

Aluminum electrolytic capacitors

Single-ended capacitors

Series/Type: B43858
Date: November 2012

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Single-ended capacitors

B43858

High ripple current – 105 °C

Long-life grade capacitors

Applications

- Professional power supplies

Features

- High ripple current capability at high frequency
- Long useful life
- RoHS-compatible

Construction

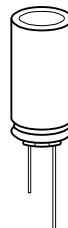
- Radial leads
- Charge-discharge proof, polar
- Aluminum case with insulating sleeve
- Minus pole marking on the insulating sleeve
- Case with safety vent

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.





Specifications and characteristics in brief

Rated voltage V_R	160 ... 450 V DC			
Surge voltage V_S	$1.1 \cdot V_R$			
Rated capacitance C_R	2.2 ... 330 μF			
Capacitance tolerance	$\pm 20\% \triangle M$			
Dissipation factor $\tan \delta$ (20 °C, 120 Hz)	$V_R \leq 250 \text{ V DC: } \tan \delta (\text{max.}) = 0.20$ $V_R \geq 350 \text{ V DC: } \tan \delta (\text{max.}) = 0.24$			
Leakage current I_{leak} (20 °C, 5 min)	$I_{\text{leak}} = 0.03 \mu\text{A} \cdot \left(\frac{C_R}{\mu\text{F}} \cdot \frac{V_R}{V} \right) + 15 \mu\text{A}$			
Self-inductance ESL	Diameter (mm)	≤ 12.5	16	18
	ESL (nH)	20	26	34
Useful life ¹⁾ 105 °C; V_R ; $I_{\text{AC,R}}$ Requirements	$> 5000 \text{ h}$ $\Delta C/C \leq \pm 35\%$ of initial value $\tan \delta \leq 3$ times initial specified limit $I_{\text{leak}} \leq$ initial specified limit			
Voltage endurance test 105 °C; V_R Post test requirements	5000 h $\Delta C/C \leq \pm 25\%$ of initial value $\tan \delta \leq 2$ times initial specified limit $I_{\text{leak}} \leq$ initial specified limit			
Vibration resistance test	To IEC 60068-2-6, test Fc: Frequency range 10 Hz ... 2 kHz, displacement amplitude 0.75 mm, acceleration max. 10 g, duration $3 \times 2 \text{ h}$. Capacitor rigidly clamped by the aluminum case.			
IEC climatic category	To IEC 60068-1: $V_R \leq 250 \text{ V: } 40/105/56$ (–40 °C/+105 °C/56 days damp heat test) $V_R \geq 350 \text{ V: } 25/105/56$ (–25 °C/+105 °C/56 days damp heat test)			
Sectional specification	IEC 60384-4			

1) Refer to chapter "General technical information, 5 Useful life" on how to interpret useful life.



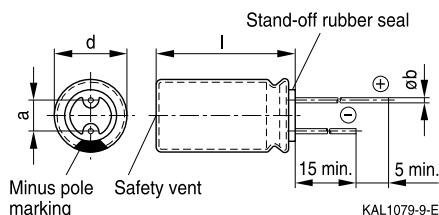
B43858

High ripple current – 105 °C

Dimensional drawings

With stand-off rubber seal

Diameters (mm): 10, 12.5, 16, 18



Dimensions and weights

Dimensions (mm)				Approx. weight
d +0.5	l	a ±0.5	b	g
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
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)	160	200	250	350	400	450
	Case dimensions d × l (mm)					
C _R (μF)						
2.2				10 × 12.5	10 × 12.5	10 × 12.5
3.3				10 × 12.5	10 × 16	10 × 16
4.7				10 × 12.5	10 × 16	10 × 16
6.8				10 × 16	10 × 16	10 × 16
10			10 × 16	10 × 16	10 × 20	10 × 20
22	10 × 16	10 × 16	10 × 20	12.5 × 20	12.5 × 25 16 × 20	16 × 20
33	10 × 16	10 × 20	12.5 × 20	12.5 × 25 16 × 20	16 × 20	16 × 25
47	12.5 × 20	12.5 × 20	12.5 × 25	16 × 25 18 × 20	16 × 31.5 18 × 25	16 × 31.5
68	12.5 × 20	12.5 × 25 16 × 20	16 × 20	16 × 31.5 18 × 25	18 × 31.5	18 × 35
82						18 × 40
100	16 × 20	16 × 25	16 × 31.5 18 × 25	18 × 35	18 × 40	
220	18 × 31.5	18 × 35	18 × 40			
330	18 × 40					

Other voltage and capacitance ratings are available upon request.


