Aluminum electrolytic capacitors

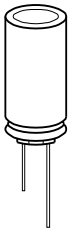
Single-ended capacitors

Series/Type: **B41866**

Date: November 2008

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Long-life grade capacitors for automotive electronics



Applications
- High-reliability equipment in industrial and automotive electronics
- High-temperature environments

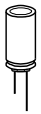
Features
- High reliability and long useful life
- High ripple current capability
- Wide temperature range up to 125 °C
- RoHS-compatible

Construction
- Charge-discharge proof, polar
- Aluminum case with insulating sleeve
- Minus pole marking on the insulating sleeve
- Case with safety vent

Delivery mode

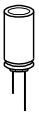
Terminal configurations and packing:
- Bulk
- Taped, Ammo pack
- Cut
- Kinked
- PAPR (protection against polarity reversal): crimped leads, J leads, bent leads

Refer to chapter "Single-ended capacitors – Taping, packing and lead configurations" for further details and ordering example.



Specifications and characteristics in brief

Rated voltage V_R Surge voltage V_S	10 ... 63 V DC 1.15 · V_R					
Rated capacitance C_R Capacitance tolerance	10 ... 10000 µF ±20% ≙ M					
Dissipation factor tan δ (20 °C, 120 Hz)	For capacitance higher than 1000 µF add 0.02 for every increase of 1000 µF.					
	V_R (V DC)	10	16 ... 25	35	50	63
	tan δ (max.)	0.20	0.17	0.12	0.10	0.15
Leakage current I_{leak} (20 °C, 5 min)	$I_{leak}=0.01\,\mu A \cdot \left(\frac{C_R}{\mu F} \cdot \frac{V_R}{V}\right)$ or 3 µA, whichever is greater					
Self-inductance ESL	Diameter (mm)	8 ... 12.5	16	18		
	ESL (nH)	20	26	34		
Useful life 125 °C; V_R; $I_{AC,R}$	2000 h for ∅ = 8 mm 3000 h for ∅ = 10 mm 5000 h for ∅ ≥ 12.5 mm					
Requirements	ΔC/C ≤ ±35% of initial value tan δ ≤ 3 times initial specified limit I_{leak} ≤ initial specified limit					
Voltage endurance test 125 °C; V_R	2000 h for ∅ = 8 mm 3000 h for ∅ = 10 mm 5000 h for ∅ ≥ 12.5 mm					
Post test requirements	ΔC/C ≤ ±30% of initial value tan δ ≤ 2 times initial specified limit I_{leak} ≤ initial specified limit					
Vibration resistance test	To IEC 60068-2-6, test Fc: Displacement amplitude 1.5 mm, frequency range 10 … 2000 Hz, acceleration max. 20 *g*, duration 3 × 2 h. Capacitor rigidly clamped by the aluminum case.					
IEC climatic category	To IEC 60068-1: 55/125/56 (−55 °C/+125 °C/56 days damp heat test)					
Sectional specification	AEC-Q200, IEC 60384-4					

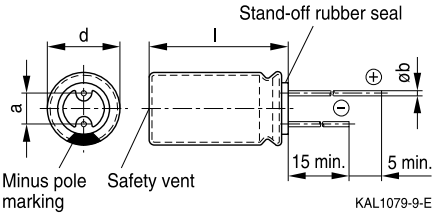


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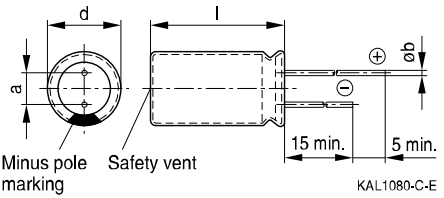
High ripple current – 125 °C

Dimensional drawings

With stand-off rubber seal
Diameters (mm): 10, 12.5, 16, 18

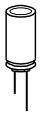


With flat rubber seal
Diameter (mm): 8



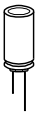
Dimensions and weights

Dimensions (mm)				Approx. weight
d +0.5	l	a ±0.5	b	g
8	11.5 +1.5	3.5	0.60 ±0.05	1.0
10	12.5 +1.0	5.0	0.60 ±0.05	1.6
10	16 +1.0	5.0	0.60 ±0.05	1.9
10	20 +2.0	5.0	0.60 ±0.05	2.6
12.5	20 +2.0	5.0	0.60 ±0.05	3.6
12.5	25 +2.0	5.0	0.60 ±0.05	4.5
12.5	40 +2.0	5.0	0.80 ±0.05	7.4
16	20 +2.0	7.5	0.80 ±0.05	5.5
16	25 +2.0	7.5	0.80 ±0.05	7.5
16	31.5 +2.0	7.5	0.80 ±0.05	7.8
18	20 +2.0	7.5	0.80 ±0.1	8.0
18	25 +2.0	7.5	0.80 ±0.1	9.0
18	31.5 +2.0	7.5	0.80 ±0.1	11.0
18	35 +2.0	7.5	0.80 ±0.1	13.0
18	40 +2.0	7.5	0.80 ±0.1	16.0



Overview of available types

V_R (V DC)	10	16	25	35	50	63
	Case dimensions d × l (mm)					
C_R (µF)						
10					8 × 11.5	
12					8 × 11.5	
15					8 × 11.5	
18					8 × 11.5	
22					8 × 11.5	
27					8 × 11.5	
33					8 × 11.5	8 × 11.5
39					8 × 11.5	10 × 12.5
47					8 × 11.5	10 × 12.5
56					8 × 11.5	10 × 12.5
68					8 × 11.5	10 × 16
82					8 × 11.5	10 × 16
100		8 × 11.5	8 × 11.5	8 × 11.5	10 × 12.5	10 × 16
120		8 × 11.5	8 × 11.5	8 × 11.5	10 × 16	10 × 16
150		8 × 11.5	8 × 11.5	10 × 12.5	10 × 16	10 × 16
180		8 × 11.5	8 × 11.5	10 × 12.5	10 × 20	10 × 20
220		8 × 11.5	8 × 11.5	10 × 12.5	10 × 20	12.5 × 20
270		8 × 11.5	10 × 12.5	10 × 16	10 × 20	12.5 × 20
330	8 × 11.5	8 × 11.5	10 × 12.5	10 × 16	12.5 × 20	12.5 × 20
390	8 × 11.5	10 × 12.5	10 × 16	10 × 20	12.5 × 25	12.5 × 25
470	8 × 11.5	10 × 12.5	10 × 16	10 × 20	12.5 × 25 16 × 20	16 × 20
560	10 × 12.5	10 × 12.5	10 × 20	12.5 × 20	16 × 20	16 × 20
680	10 × 16	10 × 16	10 × 20	12.5 × 20	16 × 25	12.5 × 40 16 × 25 18 × 20
820	10 × 16	10 × 16	12.5 × 20	12.5 × 25	16 × 25 18 × 20	16 × 31.5
1000	10 × 16	10 × 20	12.5 × 20	16 × 20	16 × 31.5 18 × 25	16 × 31.5
1200	10 × 20	12.5 × 20	12.5 × 25	16 × 25	18 × 31.5	18 × 31.5
1500	10 × 20	12.5 × 25	12.5 × 25	16 × 25 18 × 20	18 × 35	18 × 35
1800	12.5 × 20	12.5 × 25	16 × 20	16 × 31.5 18 × 25	18 × 40	18 × 40

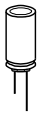


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High ripple current – 125 °C

V_R (V DC)	10	16	25	35	50	63
	Case dimensions d × l (mm)					
C_R (µF)						
2200	12.5 × 20	16 × 20	12.5 × 40 16 × 25 18 × 20	18 × 31.5		
2700	12.5 × 25	16 × 25 18 × 20	18 × 25	18 × 35		
3300	16 × 20	18 × 25	16 × 31.5	18 × 40		
3900	16 × 25	18 × 25	18 × 31.5			
4700	16 × 25 18 × 20	18 × 31.5	18 × 35			
5600	16 × 31.5	18 × 35	18 × 40			
6800	18 × 31.5	18 × 40				
8200	18 × 31.5					
10000	18 × 40					

Other voltage and capacitance ratings are available upon request.



