

# ALS20/21 SERIES

## Screw Terminals - Plain and Stud Mountings

This range of professional grade components offers high levels of reliability and performance with outstanding high frequency characteristics. Their low levels of e.s.r. and impedance are ideally suited to high efficiency power supply and inverter applications.

**Capacitance range** ..... 68 $\mu$ F to 330,000 $\mu$ F

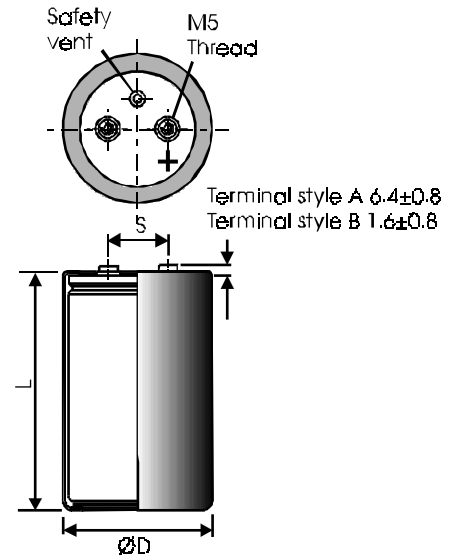
**Capacitance tolerance** ..... -10% +50%

**Voltage range** ..... 6.3V to 450V d.c.

**Temperature range** ..... -55°C to +85°C

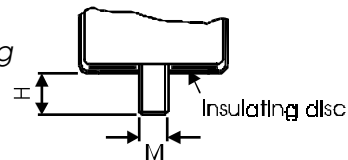
**Case sizes** ..... 35 x 52mm to 76 x 140mm

### ALS20



### ALS21

#### Stud Mounting



### DIMENSIONS (sleeved) mm

CASE CODE	D +2-1	L ±2	S ±0.5	M THREAD	H ±1	MOUNTING CLIP
DA	35	52	12.7	M8	12	V3/H2/UTE2736
DB	35	62	12.7	M8	12	V3/H2/UTE2736
DD	35	75	12.7	M8	12	V3/H2/UTE2736
DF	35	105	12.7	M8	12	V3/H2/UTE2736
KB	50	62	22.2	M12	16	V4/UTE2737
KD	50	75	22.2	M12	16	V4/UTE2737
KF	50	105	22.2	M12	16	V4/UTE2737
KJ	50	115	22.2	M12	16	V4/UTE2737
MF	65	105	28.5	M12	16	V10/UTE2738
MJ	65	115	28.5	M12	16	V10/UTE2738
NF	76	105	31.7	M12	16	V11
NJ	76	115	31.7	M12	16	V11
NN	76	140 (±3)	31.7	M12	16	V11

### Terminations

Aluminium inserts with M5 threads as standard, max torque 2NM. Max torque for stud M8:4NM/M12:8NM.

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## TECHNICAL DATA

### Related documents

CECC 30301-026  
DIN 41240 & 41248  
IEC 384-4

### Temperature range

Storage -65°C to +85°C  
Operating -55°C to +85°C  
Environmental classification 55/085/56

### Surge voltage

1000 surges (30 seconds) at 85°C with surge voltage applied. See electrical characteristics.

### Charge/discharge

10<sup>6</sup> 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  $(0.003 C_R U_R + 4) \mu\text{A}$  where  $C_R$  is the rated capacitance in  $\mu\text{F}$  and  $U_R$  is the rated d.c. voltage.

### Vibration

10Hz to 55Hz at 0.75mm or 10g for 3x2hrs duration.

### Insulation resistance

> 100M $\Omega$  at 100V d.c., across insulating sleeve.

### Voltage proof

$\geq 2500\text{V}$  d.c., across insulating sleeve.  
See 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 Aerovox.

#### FREQUENCY CORRECTION

Capacitors shall withstand the rated r.m.s. ripple current as given in the tables 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

For ambient temperature other than 85°C the following correction factors should be employed.

AMBIENT TEMPERATURE	FACTOR
30°C	2.5
50°C	2.1
70°C	1.6
85°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 (mm)	LIFE EXPECTANCY (hours)
35	10000
50	23000
65	27000
76	28000

### Mounting

Any position but refer to mounting section on page 9. For details of mounting clips and stud mounting kits see page 68/69.