B43858
High ripple current – 105 °C
Technical data and ordering codes

C_R 120 Hz 20 °C μF	Case dimensions $d \times l$ mm	$I_{AC,R}$ 100 kHz 105 °C mA	Ordering code (composition see below)
$V_R = 160 V DC$			
22	10 \times 16	300	B43858G1226M***
33	10 \times 16	350	B43858G1336M***
47	12.5 \times 20	650	B43858G1476M***
68	12.5 \times 20	700	B43858G1686M***
100	16 \times 20	950	B43858G1107M***
220	18 \times 31.5	1800	B43858G1227M***
330	18 \times 40	2300	B43858G1337M***
$V_R = 200 V DC$			
22	10 \times 16	300	B43858G2226M***
33	10 \times 20	470	B43858G2336M***
47	12.5 \times 20	590	B43858G2476M***
68	12.5 \times 25	780	B43858J2686M***
68	16 \times 20	780	B43858G2686M***
100	16 \times 25	1250	B43858G2107M***
220	18 \times 35	2000	B43858G2227M***
$V_R = 250 V DC$			
10	10 \times 16	280	B43858L2106M***
22	10 \times 20	480	B43858L2226M***
33	12.5 \times 20	630	B43858L2336M***
47	12.5 \times 25	790	B43858L2476M***
68	16 \times 20	850	B43858L2686M***
100	16 \times 31.5	1450	B43858L2107M***
100	18 \times 25	1200	B43858M2107M***
220	18 \times 40	2200	B43858L2227M***

Composition of ordering code

*** = Version

000 = for standard leads, bulk

 001 = for kinked leads, bulk (for $d \times l = 10 \times 20 \dots 12.5 \times 25$ mm and $\varnothing 16 \dots 18$ mm)

002 = for cut leads, bulk

 003 = for crimped leads, blister (for $\varnothing 16 \dots 18$ mm)

 004 = for J leads, blister (for $\varnothing 10 \dots 18$ mm, excluding $d \times l = 18 \times 40$ mm)

 008 = for taped leads, Ammo pack, lead spacing $F = 5.0$ mm (for $\varnothing 10 \dots 12.5$ mm)

 009 = for taped leads, Ammo pack, lead spacing $F = 7.5$ mm (for $\varnothing 16$ mm and $d \times l = 18 \times 20 \dots 18 \times 31.5$ mm)

 012 = for bent 90° leads, blister (for $\varnothing 16 \dots 18$ mm)


B43858
High ripple current – 105 °C
Technical data and ordering codes

C_R 120 Hz 20 °C μF	Case dimensions $d \times l$ mm	$I_{AC,R}$ 100 kHz 105 °C mA	Ordering code (composition see below)
$V_R = 350$ V DC			
2.2	10 \times 12.5	100	B43858G4225M***
3.3	10 \times 12.5	130	B43858G4335M***
4.7	10 \times 12.5	140	B43858G4475M***
6.8	10 \times 16	200	B43858G4685M***
10	10 \times 16	220	B43858G4106M***
22	12.5 \times 20	450	B43858G4226M***
33	12.5 \times 25	580	B43858G4336M***
33	16 \times 20	580	B43858J4336M***
47	16 \times 25	850	B43858G4476M***
47	18 \times 20	820	B43858J4476M***
68	16 \times 31.5	1100	B43858G4686M***
68	18 \times 25	900	B43858J4686M***
100	18 \times 35	1450	B43858G4107M***
$V_R = 400$ V DC			
2.2	10 \times 12.5	100	B43858G9225M***
3.3	10 \times 16	130	B43858G9335M***
4.7	10 \times 16	180	B43858G9475M***
6.8	10 \times 16	190	B43858G9685M***
10	10 \times 20	290	B43858G9106M***
22	12.5 \times 25	520	B43858G9226M***
22	16 \times 20	530	B43858J9226M***
33	16 \times 20	650	B43858G9336M***
47	16 \times 31.5	1050	B43858G9476M***
47	18 \times 25	900	B43858J9476M***
68	18 \times 31.5	1300	B43858G9686M***
100	18 \times 40	1600	B43858G9107M***

