EPCOS

Aluminum electrolytic capacitors

Alu-X product lines

Single-ended capacitors

Series/Type: **B41044, B43044**
Date: August 2008

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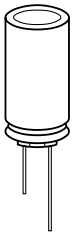
Long-life grade capacitors for professional applications



Applications

- Professional switch mode power supplies

Features

- RoHS-compatible
- High C/V value
- Very low impedance at high frequencies
- High reliability
- Load life of 5000 h at 105 °C

Construction

- Radial leads
- Aluminum case, fully insulated
- Charge-discharge proof
- Minus pole marking on the insulating sleeve
- Case with safety vent from diameter 8 mm

Delivery mode

- Bulk
- Taped, Ammo pack
- Cut
- Kinked

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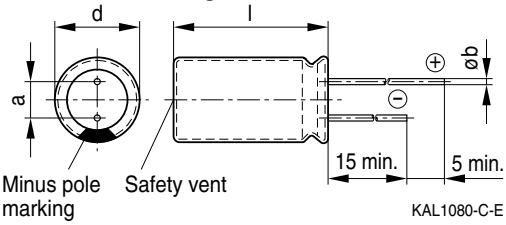
Specifications and characteristics in brief

Rated voltage V_R	6.3 … 450 V DC										
Operating temperature range	V_R < 350 V DC: –40 °C … +105 °C V_R ≥ 350 V DC: –25 °C … +105 °C										
Rated capacitance C_R (20 °C, 120 Hz)	0.22 … 15000 µF										
Capacitance tolerance	±20% ≙ M										
Load life (105 °C, V_R, $I_{AC,R}$)	V_R ≤ 100 V DC 2000 h for d = 5 ... 6.3 mm 3000 h for d = 8 mm 5000 h for d ≥ 10 mm				V_R > 100 V DC 2000 h		Requirements: ΔC/C ≤ ±20% of initial value tan δ ≤ 2 times initial specified value I_{leak} ≤ initial specified limit				
Leakage current I_{leak}	V_R ≤ 100 V DC $I_{leak} \leq 0.03\ \mu A \cdot \left(\frac{C_R}{\mu F} \cdot \frac{V_R}{V}\right)$ or 4 µA whichever is greater (20 °C, after 1 minute)					V_R > 100 V DC $I_{leak} \leq 0.02\ \mu A \cdot \left(\frac{C_R}{\mu F} \cdot \frac{V_R}{V}\right) + 15\ \mu A$ (20 °C, after 5 minutes)					
Dissipation factor (max.) (20 °C, 120 Hz)	V_R (V DC)	6.3	10	16	25	35	50	63	100	160 … 315	350 … 450
	tan δ	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08	0.15	0.20
	For capacitance higher than 1000 µF add 0.02 for every increase of 1000 µF.										
Low temperature stability (impedance ratio) (120 Hz)	V_R (V DC)		6.3	10	16	25 ... 100		160 ... 250		315 ... 450	
	$\frac{Z(-25\ °C)}{Z(+20\ °C)}$		4	3	2	2		3		8	
	$\frac{Z(-40\ °C)}{Z(+20\ °C)}$		8	6	4	3		4		–	
Shelf life	After storage for 1000 h at 105 °C, the capacitors shall meet the requirement of load life test after reforming process. After test: V_R to be applied for 30 minutes, 24 to 48 hours before measurement.										

Specifications and characteristics in brief

Frequency multiplier for rated ripple current	Voltage range 6.3 ... 100 V DC	Frequency				
		50 ... 60 Hz	120 Hz	1 kHz	10 kHz	100 kHz
	0.47 … 10 µF	–	0.42	0.60	0.80	1.00
	22 … 33 µF	–	0.55	0.75	0.90	1.00
	47 … 330 µF	–	0.70	0.85	0.95	1.00
	470 … 1000 µF	–	0.75	0.90	0.98	1.00
	2200 ... 15000 µF	–	0.80	0.95	1.00	1.00
	Voltage range 160 ... 450 V DC	0.40	0.50	0.75	0.90	1.00
Temperature multiplier for rated ripple current		+70 °C		+85 °C	+105 °C	
	6.3 ... 100 V DC	2.0		1.7	1.0	
	160 ... 450 V DC	1.8		1.4	1.0	

Dimensional drawing



Safety vent for diameter ≥ 8 mm.

