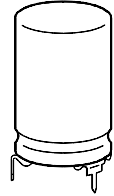


GP grade

Standard type for entertainment and industrial electronics

Construction

- Charge-discharge proof, polar
- Aluminum case, partially insulated
- Solder pins on mounting base that is securely welded to the case, ensuring perfect electrical contact
- Positive pole connection brought out axially at center
- Negative pole connected to two or three solder pins of the mounting base



KAL0276-R

Features

- Good stability and vibration resistance
- Operation at temperatures up to 105 °C¹⁾ permissible
- High parametric stability
- Pinning ensures correct insertion

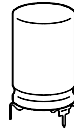
Applications

- Standard type for entertainment and industrial electronics
- Filtering, coupling and pulse circuits
- Automotive electronics

Specifications and characteristics in brief

	B 41 293	B 43 293
Rated voltage U_R	10 ... 100 V–	160 ... 385 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 $U_R \geq 350$ V–)
Rated capacitance C_R	100 ... 4 700 μ F	10 ... 220 μ F
Capacitance tolerance	– 10/+ 50 % \triangleq T	– 10/+ 50 % \triangleq T
Useful life		
40 °C, U_R	> 200 000 h ($1,5 \cdot I_{\sim R,85^\circ C}$)	> 200 000 h ($I_{\sim R,85^\circ C}$)
85 °C, U_R ; $I_{\sim R}$	> 4 000 h	> 3 000 h
Failure percentage	≤ 1 % (during useful life)	≤ 1 % (during useful life)
Failure rate	≤ 100 fit ($\leq 100 \cdot 10^{-9}$ /h)	≤ 100 fit ($\leq 100 \cdot 10^{-9}$ /h)
Voltage endurance test	2 000 h, 85 °C (at U_R)	2 000 h, 85 °C (at U_R)
Leakage current I_{lka} (5 min, 20 °C)	$I_{lka} \leq 0,3 \mu A \cdot \left(\frac{C_R}{\mu F} \cdot \frac{U_R}{V} \right)^{0,7} + 4 \mu A$	

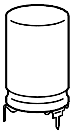
1) Operation at 105 °C and 0,6 $I_{\sim max,85^\circ C}$ permissible for a total of 500 h.



Specifications and characteristics in brief

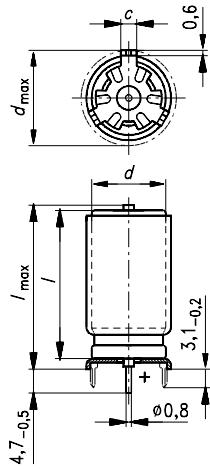
	B 41 293			B 43 293				
Self-inductance L_{ESL}	d (mm)	12	14	16	18	21	25	25
	l (mm)	30	30	30	39,5	40	40	45
	L_{ESL} approx. (nH)	23	38	38	37	17	17	40
IEC climatic category	in accordance with IEC 68–1 40/085/56 (– 40 °C/+ 85 °C, 56 days damp heat test)							
Detail specification	similar to CECC 30 301-048							
Sectional specification	IEC 384–4 ¹⁾							
Vibration resistance	in accordance with IEC 68–2–6, test Fc: displacement amplitude 0,75 mm, frequency range 10 ... 55 Hz, acceleration max. 10 g, duration 3 × 2 h							

1) These capacitors comply with the requirements for "Long-Life Grade" (LL).