Composition of ordering code

*** = Version

000 = for standard leads, bulk

 001 = for kinked leads, bulk (for $d \times l = 10 \times 20 \dots 12.5 \times 25$ mm and $\varnothing 16 \dots 18$ mm)

002 = for cut leads, bulk

 003 = for crimped leads, blister (for $\varnothing 16 \dots 18$ mm)

 004 = for J leads, blister (for $\varnothing 10 \dots 18$ mm, excluding $d \times l = 18 \times 40$ mm)

 008 = for taped leads, Ammo pack, lead spacing $F = 5.0$ mm (for $\varnothing 10 \dots 12.5$ mm)

 009 = for taped leads, Ammo pack, lead spacing $F = 7.5$ mm (for $\varnothing 16$ mm and $d \times l = 18 \times 20 \dots 18 \times 31.5$ mm)

 012 = for bent 90° leads, blister (for $\varnothing 16 \dots 18$ mm)


B43858
High ripple current – 105 °C

Technical data and ordering codes

C_R 120 Hz 20 °C μF	Case dimensions $d \times l$ mm	$I_{AC,R}$ 100 kHz 105 °C mA	Ordering code (composition see below)
$V_R = 450$ V DC			
2.2	10 \times 12.5	100	B43858G5225M***
3.3	10 \times 16	130	B43858G5335M***
4.7	10 \times 16	150	B43858G5475M***
6.8	10 \times 16	190	B43858G5685M***
10	10 \times 20	310	B43858G5106M***
22	16 \times 20	600	B43858G5226M***
33	16 \times 25	800	B43858G5336M***
47	16 \times 31.5	1050	B43858G5476M***
68	18 \times 35	1350	B43858G5686M***
82	18 \times 40	1600	B43858G5826M***

Composition of ordering code

*** = Version

000 = for standard leads, bulk

001 = for kinked leads, bulk (for $d \times l = 10 \times 20 \dots 12.5 \times 25$ mm and $\varnothing 16 \dots 18$ mm)

002 = for cut leads, bulk

003 = for crimped leads, blister (for $\varnothing 16 \dots 18$ mm)

004 = for J leads, blister (for $\varnothing 10 \dots 18$ mm, excluding $d \times l = 18 \times 40$ mm)

008 = for taped leads, Ammo pack, lead spacing $F = 5.0$ mm (for $\varnothing 10 \dots 12.5$ mm)

009 = for taped leads, Ammo pack, lead spacing $F = 7.5$ mm (for $\varnothing 16$ mm and $d \times l = 18 \times 20 \dots 18 \times 31.5$ mm)

012 = for bent 90° leads, blister (for $\varnothing 16 \dots 18$ mm)

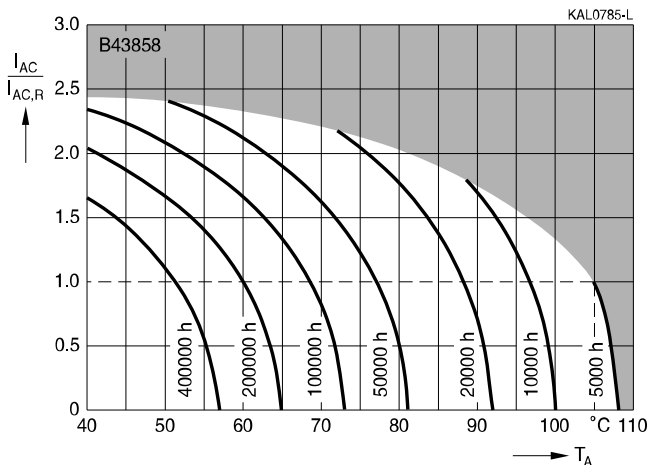


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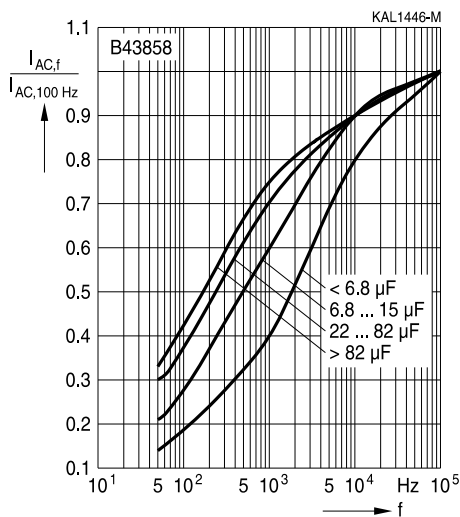
High ripple current – 105 °C

Useful life¹⁾

depending on ambient temperature T_A under ripple current operating conditions



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



1) Refer to chapter "General technical information, 5 Useful life" on how to interpret useful life.