### 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  $\mu\text{F}$
2. Rated voltage d.c.
3. Polarity of terminations
4. Tolerance on rated capacitance
5. Date code/Batch code
6. BHC part number
7. Environmental classification

### Ordering information

For details of ordering see page 70.

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Rated voltage	Cap $\mu$ F	Case Size	ESR m $\Omega$ at 20°C		Impedance m $\Omega$ at 20 °C, 10 KHz	Ripple current A at 85°C		Type number (Excluding style ref)
			100Hz	10KHz		100 Hz	10 KHz	
6.3V d.c. (7.2V surge)	10000	35x52	34.0	33.0	34.0	5.9	6.4	ALS2--103DA6R3
	15000	35x52	33.0	32.0	32.0	6.1	6.6	ALS2--153DA6R3
	22000	35x62	26.0	22.0	22.0	7.5	8.1	ALS2--223DB6R3
	33000	35x75	16.0	14.0	14.0	9.4	10.1	ALS2--333DD6R3
	47000	35x105	12.0	14.0	10.0	14.0	15.1	ALS2--473DF6R3
	47000	50x62	13.0	12.0	12.0	12.1	13.0	ALS2--473KB6R3
	68000	50x75	11.0	9.5	9.5	14.7	16.0	ALS2--683KD6R3
	100000	50x105	8.0	7.5	8.0	21.5	23.3	ALS2--104KF6R3
	100000	50x115	8.0	7.0	7.0	23.7	25.8	ALS2--104KJ6R3
	150000	65x105	7.5	7.0	7.0	25.4	27.4	ALS2--154MF6R3
	150000	65x115	7.5	7.0	7.0	27.6	30.1	ALS2--154MJ6R3
	220000	65x105	8.0	7.5	7.5	25.4	27.4	ALS2--224MF6R3
	220000	76x115	7.5	7.5	7.0	30.3	33.1	ALS2--224NJ6R3
	330000	76x140	7.5	6.5	6.5	37.0	40.0	ALS2--334NN6R3
10V d.c. (11.5V surge)	6800	35x52	38.0	31.0	32	5.7	6.3	ALS2--682DA010
	10000	35x52	34.0	26.5	27	6.0	6.5	ALS2--103DA010
	15000	35x62	24.0	19.0	20	7.4	8.1	ALS2--153DB010
	22000	35x75	20.0	17.5	18	9.3	10.0	ALS2--223DD010
	33000	35x105	15.0	12.0	13	13.8	15.0	ALS2--333DF010
	33000	50x62	15.0	12.0	13	12.0	12.9	ALS2--333KB010
	47000	50x75	11.0	10.0	10	14.6	15.8	ALS2--473KD010
	68000	50x105	9.0	8.0	8	21.2	22.8	ALS2--683KF010
