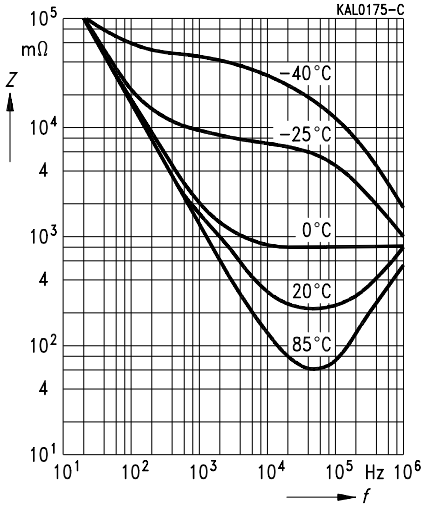
Impedance *Z* at $f = 10$ kHz
versus temperature T
Typical behavior
$U_R \geq 160$ V–



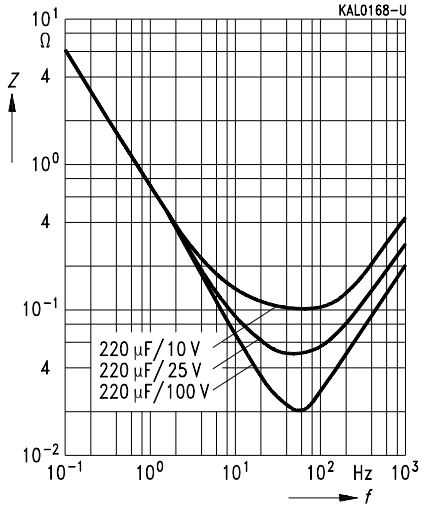
Impedance *Z*
versus frequency f
and temperature T for 1000 µF/40 V–
Typical behavior



Impedance *Z*
versus frequency f
and temperature T for 100 µF/250 V–
Typical behavior



Impedance *Z*
versus frequency *f*
Typical values at 20 °C
$U_R \leq 100$ V–



Impedance *Z*
versus frequency *f*
Typical values at 20 °C
$U_R \geq 160$ V–