B43858

High ripple current – 105 °C

Taping, packing and lead configurations

Taping

Single-ended capacitors are available taped in Ammo pack from diameter 8 to 18 mm as follows:

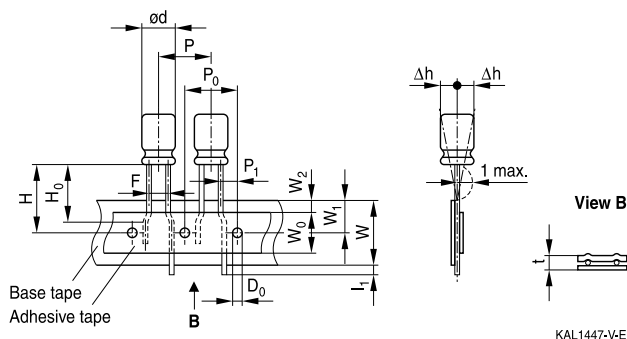
Lead spacing $F = 3.5$ mm ($\varnothing d = 8$ mm)

Lead spacing $F = 5.0$ mm ($\varnothing d = 8 \dots 12.5$ mm)

Lead spacing $F = 7.5$ mm ($\varnothing d = 16 \dots 18$ mm).

Lead spacing 3.5 mm ($\varnothing d = 8$ mm)

Last 3 digits of ordering code: 006



KAL1447-V-E

Dimensions in mm

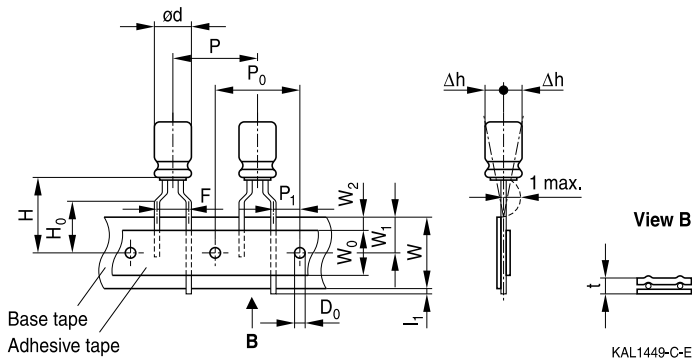
$\varnothing d$	F	H	W	W_0	W_1	W_2	P	P_0	P_1	L_1	t	Δh	D_0
8	3.5	18.5	18.0	9.5	9.0	3.0	12.7	12.7	4.6	1.0	0.7	1.0	4.0
Tolerance	+0.8 -0.2	±1.0	±0.5	min.	±0.5	max.	±1.0	±0.3	±0.6	max.	±0.2	max.	±0.2

Leads can also run straight through the taping area.



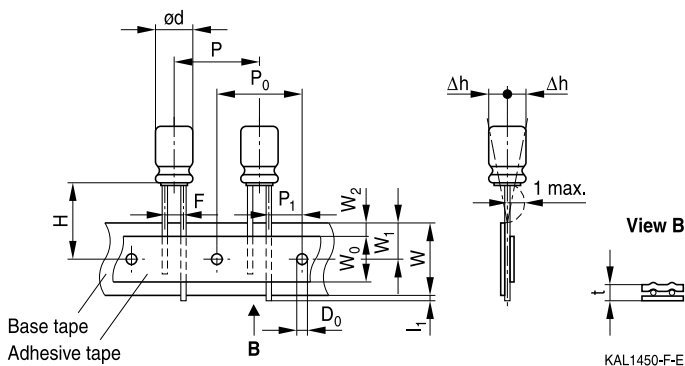
Lead spacing 5.0 mm (Ø d = 8 mm)