B 41 293
B 43 293

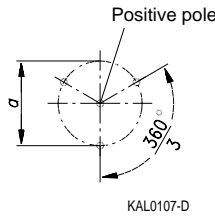
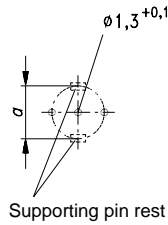
Dimensional drawing



Mounting holes
 $d = 12 \dots 14 \text{ mm}$

$d = 16 \dots 25 \text{ mm}$

Soldering star and supports are connected to the negative pole

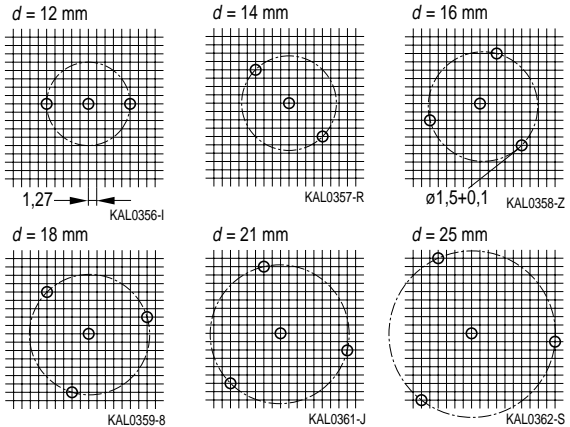


KAL0107-D

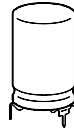
Dimensions (mm)				Approx weight (g)	Packing units (pieces)
$d \times l$	$d_{\max} \times l_{\max}$	$a \pm 0,1$	$c \pm 0,1$		
12 × 30	13,5 × 33	12,5	3,0	5,7	480
14 × 30	15,5 × 33	14,5		7,9	480
16 × 30	17,5 × 33	16,5		9,8	300
18 × 39,5	19,5 × 40,8	18,5	3,5	15	200
21 × 40	22,5 × 42	21,5		19	128
25 × 40	26,5 × 42	25,5		27	128
25 × 45	26,5 × 47	25,5		27	128

The PC-board hole arrangement specified above is based on circular arcs.

If, however, the mounting holes have to be matched to a standard drilling raster, a spacing of 1,27 mm ($1/20''$) has proved to be sufficiently accurate if the following arrangements are used:



Not for new design
For new design see types
B 41 782/B 43 782, [page 294](#)



Overview of available types

Type B 41 293

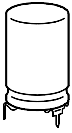
U_R (V-)	10	16	25	40	63	100
C_R (μ F)	Case dimensions $d \times l$ (mm)					
100						12 × 30
220					12 × 30	16 × 30
470			12 × 30	12 × 30	16 × 30	21 × 40
1 000	12 × 30	12 × 30	14 × 30	16 × 30	21 × 40	
2 200	14 × 30	16 × 30	18 × 39,5	21 × 40		
4 700	18 × 39,5	21 × 40	25 × 40			

Type B 43 293

U_R (V-)	160	250	350	385
C_R (μ F)	Case dimensions $d \times l$ (mm)			
10			12 × 30	
22	12 × 30	12 × 30	14 × 30	
47	14 × 30	16 × 30	18 × 39,5	
100	18 × 39,5	21 × 40	25 × 40	25 × 40
150				25 × 45
220	25 × 40			

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

Not for new design.
For new design see types B 41 782 (10...100 V) and B 43 782 (160...500 V), [page 294](#)



B 41 293
B 43 293

Technical data and ordering codes

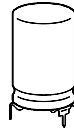
U_R	C_R	Case dimensions $d \times l$ mm	$R_{ESR, typ}$ 100 Hz 20 °C Ω	$R_{ESR, max}$ 100 Hz 20 °C Ω	Z_{max} 10 kHz 20 °C Ω	I_{max} 100 Hz 40 °C A	I_R 100 Hz 85 °C A	Ordering code ¹⁾ Short code
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B41293-