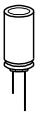
Technical data and ordering codes

C_R 120 Hz 20 °C µF	Case dimensions d × l mm	ESR_{max} 10 kHz −40 °C Ω	ESR_{max} 120 Hz 20 °C Ω	ESR_{max} 10 kHz 20 °C Ω	Z_{max} 100 kHz 20 °C Ω	$I_{AC,R}$ 100 kHz 125 °C mA	$I_{AC,max}$ 100 kHz 105 °C mA	Ordering code (composition see below)
V_R = 10 V DC								
330	8 × 11.5	5.170	0.766	0.646	0.573	297	416	B41866C3337M***
390	8 × 11.5	5.170	0.648	0.646	0.573	297	416	B41866C3397M***
470	8 × 11.5	5.170	0.538	0.646	0.573	297	416	B41866C3477M***
560	10 × 12.5	2.980	0.451	0.373	0.336	450	630	B41866C3567M***
680	10 × 16	1.404	0.372	0.175	0.160	714	1000	B41866C3687M***
820	10 × 16	1.404	0.308	0.175	0.160	714	1000	B41866C3827M***
1000	10 × 16	1.404	0.253	0.175	0.160	714	1000	B41866C3108M***
1200	10 × 20	1.070	0.211	0.134	0.127	875	1225	B41866C3128M***
1500	10 × 20	1.070	0.168	0.134	0.127	875	1225	B41866C3158M***
1800	12.5 × 20	0.881	0.140	0.110	0.104	1105	1546	B41866C3188M***
2200	12.5 × 20	0.881	0.126	0.110	0.104	1105	1546	B41866C3228M***
2700	12.5 × 25	0.710	0.103	0.089	0.082	1358	1901	B41866C3278M***
3300	16 × 20	0.401	0.092	0.050	0.046	1895	2652	B41866C3338M***
3900	16 × 25	0.314	0.078	0.039	0.037	2279	3190	B41866C3398M***
4700	16 × 25	0.314	0.070	0.039	0.037	2279	3190	B41866C3478M***
4700	18 × 20	0.341	0.070	0.043	0.040	2190	3066	B41866D3478M***
5600	16 × 31.5	0.249	0.063	0.031	0.029	2822	3950	B41866C3568M***
6800	18 × 31.5	0.226	0.056	0.028	0.027	3178	4450	B41866C3688M***
8200	18 × 31.5	0.226	0.052	0.028	0.027	3178	4450	B41866C3828M***
10000	18 × 40	0.153	0.048	0.019	0.018	4244	5941	B41866C3109M***

Composition of ordering code

*** = Version

000 = for standard leads, bulk
001 = for kinked leads, bulk (from d × l = 10 × 20 mm to 18 × 40 mm, excluding 12.5 × 40 mm)
002 = for cut leads, bulk (for ∅ ≥ 10 mm, excluding 12.5 × 40 mm)
003 = for crimped leads, blister (from d × l = 16 × 20 mm to 18 × 40 mm)
004 = for J leads, blister (from d × l = 10 × 12.5 mm to 18 × 35 mm, excluding 12.5 × 40 mm)
008 = for taped leads, Ammo pack, lead spacing F = 5.0 mm (from d × l = 8 × 11.5 mm to 12.5 × 25 mm)
009 = for taped leads, Ammo pack, lead spacing F = 7.5 mm (from d × l = 16 × 20 mm to 18 × 31.5 mm)
012 = for bent 90° leads, blister (for ∅ 16 and 18 mm)



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High ripple current – 125 °C

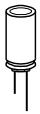
Technical data and ordering codes

C_R 120 Hz 20 °C µF	Case dimensions d × l mm	ESR_{max} 10 kHz −40 °C Ω	ESR_{max} 120 Hz 20 °C Ω	ESR_{max} 10 kHz 20 °C Ω	Z_{max} 100 kHz 20 °C Ω	$I_{AC,R}$ 100 kHz 125 °C mA	$I_{AC,max}$ 100 kHz 105 °C mA	Ordering code (composition see below)
V_R = 16 V DC								
100	8 × 11.5	5.170	2.147	0.646	0.573	297	416	B41866C4107M***
120	8 × 11.5	5.170	1.789	0.646	0.573	297	416	B41866C4127M***
150	8 × 11.5	5.170	1.432	0.646	0.573	297	416	B41866C4157M***
180	8 × 11.5	5.170	1.193	0.646	0.573	297	416	B41866C4187M***
220	8 × 11.5	5.170	0.976	0.646	0.573	297	416	B41866C4227M***
270	8 × 11.5	5.170	0.795	0.646	0.573	297	416	B41866C4277M***
330	8 × 11.5	5.170	0.651	0.646	0.573	297	416	B41866C4337M***
390	10 × 12.5	2.980	0.551	0.373	0.336	450	630	B41866C4397M***
470	10 × 12.5	2.980	0.457	0.373	0.336	450	630	B41866C4477M***
560	10 × 12.5	2.980	0.383	0.373	0.336	450	630	B41866C4567M***
680	10 × 16	1.404	0.316	0.175	0.160	714	1000	B41866C4687M***
820	10 × 16	1.404	0.262	0.175	0.160	714	1000	B41866C4827M***
1000	10 × 20	1.070	0.215	0.134	0.127	875	1225	B41866C4108M***
1200	12.5 × 20	0.881	0.179	0.110	0.104	1105	1546	B41866C4128M***
1500	12.5 × 25	0.710	0.143	0.089	0.082	1358	1901	B41866C4158M***
1800	12.5 × 25	0.710	0.119	0.089	0.082	1358	1901	B41866C4188M***
2200	16 × 20	0.401	0.109	0.050	0.046	1895	2652	B41866C4228M***
2700	16 × 25	0.314	0.089	0.039	0.037	2279	3190	B41866C4278M***
2700	18 × 20	0.341	0.089	0.043	0.040	2190	3066	B41866D4278M***
3300	18 × 25	0.314	0.080	0.039	0.037	2454	3435	B41866C4338M***
3900	18 × 25	0.314	0.068	0.039	0.037	2454	3435	B41866C4398M***
4700	18 × 31.5	0.226	0.062	0.028	0.027	3178	4450	B41866C4478M***
5600	18 × 35	0.187	0.056	0.023	0.022	3638	5093	B41866C4568M***
6800	18 × 40	0.153	0.050	0.019	0.018	4244	5941	B41866C4688M***

Composition of ordering code

*** = Version

- 000 = for standard leads, bulk
- 001 = for kinked leads, bulk (from d × l = 10 × 20 mm to 18 × 40 mm, excluding 12.5 × 40 mm)
- 002 = for cut leads, bulk (for ∅ ≥ 10 mm, excluding 12.5 × 40 mm)
- 003 = for crimped leads, blister (from d × l = 16 × 20 mm to 18 × 40 mm)
- 004 = for J leads, blister (from d × l = 10 × 12.5 mm to 18 × 35 mm, excluding 12.5 × 40 mm)
- 008 = for taped leads, Ammo pack, lead spacing F = 5.0 mm (from d × l = 8 × 11.5 mm to 12.5 × 25 mm)
- 009 = for taped leads, Ammo pack, lead spacing F = 7.5 mm (from d × l = 16 × 20 mm to 18 × 31.5 mm)
- 012 = for bent 90° leads, blister (for ∅ 16 and 18 mm)