	68000	50x115	8.5	7.5	8	23.2	25.2	ALS2--683KJ010
	100000	50x105	8.5	7.5	8	21.2	23.3	ALS2--104KF010
	100000	65x115	8.0	7.0	8	27.6	29.4	ALS2--104MJ010
	150000	65x105	8.0	8.0	8	25.4	27.4	ALS2--154MF010
	150000	76x115	9.0	8.0	9	30.3	32.3	ALS2--154NJ010
	220000	76x140	7.5	6.5	7	36.7	39.9	ALS2--224NN010
16V d.c. (18.4V surge)	4700	35x52	43.0	34.0	34	5.3	5.9	ALS2--472DA016
	6800	35x52	43.0	32.0	34	5.5	6.0	ALS2--682DA016
	10000	35x62	30.0	22.5	25	6.8	7.4	ALS2--103DB016
	15000	35x75	19.0	14.0	15	8.4	9.2	ALS2--153DD016
	22000	35x105	14.0	10.0	11	12.5	13.7	ALS2--223DF016
	22000	50x62	15.0	12.0	12	10.9	11.9	ALS2--223KB016
	33000	50x75	12.0	9.5	10	13.4	14.6	ALS2--333KD016
	47000	50x105	9.0	7.2	8	19.3	21.2	ALS2--473KF016
	47000	50x115	9.0	7.0	8	21.3	23.2	ALS2--473KJ016
	68000	65x105	8.0	7.0	8	22.7	24.9	ALS2--683MF016
	68000	65x115	8.0	7.0	8	24.8	27.0	ALS2--683MJ016
	100000	76x105	8.5	7.5	8	25.1	27.5	ALS2--104NF016
	100000	76x115	8.0	7.0	8	27.7	29.7	ALS2--104NJ016
	150000	76x140	7.5	6.5	7	33.5	35.9	ALS2--154NN016
25V d.c. (28.5V surge)	3300	35x52	47.0	34.0	40	5.1	5.8	ALS2--332DA025
	4700	35x52	46.0	32.0	35	5.3	5.9	ALS2--472DA025
	6800	35x62	32.0	22.5	25	6.6	7.3	ALS2--682DB025
	10000	35x75	21.0	14.5	15	8.2	9.1	ALS2--103DD025
	15000	35x105	15.0	10.5	12	12.3	13.5	ALS2--153DF025
	15000	50x62	17.0	12.0	12	10.7	11.8	ALS2--153KB025
	22000	50x75	13.0	9.5	11	13.0	14.4	ALS2--223KD025
	33000	50x105	10.0	7.5	8	19.0	20.8	ALS2--333KF025
	33000	50x115	9.0	7.0	8	20.9	23.2	ALS2--333KJ025
	47000	65x105	8.5	7.0	8	22.4	24.5	ALS2--473MF025
	47000	65x115	8.5	7.0	8	24.4	27.0	ALS2--473MJ025
	68000	76x105	8.5	7.5	8	24.7	27.1	ALS2--683NF025
	68000	76x115	8.0	7.0	8	26.8	29.7	ALS2--683NJ025
	100000	76x140	7.5	6.0	7	32.9	35.9	ALS2--104NN025