Last 3 digits of ordering code: 008



Lead spacing 5.0 mm (Ø d = 10 ... 12.5 mm)

Last 3 digits of ordering code: 008



Dimensions in mm

Ø d	F	H	W	W ₀	W ₁	W ₂	H ₀	P	P ₀	P ₁	L ₁	t	Δh	D ₀
4 ... 6.3	5.0	18.5	18.0	5.5	9.0	1.5	16.0	12.7	12.7	3.85	1.0	0.6	1.0	4.0
8	5.0	20.0	18.0	9.5	9.0	1.5	16.0	12.7	12.7	3.85	1.0	0.6	1.0	4.0
10		19.0		9.5			—	12.7	12.7	3.85				
12.5		19.0		11.5			—	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.	+0.3 -0.2	max.	±0.2

Taping is available up to dimensions $d \times l = 12.5 \times 25 \text{ mm}$.

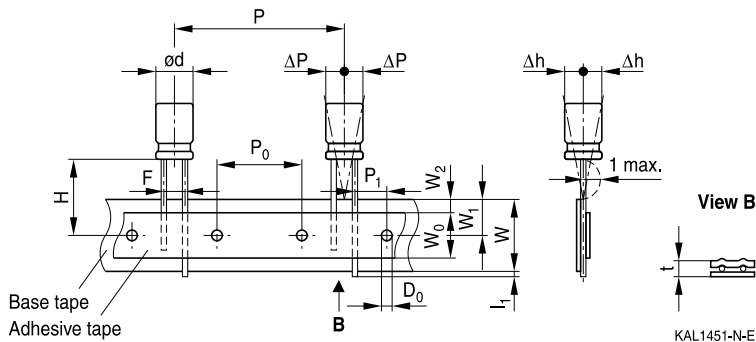


B43858

High ripple current – 105 °C

Lead spacing 7.5 mm ($\varnothing d = 16 \dots 18$ mm)

Last 3 digits of ordering code: 009



Dimensions in mm

$\varnothing d$	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

Taping is available up to dimensions $d \times l = 16 \times 31.5$ mm and 18×31.5 mm.



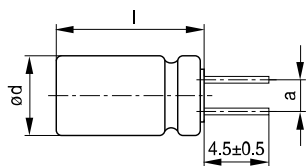
Cut or kinked leads

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

Cut leads

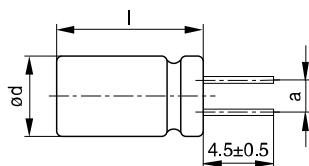
Last 3 digits of ordering code: 002

With stand-off rubber seal



KAL1085-I

With flat rubber seal



KAL1086-R

Case size $d \times l$ (mm)	Dimensions (mm) $a \pm 0.5$
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
16 × 35.5	7.5
18 × 20	7.5
18 × 25	7.5
18 × 31.5	7.5
18 × 35	7.5
18 × 40	7.5



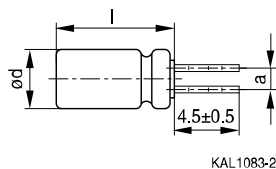
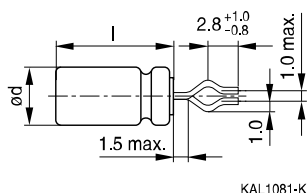
B43858

High ripple current – 105 °C

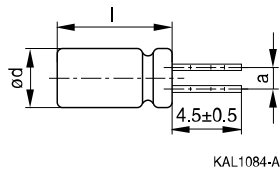
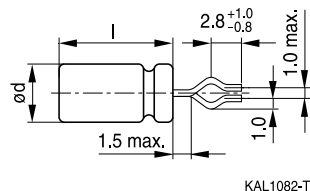
Kinked leads

Last 3 digits of ordering code: 001

With stand-off rubber seal



With flat rubber seal



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
16 × 35.5	7.5
18 × 20	7.5
18 × 25	7.5
18 × 31.5	7.5
18 × 35	7.5
18 × 40	7.5



PAPR leads (Protection Against Polarity Reversal)

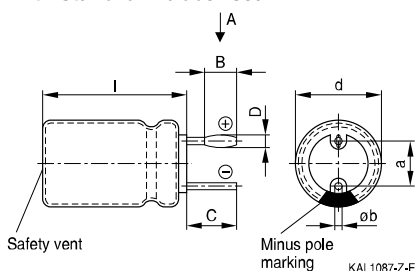
These lead configurations ensure correct placement of the capacitor on the PCB with regard to polarity. PAPR leads are available for diameters from 10 mm up to 18 mm (excluding $d \times l = 12.5 \times 30/35/40$ mm).

