

Screw Terminal Capacitors

ALS30/40 series

Listed here are only samples of the range of Screw Terminal Capacitors we can produce.

Electrical characteristics and case size are just two parameters that can be optimised by our design engineers to achieve the exact product you require. Please contact our sales office for more details.



ALS30/31 Series

The ALS30/31 series of screw terminal capacitors cover a wide range of case sizes and voltage ratings featuring high ripple currents and long life performance. They are ideally suited for industrial and commercial applications demanding high reliability and long life expectancy such as frequency converters, UPS systems and switch mode power supplies.

ALS40/41 Series

The ALS40/41 series of screw terminal capacitors feature the same high ripple currents and long life characteristics as the ALS30/31 series but can operate at higher temperatures. They are similarly suited for high reliability and long life applications such as frequency converters, UPS systems and switch mode power supplies, but the extended temperature range allows increased ripple currents at lower temperatures.

	ALS30/31	ALS40/41
Capacitance Range	68µF to 1,500,000µF	100µF to 1,500,000µF
Capacitance Tolerance	±20%	±20%
Voltage Range	10V to 600V d.c.	10V to 500V d.c.
Temperature range	-40°C to +85°C	-40°C to +105°C
Case sizes	36 x 52mm to 91 x 220mm	36 x 52mm to 91 x 220mm

Screw Terminal Capacitors

ALS30/40
case sizes

CASE DIMENSIONS AND TERMINAL STYLES

Terminations

Aluminium inserts with M5 threads as standard, max. torque 2NM. Optional M6 threaded inserts have a max. torque 4NM. Max. torque for stud mounting M8:4NM and M12:8NM

Terminal options

(preferred options shown in bold)

Term. Style	Thread	Height T - mm ±0.5	Dia. - DT mm ±0.5	Thread depth TD - mm minimum	Drawing
A¹	M5	5.5	13	10	Fig.2
A²	M5	7.14	8	10	Fig.1
B	M5	7.14	13	10	Fig.1
C	M6	5.5	13	10	Fig.1
F	M5	2.36	8	5.5	Fig.1
G	M6	6.35	17	11.8	Fig.1
J	M6	3.17	17	8.8	Fig.1
M	M5	7.14	8	10	Fig.1
R³	M5	5.5	15	10	Fig. 2

- Notes: ¹ Terminal post with flats.
Can diameters 51, 66, 77, 91mm.
Dimension Z is 10mm.
- ² Can diameter 36mm only.
- ³ Terminal post with flats.
Dimension Z is 13mm.

Mounting

Any position but refer to the earlier section 'Application & Operation'. Details of mounting clips and stud mounting kits can be found near the back of the catalogue.

Stud Mounting - ALS31/41

Case Polarity - due to the presence of electrolyte in the capacitor the aluminium can and stud mounting will essentially be at the same potential as the negative terminal. BHC therefore recommends that the stud and can are insulated (see accessories for insulating nuts).

Fig. 1 - Terminal Styles A², B, C, F, G, J, M

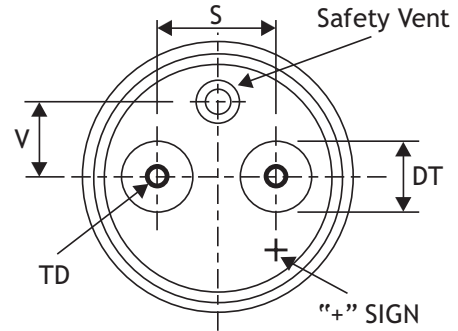
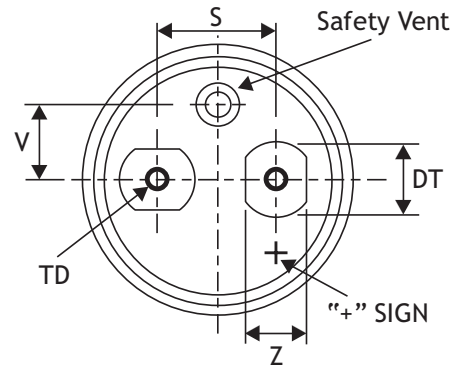
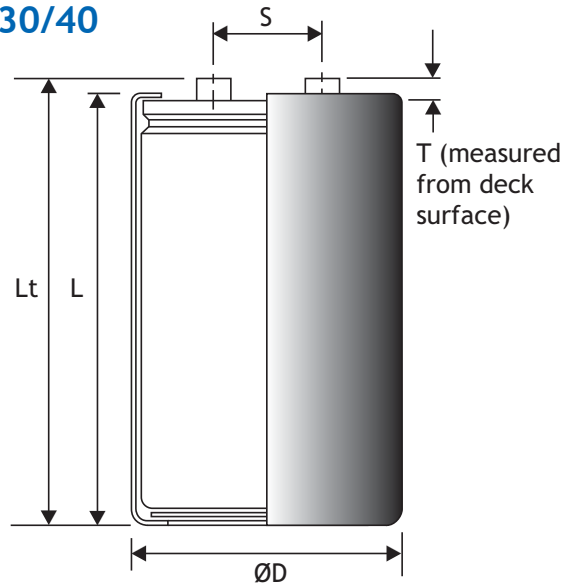