10	1 000	12 × 30	0,18	0,32	0,16	1,7	0,57	-A3108-T
	2 200	14 × 30	0,10	0,18	0,08	2,3	0,81	-J3228-T
	4 700	18 × 39,5	0,06	0,10	0,05	4,1	1,4	-J3478-T
16	1 000	12 × 30	0,15	0,28	0,13	1,8	0,63	-J4108-T
	2 200	16 × 30	0,09	0,16	0,06	2,7	0,93	-B4228-T
	4 700	21 × 40	0,06	0,09	0,05	4,4	1,5	-A4478-T
25	470	12 × 30	0,21	0,53	0,19	1,5	0,53	-A5477-T
	1 000	14 × 30	0,12	0,25	0,09	2,1	0,74	-J5108-T
	2 200	18 × 39,5	0,07	0,14	0,05	3,8	1,3	-J5228-T
	4 700	25 × 40	0,05	0,09	0,05	5,2	1,8	-B5478-T
40	470	12 × 30	0,18	0,38	0,15	1,7	0,57	-J7477-T
	1 000	16 × 30	0,10	0,18	0,08	2,6	0,88	-B7108-T
	2 200	21 × 40	0,07	0,11	0,05	4,1	1,4	-B7228-T
63	220	12 × 30	0,30	0,64	0,25	1,3	0,44	-J8227-T
	470	16 × 30	0,14	0,30	0,12	2,1	0,74	-B8477-T
	1 000	21 × 40	0,08	0,14	0,06	3,8	1,3	-A8108-T
100	100	12 × 30	0,40	1,0	0,45	1,1	0,38	-B9107-T
	220	16 × 30	0,22	0,55	0,20	1,7	0,59	-B9227-T
	470	21 × 40	0,12	0,26	0,10	2,9	1,0	-B9477-T

Not for new design. For new design see type B 41 782 (10 ... 100 V), [page 294](#)

1) To obtain the required ordering code, prefix the type number to the short code. E. g.: B41293-A3108-T



Technical data and ordering codes

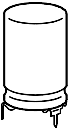
U_R	C_R	Case dimensions $d \times l$ mm	$R_{ESR, typ}$ 100 Hz 20 °C Ω	$R_{ESR, max}$ 100 Hz 20 °C Ω	Z_{max} 10 kHz 20 °C Ω	$I_{\sim max}$ 100 Hz 40 °C A	$I_{\sim R}$ 100 Hz 85 °C A	Ordering code ¹⁾ Short code
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B43293-

160	22	12 × 30	4,0	8,8	6,8	0,36	0,12	-A1226-T
	47	14 × 30	1,9	4,1	3,3	0,55	0,19	-A1476-T
	100	18 × 39,5	0,95	1,9	1,5	1,0	0,35	-A1107-T
	220	25 × 40	0,43	0,88	0,68	1,8	0,62	-A1227-T
250	22	12 × 30	3,3	8,8	6,8	0,39	0,13	-A2226-T
	47	16 × 30	1,5	4,1	3,3	0,67	0,23	-A2476-T
	100	21 × 40	0,72	1,9	1,5	1,3	0,44	-A2107-T
350	10	12 × 30	5,6	19	15	0,30	0,10	-A4106-T
	22	14 × 30	2,5	8,8	6,8	0,48	0,17	-A4226-T
	47	18 × 39,5	1,2	4,1	3,3	0,91	0,31	-A4476-T
	100	25 × 40	0,56	1,9	1,5	1,6	0,54	-A4107-T
385	100	25 × 40	0,56	1,9	1,5	1,6	0,54	-A0107-T
	150	25 × 45	0,37	1,3	1,0	2,0	0,70	-A0157-T

Not for new design. For new design see type B 43 782 (160 ... 500 V), [page 294](#)

1) To obtain the required ordering code, prefix the type number to the short code. E. g.: B43293-A1226-T