Note: Values of E.S.R. and Impedance quoted above are maximum

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Rated voltage	Cap $\mu$ F	Case Size	ESR $m\Omega$ at 20°C		Impedance $m\Omega$ at 20 °C, 10 KHz	Ripple current A at 85°C		Type number (Excluding style ref)
			100Hz	10KHz		100 Hz	10 KHz	
40V d.c. (46V surge)	2200	35x52	55.0	38.0	40	4.9	5.7	ALS2--222DA040
	3300	35x52	48.0	31.0	32	5.2	5.9	ALS2--332DA040
	4700	35x62	31.0	19.5	20	6.4	7.3	ALS2--472DB040
	6800	35x75	26.0	15.5	17	8.0	9.0	ALS2--682DD040
	10000	35x105	16.0	11.0	12	11.9	13.4	ALS2--103DF040
	10000	50x62	18.0	12.5	13	10.3	11.6	ALS2--103KB040
	15000	50x75	15.0	10.0	11	12.6	14.1	ALS2--153KD040
	22000	50x105	11.0	7.5	9	18.3	20.8	ALS2--223KF040
	22000	50x115	10.0	7.0	8	20.0	22.8	ALS2--223KJ040
	33000	65x105	9.5	7.5	8	21.8	24.5	ALS2--333MF040
	33000	65x115	9.0	7.5	8	23.6	26.5	ALS2--333MJ040
	47000	76x105	10.0	9.0	9	24.1	27.1	ALS2--473NF040
	47000	76x115	9.5	8.0	9	26.0	29.2	ALS2--473NJ040
	68000	76x140	9.0	7.0	8	31.6	35.9	ALS2--683NN040
63V d.c. (72V surge)	1500	35x52	76	40.0	50	4.7	5.7	ALS2--152DA063
	2200	35x52	74	42.0	45	4.8	5.8	ALS2--222DA063
	3300	35x62	42	19.5	20	6.0	7.1	ALS2--332DB063
	3300	35x75	32	15.5	16	7.5	8.8	ALS2--332DD063
	4700	35x75	32	15.5	16	7.5	8.9	ALS2--472DD063
	4700	35x105	22	11.0	12	10.9	13.1	ALS2--472DF063
	6800	50x62	23	12.5	13	9.6	11.4	ALS2--682KB063
	6800	50x75	18	10.0	11	11.6	13.9	ALS2--682KD063
	10000	50x105	13	7.5	9	16.8	20.2	ALS2--103KF063
	15000	50x115	12	7.5	8	19.0	22.4	ALS2--153KJ063
	15000	65x105	12	7.5	8	20.2	24.1	ALS2--153MF063
	22000	65x115	11	8.0	9	22.1	26.1	ALS2--223MJ063
	22000	76x105	11	8.5	9	22.4	26.6	ALS2--223NF063
	33000	76x105	11	9.0	10	22.4	26.6	ALS2--333NF063
	33000	76x115	9	8.5	9	24.3	28.7	ALS2--333NJ063
	33000	76x140	11	7.0	8	29.5	35.0	ALS2--333NN063
47000	76x140	9	7.5	8	29.5	35.0	ALS2--473NN063	
100V d.c. (115V surge)	680	35x52	168	78.0	90	3.2	4.3	ALS2--681DA100
	1000	35x52	163	76.0	80	3.5	4.5	ALS2--102DA100
	1500	35x62	107	49.0	50	4.5	5.6	ALS2--152DB100
	1500	35x75	103	45.0	50	5.2	6.8	ALS2--152DD100
	2200	35x75	75	36.0	40	5.6	7.0	ALS2--222DD100
	2200	35x105	71	32.0	35	7.6	10.0	ALS2--222DF100
	3300	50x62	51	25.0	28	7.2	9.0	ALS2--332KB100
	3300	50x75	49	23.0	23	8.4	10.9	ALS2--332KD100
	4700	50x75	37	19.0	20	8.9	11.0	ALS2--472KD100
	4700	50x105	27	14.0	15	11.9	15.5	ALS2--472KF100
	6800	50x115	26	13.5	14	13.8	17.6	ALS2--682KJ100
	6800	65x105	21	12.0	13	15.0	18.8	ALS2--682MF100
	10000	65x105	21	12.0	12	15.5	19.0	ALS2--103MF100
	10000	65x115	20	11.5	12	16.8	20.8	ALS2--103MJ100
	15000	76x105	17	11.5	12	17.2	21.0	ALS2--153NF100
	15000	76x115	17	11.0	11	18.7	22.9	ALS2--153NJ100
15000	76x140	13	9.0	10	22.6	27.8	ALS2--153NN100	
22000	76x140	13	9.0	9	22.8	27.8	ALS2--223NN100	