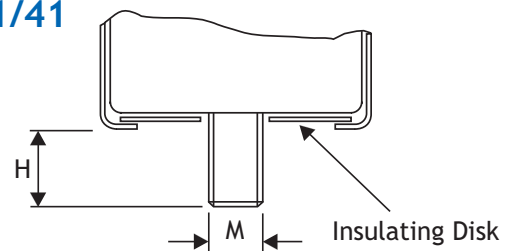
Fig. 2 - Terminal Style A¹, R



ALS30/40



ALS31/41



ALS30/40

case sizes & technical data

DIMENSIONS (sleeved) mm

CASE CODE	D ±1	L ±2	Lt* ±1	S ±0.5	T ±0.5	V mm	M THREAD	H ±1	MOUNTING CLIP	WEIGHT grams nom.	Terminal Style										
											A ¹	A ²	B	C	F	G	J	M	R		
DA	36	52	58.5	12.8	7.14	8	M8	12	V3/H2/UTE2736	75	•		•			•					
DB	36	62	67.5	12.8	7.14	8	M8	12	V3/H2/UTE2736	90	•		•			•					
DE	36	82	87.5	12.8	7.14	8	M8	12	V3/H2/UTE2736	115	•		•			•					
DF	36	105	111.5	12.8	7.14	8	M8	12	V3/H2/UTE2736	140	•		•			•					
KE	51	82	86.5	22.2	5.5	13.7	M12	16	V4/UTE2737	220	•	•	•			•	•				
KF	51	105	110.5	22.2	5.5	13.7	M12	16	V4/UTE2737	300	•	•	•			•	•				
MF	66	105	110.5	28.5	5.5	15.8	M12	16	V10/UTE2738	505	•	•	•			•	•				
ND	77	75	79.5	31.8	5.5	19	M12	16	V11	495	•	•	•			•	•	•			
NF	77	105	110.5	31.8	5.5	19	M12	16	V11	690	•	•	•			•	•	•			
NP	77	146	150.5	31.8	5.5	19	M12	16	V11	960	•	•	•			•	•	•			
NT	77	220	224.5	31.8	5.5	19	M12	16	V11	1450	•	•	•			•	•	•			
RC	91	67	71.5	31.8	5.5	25	M12	16	V90	615	•	•	•			•					
RD	91	75	79.5	31.8	5.5	25	M12	16	V90	690	•	•	•			•					
RH	91	98	103.5	31.8	5.5	25	M12	16	V90	900	•	•	•			•					
RP	91	146	149.5	31.8	5.5	25	M12	16	V90	1345	•	•	•			•					
RT	91	220	223.5	31.8	5.5	25	M12	16	V90	2000	•	•	•			•					

* Dimensions Lt will change dependant on terminal style.

TECHNICAL DATA

Related documents

IEC 384-4

Temperature range

ALS30/31

Storage -55°C to +85°C

Operating -40°C to +85°C

Environmental classification 40/085/56

ALS40/41

Storage -55°C to +105°C

Operating -40°C to +105°C

Environmental classification 40/105/56

Surge voltage

1000 surges (30 seconds) at 85°C (ALS30/31) and 105°C (ALS40/41) with surge voltage applied. See electrical characteristics for more details.

SHORT DURATION SURGE VOLTAGE (<500 mS)

RATED VOLTAGE	SURGE VOLTAGE
200	350
250	400
350	500
400	520
415	530
450	550
500	600

Charge/discharge

10⁶ cycles at 25°C and rated voltage. One cycle per second with a time constant of 0.1.

D.C. leakage current

After application of rated d.c. voltage for 5 minutes at 20°C, the d.c. leakage current shall not exceed 0.006 C_r U_r (0.003 C_r U_r for ALS40) or 6mA whichever is the smaller. Where C_r is the rated capacitance in µF and U_r is the rated d.c. voltage.

Vibration

10Hz to 55Hz at 0.75mm or 10g for 3x2hrs duration. Except 220mm long cans 10-55hz at 0.35mm or 5g for 3x0.5hrs duration.

Insulation resistance

≥ 100MΩ at 100V d.c., across insulating sleeve.

Voltage proof

≥ 2500V d.c., across insulating sleeve.

Capacitor marking

The capacitors are marked with items 1 to 6 from the following list as a minimum, and as much of the remaining information as is practical.

1. Rated capacitance in µF
2. Rated voltage d.c.
3. Polarity of terminations
4. Tolerance on rated capacitance
5. Date code/Batch number
6. BHC part number
7. Environmental classification

Technical data continued overleaf....

Screw Terminal Capacitors

ALS30/40 technical data

Ripple current

The following values are approximate only, to give an indication of the effects of frequency and temperature on ripple current. More accurate data can be obtained by referring to the Application Notes available from BHC.

FREQUENCY CORRECTION

Capacitors shall withstand the rated r.m.s. ripple current as given in the table at upper category temperature in circulating air. For frequencies other than those shown the following formula should be used:

$$\text{Ripple current} = \sqrt{\frac{F \times A^2 \times B^2}{100 \times (B^2 - A^2) + (F \times A^2)}}$$

A = 100Hz ripple current

B = 10kHz ripple current

F = Required frequency (Hz)

TEMPERATURE CORRECTION - ALS30/31

For ambient temperature other than 85°C the following multipliers should be applied to the 85°C ripple current.

AMBIENT TEMPERATURE	FACTOR
50°C	2.1
60°C	1.9
70°C	1.7
85°C	1.0

TEMPERATURE CORRECTION - ALS40/41

For ambient temperature other than 105°C the following multipliers should be applied to the 105°C ripple current.

AMBIENT TEMPERATURE	FACTOR
50°C	2.5
60°C	2.4
70°C	2.2
85°C	1.8
105°C	1.0

N.B. The sum of the d.c. and a.c. voltage components should not exceed the d.c. voltage rating.

Life expectancy

At rated temperature with rated voltage and ripple current applied.

Can Diameter	Range	Life Expectancy (hours)
36	ALS30/31	11000
	ALS40/41	6000
51	ALS30/31	18000
	ALS40/41	7000
66	ALS30/31	19000
	ALS40/41	8000
77, 91	ALS30/31	20000
	ALS40/41	9000

ALS30/31

Rated voltage d.c.	Cap (µF)	Case Size (mm)	ESR (mΩ) at 20°C 100Hz (max)	Impedance (mΩ) at 20°C 10 KHz (max)	Ripple current (A) at 85°C		Type number
					100 Hz	10 KHz	
10V d.c. (11.5V surge)	33000	36x52	20	18	8.4	8.9	ALS3 - - 333DA010
	47000	36x62	15	14	10.2	10.7	ALS3 - - 473DB010
	68000	36x82	10	9	13.6	14.3	ALS3 - - 683DE010
	100000	36x105	8	8	17.1	17.9	ALS3 - - 104DF010
	150000	51x82	8	7	16.0	18.0	ALS3 - - 154KE010
	220000	51x105	7	6	20.6	22.0	ALS3 - - 224KF010
	330000	77x75	10	10	18.4	18.5	ALS3 - - 334ND010
	330000	66x105	6	5	24.4	26.0	ALS3 - - 334MF010
	330000	91x67	8	8	22.6	23.1	ALS3 - - 334RC010
	470000	91x75	11	11	19.4	19.5	ALS3 - - 474RD010
	470000	77x105	5	5	30.8	32.8	ALS3 - - 474NF010
	680000	91x98	7	6	27.9	28.0	ALS3 - - 684RH010
	680000	77x146	5	4	32.3	32.7	ALS3 - - 684NP010
	1000000	91x146	4	4	45.3	45.6	ALS3 - - 105RP010
	1000000	77x220	4	4	44.7	45.3	ALS3 - - 105NT010
	1500000	91x220	4	4	53.8	54.3	ALS3 - - 155RT010

Mounting Style 0 or 1 **
Termination Style A,B,C,F,G,J,M or R

Ordering information


For full ordering details see pages 54 & 55.