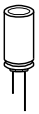
Technical data and ordering codes

C_R 120 Hz 20 °C µF	Case dimensions d × l mm	ESR_{max} 10 kHz −40 °C Ω	ESR_{max} 120 Hz 20 °C Ω	ESR_{max} 10 kHz 20 °C Ω	Z_{max} 100 kHz 20 °C Ω	$I_{AC,R}$ 100 kHz 125 °C mA	$I_{AC,max}$ 100 kHz 105 °C mA	Ordering code (composition see below)
V_R = 25 V DC								
100	8 × 11.5	5.170	2.147	0.646	0.573	297	416	B41866C5107M***
120	8 × 11.5	5.170	1.789	0.646	0.573	297	416	B41866C5127M***
150	8 × 11.5	5.170	1.432	0.646	0.573	297	416	B41866C5157M***
180	8 × 11.5	5.170	1.193	0.646	0.573	297	416	B41866C5187M***
220	8 × 11.5	5.170	0.976	0.646	0.573	297	416	B41866C5227M***
270	10 × 12.5	2.980	0.795	0.373	0.336	450	630	B41866C5277M***
330	10 × 12.5	2.980	0.651	0.373	0.336	450	630	B41866C5337M***
390	10 × 16	1.404	0.551	0.175	0.160	714	1000	B41866C5397M***
470	10 × 16	1.404	0.457	0.175	0.160	714	1000	B41866C5477M***
560	10 × 20	1.070	0.383	0.134	0.127	875	1225	B41866C5567M***
680	10 × 20	1.070	0.316	0.134	0.127	875	1225	B41866C5687M***
820	12.5 × 20	0.881	0.262	0.110	0.104	1105	1546	B41866C5827M***
1000	12.5 × 20	0.881	0.215	0.110	0.104	1105	1546	B41866C5108M***
1200	12.5 × 25	0.710	0.179	0.089	0.082	1358	1901	B41866C5128M***
1500	12.5 × 25	0.710	0.143	0.089	0.082	1358	1901	B41866C5158M***
1800	16 × 20	0.401	0.119	0.050	0.046	1895	2652	B41866C5188M***
2200	12.5 × 40	0.406	0.109	0.051	0.047	2185	3058	B41866C5228M***
2200	16 × 25	0.314	0.109	0.039	0.037	2279	3190	B41866D5228M***
2200	18 × 20	0.341	0.109	0.043	0.040	2190	3066	B41866E5228M***
2700	18 × 25	0.312	0.088	0.039	0.037	2454	3436	B41866D5278M***
3300	16 × 31.5	0.248	0.080	0.031	0.029	2822	3951	B41866D5338M***
3900	18 × 31.5	0.224	0.068	0.028	0.027	3178	4449	B41866D5398M***
4700	18 × 35	0.184	0.061	0.023	0.022	3638	5093	B41866D5478M***
5600	18 × 40	0.152	0.056	0.019	0.018	4244	5942	B41866C5568M***

Composition of ordering code

*** = Version

- 000 = for standard leads, bulk
- 001 = for kinked leads, bulk (from d × l = 10 × 20 mm to 18 × 40 mm, excluding 12.5 × 40 mm)
- 002 = for cut leads, bulk (for ∅ ≥ 10 mm, excluding 12.5 × 40 mm)
- 003 = for crimped leads, blister (from d × l = 16 × 20 mm to 18 × 40 mm)
- 004 = for J leads, blister (from d × l = 10 × 12.5 mm to 18 × 35 mm, excluding 12.5 × 40 mm)
- 008 = for taped leads, Ammo pack, lead spacing F = 5.0 mm (from d × l = 8 × 11.5 mm to 12.5 × 25 mm)
- 009 = for taped leads, Ammo pack, lead spacing F = 7.5 mm (from d × l = 16 × 20 mm to 18 × 31.5 mm)
- 012 = for bent 90° leads, blister (for ∅ 16 and 18 mm)



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High ripple current – 125 °C

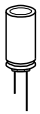
Technical data and ordering codes

C_R 120 Hz 20 °C µF	Case dimensions d × l mm	ESR_{max} 10 kHz −40 °C Ω	ESR_{max} 120 Hz 20 °C Ω	ESR_{max} 10 kHz 20 °C Ω	Z_{max} 100 kHz 20 °C Ω	$I_{AC,R}$ 100 kHz 125 °C mA	$I_{AC,max}$ 100 kHz 105 °C mA	Ordering code (composition see below)
V_R = 35 V DC								
100	8 × 11.5	5.170	1.516	0.646	0.573	297	416	B41866C7107M***
120	8 × 11.5	5.170	1.263	0.646	0.573	297	416	B41866C7127M***
150	10 × 12.5	2.980	1.011	0.373	0.336	450	630	B41866C7157M***
180	10 × 12.5	2.980	0.842	0.373	0.336	450	630	B41866C7187M***
220	10 × 12.5	2.980	0.689	0.373	0.336	450	630	B41866C7227M***
270	10 × 16	1.404	0.561	0.175	0.160	714	1000	B41866C7277M***
330	10 × 16	1.404	0.459	0.175	0.160	714	1000	B41866C7337M***
390	10 × 20	1.070	0.389	0.134	0.127	875	1225	B41866C7397M***
470	10 × 20	1.070	0.323	0.134	0.127	875	1225	B41866C7477M***
560	12.5 × 20	0.881	0.271	0.110	0.104	1105	1546	B41866C7567M***
680	12.5 × 20	0.881	0.223	0.110	0.104	1105	1546	B41866C7687M***
820	12.5 × 25	0.710	0.185	0.089	0.082	1358	1901	B41866C7827M***
1000	16 × 20	0.401	0.152	0.050	0.046	1895	2652	B41866C7108M***
1200	16 × 25	0.314	0.126	0.039	0.037	2279	3190	B41866C7128M***
1500	16 × 25	0.314	0.101	0.039	0.037	2279	3190	B41866C7158M***
1500	18 × 20	0.341	0.101	0.043	0.040	2190	3066	B41866D7158M***
1800	16 × 31.5	0.249	0.084	0.031	0.029	2822	3950	B41866C7188M***
1800	18 × 25	0.314	0.084	0.039	0.037	2454	3435	B41866D7188M***
2200	18 × 31.5	0.226	0.080	0.028	0.027	3178	4450	B41866C7228M***
2700	18 × 35	0.187	0.065	0.023	0.022	3638	5093	B41866C7278M***
3300	18 × 40	0.153	0.061	0.019	0.018	4244	5941	B41866C7338M***
V_R = 50 V DC								
10	8 × 11.5	7.445	12.631	0.931	0.826	160	224	B41866C6106M***
12	8 × 11.5	7.445	10.526	0.931	0.826	160	224	B41866C6126M***
15	8 × 11.5	7.445	8.421	0.931	0.826	160	224	B41866C6156M***
18	8 × 11.5	7.445	7.017	0.931	0.826	160	224	B41866C6186M***
22	8 × 11.5	7.445	5.742	0.931	0.826	210	294	B41866C6226M***
27	8 × 11.5	7.445	4.678	0.931	0.826	210	294	B41866C6276M***
33	8 × 11.5	6.204	3.828	0.776	0.688	250	350	B41866C6336M***

Composition of ordering code

*** = Version

- 000 = for standard leads, bulk
- 001 = for kinked leads, bulk (from d × l = 10 × 20 mm to 18 × 40 mm, excluding 12.5 × 40 mm)
- 002 = for cut leads, bulk (for ∅ ≥ 10 mm, excluding 12.5 × 40 mm)
- 003 = for crimped leads, blister (from d × l = 16 × 20 mm to 18 × 40 mm)
- 004 = for J leads, blister (from d × l = 10 × 12.5 mm to 18 × 35 mm, excluding 12.5 × 40 mm)
- 008 = for taped leads, Ammo pack, lead spacing F = 5.0 mm (from d × l = 8 × 11.5 mm to 12.5 × 25 mm)
- 009 = for taped leads, Ammo pack, lead spacing F = 7.5 mm (from d × l = 16 × 20 mm to 18 × 31.5 mm)
- 012 = for bent 90° leads, blister (for ∅ 16 and 18 mm)