Case dimensions

d × l mm	$d_{max} \times l_{max}$ mm	a mm	b mm
5 × 11	5.5 × 12.5	2.0 ±0.5	0.5 ±0.1
6.3 × 11	6.8 × 12.5	2.5 ±0.5	0.5 ±0.1
8 × 11.5	8.5 × 13.0	3.5 ±0.5	0.6 ±0.1
8 × 15	8.5 × 16.5	3.5 ±0.5	0.6 ±0.1
8 × 20	8.5 × 21.5	3.5 ±0.5	0.6 ±0.1
10 × 12.5	11.0 × 14.0	5.0 ±0.5	0.6 ±0.1
10 × 16	11.0 × 17.5	5.0 ±0.5	0.6 ±0.1
10 × 20	11.0 × 22.0	5.0 ±0.5	0.6 ±0.1
12.5 × 20	13.5 × 22.0	5.0 ±0.5	0.6 ±0.1
12.5 × 25	13.5 × 27.0	5.0 ±0.5	0.6 ±0.1
16 × 20	17.0 × 22.0	7.5 ±0.5	0.8 ±0.1
16 × 25	17.0 × 27.0	7.5 ±0.5	0.8 ±0.1
16 × 31.5	17.0 × 33.5	7.5 ±0.5	0.8 ±0.1
16 × 35.5	17.0 × 37.5	7.5 ±0.5	0.8 ±0.1
18 × 20	19.0 × 22.0	7.5 ±0.5	0.8 ±0.1
18 × 25	19.0 × 27.0	7.5 ±0.5	0.8 ±0.1
18 × 31.5	19.0 × 33.5	7.5 ±0.5	0.8 ±0.1
18 × 35.5	19.0 × 37.5	7.5 ±0.5	0.8 ±0.1
18 × 40	19.0 × 42.0	7.5 ±0.5	0.8 ±0.1

Overview of available types B41044

V_R (V DC)	6.3	10	16	25
	Case dimensions d × l (mm)			
C_R (µF)				
4.7				5 × 11
10			5 × 11	5 × 11
22	5 × 11	5 × 11	5 × 11	5 × 11
33	5 × 11	5 × 11	5 × 11	5 × 11
47	5 × 11	5 × 11	5 × 11	5 × 11
100	5 × 11	5 × 11	6.3 × 11	6.3 × 11
150	6.3 × 11	6.3 × 11	6.3 × 11	8 × 11.5
220	6.3 × 11	6.3 × 11	8 × 11.5	8 × 11.5
330	6.3 × 11	8 × 11.5	8 × 11.5	10 × 12.5
470	8 × 11.5	8 × 11.5	10 × 12.5	10 × 16
680	10 × 12.5	10 × 12.5	10 × 16	10 × 20
1000	10 × 12.5	10 × 16	10 × 20	12.5 × 20
1500	10 × 20	10 × 20	12.5 × 20	16 × 20
2200	12.5 × 20	12.5 × 20	12.5 × 25	16 × 25
3300	12.5 × 20	12.5 × 25	16 × 25	16 × 31.5
4700	16 × 25	16 × 25	16 × 31.5	18 × 35.5
6800	16 × 25	16 × 31.5	18 × 35.5	
10000	16 × 31.5	16 × 35.5		
15000	16 × 35.5			

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Overview of available types B41044

V_R (V DC)	35	50	63	100
	Case dimensions d × l (mm)			
C_R (µF)				
0.22		5 × 11		
0.47		5 × 11		
1.0		5 × 11		
2.2		5 × 11		5 × 11
3.3		5 × 11	5 × 11	5 × 11
4.7	5 × 11	5 × 11	5 × 11	5 × 11
10	5 × 11	5 × 11	5 × 11	6.3 × 11
22	5 × 11	5 × 11	6.3 × 11	8 × 11.5
33	5 × 11	6.3 × 11	6.3 × 11	10 × 12.5
47	6.3 × 11	8 × 11.5	8 × 11.5	10 × 16
100	8 × 11.5	8 × 11.5	10 × 16	12.5 × 20
150	8 × 11.5	10 × 12.5	10 × 20	12.5 × 25
220	10 × 12.5	10 × 16	10 × 25	16 × 25
330	10 × 16	10 × 20	12.5 × 20	16 × 31.5
470	10 × 20	12.5 × 20	16 × 20	18 × 40
680	12.5 × 20	12.5 × 25	16 × 25	
1000	12.5 × 25	16 × 25	16 × 35.5	
1500	16 × 25	16 × 31.5		
2200	16 × 31.5	18 × 35.5		
3300	18 × 35.5			