ALS30/31

Rated voltage d.c.	Cap (μ F)	Case Size (mm)	ESR ($m\Omega$) at 20 °C 100Hz (max)	Impedance ($m\Omega$) at 20 °C 10 KHz (max)	Ripple current (A) at 85 °C		Type number
					100 Hz	10 KHz	
16V d.c. (18.4V surge)	22000	36x52	22	18	8.3	8.8	ALS3 - - 223DA016
	33000	36x62	17	14	10.1	10.6	ALS3 - - 333DB016
	47000	36x82	11	10	13.4	14.1	ALS3 - - 473DE016
	68000	36x105	9	8	16.9	17.7	ALS3 - - 683DF016
	100000	51x82	10	9	16.0	16.9	ALS3 - - 104KE016
	150000	51x105	8	7	20.0	20.9	ALS3 - - 154KF016
	220000	77x75	10	10	18.5	18.6	ALS3 - - 224ND016
	220000	66x105	6	5	29.3	29.7	ALS3 - - 224MF016
	330000	91x67	8	8	22.6	23.1	ALS3 - - 334RC016
	330000	91x75	11	11	19.1	19.2	ALS3 - - 334RD016
	330000	77x105	5	5	28.6	30.8	ALS3 - - 334NF016
	470000	91x98	7	7	27.6	27.8	ALS3 - - 474RH016
	470000	77x146	5	5	38.9	39.6	ALS3 - - 474NP016
	680000	91x146	4	4	45.3	45.5	ALS3 - - 684RP016
	680000	77x220	4	4	46.7	47.6	ALS3 - - 684NT016
	1000000	91x220	4	3	56.4	57.3	ALS3 - - 105RT016
25V d.c. (28.5V surge)	15000	36x52	24	20	8.2	8.7	ALS3 - - 153DA025
	22000	36x62	17	15	9.9	10.4	ALS3 - - 223DB025
	33000	36x82	11	10	13.2	13.9	ALS3 - - 333DE025
	47000	36x105	9	7	16.6	17.4	ALS3 - - 473DF025
	68000	51x82	11	10	15.6	16.9	ALS3 - - 683KE025
	100000	51x105	9	8	19.6	20.6	ALS3 - - 104KF025
	150000	77x75	11	11	17.9	18.1	ALS3 - - 154ND025
	150000	66x105	6	6	28.4	28.9	ALS3 - - 154MF025
	220000	91x67	9	8	21.9	22.6	ALS3 - - 224RC025
	220000	91x75	12	12	18.7	18.8	ALS3 - - 224RD025
	220000	77x105	6	6	28.1	30.8	ALS3 - - 224NF025
	330000	91x98	8	8	26.4	26.5	ALS3 - - 334RH025
	330000	77x146	5	5	37.3	39.6	ALS3 - - 334NP025
	470000	91x146	4	4	43.6	43.9	ALS3 - - 474RP025
	470000	77x220	4	4	45.8	47.0	ALS3 - - 474NT025
	680000	91x220	4	4	55.4	56.7	ALS3 - - 684RT025
40V d.c. (46V surge)	10000	36x52	23	20	7.9	8.4	ALS3 - - 103DA040
	15000	36x62	17	14	9.5	10.0	ALS3 - - 153DB040
	22000	36x82	11	10	12.7	13.3	ALS3 - - 223DE040
	33000	51x82	12	11	14.2	16.7	ALS3 - - 333KE040
	47000	51x82	12	11	14.2	16.7	ALS3 - - 473KE040
	68000	51x105	10	9	18.0	20.6	ALS3 - - 683KF040
	100000	77x75	13	12	16.4	16.5	ALS3 - - 104ND040
	100000	66x105	7	6	26.3	26.6	ALS3 - - 104MF040
	100000	91x67	8	7	23.0	24.8	ALS3 - - 104RC040
	100000	91x75	10	10	20.3	20.4	ALS3 - - 104RD040
	150000	77x105	8	8	26.8	30.2	ALS3 - - 154NF040
	150000	91x98	7	7	28.6	28.9	ALS3 - - 154RH040
	220000	77x146	6	5	35.4	39.6	ALS3 - - 224NP040
	220000	91x146	4	4	46.5	47.0	ALS3 - - 224RP040
	330000	77x220	4	4	45.0	46.5	ALS3 - - 334NT040
	470000	91x220	4	4	52.3	53.4	ALS3 - - 474RT040
63V d.c. (72.5V surge)	4700	36x52	36	28	6.7	7.4	ALS3 - - 472DA063
	6800	36x62	26	20	8.2	9.0	ALS3 - - 682DB063
	10000	36x82	17	14	10.8	11.9	ALS3 - - 103DE063
	15000	36x105	15	8	10.9	14.4	ALS3 - - 153DF063
	15000	51x82	12	11	13.9	14.4	ALS3 - - 153KE063
	22000	51x82	12	11	13.9	14.4	ALS3 - - 223KE063
	33000	51x105	10	9	17.4	18.0	ALS3 - - 333KF063
	47000	77x75	13	13	16.6	16.8	ALS3 - - 473ND063
	47000	66x105	8	7	26.7	26.5	ALS3 - - 473MF063
	47000	91x75	11	10	20.3	20.7	ALS3 - - 473RD063
	68000	91x67	10	9	20.9	22.4	ALS3 - - 683RC063
	68000	77x105	8	8	24.7	26.4	ALS3 - - 683NF063
	68000	91x98	8	7	28.9	29.6	ALS3 - - 683RH063
	100000	77x146	6	6	34.8	35.4	ALS3 - - 104NP063
	150000	91x146	5	5	40.2	40.7	ALS3 - - 154RP063
	150000	77x220	4	4	43.3	45.1	ALS3 - - 154NT063
220000	91x220	4	4	52.4	54.3	ALS3 - - 224RT063	

Ordering information

For full ordering details see pages 54 & 55.