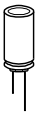
Technical data and ordering codes

C_R 120 Hz 20 °C µF	Case dimensions d × l mm	ESR_{max} 10 kHz −40 °C Ω	ESR_{max} 120 Hz 20 °C Ω	ESR_{max} 10 kHz 20 °C Ω	Z_{max} 100 kHz 20 °C Ω	$I_{AC,R}$ 100 kHz 125 °C mA	$I_{AC,max}$ 100 kHz 105 °C mA	Ordering code (composition see below)
V_R = 50 V DC								
39	8 × 11.5	6.204	3.239	0.776	0.688	250	350	B41866C6396M***
47	8 × 11.5	5.687	2.688	0.711	0.631	370	518	B41866C6476M***
56	8 × 11.5	5.429	2.256	0.679	0.602	370	518	B41866C6566M***
68	8 × 11.5	5.170	1.858	0.646	0.573	370	518	B41866C6686M***
82	8 × 11.5	5.170	1.540	0.646	0.573	370	518	B41866C6826M***
100	10 × 12.5	2.980	1.263	0.373	0.336	450	630	B41866C6107M***
120	10 × 16	1.404	1.053	0.175	0.160	714	1000	B41866C6127M***
150	10 × 16	1.404	0.842	0.175	0.160	714	1000	B41866C6157M***
180	10 × 20	1.070	0.702	0.134	0.127	875	1225	B41866C6187M***
220	10 × 20	1.070	0.574	0.134	0.127	875	1225	B41866C6227M***
270	10 × 20	1.070	0.468	0.134	0.127	875	1225	B41866C6277M***
330	12.5 × 20	0.881	0.383	0.110	0.104	1105	1546	B41866C6337M***
390	12.5 × 25	0.710	0.324	0.089	0.082	1358	1901	B41866C6397M***
470	12.5 × 25	0.710	0.269	0.089	0.082	1358	1901	B41866C6477M***
470	16 × 20	0.680	0.269	0.085	0.080	1370	1918	B41866D6477M***
560	16 × 20	0.401	0.226	0.050	0.046	1895	2652	B41866C6567M***
680	16 × 25	0.314	0.186	0.039	0.037	2279	3190	B41866C6687M***
820	16 × 25	0.314	0.154	0.039	0.037	2279	3190	B41866C6827M***
820	18 × 20	0.344	0.154	0.043	0.040	2190	3066	B41866E6827M***
1000	16 × 31.5	0.249	0.126	0.031	0.029	2822	3950	B41866C6108M***
1000	18 × 25	0.314	0.126	0.039	0.037	2454	3435	B41866D6108M***
1200	18 × 31.5	0.226	0.105	0.028	0.027	3178	4450	B41866C6128M***
1500	18 × 35	0.187	0.084	0.023	0.022	3638	5093	B41866C6158M***
1800	18 × 40	0.153	0.070	0.019	0.018	4244	5941	B41866C6188M***

Composition of ordering code

*** = Version

- 000 = for standard leads, bulk
- 001 = for kinked leads, bulk (from d × l = 10 × 20 mm to 18 × 40 mm, excluding 12.5 × 40 mm)
- 002 = for cut leads, bulk (for ∅ ≥ 10 mm, excluding 12.5 × 40 mm)
- 003 = for crimped leads, blister (from d × l = 16 × 20 mm to 18 × 40 mm)
- 004 = for J leads, blister (from d × l = 10 × 12.5 mm to 18 × 35 mm, excluding 12.5 × 40 mm)
- 008 = for taped leads, Ammo pack, lead spacing F = 5.0 mm (from d × l = 8 × 11.5 mm to 12.5 × 25 mm)
- 009 = for taped leads, Ammo pack, lead spacing F = 7.5 mm (from d × l = 16 × 20 mm to 18 × 31.5 mm)
- 012 = for bent 90° leads, blister (for ∅ 16 and 18 mm)



B41866

High ripple current – 125 °C

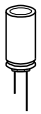
Technical data and ordering codes

C_R 120 Hz 20 °C µF	Case dimensions d × l mm	ESR_{max} 10 kHz −40 °C Ω	ESR_{max} 120 Hz 20 °C Ω	ESR_{max} 10 kHz 20 °C Ω	Z_{max} 100 kHz 20 °C Ω	$I_{AC,R}$ 100 kHz 125 °C mA	$I_{AC,max}$ 100 kHz 105 °C mA	Ordering code (composition see below)
V_R = 63 V DC								
33	8 × 11.5	24.600	5.742	2.460	2.160	153	214	B41866C8336M***
39	10 × 12.5	7.963	4.858	0.796	0.711	309	433	B41866C8396M***
47	10 × 12.5	7.963	4.031	0.796	0.711	309	433	B41866C8476M***
56	10 × 12.5	7.963	3.383	0.796	0.711	309	433	B41866C8566M***
68	10 × 16	5.097	2.786	0.510	0.435	433	606	B41866C8686M***
82	10 × 16	5.097	2.311	0.510	0.435	433	606	B41866C8826M***
100	10 × 16	5.097	1.895	0.510	0.435	433	606	B41866C8107M***
120	10 × 16	5.097	1.579	0.510	0.435	433	606	B41866C8127M***
150	10 × 16	5.097	1.263	0.510	0.435	433	606	B41866C8157M***
180	10 × 20	3.434	1.053	0.343	0.325	546	765	B41866C8187M***
220	12.5 × 20	2.522	0.861	0.252	0.243	723	1012	B41866C8227M***
270	12.5 × 20	2.522	0.702	0.252	0.243	723	1012	B41866C8277M***
330	12.5 × 20	2.522	0.574	0.252	0.243	723	1012	B41866C8337M***
390	12.5 × 25	1.671	0.486	0.167	0.155	989	1385	B41866C8397M***
470	16 × 20	2.030	0.403	0.203	0.191	930	1301	B41866C8477M***
560	16 × 20	2.030	0.338	0.203	0.191	930	1301	B41866C8567M***
680	12.5 × 40	0.948	0.279	0.095	0.089	1588	2223	B41866C8687M***
680	16 × 25	1.522	0.279	0.152	0.143	1165	1631	B41866D8687M***
680	18 × 20	1.845	0.279	0.185	0.173	1052	1473	B41866E8687M***
820	16 × 31.5	1.219	0.231	0.122	0.109	1461	2045	B41866C8827M***
1000	16 × 31.5	1.219	0.189	0.122	0.109	1461	2045	B41866C8108M***
1200	18 × 31.5	1.108	0.158	0.111	0.099	1645	2303	B41866C8128M***
1500	18 × 35	0.936	0.126	0.094	0.085	1847	2586	B41866C8158M***
1800	18 × 40	0.840	0.105	0.084	0.080	2015	2611	B41866C8188M***

Composition of ordering code

*** = Version

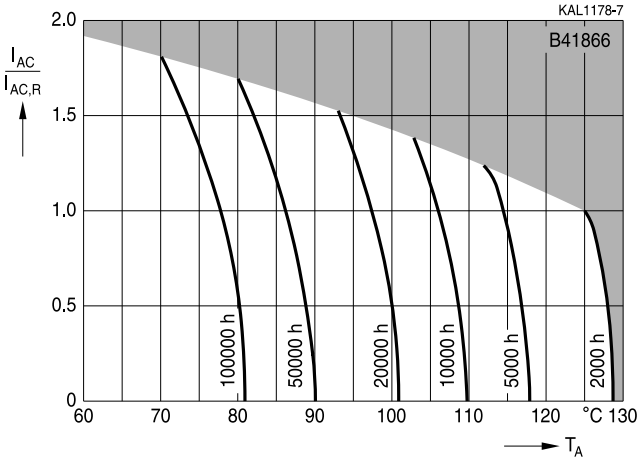
000 = for standard leads, bulk
001 = for kinked leads, bulk (from d × l = 10 × 20 mm to 18 × 40 mm, excluding 12.5 × 40 mm)
002 = for cut leads, bulk (for ∅ ≥ 10 mm, excluding 12.5 × 40 mm)
003 = for crimped leads, blister (from d × l = 16 × 20 mm to 18 × 40 mm)
004 = for J leads, blister (from d × l = 10 × 12.5 mm to 18 × 35 mm, excluding 12.5 × 40 mm)
008 = for taped leads, Ammo pack, lead spacing F = 5.0 mm (from d × l = 8 × 11.5 mm to 12.5 × 25 mm)
009 = for taped leads, Ammo pack, lead spacing F = 7.5 mm (from d × l = 16 × 20 mm to 18 × 31.5 mm)
012 = for bent 90° leads, blister (for ∅ 16 and 18 mm)