There are three configurations available: Crimped leads, J leads, bent 90° leads

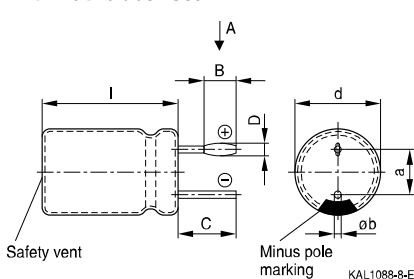
Crimped leads

Last 3 digits of ordering code: 003

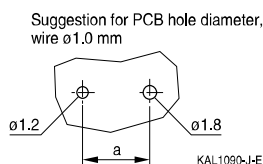
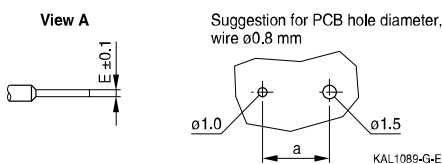
With stand-off rubber seal



With flat rubber seal



Suggestion for PCB hole diameter



Case size $d \times l$ (mm)	Dimensions (mm)					
	B ± 0.2	C ± 0.5	D ± 0.1	E ± 0.1	a ± 0.5	$\varnothing b$
16 \times 20	1.5	3.0	1.3	0.3	7.5	0.8 ± 0.05
16 \times 25	1.5	3.0	1.3	0.3	7.5	0.8 ± 0.05
16 \times 31.5	1.5	3.0	1.3	0.3	7.5	0.8 ± 0.05
16 \times 35.5	1.5	3.0	1.3	0.3	7.5	0.8 ± 0.05
18 \times 20	1.5	3.0	1.3	0.3	7.5	0.8 ± 0.1
18 \times 25	1.5	3.0	1.3	0.3	7.5	0.8 ± 0.1
18 \times 31.5	1.5	3.0	1.3	0.3	7.5	0.8 ± 0.1
18 \times 35	1.5	3.0	1.3	0.3	7.5	0.8 ± 0.1
18 \times 40	1.5	3.0	1.3	0.3	7.5	0.8 ± 0.1

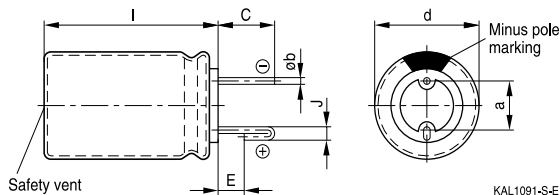


B43858

High ripple current – 105 °C

J leads

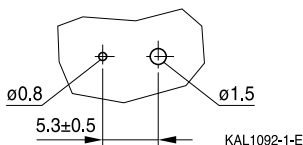
Last 3 digits of ordering code: 004



KAL1091-S-E

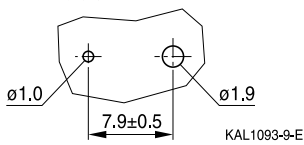
Suggestion for PCB hole diameter

Suggestion for PCB hole diameter,
wire $\varnothing 0.6$ mm



KAL1092-1-E

Suggestion for PCB hole diameter,
wire $\varnothing 0.8$ mm



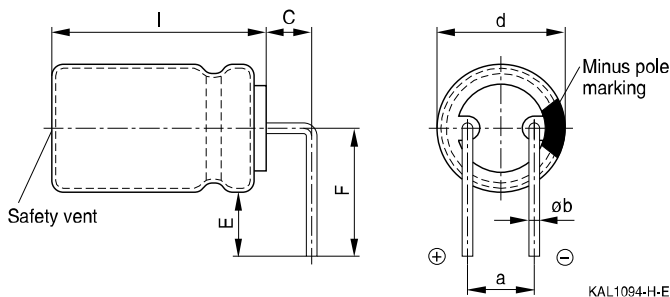
KAL1093-9-E

Case size $d \times l$ (mm)	Dimensions (mm)				
	$C \pm 0.5$	$E \pm 0.5$	$J \pm 0.2$	$a \pm 0.5$	$\varnothing b$
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
16×35.5	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 d × l (mm)	Dimensions (mm)				
	C ±0.5	E ±0.5	F ±0.5	a ±0.5	Øb
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
16 × 35.5	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.