Mounting Style 0 or 1 

Termination Style A,B,C,F,G,J,M or R 

Screw Terminal Capacitors

ALS30/31

Rated voltage d.c.	Cap (μ F)	Case Size (mm)	ESR ($m\Omega$) at 20 °C 100Hz (max)	Impedance ($m\Omega$) at 20 °C 10 KHz (max)	Ripple current (A) at 85 °C		Type number
					100 Hz	10 KHz	
100V d.c. (115V surge)	2200	36x52	69	55	4.9	5.4	ALS3 - - 222DA100
	3300	36x62	49	39	6.0	6.6	ALS3 - - 332DB100
	4700	36x82	33	27	7.9	8.8	ALS3 - - 472DE100
	6800	36x105	23	19	10.0	11.1	ALS3 - - 682DF100
	10000	51x82	28	24	10.1	10.5	ALS3 - - 103KE100
	15000	51x105	20	18	12.6	13.1	ALS3 - - 153KF100
	22000	77x75	25	24	12.0	12.2	ALS3 - - 223ND100
	22000	66x105	13	12	18.4	19.1	ALS3 - - 223MF100
	22000	91x67	15	13	18.9	20.9	ALS3 - - 223RC100
	22000	91x75	21	20	14.7	15.0	ALS3 - - 223RD100
	33000	77x105	15	14	17.6	19.0	ALS3 - - 333NF100
	33000	91x98	13	12	20.8	21.2	ALS3 - - 333RH100
	47000	77x146	10	9	25.2	25.7	ALS3 - - 473NP100
	68000	91x146	9	8	29.4	29.8	ALS3 - - 683RP100
	68000	77x220	7	6	40.6	41.5	ALS3 - - 683NT100
	100000	91x220	6	5	30.8	33.3	ALS3 - - 104RT100
200V d.c. (230V surge)	470	36x52	286	227	2.6	4.3	ALS3 - - 471DA200
	680	36x62	199	158	3.9	5.4	ALS3 - - 681DB200
	1000	36x82	135	107	5.1	7.1	ALS3 - - 102DE200
	1500	36x105	90	72	5.6	9.1	ALS3 - - 152DF200
	2200	51x82	73	60	8.2	9.7	ALS3 - - 222KE200
	3300	51x105	48	40	9.2	13.1	ALS3 - - 332KF200
	4700	77x75	48	42	10.6	11.5	ALS3 - - 472ND200
	4700	66x105	33	27	13.0	19.1	ALS3 - - 472MF200
	6800	66x105	27	23	15.7	17.7	ALS3 - - 682MF200
	6800	91x67	38	29	13.7	18.5	ALS3 - - 682RC200
	6800	91x75	35	31	13.3	14.3	ALS3 - - 682RD200
	10000	77x105	28	25	14.9	15.9	ALS3 - - 103NF200
	10000	91x98	23	20	18.8	20.3	ALS3 - - 103RH200
	15000	77x146	18	16	21.4	22.7	ALS3 - - 153NP200
	22000	91x146	13	12	26.7	28.0	ALS3 - - 223RP200
	22000	77x220	11	9	36.1	38.7	ALS3 - - 223NT200
33000	91x220	10	9	42.2	44.8	ALS3 - - 333RT200	
250V d.c. (287V surge)	470	36x52	247	187	3.0	4.5	ALS3 - - 471DA250
	680	36x62	172	131	3.8	5.6	ALS3 - - 681DB250
	1000	36x82	117	89	5.0	7.4	ALS3 - - 102DE250
	1500	51x82	86	67	6.2	9.8	ALS3 - - 152KE250
	2200	51x82	69	55	7.7	9.1	ALS3 - - 222KE250
	3300	51x105	45	36	10.4	12.4	ALS3 - - 332KF250
	3300	77x75	52	43	10.4	11.9	ALS3 - - 332ND250
	4700	66x105	31	24	15.0	18.2	ALS3 - - 472MF250
	4700	91x75	38	32	13.2	14.9	ALS3 - - 472RD250
	6800	91x67	35	27	13.5	17.7	ALS3 - - 682RC250
	6800	77x105	29	25	15.0	16.5	ALS3 - - 682NF250
	10000	91x98	24	21	17.1	18.4	ALS3 - - 103RH250
	10000	77x146	19	16	21.6	24.0	ALS3 - - 103NP250
	15000	91x146	14	12	27.0	29.5	ALS3 - - 153RP250
	15000	77x220	12	10	32.4	36.5	ALS3 - - 153NT250
	22000	77x220	9	7	36.3	45.8	ALS3 - - 223NT250
22000	91x220	12	10	42.3	47.4	ALS3 - - 223RT250	

Mounting Style 0 or 1 
Termination Style A,B,C,F,G,J,M or R 

Ordering information

For full ordering details see pages 54 & 55.

ALS30/31

Rated voltage d.c.	Cap (μ F)	Case Size (mm)	ESR ($m\Omega$) at 20 °C 100Hz (max)	Impedance ($m\Omega$) at 20 °C 10 KHz (max)	Ripple current (A) at 85 °C		Type number
					100 Hz	10 KHz	
350V d.c. (385V surge)	330	36x52	325	226	2.4	5.0	ALS3 - - 331DA350
	470	36x82	223	154	3.4	7.2	ALS3 - - 471DE350
	680	36x105	154	107	4.4	9.0	ALS3 - - 681DF350
	1000	51x82	116	82	6.1	10.6	ALS3 - - 102KE350
	1500	51x105	77	55	8.2	13.5	ALS3 - - 152KF350
	2200	51x105	66	48	8.7	14.1	ALS3 - - 222KF350
	2200	77x75	66	50	9.1	15.6	ALS3 - - 222ND350
	2200	66x105	52	37	11.9	19.3	ALS3 - - 222MF350
	3300	66x105	39	29	12.8	20.3	ALS3 - - 332MF350
	3300	91x67	49	34	11.8	18.0	ALS3 - - 332RC350
	3300	91x75	47	36	12.5	19.8	ALS3 - - 332RD350
	4700	77x105	35	27	14.7	21.7	ALS3 - - 472NF350
	4700	91x98	31	24	16.3	26.6	ALS3 - - 472RH350
	6800	77x146	23	18	19.3	26.0	ALS3 - - 682NP350
	6800	91x146	20	15	24.9	34.4	ALS3 - - 682RP350
	10000	77x220	15	11	31.7	39.3	ALS3 - - 103NT350
	15000	91x220	15	12	38.2	46.4	ALS3 - - 153RT350
400V d.c. (440V surge)	220	36x52	570	387	2.1	4.4	ALS3 - - 221DA400
	330	36x62	382	260	2.7	5.5	ALS3 - - 331DB400
	470	36x82	267	182	3.5	7.1	ALS3 - - 471DE400
	680	36x105	185	126	4.4	8.8	ALS3 - - 681DF400
	1000	51x82	139	98	5.8	10.3	ALS3 - - 102KE400
	1500	51x105	92	65	7.8	13.1	ALS3 - - 152KF400
	1500	77x75	97	70	8.3	14.7	ALS3 - - 152ND400
	2200	51x105	78	56	8.4	13.5	ALS3 - - 222KF400
	2200	66x105	62	44	11.2	18.8	ALS3 - - 222MF400
	2200	91x75	69	50	10.7	18.9	ALS3 - - 222RD400
	3300	91x67	53	38	11.7	17.1	ALS3 - - 332RC400
	3300	77x105	49	36	13.4	21.3	ALS3 - - 332NF400
	3300	91x98	45	32	14.9	25.3	ALS3 - - 332RH400
	4700	77x105	38	26	14.6	20.9	ALS3 - - 472NF400
	4700	91x98	36	26	17.1	25.4	ALS3 - - 472RH400
	4700	77x146	33	24	18.0	26.0	ALS3 - - 472NP400
	6800	77x146	27	20	19.5	26.9	ALS3 - - 682NP400
6800	91x146	24	17	23.2	32.9	ALS3 - - 682RP400	
6800	77x220	22	15	29.0	40.7	ALS3 - - 682NT400	
10000	91x220	17	12	35.7	49.4	ALS3 - - 103RT400	
415V d.c. (456V surge)	220	36x52	555	368	2.1	4.4	ALS3 - - 221DA415
	330	36x62	372	247	2.7	5.6	ALS3 - - 331DB415
	470	36x82	261	173	3.5	7.2	ALS3 - - 471DE415
	680	36x105	180	120	4.5	9.0	ALS3 - - 681DF415
	1000	51x82	136	94	5.7	10.4	ALS3 - - 102KE415
	1500	51x105	90	62	7.6	13.1	ALS3 - - 152KF415
	1500	77x75	96	68	8.1	14.7	ALS3 - - 152ND415
	2200	66x105	61	42	11.0	18.9	ALS3 - - 222MF415
	2200	91x67	71	49	10.5	17.5	ALS3 - - 222RC415
	2200	91x75	68	49	11.1	18.9	ALS3 - - 222RD415
	3300	77x105	48	36	13.4	21.3	ALS3 - - 332NF415
	3300	91x98	45	32	14.6	25.3	ALS3 - - 332RH415
	4700	77x146	33	24	17.6	25.9	ALS3 - - 472NP415
	6800	91x146	23	17	22.7	32.8	ALS3 - - 682RP415
	6800	77x220	21	15	28.5	40.1	ALS3 - - 682NT415
	10000	91x220	17	12	35.2	48.7	ALS3 - - 103RT415