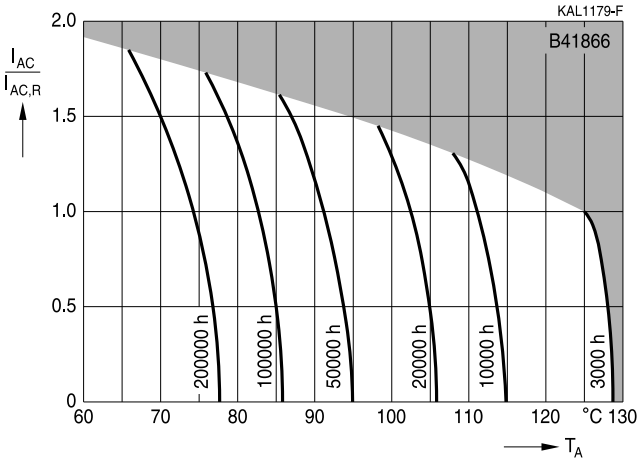
Useful life

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

d = 8 mm



d = 10 mm

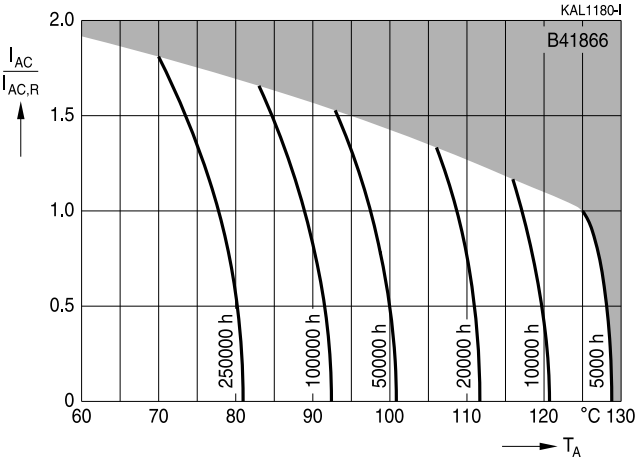


1) Refer to chapter "General technical information, 5.3 Calculation of useful life" for an explanation on how to interpret the useful life graphs.

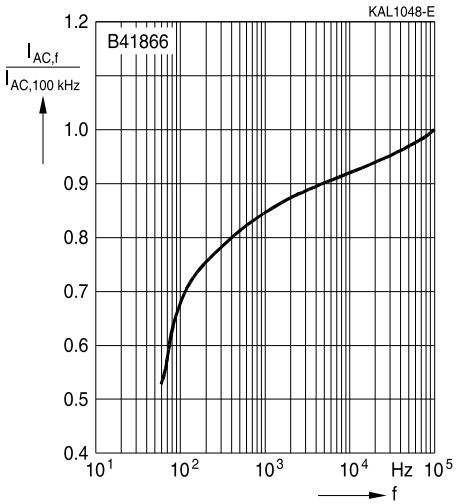
Useful life

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

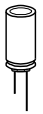
d ≥ 12.5 mm



Frequency factor of permissible ripple current I_{AC} versus frequency f



1) Refer to chapter "General technical information, 5.3 Calculation of useful life" for an explanation on how to interpret the useful life graphs.

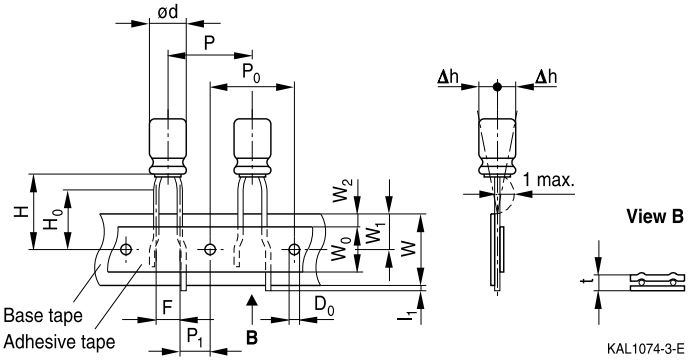


Taping, packing and lead configurations

Taping

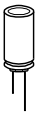
Single-ended capacitors are available taped in Ammo pack from diameter 5 to 18 mm as follows:
Lead spacing F = 2.5 mm (∅ d = 5 … 6.3 mm)
Lead spacing F = 3.5 mm (∅ d = 8 mm)
Lead spacing F = 5.0 mm (from d × l = 10 × 12.5 mm to 12.5 × 30 mm)
Lead spacing F = 7.5 mm (∅ d = 16 ... 18 mm).

Lead spacing 2.5 mm (∅ d = 5 ... 6.3 mm)
Last 3 digits of ordering code: 007



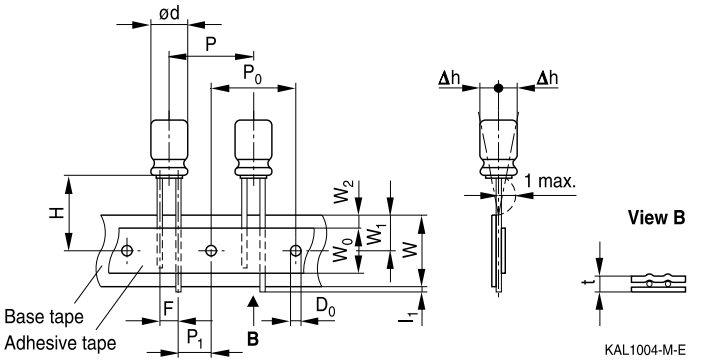
Dimensions in mm

∅ d	F	H	W	W_0	W_1	W_2	H_0	P	P_0	P_1	l_1	t	Δh	D_0
5 6.3	2.5	18.5	18.0	5.5	9.0	1.5	16.0	12.7	12.7	5.1	1.0	0.7	1.0	4.0
Toler-ance	+0.8 −0.2	±0.75	±0.5	min.	±0.5	max.	±0.5	±1.0	±0.2	±0.5	max.	±0.2	max.	±0.2



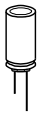
Lead spacing 3.5 mm (∅ d = 8 mm)

Last 3 digits of ordering code: 006

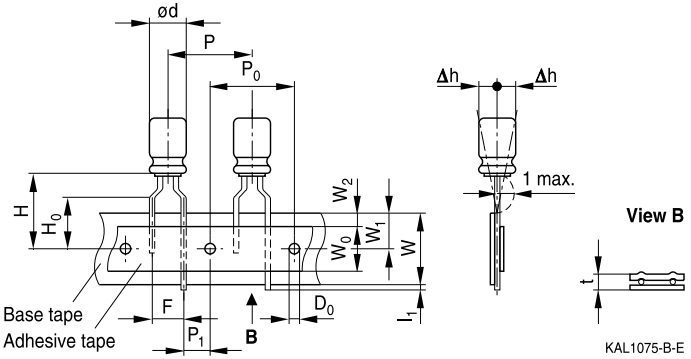


Dimensions in mm

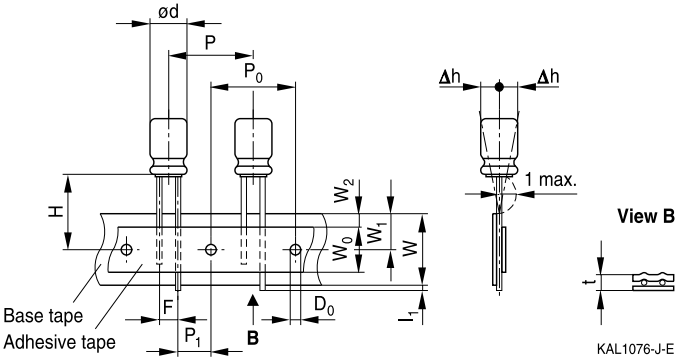
∅ d	F	H	W	W_0	W_1	W_2	P	P_0	P_1	l_1	t	Δh	D_0
8	3.5	18.5	18.0	12.5	9.0	1.5	12.7	12.7	4.6	1.0	0.7	1.0	4.0
Tolerance	+0.8 −0.2	±1.0	±0.5	min.	±0.5	max.	±1.0	±0.2	±0.5	max.	±0.2	max.	±0.2