Overview of available types B43044

V_R (V DC)	160	200	250
	Case dimensions d × l (mm)		
C_R (µF)			
10			10 × 20
22	10 × 20	10 × 20	12.5 × 20
33	10 × 20	12.5 × 20	12.5 × 25
47	12.5 × 20	12.5 × 20	12.5 × 25
68	12.5 × 20	12.5 × 25	16 × 25
100	16 × 25	16 × 25	16 × 31.5
150	16 × 31.5	18 × 25	18 × 31.5
220	16 × 31.5	18 × 31.5	18 × 40
330	18 × 31.5		

V_R (V DC)	350	400	450
	Case dimensions d × l (mm)		
C_R (µF)			
3.3			10 × 20
4.7			12.5 × 20
10	10 × 20	10 × 20	12.5 × 25
22	12.5 × 20	12.5 × 25	16 × 25
33	16 × 20	16 × 25	16 × 31.5
47	16 × 25	16 × 25	18 × 31.5
68	16 × 31.5	18 × 31.5	18 × 35.5
100	18 × 31.5	18 × 40	

Technical data and ordering codes B41044

V_R V DC	C_R 120 Hz 20 °C µF	Case dimensions d × l mm	Z_{max} 100 kHz 20 °C Ω	$I_{AC,R}$ 100 kHz 105 °C mA	Ordering code (composition see below)
6.3	22	5 × 11	0.700	180	B41044A2226M***
	33	5 × 11	0.700	180	B41044A2336M***
	47	5 × 11	0.650	180	B41044A2476M***
	100	5 × 11	0.650	180	B41044A2107M***
	150	6.3 × 11	0.300	280	B41044A2157M***
	220	6.3 × 11	0.300	280	B41044A2227M***
	330	6.3 × 11	0.300	280	B41044A2337M***
	470	8 × 11.5	0.140	450	B41044A2477M***
	680	10 × 12.5	0.100	660	B41044A2687M***
	1000	10 × 12.5	0.100	660	B41044A2108M***
	1500	10 × 20	0.054	1100	B41044A2158M***
	2200	12.5 × 20	0.050	1400	B41044A2228M***
	3300	12.5 × 20	0.050	1400	B41044A2338M***
	4700	16 × 25	0.030	2100	B41044A2478M***
	6800	16 × 25	0.030	2100	B41044A2688M***
	10000	16 × 31.5	0.025	2600	B41044A2109M***
	15000	16 × 35.5	0.022	3000	B41044A2159M***
10	22	5 × 11	0.700	180	B41044A3226M***
	33	5 × 11	0.700	180	B41044A3336M***
	47	5 × 11	0.650	180	B41044A3476M***
	100	5 × 11	0.650	180	B41044A3107M***
	150	6.3 × 11	0.300	280	B41044A3157M***
	220	6.3 × 11	0.300	280	B41044A3227M***
	330	8 × 11.5	0.140	450	B41044A3337M***
	470	8 × 11.5	0.140	450	B41044A3477M***
	680	10 × 12.5	0.100	660	B41044A3687M***
	1000	10 × 16	0.080	850	B41044A3108M***
	1500	10 × 20	0.054	1100	B41044A3158M***
	2200	12.5 × 20	0.050	1400	B41044A3228M***
	3300	12.5 × 25	0.038	1700	B41044A3338M***
	4700	16 × 25	0.030	2100	B41044A3478M***
	6800	16 × 31.5	0.025	2600	B41044A3688M***
	10000	16 × 35.5	0.022	3000	B41044A3109M***

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008 = for taped leads, Ammo pack, lead spacing a = 5.0 mm

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Technical data and ordering codes B41044

V_R V DC	C_R 120 Hz 20 °C µF	Case dimensions d × l mm	Z_{max} 100 kHz 20 °C Ω	$I_{AC,R}$ 100 kHz 105 °C mA	Ordering code (composition see below)
16	10	5 × 11	0.70	180	B41044A4106M***
	22	5 × 11	0.70	180	B41044A4226M***
	33	5 × 11	0.70	180	B41044A4336M***
	47	5 × 11	0.65	180	B41044A4476M***
	100	6.3 × 11	0.30	280	B41044A4107M***
	150	6.3 × 11	0.30	280	B41044A4157M***
	220	8 × 11.5	0.14	450	B41044A4227M***
	330	8 × 11.5	0.14	450	B41044A4337M***
	470	10 × 12.5	0.10	660	B41044A4477M***
	680	10 × 16	0.080	850	B41044A4687M***
	1000	10 × 20	0.054	1100	B41044A4108M***
	1500	12.5 × 20	0.050	1400	B41044A4158M***
	2200	12.5 × 25	0.038	1700	B41044A4228M***
	3300	16 × 25	0.030	2100	B41044A4338M***
	4700	16 × 31.5	0.025	2600	B41044A4478M***
	6800	18 × 35.5	0.022	3000	B41044A4688M***
25	4.7	5 × 11	0.70	180	B41044A5475M***
	10	5 × 11	0.70	180	B41044A5106M***
	22	5 × 11	0.70	180	B41044A5226M***
	33	5 × 11	0.70	180	B41044A5336M***
	47	5 × 11	0.65	180	B41044A5476M***
	100	6.3 × 11	0.30	280	B41044A5107M***
	150	8 × 11.5	0.14	450	B41044A5157M***
	220	8 × 11.5	0.14	450	B41044A5227M***
	330	10 × 12.5	0.10	660	B41044A5337M***
	470	10 × 16	0.080	850	B41044A5477M***
	680	10 × 20	0.054	1100	B41044A5687M***
	1000	12.5 × 20	0.050	1400	B41044A5108M***
	1500	16 × 20	0.030	2100	B41044A5158M***
	2200	16 × 25	0.030	2100	B41044A5228M***
	3300	16 × 31.5	0.025	2600	B41044A5338M***
	4700	18 × 35.5	0.022	3000	B41044A5478M***