Mounting Style 0 or 1 
Termination Style A,B,C,F,G,J,M or R 



Ordering information

For full ordering details see pages 54 & 55.

Screw Terminal Capacitors

ALS30/31

Rated voltage d.c.	Cap (μ F)	Case Size (mm)	ESR ($m\Omega$) at 20 °C 100Hz (max)	Impedance ($m\Omega$) at 20 °C 10 KHz (max)	Ripple current (A) at 85 °C		Type number	
					100 Hz	10 KHz		
450V d.c. (495V surge)	150	36x52	735	485	1.8	4.1	ALS3 - - 151DA450	
	220	36x62	502	332	2.4	5.1	ALS3 - - 221DB450	
	330	36x82	335	221	3.1	6.7	ALS3 - - 331DE450	
	470	36x105	235	155	4.0	8.4	ALS3 - - 471DF450	
	680	51x82	175	117	4.9	9.9	ALS3 - - 681KE450	
	1000	51x105	118	79	6.5	12.6	ALS3 - - 102KF450	
	1500	77x75	95	65	8.7	14.9	ALS3 - - 152ND450	
	1500	66x105	81	52	9.5	17.4	ALS3 - - 152MF450	
	2200	91x67	74	46	9.6	15.4	ALS3 - - 222RC450	
	2200	91x75	67	47	11.5	19.0	ALS3 - - 222RD450	
	2200	66x105	67	47	11.1	19.3	ALS3 - - 222MF450	
	2200	77x105	59	41	12.2	21.1	ALS3 - - 222NF450	
	3300	91x75	53	33	12.6	17.9	ALS3 - - 332RD450	
	3300	77x105	40	30	13.8	21.2	ALS3 - - 332NF450	
	3300	91x98	44	30	15.6	25.5	ALS3 - - 332RH450	
	3300	77x146	39	27	16.1	25.1	ALS3 - - 332NP450	
	4700	77x146	36	26	17.1	25.2	ALS3 - - 472NP450	
	4700	91x146	29	19	21.0	31.8	ALS3 - - 472RP450	
	6800	77x220	21	14	27.4	38.8	ALS3 - - 682NT450	
	10000	91x220	18	13	33.4	46.5	ALS3 - - 103RT450	
500V d.c. (550V surge)	100	36x52	1231	847	1.6	2.9	ALS3 - - 101DA500	
	150	36x62	823	566	2.0	3.7	ALS3 - - 151DB500	
	220	36x82	560	386	2.7	4.8	ALS3 - - 221DE500	
	330	36x82	450	350	3.2	5.7	ALS3 - - 331DE500	
	330	36x105	374	258	3.5	6.2	ALS3 - - 331DF500	
	470	51x82	276	194	4.4	7.5	ALS3 - - 471KE500	
	680	51x105	190	133	5.7	9.6	ALS3 - - 681KF500	
	1000	77x75	173	109	7.6	12.2	ALS3 - - 102ND500	
	1000	66x105	137	96	8.1	13.8	ALS3 - - 102MF500	
	1500	77x105	91	65	10.6	17.0	ALS3 - - 152NF500	
	1500	91x67	110	87	9.5	14.3	ALS3 - - 152RC500	
	1500	91x75	119	76	10.1	15.9	ALS3 - - 152RD500	
	2200	91x98	80	50	13.7	21.1	ALS3 - - 222RH500	
	2200	77x146	62	44	14.3	21.8	ALS3 - - 222NP500	
	3300	77x146	54	39	15.3	22.6	ALS3 - - 332NP500	
	3300	91x146	51	32	19.0	28.3	ALS3 - - 332RP500	
	4700	77x220	37	24	24.3	33.3	ALS3 - - 472NT500	
	6800	91x220	27	22	26.5	41.3	ALS3 - - 682RT500	
	550V d.c. (605V surge)	68	36x52	2178	1665	0.9	1.3	ALS3 - - 680DA550
		150	36x82	988	757	1.4	2.3	ALS3 - - 151DE550
220		36x105	674	500	2.0	2.9	ALS3 - - 221DF550	
330		51x82	458	330	3.0	3.4	ALS3 - - 331KE550	
470		51x105	321	248	3.9	4.4	ALS3 - - 471KF550	
680		77x75	230	173	4.5	6.0	ALS3 - - 681ND550	
680		66x105	221	170	5.4	6.3	ALS3 - - 681MF550	
1000		66x105	154	120	5.8	7.5	ALS3 - - 102MF550	
1200		77x105	130	99	7.7	9.0	ALS3 - - 122NF550	
1500		77x146	103	80	9.0	11.4	ALS3 - - 152NP550	
1800		77x146	87	68	11.0	12.2	ALS3 - - 182NP550	
2200		77x220	70	55	13.9	17.3	ALS3 - - 222NT550	
3300		77x220	48	40	16.5	20.2	ALS3 - - 332NT550	
600V d.c. (640V surge)		68	36x52	2772	1662	0.7	1.3	ALS3 - - 680DA600
		100	36x62	1886	1131	0.9	1.6	ALS3 - - 101DB600
	150	36x82	1257	754	1.3	2.1	ALS3 - - 151DE600	
	220	36x105	858	514	1.6	2.8	ALS3 - - 221DF600	
	220	51x82	862	519	2.1	3.5	ALS3 - - 221KE600	
	470	51x105	407	246	3.3	5.5	ALS3 - - 471KF600	
	680	66x105	281	170	4.7	7.8	ALS3 - - 681MF600	
	680	77x75	290	179	4.4	7.0	ALS3 - - 681ND600	
	1000	77x105	194	119	6.2	10.0	ALS3 - - 102NF600	
	1500	77x146	130	79	8.7	14.0	ALS3 - - 152NP600	
	2200	77x220	88	53	13.5	18.3	ALS3 - - 222NT600	

Mounting Style 0 or 1 
Termination Style A,B,C,F,G,J,M or R 

Ordering information

For full ordering details see pages 54 & 55.