Lead spacing 5.0 mm (∅ d = 5 ... 8 mm)
Last 3 digits of ordering code: 008

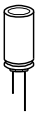


Lead spacing 5.0 mm (from d × l = 10 × 12.5 mm to 12.5 × 30 mm)
Last 3 digits of ordering code: 008



Dimensions in mm

∅ d	F	H	W	W_0	W_1	W_2	H_0	P	P_0	P_1	l_1	t	Δh	D_0
5	5.0	18.5	18.0	5.5	9.0	1.5	16.0	12.7	12.7	3.85	1.0	0.7	1.0	4.0
6.3														
8	5.0	20.0	18.0	12.5	9.0	1.5	16.0	12.7	12.7	3.85	1.0	0.7	1.0	4.0
10		19.0					–	12.7	12.7	3.85				
12.5		19.0					–	15.0	15.0	5.0				
Tolerance	+0.8 −0.2	±0.75	±0.5	min.	±0.5	max.	±0.5	±1.0	±0.2	±0.5	max.	±0.2	max.	±0.2

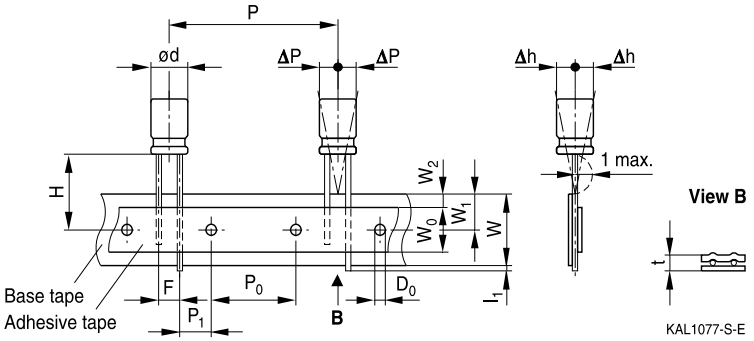


B41866

High ripple current – 125 °C

Lead spacing 7.5 mm (∅ d = 16 ...18 mm)

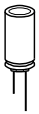
Last 3 digits of ordering code: 009



Dimensions in mm

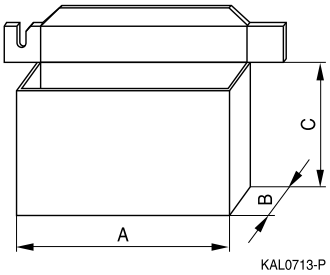
∅ d	F	H	W	W_0	W_1	W_2	P	P_0	P_1	l_1	t	ΔP	Δh	D_0
16	7.5	18.5	18.0	12.5	9.0	1.5	30.0	15.0	3.75	1.0	0.7	0	0	4.0
18 *)														
Tolerance	±0.8	−0.5 +0.75	±0.5	min.	±0.5	max.	±1.0	±0.2	±0.5	max.	±0.2	±1.0	±1.0	±0.2

*) Available only for case dimensions 18 × 20, 18 × 25 and 18 × 31.5 mm

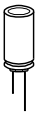


Packing units and box dimensions

Ammo pack



Case size d × l	Dimensions (mm)			Packing units
mm	A_{max}	B_{max}	C_{max}	pcs.
5 × 11	345	55	240	2000
6.3 × 11	345	55	290	2000
8 × 11.5	345	55	240	1000
10 × 12.5	345	55	280	750
10 × 16	345	60	200	500
10 × 20	345	60	200	500
12.5 × 20	345	65	280	500
12.5 × 25	345	65	280	500
16 × 20	315	65	275	300
16 × 25	315	65	275	300
16 × 31.5	315	65	275	300
18 × 20	315	65	275	250
18 × 25	315	65	275	250
18 × 31.5	315	65	275	250



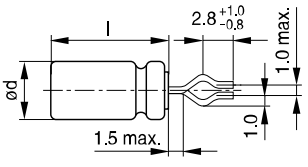
Kinked or cut leads

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

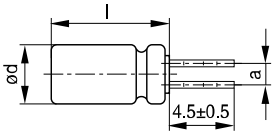
Kinked leads

Last 3 digits of ordering code: 001

With stand-off rubber seal

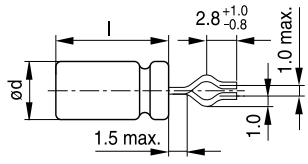


KAL1081-K

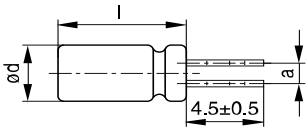


KAL1083-2

With flat rubber seal

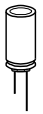


KAL1082-T



KAL1084-A

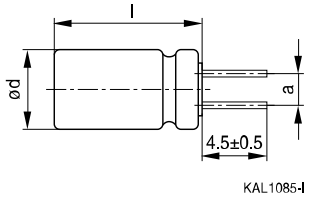
Case size d × l (mm)	Dimensions (mm) a ±0.5
10 × 20	5.0
12.5 × 20	5.0
12.5 × 25	5.0
16 × 20	7.5
16 × 25	7.5
16 × 31.5	7.5
18 × 20	7.5
18 × 25	7.5
18 × 31.5	7.5
18 × 35	7.5
18 × 40	7.5



Cut leads

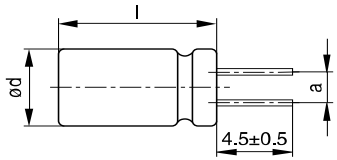
Last 3 digits of ordering code: 002

With stand-off rubber seal



KAL1085-I

With flat rubber seal



KAL1086-R

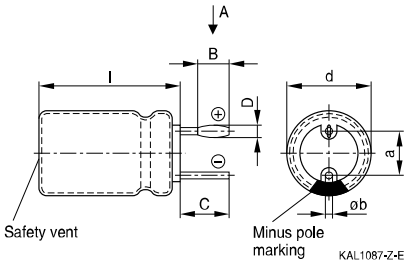
Case size d × l (mm)	Dimensions (mm) a ±0.5
10 × 12.5	5.0
10 × 16	5.0
10 × 20	5.0
12.5 × 20	5.0
12.5 × 25	5.0
16 × 20	7.5
16 × 25	7.5
16 × 31.5	7.5
18 × 20	7.5
18 × 25	7.5
18 × 31.5	7.5
18 × 35	7.5
18 × 40	7.5
20 × 20	10.0
20 × 25	10.0
20 × 30	10.0
20 × 35	10.0
20 × 40	10.0
22 × 30	10.0
22 × 35	10.0
22 × 40	10.0

PAPR leads (Protection Against Polarity Reversal)

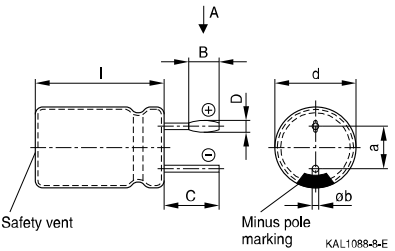
These lead configurations ensure correct placement of the capacitor on the PCB with regard to polarity. PAPR leads are available for diameters from 10 mm up to 20 mm.
There are three configurations available: Crimped leads, J leads, bent 90° leads

Crimped leads
Last 3 digits of ordering code: 003

With stand-off rubber seal

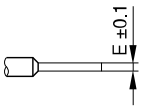


With flat rubber seal

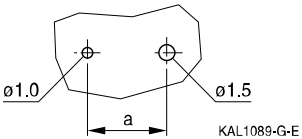


Suggestion for PCB hole diameter

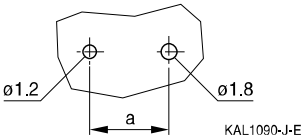
View A



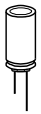
Suggestion for PCB hole diameter, wire ø0.8 mm