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008 = for taped leads, Ammo pack, lead spacing a = 5.0 mm

Technical data and ordering codes B41044

V_R V DC	C_R 120 Hz 20 °C µF	Case dimensions d × l mm	Z_{max} 100 kHz 20 °C Ω	$I_{AC,R}$ 100 kHz 105 °C mA	Ordering code (composition see below)
35	4.7	5 × 11	0.70	180	B41044A7475M***
	10	5 × 11	0.70	180	B41044A7106M***
	22	5 × 11	0.70	180	B41044A7226M***
	33	5 × 11	0.65	180	B41044A7336M***
	47	6.3 × 11	0.30	280	B41044A7476M***
	100	8 × 11.5	0.14	450	B41044A7107M***
	150	8 × 11.5	0.14	450	B41044A7157M***
	220	10 × 12.5	0.10	660	B41044A7227M***
	330	10 × 16	0.080	850	B41044A7337M***
	470	10 × 20	0.054	1100	B41044A7477M***
	680	12.5 × 20	0.050	1400	B41044A7687M***
	1000	12.5 × 25	0.038	1700	B41044A7108M***
	1500	16 × 25	0.030	2100	B41044A7158M***
	2200	16 × 31.5	0.025	2600	B41044A7228M***
	3300	18 × 35.5	0.022	3000	B41044A7338M***
50	0.22	5 × 11	8.0	18	B41044A6224M***
	0.47	5 × 11	5.0	25	B41044A6474M***
	1.0	5 × 11	3.5	40	B41044A6105M***
	2.2	5 × 11	3.0	55	B41044A6225M***
	3.3	5 × 11	2.6	65	B41044A6335M***
	4.7	5 × 11	2.3	90	B41044A6475M***
	10	5 × 11	1.4	120	B41044A6106M***
	22	5 × 11	1.2	150	B41044A6226M***
	33	6.3 × 11	0.60	200	B41044A6336M***
	47	8 × 11.5	0.43	250	B41044A6476M***
	100	8 × 11.5	0.35	340	B41044A6107M***
	150	10 × 12.5	0.17	490	B41044A6157M***
	220	10 × 16	0.20	650	B41044A6227M***
	330	10 × 20	0.10	810	B41044A6337M***
	470	12.5 × 20	0.085	1100	B41044A6477M***
	680	12.5 × 25	0.065	1200	B41044A6687M***
	1000	16 × 25	0.043	1600	B41044A6108M***
	1500	16 × 31.5	0.038	2000	B41044A6158M***
	2200	18 × 35.5	0.034	2300	B41044A6228M***

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008 = for taped leads, Ammo pack, lead spacing a = 5.0 mm