ALS40/41

Rated voltage d.c.	Cap (μ F)	Case Size (mm)	ESR ($m\Omega$) at 20 °C 100Hz (max)	Impedance ($m\Omega$) at 20 °C 10 KHz (max)	Ripple current (A) at 105 °C		Type number
					100 Hz	10 KHz	
10V d.c. (11.5V surge)	33000	36x52	22	19	7.1	7.5	ALS4 - - 333DA010
	47000	36x62	16	14	8.6	9.0	ALS4 - - 473DB010
	68000	36x82	11	10	11.5	12.0	ALS4 - - 683DE010
	100000	36x105	8	7	14.5	15.1	ALS4 - - 104DF010
	150000	51x82	12	11	12.3	12.4	ALS4 - - 154KE010
	220000	51x105	8	8	16.8	17.0	ALS4 - - 224KF010
	330000	77x75	13	12	14.1	14.1	ALS4 - - 334ND010
	330000	66x105	6	6	24.4	24.7	ALS4 - - 334MF010
	330000	91x67	8	8	19.2	19.7	ALS4 - - 334RC010
	470000	91x75	11	11	16.4	16.5	ALS4 - - 474RD010
	470000	77x105	7	7	23.1	23.2	ALS4 - - 474NF010
	680000	91x98	7	7	23.5	23.6	ALS4 - - 684RH010
	680000	77x146	5	5	27.4	27.8	ALS4 - - 684NP010
	1000000	91x146	4	4	38.3	38.5	ALS4 - - 105RP010
	1000000	77x220	4	4	37.8	38.3	ALS4 - - 105NT010
	1500000	91x220	4	4	45.5	46.0	ALS4 - - 155RT010
	16V d.c. (18.4V surge)	22000	36x52	24	20	7.0	7.4
33000		36x62	17	14	8.5	8.9	ALS4 - - 333DB016
47000		36x82	11	10	11.3	11.9	ALS4 - - 473DE016
68000		36x105	9	8	14.3	15.0	ALS4 - - 683DF016
100000		51x82	12	11	12.3	12.5	ALS4 - - 104KE016
150000		51x105	8	8	16.7	17.0	ALS4 - - 154KF016
220000		77x75	12	12	14.2	14.3	ALS4 - - 224ND016
220000		66x105	6	6	24.5	24.8	ALS4 - - 224MF016
330000		91x67	8	8	19.2	19.7	ALS4 - - 334RC016
330000		91x75	11	11	16.2	16.2	ALS4 - - 334RD016
330000		77x105	7	7	22.7	22.9	ALS4 - - 334NF016
470000		91x98	8	7	23.4	23.5	ALS4 - - 474RH016
470000		77x146	5	5	32.3	32.6	ALS4 - - 474NP016
680000		91x146	4	4	38.3	38.5	ALS4 - - 684RP016
680000		77x220	4	4	39.6	40.4	ALS4 - - 684NT016
1000000		91x220	4	3	47.8	48.6	ALS4 - - 105RT016
25V d.c. (28.5V surge)		15000	36x52	24	20	6.9	7.3
	22000	36x62	17	15	8.4	8.8	ALS4 - - 223DB025
	33000	36x82	11	10	11.1	11.7	ALS4 - - 333DE025
	47000	36x105	9	8	14.0	14.7	ALS4 - - 473DF025
	68000	51x82	13	12	12.0	12.2	ALS4 - - 683KE025
	100000	51x105	9	8	16.4	16.7	ALS4 - - 104KF025
	150000	77x75	13	13	13.7	13.8	ALS4 - - 154ND025
	150000	66x105	6	6	23.8	24.1	ALS4 - - 154MF025
	150000	91x75	10	10	18.7	18.8	ALS4 - - 154RD025
	220000	91x67	9	8	18.6	19.2	ALS4 - - 224RC025
	220000	77x105	8	7	22.3	22.4	ALS4 - - 224NF025
	330000	91x98	8	8	22.3	22.4	ALS4 - - 334RH025
	330000	77x146	5	5	31.0	31.1	ALS4 - - 334NP025
	470000	91x146	4	4	36.9	37.1	ALS4 - - 474RP025
	470000	77x220	4	4	38.9	39.8	ALS4 - - 474NT025
	680000	91x220	4	3	47.0	48.1	ALS4 - - 684RT025
	40V d.c. (46V surge)	10000	36x52	23	19	6.6	6.9
10000		36x62	19	16	8.1	8.7	ALS4 - - 103DB040
15000		36x82	13	10	10.8	11.6	ALS4 - - 153DE040
22000		36x105	10	8	13.6	14.5	ALS4 - - 223DF040
33000		51x82	13	12	11.7	12.0	ALS4 - - 333KE040
47000		51x105	9	8	16.2	16.6	ALS4 - - 473KF040
68000		77x75	13	13	13.9	14.0	ALS4 - - 683ND040
100000		66x105	7	7	20.6	20.8	ALS4 - - 104MF040
100000		91x67	10	9	17.7	18.5	ALS4 - - 104RC040
100000		91x75	12	11	16.0	16.1	ALS4 - - 104RD040
100000		77x105	7	7	22.4	22.7	ALS4 - - 104NF040
150000		91x98	8	8	22.6	22.8	ALS4 - - 154RH040
150000		77x146	5	5	31.3	31.6	ALS4 - - 154NP040
220000		91x146	4	4	36.8	37.1	ALS4 - - 224RP040
220000		77x220	4	4	37.7	39.2	ALS4 - - 224NT040
330000		91x220	4	4	45.6	47.0	ALS4 - - 334RT040

Ordering information

For full ordering details see pages 54 & 55.