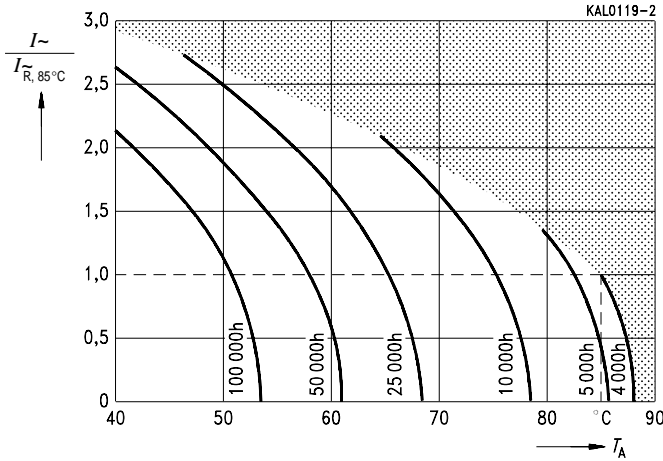


B 41 293
B 43 293

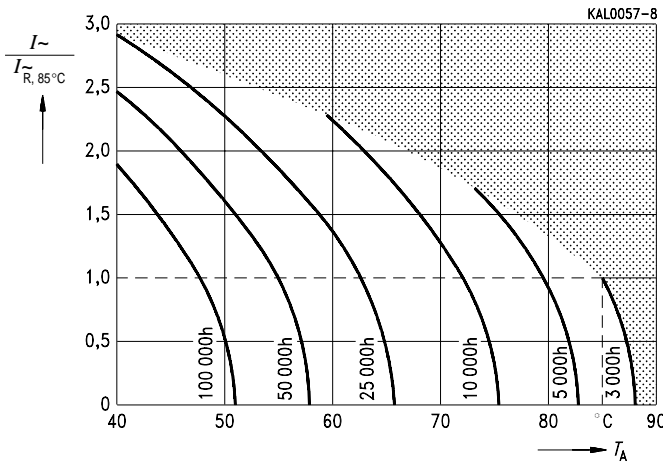
Useful life

versus ambient temperature T_A under ripple current operating conditions ¹⁾

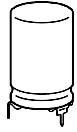
$U_R = 10 \dots 100 \text{ V-}$



$U_R = 160 \dots 385 \text{ V-}$

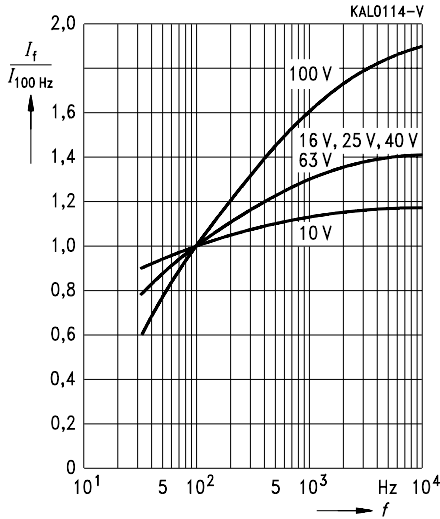


1) Refer to [page 34](#) for an explanation on how to interpret the useful life graphs.



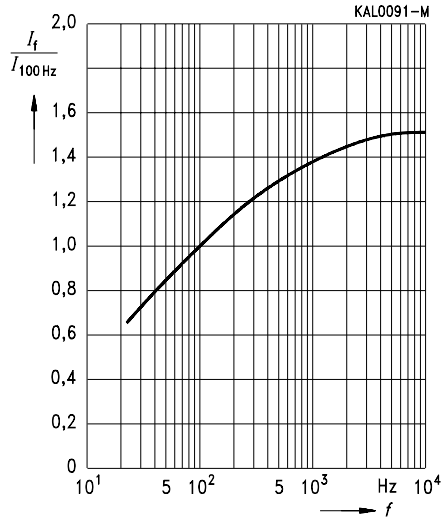
Permissible ripple current I_r versus frequency f