Technical data and ordering codes B41044

V_R V DC	C_R 120 Hz 20 °C µF	Case dimensions d × l mm	Z_{max} 100 kHz 20 °C Ω	$I_{AC,R}$ 100 kHz 105 °C mA	Ordering code (composition see below)
63	3.3	5 × 11	2.0	64	B41044A8335M***
	4.7	5 × 11	2.0	76	B41044A8475M***
	10	5 × 11	2.0	111	B41044A8106M***
	22	6.3 × 11	0.60	190	B41044A8226M***
	33	6.3 × 11	0.60	233	B41044A8336M***
	47	8 × 11.5	0.50	328	B41044A8476M***
	100	10 × 16	0.12	456	B41044A8107M***
	150	10 × 20	0.10	610	B41044A8157M***
	220	10 × 25	0.090	809	B41044A8227M***
	330	12.5 × 20	0.085	1036	B41044A8337M***
	470	16 × 20	0.050	1411	B41044A8477M***
	680	16 × 25	0.043	1843	B41044A8687M***
	1000	16 × 35.5	0.025	1967	B41044A8108M***
100	2.2	5 × 11	2.5	52	B41044A9225M***
	3.3	5 × 11	2.5	64	B41044A9335M***
	4.7	5 × 11	2.5	76	B41044A9475M***
	10	6.3 × 11	1.0	128	B41044A9106M***
	22	8 × 11.5	0.60	224	B41044A9226M***
	33	10 × 12.5	0.40	319	B41044A9336M***
	47	10 × 16	0.30	417	B41044A9476M***
	100	12.5 × 20	0.15	570	B41044A9107M***
	150	12.5 × 25	0.12	762	B41044A9157M***
	220	16 × 25	0.070	1048	B41044A9227M***
	330	16 × 31.5	0.050	1404	B41044A9337M***
	470	18 × 40	0.030	1980	B41044A9477M***

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Technical data and ordering codes B43044

V_R V DC	C_R 120 Hz 20 °C µF	Case dimensions d × l mm	Z_{max} 100 kHz 20 °C Ω	$I_{AC,R}$ 100 kHz 105 °C mA	Ordering code (composition see below)
160	22	10 × 20	1.3	440	B43044A1226M***
	33	10 × 20	1.3	565	B43044A1336M***
	47	12.5 × 20	0.91	725	B43044A1476M***
	68	12.5 × 20	0.63	950	B43044A1686M***
	100	16 × 25	0.27	1280	B43044A1107M***
	150	16 × 31.5	0.22	1300	B43044A1157M***
	220	16 × 31.5	0.22	1300	B43044A1227M***
	330	18 × 31.5	0.22	1700	B43044A1337M***
200	22	10 × 20	1.5	440	B43044A2226M***
	33	12.5 × 20	0.91	590	B43044A2336M***
	47	12.5 × 20	0.91	780	B43044A2476M***
	68	12.5 × 25	0.63	950	B43044A2686M***
	100	16 × 25	0.27	1280	B43044A2107M***
	150	18 × 25	0.27	1500	B43044A2157M***
	220	18 × 31.5	0.22	1700	B43044A2227M***
250	10	10 × 20	3.5	300	B43044F2106M***
	22	12.5 × 20	2.3	480	B43044F2226M***
	33	12.5 × 25	1.7	630	B43044F2336M***
	47	12.5 × 25	1.7	630	B43044F2476M***
	68	16 × 25	0.78	1000	B43044F2686M***
	100	16 × 31.5	0.63	1400	B43044F2107M***
	150	18 × 31.5	0.42	1450	B43044F2157M***
	220	18 × 40	0.35	1485	B43044F2227M***
350	10	10 × 20	2.9	180	B43044A4106M***
	22	12.5 × 20	2.1	270	B43044A4226M***
	33	16 × 20	0.91	600	B43044A4336M***
	47	16 × 25	0.73	700	B43044A4476M***
	68	16 × 31.5	0.49	1100	B43044A4686M***
	100	18 × 31.5	0.40	1170	B43044A4107M***

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Technical data and ordering codes B43044

V_R V DC	C_R 120 Hz 20 °C µF	Case dimensions d × l mm	Z_{max} 100 kHz 20 °C Ω	$I_{AC,R}$ 100 kHz 105 °C mA	Ordering code (composition see below)
400	10	10 × 20	2.9	180	B43044A9106M***
	22	12.5 × 25	1.3	300	B43044A9226M***
	33	16 × 25	0.91	600	B43044A9336M***
	47	16 × 25	0.73	700	B43044A9476M***
	68	18 × 31.5	0.49	1100	B43044A9686M***
	100	18 × 40	0.34	1250	B43044A9107M***
450	3.3	10 × 20	6.5	150	B43044A5335M***
	4.7	12.5 × 20	3.6	200	B43044A5475M***
	10	12.5 × 25	2.5	315	B43044A5106M***
	22	16 × 25	1.7	570	B43044A5226M***
	33	16 × 31.5	1.1	620	B43044A5336M***
	47	18 × 31.5	0.93	900	B43044A5476M***
	68	18 × 35.5	0.71	980	B43044A5686M***