Mounting Style 0 or 1 
Termination Style A,B,C,F,G,J,M or R 



Screw Terminal Capacitors

ALS40/41

Rated voltage d.c.	Cap (μ F)	Case Size (mm)	ESR ($m\Omega$) at 20 °C 100Hz (max)	Impedance ($m\Omega$) at 20 °C 10 KHz (max)	Ripple current (A) at 105 °C		Type number
					100 Hz	10 KHz	
63V d.c. (72.5V surge)	3300	36x52	38	30	5.5	6.2	ALS4 - - 332DA063
	4700	36x62	27	22	6.7	7.5	ALS4 - - 472DB063
	6800	36x82	19	15	8.9	10.0	ALS4 - - 682DE063
	10000	36x105	13	10	11.2	12.6	ALS4 - - 103DF063
	15000	51x82	16	15	10.7	11.2	ALS4 - - 153KE063
	22000	51x105	11	10	14.7	15.3	ALS4 - - 223KF063
	22000	77x75	14	12	14.6	15.1	ALS4 - - 223ND063
	33000	66x105	8	7	21.3	22.2	ALS4 - - 333MF063
	33000	91x67	10	8	18.1	20.1	ALS4 - - 333RC063
	33000	91x75	11	11	17.1	17.5	ALS4 - - 333RD063
	47000	77x105	9	8	20.7	21.1	ALS4 - - 473NF063
	47000	91x98	8	7	24.4	25.1	ALS4 - - 473RH063
	68000	77x146	6	6	29.1	29.8	ALS4 - - 683NP063
	100000	91x146	5	5	34.5	35.2	ALS4 - - 104RP063
	100000	77x220	4	4	36.7	38.8	ALS4 - - 104NT063
	150000	91x220	4	4	44.4	46.5	ALS4 - - 154RT063
100V d.c. (115V surge)	1500	36x52	79	62	3.9	4.5	ALS4 - - 152DA100
	2200	36x62	56	44	4.8	5.5	ALS4 - - 222DB100
	3300	36x82	37	29	6.4	7.4	ALS4 - - 332DE100
	4700	36x105	26	21	8.1	9.3	ALS4 - - 472DF100
	6800	51x82	32	28	8.0	8.4	ALS4 - - 682KE100
	10000	51x105	21	18	10.9	11.5	ALS4 - - 103KF100
	15000	77x75	28	26	9.7	9.9	ALS4 - - 153ND100
	15000	66x105	14	12	15.8	16.7	ALS4 - - 153MF100
	15000	91x75	20	18	12.9	13.4	ALS4 - - 153RD100
	22000	91x67	17	16	14.3	15.2	ALS4 - - 223RC100
	22000	77x105	15	13	15.5	16.0	ALS4 - - 223NF100
	22000	91x98	13	11	18.4	19.0	ALS4 - - 223RH100
	33000	77x146	10	10	21.6	22.2	ALS4 - - 333NP100
	47000	91x146	9	8	25.9	26.5	ALS4 - - 473RP100
	47000	77x220	7	6	35.4	36.6	ALS4 - - 473NT100
	100000	91x220	6	6	37.2	37.9	ALS4 - - 104RT100
200V d.c. (230V surge)	680	36x52	195	154	2.9	4.0	ALS4 - - 681DA200
	680	36x62	188	147	3.3	4.6	ALS4 - - 681DB200
	1000	36x82	128	100	4.3	6.1	ALS4 - - 102DE200
	1500	36x105	86	67	5.6	7.8	ALS4 - - 152DF200
	2200	51x82	71	58	6.8	8.0	ALS4 - - 222KE200
	3300	51x105	47	38	9.1	10.9	ALS4 - - 332KF200
	4700	77x75	48	42	8.7	9.4	ALS4 - - 472ND200
	6800	66x105	27	23	12.9	14.5	ALS4 - - 682MF200
	6800	91x67	37	28	11.8	15.9	ALS4 - - 682RC200
	6800	91x75	36	32	10.9	11.7	ALS4 - - 682RD200
	6800	77x105	29	25	13.4	14.8	ALS4 - - 682NF200
	10000	91x98	23	20	15.4	16.6	ALS4 - - 103RH200
	10000	77x146	19	16	19.3	21.5	ALS4 - - 103NP200
	15000	91x146	14	12	24.2	26.5	ALS4 - - 153RP200
	22000	77x220	11	10	29.5	31.6	ALS4 - - 223NT200
	33000	91x220	10	8	34.3	36.4	ALS4 - - 333RT200
250V d.c. (287V surge)	470	36x52	235	174	2.5	3.9	ALS4 - - 471DA250
	680	36x62	164	122	3.2	4.8	ALS4 - - 681DB250
	1000	36x82	111	83	4.2	6.3	ALS4 - - 102DE250
	1000	36x105	108	79	4.7	7.5	ALS4 - - 102DF250
	1500	51x82	83	64	6.2	8.2	ALS4 - - 152KE250
	2200	51x105	56	42	8.3	11.1	ALS4 - - 222KF250
	3300	77x75	52	42	8.5	9.7	ALS4 - - 332ND250
	4700	66x105	30	24	12.3	15.0	ALS4 - - 472MF250
	4700	91x67	42	30	10.9	16.3	ALS4 - - 472RC250
	4700	91x75	38	32	10.7	12.1	ALS4 - - 472RD250
	6800	77x105	30	25	12.1	13.4	ALS4 - - 682NF250
	6800	91x98	25	20	15.1	17.3	ALS4 - - 682RH250
	10000	77x146	19	16	17.5	19.5	ALS4 - - 103NP250
	15000	91x146	14	12	21.9	23.9	ALS4 - - 153RP250
	15000	77x220	12	10	29.2	33.0	ALS4 - - 153NT250
	22000	91x220	11	9	34.1	38.2	ALS4 - - 223RT250

Ordering information

For full ordering details see pages 54 & 55.