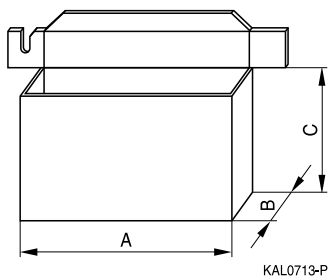


B43858

High ripple current – 105 °C

Packing units and box dimensions

Ammo pack



Case size $d \times l$ mm	Dimensions (mm)			Packing units pcs.
	A_{max}	B_{max}	C_{max}	
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



Overview of packing units and code numbers for case sizes 8 × 11.5 ... 16 × 35.5

						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.
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	216
16 × 31.5	200	300			250	250	344	344	180
16 × 35.5	100	—			100	100	150	150	150
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					
		008	5	8...12.5					
		009	7.5	16...18					

1) Available upon request



B43858

High ripple current – 105 °C

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

						PAPR			
Case size d × l mm	Stan- dard, bulk pcs.	Taped, Ammo pack pcs.			Kinked leads, bulk pcs.	Cut leads, bulk pcs.	Crimped leads, blister pcs.	J leads, blister pcs.	Bent 90° leads, blister 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
The last three digits of the complete ordering code state the lead configuration	000	Code	F (mm)	d (mm)	001	002	003	004	012
		009	7.5	16...18					



Cautions and warnings

Personal safety

The electrolytes used by EPCOS have been optimized both with a view to the intended application and 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, some of the high-voltage electrolytes used by EPCOS are self-extinguishing.

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 alternative materials are currently known. However, the amount of dangerous materials used in our products is limited to an absolute minimum.

Materials and chemicals used in EPCOS aluminum electrolytic capacitors are continuously adapted in compliance with the EPCOS Corporate Environmental Policy and the latest EU regulations and guidelines such as RoHS, REACH/SVHC, GADSL, and ELV.

MDS (Material Data Sheets) are available on the EPCOS website for all types listed in the data book. MDS for customer specific capacitors are available upon request.

MSDS (Material Safety Data Sheets) are available for all of our electrolytes upon request.

Nevertheless, the following rules should be observed when handling aluminum electrolytic capacitors: No electrolyte should come into contact with eyes or skin. If electrolyte does come into contact with the skin, wash the affected areas 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 inhaling 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.


B43858
High ripple current – 105 °C

Product safety

The table below summarizes 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"
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"
Robustness of terminals	The following maximum tightening torques must not be exceeded when connecting screw terminals: M5: 2.5 Nm M6: 4.0 Nm	11.3 "Mounting torques"
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"
Soldering	Do not exceed the specified time or temperature limits during soldering.	11.5 "Soldering"
Soldering, cleaning agents	Do not allow halogenated hydrocarbons to come into contact with aluminum electrolytic capacitors.	11.6 "Cleaning agents"
Upper category temperature	Do not exceed the upper category temperature.	7.2 "Maximum permissible operating temperature"
Passive flammability	Avoid external energy, such as fire or electricity.	8.1 "Passive flammability"



B43858

High ripple current – 105 °C

Topic	Safety information	Reference chapter "General technical information"
Active flammability	Avoid overload of the capacitors.	8.2 "Active flammability"
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"
Storage	Do not store capacitors at high temperatures or high humidity. Capacitors should be stored at +5 to +35 °C and a relative humidity of $\leq 75\%$.	7.3 Storage conditions
		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"


B43858
High ripple current – 105 °C

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	Reststrom
$I_{leak,op}$	Operating leakage current	Betriebsreststrom
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 · π · f	Kreisfrequenz; 2 · π · f

Note

All dimensions are given in mm.

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The following applies to all products named in this publication:

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B43858A1476M008	B43858F2476M002	B43858F2226M000	B43858A2686M002	B43858A4335M010
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B43858A1107M009	B43858A4226M000	B43858A1336M000	B43858A2226M008	B43858A1686M000
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