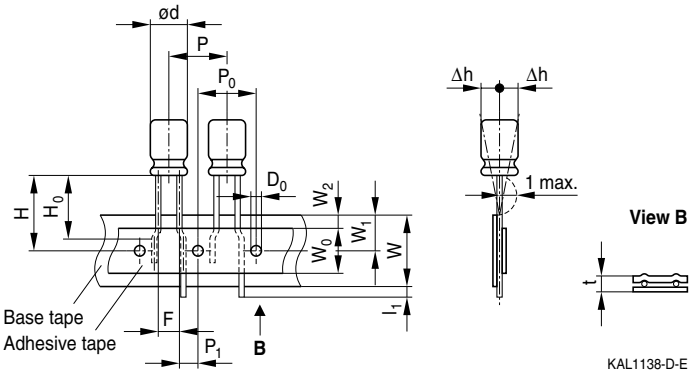
*** = Version
000 = for standard leads, bulk
001 = for kinked leads, bulk
002 = for cut leads, bulk
016 = for taped leads, Ammo pack, lead spacing a = 2.0 mm
007 = for taped leads, Ammo pack, lead spacing a = 2.5 mm
006 = for taped leads, Ammo pack, lead spacing a = 3.5 mm
008 = for taped leads, Ammo pack, lead spacing a = 5.0 mm

Taping, packing and lead configurations of single-ended capacitors

Single-ended capacitors are available taped in Ammo pack from diameter 4 to 10 mm as follows:

Lead spacing 2.0 mm (∅ d = 4 ... 5 mm)

Last 3 digits of ordering code: 016

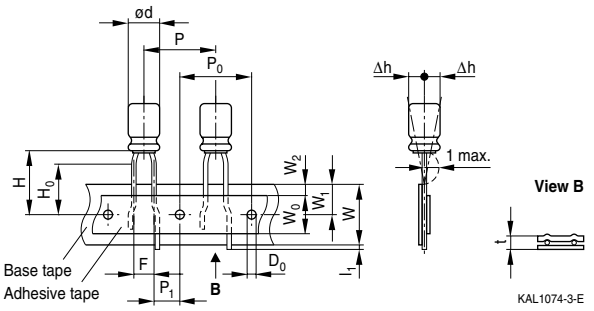


Dimensions in mm

∅ d	F	H	W	W_0	W_1	W_2	P	P_0	P_1	l_1	t	Δh	D_0
4 ... 5	2.0	18.5	18.0	7.0	9.0	3.0	12.7	12.7	5.10	1.0	0.7	1	4.0
	–0.2	±0.75	±0.5	min.	±0.5	max.	±1.0	±0.3	±0.7	max.	±0.2	±1.0	±0.2

Lead spacing 2.5 mm (∅ d = 4 ... 6.3 mm)

Last 3 digits of ordering code: 007

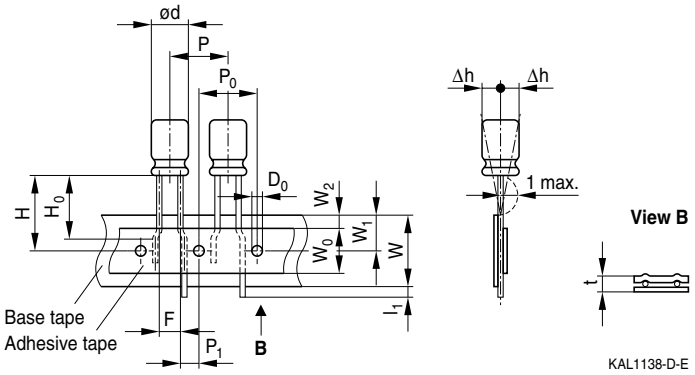


Dimensions in mm

∅ d	F	H	H_0	W	W_0	W_1	W_2	P	P_0	P_1	l_1	t	Δh	D_0
4 ... 6.3	2.5	18.5	16.0	18.0	7.0	9.0	3.0	12.7	12.7	5.10	1.0	0.7	0	4.0
Tolerance	–0.2	±0.75	±0.5	±0.5	min.	±0.5	max.	±1.0	±0.3	±0.7	max.	±0.2	±1.0	±0.2

Lead spacing 3.5 mm (∅ d = 8 mm)