$U_R \leq 100 \text{ V-}$



Permissible ripple current I_r versus frequency f

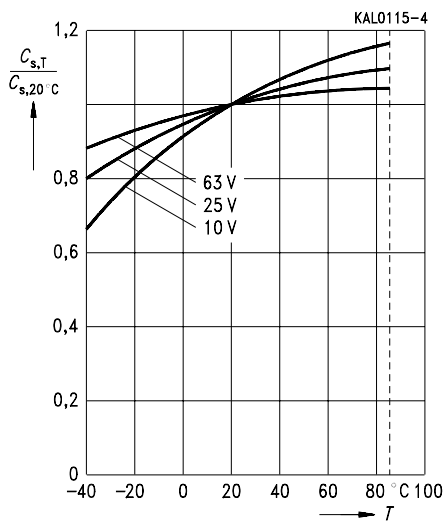
$U_R \geq 160 \text{ V-}$



Series capacitance C_s at $f = 100 \text{ Hz}$ versus temperature T

Typical behavior

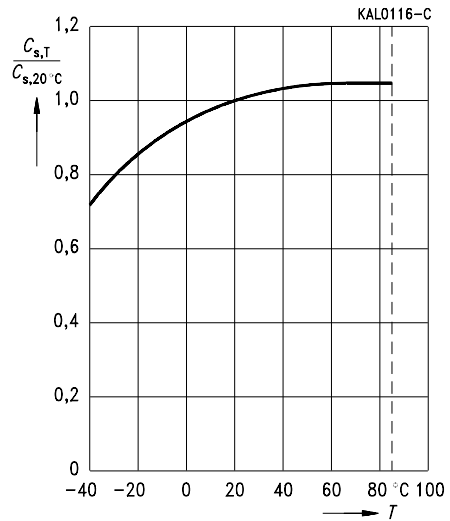
$U_R \leq 100 \text{ V-}$

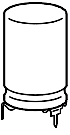


Series capacitance C_s at $f = 100 \text{ Hz}$ versus temperature T

Typical behavior

$U_R \geq 160 \text{ V-}$





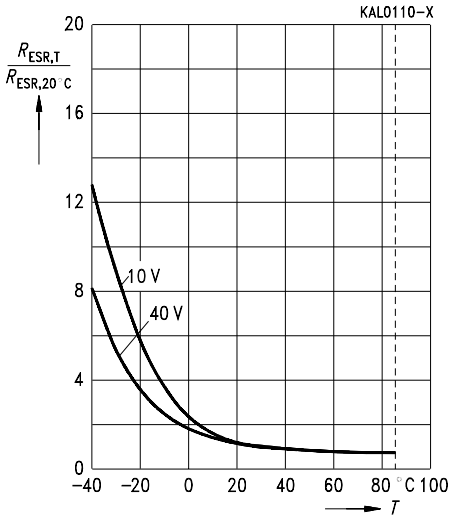
B 41 293
B 43 293

Equivalent series resistance R_{ESR}

at $f = 100 \text{ Hz}$ versus temperature T

Typical behavior

$U_R \leq 100 \text{ V-}$

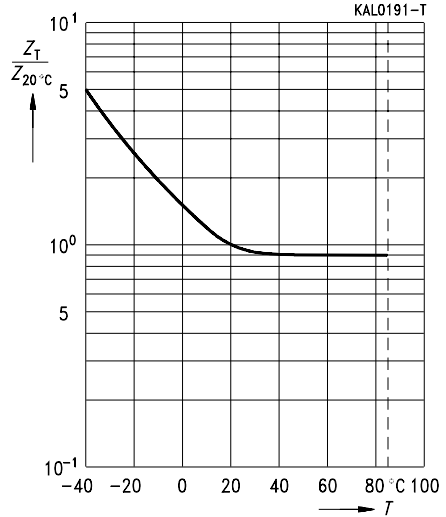


Impedance Z at $f = 100 \text{ Hz}$

versus temperature T

Typical behavior