Suggestion for PCB hole diameter, wire ø1.0 mm

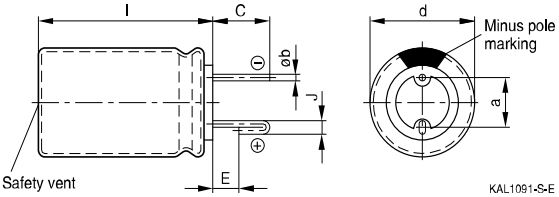


Case size	Dimensions (mm)					
d × l (mm)	B ±0.2	C ±0.5	D ±0.1	E ±0.1	a ±0.5	∅b
16 × 20	1.5	3.0	1.3	0.3	7.5	0.8 ±0.05
16 × 25	1.5	3.0	1.3	0.3	7.5	0.8 ±0.05
16 × 31.5	1.5	3.0	1.3	0.3	7.5	0.8 ±0.05
18 × 20	1.5	3.0	1.3	0.3	7.5	0.8 ±0.1
18 × 25	1.5	3.0	1.3	0.3	7.5	0.8 ±0.1
18 × 31.5	1.5	3.0	1.3	0.3	7.5	0.8 ±0.1
18 × 35	1.5	3.0	1.3	0.3	7.5	0.8 ±0.1
18 × 40	1.5	3.0	1.3	0.3	7.5	0.8 ±0.1
20 × 20	1.5	3.0	1.6	0.3	10.0	1.0 ±0.1
20 × 25	1.5	3.0	1.6	0.3	10.0	1.0 ±0.1
20 × 30	1.5	3.0	1.6	0.3	10.0	1.0 ±0.1
20 × 35	1.5	3.0	1.6	0.3	10.0	1.0 ±0.1
20 × 40	1.5	3.0	1.6	0.3	10.0	1.0 ±0.1



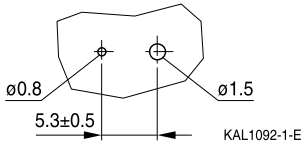
J leads

Last 3 digits of ordering code: 004

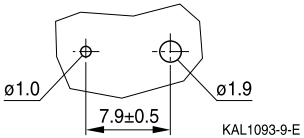


Suggestion for PCB hole diameter

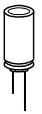
Suggestion for PCB hole diameter, wire ø0.6 mm



Suggestion for PCB hole diameter, wire ø0.8 mm

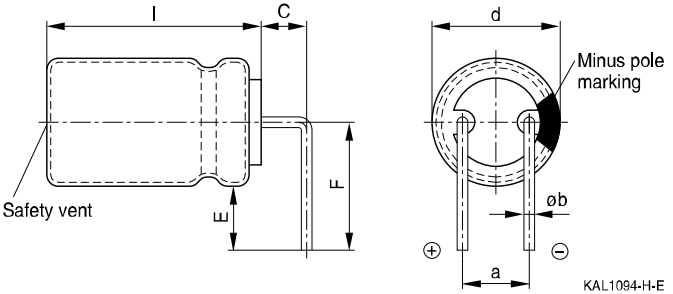


Case size	Dimensions (mm)				
d × l (mm)	C ±0.5	E ±0.5	J ±0.2	a ±0.5	∅b
10 × 12.5	3.2	0.7	1.2	5.0	0.6 ±0.05
10 × 16	3.2	0.7	1.2	5.0	0.6 ±0.05
10 × 20	3.2	0.7	1.2	5.0	0.6 ±0.05
12.5 × 20	3.2	0.7	1.2	5.0	0.6 ±0.05
12.5 × 25	3.2	0.7	1.2	5.0	0.6 ±0.05
16 × 20	3.5	0.7	1.6	7.5	0.8 ±0.05
16 × 25	3.5	0.7	1.6	7.5	0.8 ±0.05
16 × 31.5	3.5	0.7	1.6	7.5	0.8 ±0.05
18 × 20	3.5	0.7	1.6	7.5	0.8 ±0.1
18 × 25	3.5	0.7	1.6	7.5	0.8 ±0.1
18 × 31.5	3.5	0.7	1.6	7.5	0.8 ±0.1
18 × 35	3.5	0.7	1.6	7.5	0.8 ±0.1



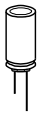
Bent 90° leads for horizontal mounting pinning

Last 3 digits of ordering code: 012



Case size	Dimensions (mm)				
d × l (mm)	C ±0.5	E ±0.5	F ±0.5	a ±0.5	∅b
16 × 20	4.0	4.0	12.0	7.5	0.8 ±0.05
16 × 25	4.0	4.0	12.0	7.5	0.8 ±0.05
16 × 31.5	4.0	4.0	12.0	7.5	0.8 ±0.05
18 × 20	4.0	4.0	13.0	7.5	0.8 ±0.1
18 × 25	4.0	4.0	13.0	7.5	0.8 ±0.1
18 × 31.5	4.0	4.0	13.0	7.5	0.8 ±0.1
18 × 35	4.0	4.0	13.0	7.5	0.8 ±0.1
18 × 40	4.0	4.0	13.0	7.5	0.8 ±0.1

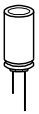
Bent leads for diameter 12.5 mm available upon request.



Overview of packing units and code numbers for case sizes 5 × 11 ... 16 × 31.5

							PAPR		
Case size d × l	Stan-dard, bulk	Taped, Ammo pack			Kinked leads, bulk	Cut leads, bulk	Crimped leads, blister	J leads, blister	Bent 90° leads, blister
mm	pcs.	pcs.			pcs.	pcs.	pcs.	pcs.	pcs.
5 × 11	2000	2000			–	–	–	–	
6.3 × 11	2500	2000			–	–	–	–	
8 × 11.5	1000	1000			–	–	–	–	
10 × 12.5	1000	750			–	1000	–	675	
10 × 16	1000	500			–	1000	–	675	
10 × 20	500	500			500	500	–	500	
12.5 × 20	350	500			350	350	–	300	1)
12.5 × 25	250	500			500	500	–	225	1)
12.5 × 30	200	–			–	–	–	–	
12.5 × 35	175	–			–	–	–	–	
12.5 × 40	175	–			–	–	–	–	
16 × 20	250	300			200	200	200	200	120
16 × 25	250	300			200	200	200	200	120
16 × 31.5	200	300			250	250	344	344	120
The last three digits of the complete ordering code state the lead configuration	**000**	Code	F (mm)	d (mm)	**001**	**002**	**003**	**004**	**012**
		006	3.5	8					
		007	2.5	5...6.3					
		008	5	5...12.5					
		009	7.5	16...18					

1) Available upon request

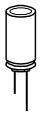


B41866

High ripple current – 125 °C

Overview of packing units and code numbers for case sizes 18 × 20 ... 25 × 40

							PAPR		
Case size d × l	Stan-dard, bulk	Taped, Ammo pack			Kinked leads, bulk	Cut leads, bulk	Crimped leads, blister	J leads, blister	Bent 90° leads, blister
mm	pcs.	pcs.			pcs.	pcs.	pcs.	pcs.	pcs.
18 × 20	175	250			175	175	200	200	120
18 × 25	150	250			150	150	200	200	120
18 × 31.5	100	250			100	100	150	150	120
18 × 35	100	–			100	100	150	150	150
18 × 40	125	–			100	100	120	–	72
20 × 20	125	–			–	125	200	–	–
20 × 25	125	–			–	125	200	–	–
20 × 30	100	–			–	100	120	–	–
20 × 35	100	–			–	100	120	–	–
20 × 40	100	–			–	100	120	–	–
22 × 30	80	–			–	100	–	–	–
22 × 35	80	–			–	100	–	–	–
22 × 40	80	–			–	100	–	–	–
25 × 40	40	–			–	–	–	–	–
The last three digits of the complete ordering code state the lead configuration	**000**	Code	F (mm)	d (mm)	**001**	**002**	**003**	**004**	**012**
		007	2.5	4...6.3					
		008	5	6.3...12.5					
		009	7.5	16...18					



Cautions and warnings

Personal safety

The electrolytes used by EPCOS have not only been optimized with a view to the intended application, but also with regard to health and environmental compatibility. They do not contain any solvents that are detrimental to health, e.g. dimethyl formamide (DMF) or dimethyl acetamide (DMAC).