Last 3 digits of ordering code: 006

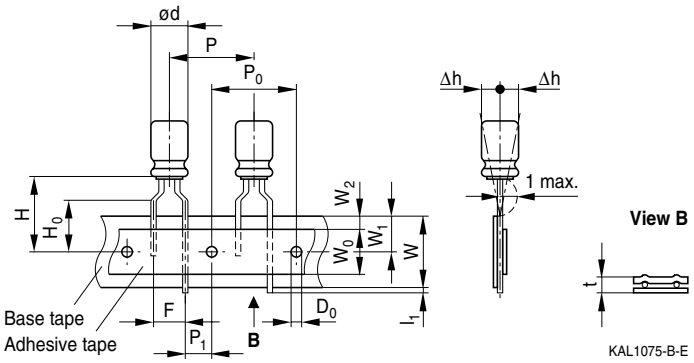


Dimensions in mm

∅ d	F	H	W	W_0	W_1	W_2	P	P_0	P_1	l_1	t	Δh	D_0
8	3.5	18.5	18.0	10	9.0	3.0	12.7	12.7	5.10	1.0	0.7	1	4.0
Tolerance	±0.5	±0.75	±0.5	min.	±0.5	max.	±1.0	±0.3	±0.7	max.	±0.2	max.	±0.2

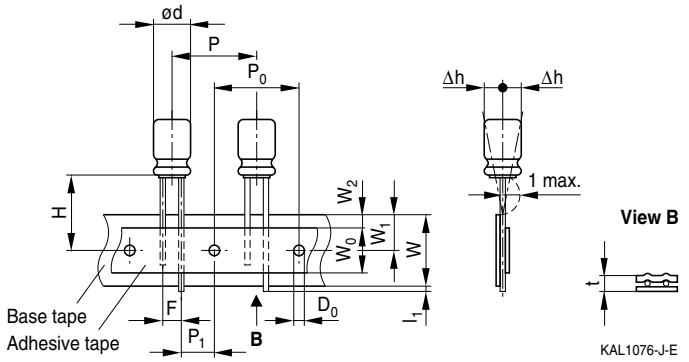
Lead spacing 5.0 mm (∅ d = 4 ... 8 mm)

Last 3 digits of ordering code: 008



Lead spacing 5.0 mm (∅ d = 10 mm)

Last 3 digits of ordering code: 008



Dimensions in mm

∅ d	F	H	H_0	W	W_0	W_1	W_2	P	P_0	P_1	L_1	t	Δh	D_0
4 ... 6.3	5.0	18.5	16	18.0	7.0	9.0	3.0	12.7	12.7	3.85	1.0	0.6	2.0	4.0
8	5.0	18.5	16	18.0	10	9.0	3.0	12.7	12.7	3.85	1.0	0.6	2.0	4.0
10	5.0	18.5	–	18.0	12.5	9.0	3.0	12.7	12.7	3.85	1.0	0.6	2.0	4.0
Tolerance	+0.6 −0.2	±0.75	±0.5	+1.0 −0.5	+1.0 −0	±0.5	max.	±0.5	±0.3	±0.7	max.	+0.3 −0.2	max.	±0.2

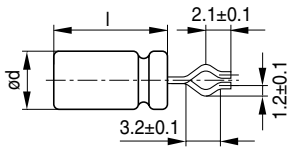
Taping is available up to dimensions d × l = 10 × 20 mm. For ∅ 12.5, 16 and 18 mm taping is not available.

Kinked or cut leads

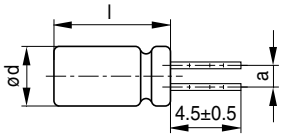
Single-ended capacitors are available with kinked or cut leads. Other lead configurations also available on request.

Kinked leads

Last 3 digits of ordering code: 001



KAL1137-5



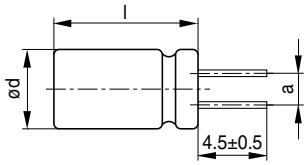
KAL1084-A

Case size d × l (mm)	a (mm)
4 × 7	1.5
5 × 7	2.0
5 × 11	2.0
6.3 × 7	2.5
6.3 × 11	2.5
6.3 × 15	2.5
8 × 7	3.5
8 × 11.5	3.5
8 × 15	3.5
8 × 20	3.5
10 × 12.5	5.0
10 × 16	5.0
10 × 20	5.0
10 × 25	5.0
10 × 31.5	5.0

Case size d × l (mm)	a (mm)
12.5 × 16	5.0
12.5 × 20	5.0
12.5 × 25	5.0
12.5 × 31.5	5.0
12.5 × 35.5	5.0
12.5 × 40	5.0
16 × 20	7.5
16 × 25	7.5
16 × 31.5	7.5
16 × 35.5	7.5
16 × 40	7.5
18 × 20	7.5
18 × 25	7.5
18 × 31.5	7.5
18 × 35.5	7.5
18 × 40	7.5