Note: Values of E.S.R. and Impedance quoted above are maximum

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Rated voltage	Cap $\mu$ F	Case Size	ESR $m\Omega$ at 20°C		Impedance $m\Omega$ at 20 °C, 10 KHz	Ripple current A at 85°C		Type number (Excluding style ref)
			100Hz	10KHz		100 Hz	10 KHz	
160V d.c. (184V surge)	330	35x52	259	95	100	2.7	3.5	ALS2--331DA160
	470	35x52	231	72	80	3.0	3.7	ALS2--471DA160
	680	35x62	158	48	50	3.7	4.6	ALS2--681DB160
	680	35x75	152	42	45	4.4	6.1	ALS2--681DD160
	1000	35x75	132	57	58	4.7	5.7	ALS2--102DD160
	1000	35x105	105	29	32	6.3	8.4	ALS2--102DF160
	1500	50x62	74	24	25	6.1	8.3	ALS2--152KB160
	1500	50x75	71	21	22	7.0	10.0	ALS2--152KD160
	2200	50x75	63	28	28	7.5	9.1	ALS2--222KD160
	2200	50x105	49	15	17	10.0	12.8	ALS2--222KF160
	3300	50x115	36	13	14	11.7	14.7	ALS2--332KJ160
	3300	65x105	27	12	13	12.6	15.4	ALS2--332MF160
	4700	65x115	27	11	12	14.1	17.0	ALS2--472MJ160
	4700	76x105	28	12	13	14.3	17.1	ALS2--472NF160
	6800	76x105	23	12	13	14.5	17.2	ALS2--682NF160
	6800	76x115	22	11	12	15.7	18.7	ALS2--682NJ160
	6800	76x140	20	9	10	19.0	22.8	ALS2--682NN160
	10000	76x140	17	10	10	19.1	22.8	ALS2--103NN160
200V d.c. (230V surge)	220	35x52	530	180	185	2.2	2.9	ALS2--221DA200
	330	35x62	356	121	125	2.8	3.7	ALS2--331DB200
	470	35x75	246	82	85	3.6	4.8	ALS2--471DD200
	680	50x62	115	41	45	4.6	7.1	ALS2--681KB200
	680	50x75	113	48	42	5.0	8.2	ALS2--681KD200
	1000	50x75	117	40	41	5.7	8.1	ALS2--102KD200
	1500	50x105	79	28	30	8.1	10.7	ALS2--152KF200
	1500	50x115	54	20	22	8.6	12.8	ALS2--152KJ200
	2200	65x105	40	17	18	10.7	14.3	ALS2--222MF200
	2200	65x115	39	16	17	11.3	14.5	ALS2--222MJ200
	3300	65x105	40	17	17	11.4	14.3	ALS2--332MF200
	3300	76x105	40	17	17	12.6	15.6	ALS2--332NF200
	3300	76x115	30	14	15	13.5	16.7	ALS2--332NJ200
	4700	76x105	32	15	16	12.9	15.5	ALS2--472NF200
	4700	76x140	29	13	14	16.7	23.6	ALS2--472NN200
6800	76x140	23	12	12	17.0	20.4	ALS2--682NN200	
250V d.c. (287V surge)	150	35x52	870	337	400	1.7	2.2	ALS2--151DA250
	220	35x52	680	271	280	1.9	2.6	ALS2--221DA250
	330	35x62	405	181	200	2.5	3.3	ALS2--331DB250
	470	35x75	237	80	85	3.2	4.7	ALS2--471DD250
	680	50x62	195	86	90	4.1	5.3	ALS2--681KB250
	680	50x75	194	84	86	4.5	6.0	ALS2--681KD250
	1000	50x75	140	83	85	5.1	6.6	ALS2--102KD250
	1500	50x105	90	41	45	7.3	9.4	ALS2--152KF250
	1500	50x115	90	41	45	7.6	10.1	ALS2--152KJ250
	2200	65x105	64	30	32	9.5	12.0	ALS2--222MF250
	2200	65x115	64	30	32	10.1	12.8	ALS2--222MJ250
	3300	65x105	40	17	18	10.2	13.6	ALS2--332MF250
	3300	76x105	46	24	24	11.3	13.6	ALS2--332NF250
	3300	76x115	46	23	24	12.1	14.7	ALS2--332NJ250
	4700	76x105	33	16	17	11.5	14.1	ALS2--472NF250
4700	76x140	32	17	18	14.9	18.0	ALS2--472NN250	
6800	76x140	23	12	13	15.3	18.3	ALS2--682NN250	