Furthermore, part of the high-voltage electrolytes used by EPCOS are self-extinguishing. They contain flame-retarding substances which will quickly extinguish any flame that may have been ignited.

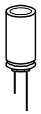
As far as possible, EPCOS does not use any dangerous chemicals or compounds to produce operating electrolytes. However, in exceptional cases, such materials must be used in order to achieve specific physical and electrical properties because no safe substitute materials are currently known. However, the amount of dangerous materials used in our products has been limited to an absolute minimum. Nevertheless, the following rules should be observed when handling Al electrolytic capacitors:

- Any escaping electrolyte should not come into contact with eyes or skin.
- If electrolyte does come into contact with the skin, wash the affected parts immediately with running water. If the eyes are affected, rinse them for 10 minutes with plenty of water. If symptoms persist, seek medical treatment.
- Avoid breathing in electrolyte vapor or mists. Workplaces and other affected areas should be well ventilated. Clothing that has been contaminated by electrolyte must be changed and rinsed in water.

Product safety

The table below summarize the safety instructions that must be observed without fail. A detailed description can be found in the relevant sections of chapter "General technical information".

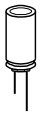
Topic	Safety information	Reference Chapter "General technical information"
Polarity	Make sure that polar capacitors are connected with the right polarity.	1 "Basic construction of aluminum electrolytic capacitors"
Reverse voltage	Voltages polarity classes should be prevented by connecting a diode.	3.1.6 "Reverse voltage"
Upper category temperature	Do not exceed the upper category temperatur.	7.2 "Maximum permissible operating temperature"
Maintenance	Make periodic inspections of the capacitors. Before the inspection, make sure that the power supply is turned off and carefully discharge the electricity of the capacitors. Do not apply any mechanical stress to the capacitor terminals.	10 "Maintenance"
Mounting position of screw terminal capacitors	Do not mount the capacitor with the terminals (safety vent) upside down.	11.1 "Mounting positions of capacitors with screw terminals"
Mounting of single-ended capacitors	The internal structure of single-ended capacitors might be damaged if excessive force is applied to the lead wires. Avoid any compressive, tensile or flexural stress. Do not move the capacitor after soldering to PC board. Do not pick up the PC board by the soldered capacitor. Do not insert the capacitor on the PC board with a hole space different to the lead space specified.	11.4 "Mounting considerations for single-ended capacitors"
Robustness of terminals	The following maximum tightening torques must not be exceeded when connecting screw terminals: M5: 2 Nm M6: 2.5 Nm	11.3 "Mounting torques"
Soldering	Do not exceed the specified time or temperature limits during soldering.	11.5 "Soldering"



Topic	Safety information	Reference Chapter "General technical information"
Soldering, cleaning agents	Do not allow halogenated hydrocarbons to come into contact with aluminum electrolytic capacitors.	11.6 "Cleaning agents"
Passive flammability	Avoid external energy, such as fire or electricity.	8.1 "Passive flammability"
Active flammability	Avoid overload of the capacitors.	8.2 "Active flammability"
		Reference Chapter "Capacitors with screw terminals"
Breakdown strength of insulating sleeves	Do not damage the insulating sleeve, especially when ring clips are used for mounting.	"Screw terminals - accessories"

Symbols and terms

Symbol	English	German
C	Capacitance	Kapazität
C_R	Rated capacitance	Nennkapazität
C_S	Series capacitance	Serienkapazität
$C_{S,T}$	Series capacitance at temperature T	Serienkapazität bei Temperatur T
C_f	Capacitance at frequency f	Kapazität bei Frequenz f
d	Case diameter, nominal dimension	Gehäusedurchmesser, Nennmaß
d_{max}	Maximum case diameter	Maximaler Gehäusedurchmesser
ESL	Self-inductance	Eigeninduktivität
ESR	Equivalent series resistance	Ersatzserienwiderstand
ESR_f	Equivalent series resistance at frequency f	Ersatzserienwiderstand bei Frequenz f
ESR_T	Equivalent series resistance at temperature T	Ersatzserienwiderstand bei Temperatur T
f	Frequency	Frequenz
I	Current	Strom
I_{AC}	Alternating current (ripple current)	Wechselstrom
$I_{AC,rms}$	Root-mean-square value of alternating current	Wechselstrom, Effektivwert
$I_{AC,f}$	Ripple current at frequency f	Wechselstrom bei Frequenz f
$I_{AC,max}$	Maximum permissible ripple current	Maximal zulässiger Wechselstrom
$I_{AC,R}$	Rated ripple current	Nennwechselstrom
$I_{AC,R}$ (B)	Rated ripple current for base cooling	Nennwechselstromstrom für Bodenkühlung
I_{leak}	Leakage current	Ableitstrom
$I_{leak,op}$	Operating leakage current	Ableitstrom bei Betrieb
l	Case length, nominal dimension	Gehäuselänge, Nennmaß
l_{max}	Maximum case length (without terminals and mounting stud)	Maximale Gehäuselänge (ohne Anschlüsse und Gewindebolzen)
R	Resistance	Widerstand
R_{ins}	Insulation resistance	Isolationswiderstand
R_{symm}	Balancing resistance	Symmetrierwiderstand
T	Temperature	Temperatur
ΔT	Temperature difference	Temperaturdifferenz
T_A	Ambient temperature	Umgebungstemperatur
T_C	Case temperature	Gehäusetemperatur
T_B	Capacitor base temperature	Temperatur des Becherbodens
t	Time	Zeit
Δt	Period	Zeitraum
t_b	Service life (operating hours)	Brauchbarkeitsdauer (Betriebszeit)



Symbol	English	German
V	Voltage	Spannung
V_F	Forming voltage	Formierspannung
V_{op}	Operating voltage	Betriebsspannung
V_R	Rated voltage, DC voltage	Nennspannung, Gleichspannung
V_S	Surge voltage	Spitzenspannung
X_C	Capacitive reactance	Kapazitiver Blindwiderstand
X_L	Inductive reactance	Induktiver Blindwiderstand
Z	Impedance	Scheinwiderstand
Z_T	Impedance at temperature T	Scheinwiderstand bei Temperatur T
tan δ	Dissipation factor	Verlustfaktor
λ	Failure rate	Ausfallrate
ε_0	Absolute permittivity	Elektrische Feldkonstante
ε_r	Relative permittivity	Dielektrizitätszahl
ω	Angular velocity; $2 \cdot \pi \cdot f$	Kreisfrequenz; $2 \cdot \pi \cdot f$

Notes

All dimensions are given in mm.

Important notes

The following applies to all products named in this publication:

1. Some parts of this publication contain **statements about the suitability of our products for certain areas of application**. These statements are based on our knowledge of typical requirements that are often placed on our products in the areas of application concerned. We nevertheless expressly point out **that such statements cannot be regarded as binding statements about the suitability of our products for a particular customer application**. As a rule, EPCOS is either unfamiliar with individual customer applications or less familiar with them than the customers themselves. For these reasons, it is always ultimately incumbent on the customer to check and decide whether an EPCOS product with the properties described in the product specification is suitable for use in a particular customer application.
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 lifesaving 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.
3. **The warnings, cautions and product-specific notes must be observed.**
4. In order to satisfy certain technical requirements, **some of the products described in this publication may contain substances subject to restrictions in certain jurisdictions (e.g. because they are classed as hazardous)**. Useful information on this will be found in our Material Data Sheets on the Internet (www.epcos.com/material). Should you have any more detailed questions, please contact our sales offices.
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