Cut leads

Last 3 digits of ordering code: 002



KAL1086-R

Case size d × l (mm)	a (mm)
4 × 7	1.5
5 × 7	2.0
5 × 11	2.0
6.3 × 7	2.5
6.3 × 11	2.5
6.3 × 15	2.5
8 × 7	3.5
8 × 11.5	3.5
8 × 15	3.5
8 × 20	5.0
10 × 12.5	5.0
10 × 16	5.0
10 × 20	5.0
10 × 25	5.0
10 × 31.5	5.0

Case size d × l (mm)	a (mm)
12.5 × 16	5.0
12.5 × 20	5.0
12.5 × 25	5.0
12.5 × 31.5	5.0
12.5 × 35.5	5.0
12.5 × 40	5.0
16 × 20	7.5
16 × 25	7.5
16 × 31.5	7.5
16 × 35.5	7.5
16 × 40	7.5
18 × 20	7.5
18 × 25	7.5
18 × 31.5	7.5
18 × 35.5	7.5
18 × 40	7.5

EPCOS

Cautions and warnings

General

Also see “Important notes” on page 22.

1 Aluminum electrolytic capacitors have a bi-polar structure. This is marked on the body of the capacitor. A capacitor must not be mounted with reversed polarity. The application of an AC or reverse voltage may cause a short circuit or damage the capacitor. Bi-polar capacitors must not be used in AC applications, where the polarity may be reversed in the circuits or is unknown.

2 The DC voltage applied to the capacitor terminal must not exceed its rated operating voltage, as this will result in a rapid increase of the leakage current and may damage the capacitor. It is recommended to operate the capacitor at 70–80% of its rated voltage to optimize its service life.

3 The ripple current applied to the capacitor must be within the permitted range. An excessive ripple current leads to impaired electrical properties and may damage the capacitor. Note that the sum of the peak values of the ripple voltage and the DC operating voltage must not exceed the rated DC voltage.

4 Capacitors must be used within their permitted range of operating temperature. Operation at room temperature optimizes their service life.

5 Capacitors with case diameter ≥8 mm are equipped with a safety vent. In capacitors fitted with a lead or soldering lug, the safety vent is usually located at the base of the case. It needs sufficient space around it to operate optimally. The following dimensions are recommended: for case diameter d = 8 to 16 mm, more than 2 mm; for d =18 to 35 mm, more than 3 mm; and for d = 42 mm or more, more than 5 mm.

6 Capacitors should not be mounted with the safety vent face down on the board. Do not locate any wire or copper trace near the safety vent. Do not reverse the voltage, as this may result in excess pressure and the leakage of electrolyte.

7 Gas is released through the safety vent when the pressure inside the capacitor is too high. A gaseous liquid around the safety vent does not indicate a leakage of electrolyte.

8 The capacitor should be stored under conditions of normal temperature and in a non-acid, non-alkali environment of normal humidity. Exposure to high temperatures, for example under direct sunlight, will reduce its operating life. If the capacitor is stored in an environment containing acids or alkalis, the solderability of the leads may be affected.

9 The leakage current of an aluminum electrolytic capacitor may increase after a long period of storage. After such storage, the capacitor must be aged by applying the rated operating voltage for 6–8 hours before use.

10 Manual soldering:

a Soldering must be performed within the specified conditions.
Bit temperature: 350 °C; application time of soldering iron: 3 seconds.

b Ensure that the soldering iron does not touch any part of the capacitor body.

EPCOS

Cautions and warnings

11 Do not apply excessive force to the leads and terminals. Do not move the capacitor after soldering it onto the PC board and do not carry the PC board by gripping the capacitor. Observe the following rules to prevent undue stress to the capacitor:

a Do not tilt or bend the capacitor after soldering.

b Ensure that the terminal spacing matches the corresponding hole spacing on the PC board.

12 The aluminum case is not insulated from the cathode. Do not place a conductor under the aluminum capacitors on the PC board as this may cause a short circuit. The case and top of capacitors used in switched mode power supplies have a high-voltage-resistant heat shrink sleeve to ensure safe usage.

13 The leads of capacitors with a case diameter exceeding 14 mm cannot be used for fixing.

EPCOS

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The following applies to all products named in this publication:

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2. We also point out that **in individual cases, a malfunction of electronic components or failure before the end of their usual service life cannot be completely ruled out in the current state of the art, even if they are operated as specified.** In customer applications requiring a very high level of operational safety and especially in customer applications in which the malfunction or failure of an electronic component could endanger human life or health (e.g. in accident prevention or life-saving systems), it must therefore be ensured by means of suitable design of the customer application or other action taken by the customer (e.g. installation of protective circuitry or redundancy) that no injury or damage is sustained by third parties in the event of malfunction or failure of an electronic component.
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