Mounting Style 0 or 1 
Termination Style A,B,C,F,G,J,M or R 

ALS40/41

Rated voltage d.c.	Cap (μ F)	Case Size (mm)	ESR ($m\Omega$) at 20 °C 100Hz (max)	Impedance ($m\Omega$) at 20 °C 10 KHz (max)	Ripple current (A) at 105 °C		Type number
					100 Hz	10 KHz	
350V d.c. (385V surge)	220	36x52	457	303	1.8	4.5	ALS4 - - 221DA350
	330	36x62	307	204	2.4	5.7	ALS4 - - 331DB350
	470	36x82	215	143	3.0	7.2	ALS4 - - 471DE350
	680	36x105	149	99	3.9	8.9	ALS4 - - 681DF350
	1000	51x82	113	78	5.0	10.0	ALS4 - - 102KE350
	1500	51x105	75	52	6.8	12.5	ALS4 - - 152KF350
	2200	77x75	66	49	8.3	13.7	ALS4 - - 222ND350
	2200	66x105	51	35	9.8	17.9	ALS4 - - 222MF350
	2200	91x67	74	52	9.1	16.4	ALS4 - - 222RC350
	2200	91x75	56	40	9.4	17.8	ALS4 - - 222RD350
	3300	77x105	41	30	11.7	19.7	ALS4 - - 332NF350
	4700	91x98	31	23	14.6	23.2	ALS4 - - 472RH350
	4700	77x146	27	20	15.7	23.6	ALS4 - - 472NP350
	6800	91x146	19	14	20.3	29.7	ALS4 - - 682RP350
	6800	77x220	23	17	25.4	35.7	ALS4 - - 682NT350
	10000	91x220	21	16	31.0	42.7	ALS4 - - 103RT350
400V d.c. (440V surge)	220	36x52	542	349	2.0	4.9	ALS4 - - 221DA400
	220	36x62	537	344	2.1	5.4	ALS4 - - 221DB400
	470	36x82	254	164	3.2	7.8	ALS4 - - 471DE400
	470	36x105	251	161	3.5	8.5	ALS4 - - 471DF400
	680	51x82	183	121	4.2	9.8	ALS4 - - 681KE400
	1000	51x105	124	81	5.6	12.3	ALS4 - - 102KF400
	1500	77x75	93	64	7.6	13.9	ALS4 - - 152ND400
	2200	66x105	60	41	9.7	18.1	ALS4 - - 222MF400
	2200	91x67	63	44	9.4	15.9	ALS4 - - 222RC400
	2200	91x75	67	47	10.0	17.5	ALS4 - - 222RD400
	2200	77x105	62	42	10.6	19.8	ALS4 - - 222NF400
	3300	91x98	44	31	13.6	23.4	ALS4 - - 332RH400
	4700	77x146	33	23	15.4	22.6	ALS4 - - 472NP400
	6800	91x146	23	17	20.0	28.3	ALS4 - - 682RP400
	6800	77x220	21	15	23.5	33.3	ALS4 - - 682NT400
	10000	91x220	18	14	29.0	40.3	ALS4 - - 103RT400
415V d.c. (456V surge)	220	36x52	530	331	2.0	5.0	ALS4 - - 221DA415
	220	36x62	524	325	2.1	5.4	ALS4 - - 221DB415
	330	36x82	349	217	2.8	7.1	ALS4 - - 331DE415
	470	36x105	245	152	3.5	8.7	ALS4 - - 471DF415
	680	51x82	180	115	4.4	9.9	ALS4 - - 681KE415
	1000	51x105	122	77	5.8	12.3	ALS4 - - 102KF415
	1500	77x75	95	65	7.6	13.8	ALS4 - - 152ND415
	2200	66x105	60	39	9.7	18.1	ALS4 - - 222MF415
	2200	91x67	61	43	9.4	15.8	ALS4 - - 222RC415
	2200	91x75	67	47	10.0	17.3	ALS4 - - 222RD415
	2200	77x105	61	41	10.7	19.7	ALS4 - - 222NF415
	3300	91x98	44	30	13.6	23.3	ALS4 - - 332RH415
	3300	77x146	40	27	14.2	23.6	ALS4 - - 332NP415
	4700	91x146	29	19	18.5	29.8	ALS4 - - 472RP415
	6800	77x220	21	14	23.0	32.5	ALS4 - - 682NT415
	10000	91x220	18	14	28.3	39.3	ALS4 - - 103RT415
450V d.c. (495V surge)	150	36x52	721	360	1.8	4.5	ALS4 - - 151DA450
	150	36x62	715	356	1.9	4.8	ALS4 - - 151DB450
	220	36x82	487	242	2.5	6.2	ALS4 - - 221DE450
	330	36x105	325	162	3.2	7.9	ALS4 - - 331DF450
	470	51x82	239	123	4.1	9.0	ALS4 - - 471KE450
	680	51x105	164	84	5.3	11.3	ALS4 - - 681KF450
	1000	77x75	125	69	7.0	13.2	ALS4 - - 102ND450
	1500	66x105	79	42	8.9	17.1	ALS4 - - 152MF450
	1500	91x67	78	57	8.7	15.3	ALS4 - - 152RC450
	1500	91x75	87	49	9.3	16.7	ALS4 - - 152RD450
	1500	77x105	80	43	9.8	18.7	ALS4 - - 152NF450
	2200	91x98	58	32	12.5	22.5	ALS4 - - 222RH450
	2200	77x146	54	29	13.1	22.9	ALS4 - - 222NP450
	3300	77x146	38	27	14.6	22.0	ALS4 - - 332NP450
	3300	91x146	37	20	17.4	28.9	ALS4 - - 332RP450
	4700	77x220	27	15	21.9	32.0	ALS4 - - 472NT450
6800	91x220	19	15	23.5	39.2	ALS4 - - 682RT450	

Ordering information



For full ordering details see pages 54 & 55.

Mounting Style 0 or 1 Termination Style A,B,C,F,G,J,M or R 

Screw Terminal Capacitors

ALS40/41

Rated voltage d.c.	Cap (μ F)	Case Size (mm)	ESR ($m\Omega$) at 20 °C		Impedance ($m\Omega$) at 20 °C		Ripple current (A) at 105 °C		Type number
			100Hz (max)	10 KHz (max)	100 Hz	10 KHz			
500V d.c. (550V surge)	100	36x52	1499	1135	0.9	1.4	ALS4 - - 101DA500		
	150	36x62	1002	758	1.1	1.8	ALS4 - - 151DB500		
	220	36x82	683	500	1.5	2.4	ALS4 - - 221DE500		
	330	36x105	456	347	1.9	3.1	ALS4 - - 331DF500		
	470	51x82	332	240	2.9	4.0	ALS4 - - 471KE500		
	680	51x105	228	170	3.8	5.1	ALS4 - - 681KF500		
	680	77x75	234	173	4.2	5.8	ALS4 - - 681ND500		
	680	91x67	242	201	4.9	6.3	ALS4 - - 681RC500		
	1000	66x105	155	117	5.5	7.4	ALS4 - - 102MF500		
	1000	91x75	161	119	5.6	7.8	ALS4 - - 102RD500		
	1500	77x105	110	81	6.9	9.5	ALS4 - - 152NF500		
	1500	91x98	107	79	7.8	10.6	ALS4 - - 152RH500		
	2200	77x146	74	57	9.7	12.7	ALS4 - - 222NP500		
	3300	91x146	51	40	13.0	16.8	ALS4 - - 332RP500		
	3300	77x220	49	39	15.4	19.4	ALS4 - - 332NT500		

Mounting Style 0 or 1 ^{**}
Termination Style A,B,C,F,G,J,M or R 

Ordering information

For full ordering details see pages 54 & 55.