$U_R \geq 160 \text{ V-}$

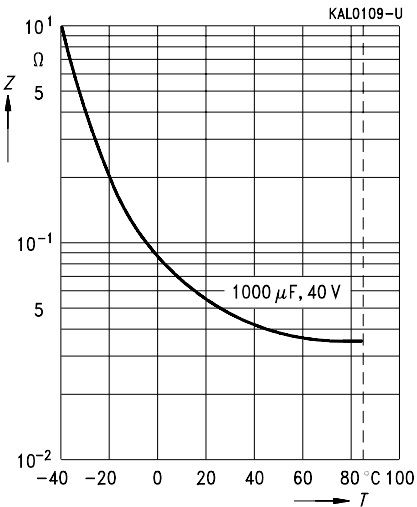


Impedance Z at $f = 10 \text{ kHz}$

versus temperature T

Typical behavior

$U_R \leq 100 \text{ V-}$

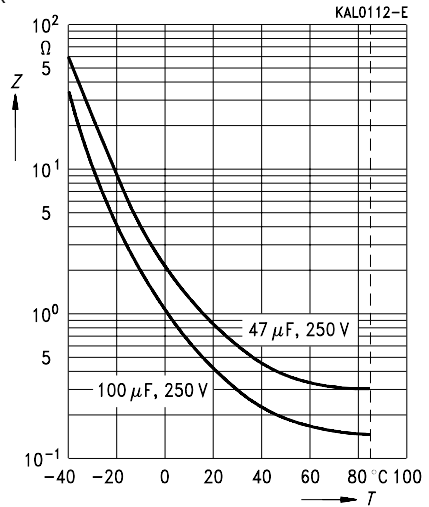


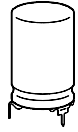
Impedance Z at $f = 10 \text{ kHz}$

versus temperature T

Typical behavior

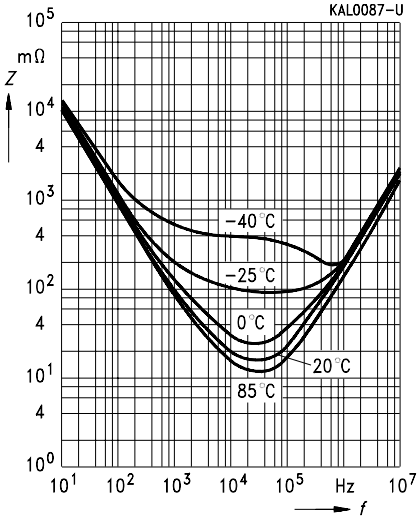
$U_R \geq 160 \text{ V-}$





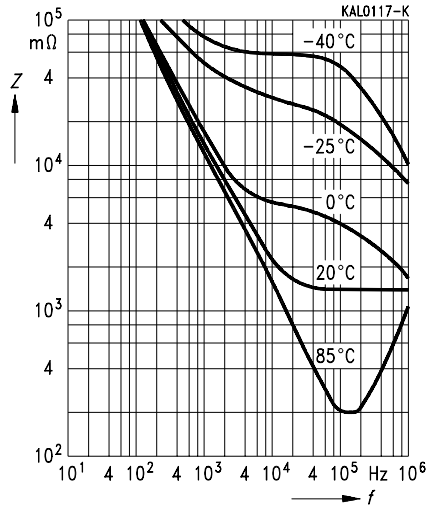
Impedance Z

versus frequency f
and temperature T for 1000 $\mu\text{F}/40\text{ V}$ –
Typical behavior



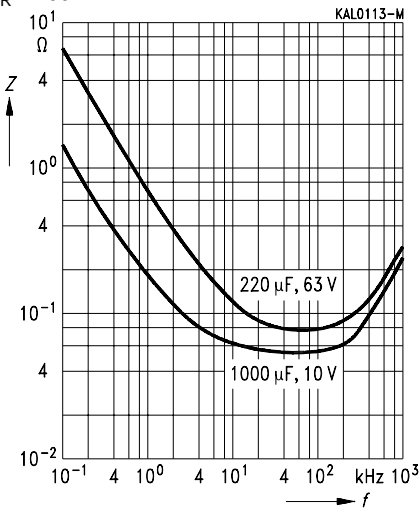
Impedance Z

versus frequency f
and temperature T for 22 $\mu\text{F}/250\text{ V}$ –
Typical behavior



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
 $U_R \geq 160\text{ V}$ –