Note: Values of E.S.R. and Impedance quoted above are maximum

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Rated voltage	Cap $\mu$ F	Case Size	ESR m $\Omega$ at 20°C		Impedance m $\Omega$ at 20 °C, 10 KHz	Ripple current A at 85°C		Type number (Excluding style ref)
			100Hz	10KHz		100 Hz	10 KHz	
315V d.c. (362V surge)	150	35x52	770	229	310	1.5	2.2	ALS2--151DA315
	220	35x62	545	204	210	2.0	2.8	ALS2--221DB315
	220	35x75	520	198	200	2.2	3.2	ALS2--221DD315
	330	35x75	361	134	140	2.6	3.8	ALS2--331DD315
	330	35x105	350	130	135	3.1	4.6	ALS2--331DF315
	470	50x62	254	95	100	3.3	5.1	ALS2--471KB315
	470	50x75	252	93	100	3.5	5.7	ALS2--471KD315
	680	50x75	177	67	70	4.1	6.5	ALS2--681KD315
	680	50x105	175	65	68	4.9	6.7	ALS2--681KF315
	1000	50x105	120	46	50	5.7	8.5	ALS2--102KF315
	1000	50x115	120	46	50	6.0	9.5	ALS2--102KJ315
	1500	65x105	83	33	35	7.8	11.7	ALS2--152MF315
	1500	65x115	83	33	35	8.2	12.3	ALS2--152MJ315
	2200	76x105	60	26	27	9.6	13.5	ALS2--222NF315
	2200	76x115	59	25	27	10.2	14.3	ALS2--222NJ315
3300	76x140	41	18	19	12.8	17.6	ALS2--332NN315	
350V d.c. (385V surge)	100	35x52	1089	368	400	1.2	2.0	ALS2--101DA350
	150	35x52	710	247	300	1.5	2.4	ALS2--151DA350
	220	35x62	502	174	200	1.9	3.0	ALS2--221DB350
	220	35x75	480	167	200	2.1	3.5	ALS2--221DD350
	330	35x75	291	74	125	2.5	4.9	ALS2--331DD350
	330	35x105	320	112	120	3.0	4.9	ALS2--331DF350
	470	50x62	235	82	85	3.1	5.4	ALS2--471KB350
	470	50x75	158	56	60	3.4	7.0	ALS2--471KD350
	680	50x75	160	58	60	4.0	6.9	ALS2--681KD350
	680	50x105	110	39	40	4.7	9.1	ALS2--681KF350
	1000	50x105	110	40	41	5.5	9.0	ALS2--102KF350
	1000	50x115	110	40	41	5.8	10.0	ALS2--102KJ350
	1500	65x105	77	29	30	7.5	12.2	ALS2--152MF350
	1500	65x115	76	29	30	7.9	12.9	ALS2--152MJ350
	2200	76x105	55	23	24	9.1	14.1	ALS2--222NF350
2200	76x115	55	22	24	9.7	15.0	ALS2--222NJ350	
3300	76x140	38	16	18	12.1	18.2	ALS2--332NN350	
400V d.c. (440V surge)	100	35x52	1750	1199	1200	1.1	1.5	ALS2--101DA400
	150	35x62	1313	797	800	1.5	2.0	ALS2--151DB400
	220	35x75	896	543	550	1.9	2.6	ALS2--221DD400
	330	50x62	600	364	370	2.4	3.3	ALS2--331KB400
	470	50x75	380	256	260	3.1	4.3	ALS2--471KD400
	680	50x115	260	178	180	4.4	6.1	ALS2--681KJ400
	1000	65x115	130	81	90	6.1	9.8	ALS2--102MJ400
	1500	76x105	120	85	90	7.5	10.1	ALS2--152NF400
	1500	76x115	90	57	60	7.8	11.9	ALS2--152NJ400
	2200	76x105	96	61	62	8.3	11.1	ALS2--222NF400
	2200	76x140	94	59	60	10.0	13.5	ALS2--222NN400
	3300	76x140	65	42	43	11.1	14.8	ALS2--332NN400
450V d.c. (495V surge)	68	35x52	1856	1018	1100	0.8	1.5	ALS2--680DA450
	100	35x52	1915	1050	1100	1.0	1.5	ALS2--101DA450
	150	35x75	1100	694	800	1.4	2.1	ALS2--151DD450
	220	35x105	572	314	350	2.0	3.7	ALS2--221DF450
	330	50x75	382	211	230	2.4	4.6	ALS2--331KD450
	470	50x105	269	149	160	3.3	6.1	ALS2--471KF450
	680	50x115	260	152	160	4.0	6.6	ALS2--681KJ450
	1000	65x105	180	109	115	5.3	8.4	ALS2--102MF450
1500	76x105	120	75	80	6.8	10.5	ALS2--152NF450	
2200	76x140	80	52	55	9.1	13.9	ALS2--222NN450	

Note: Values of E.S.R. and Impedance quoted above are maximum

# ALS27/29 SERIES

## Screw Terminals - Plain and Stud Mountings

This range of professional grade components offers high levels of reliability and performance with outstanding high frequency characteristics. Their low levels of e.s.r. and impedance are ideally suited to high efficiency power supply and inverter applications. Physical dimensions meet the requirements of CO37/39.

**Capacitance range** ..... 68 $\mu$ F to 470,000 $\mu$ F

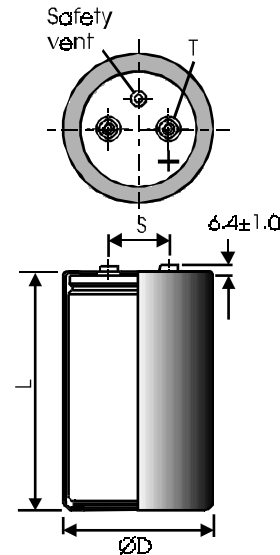
**Capacitance tolerance** ..... -10% +50%

**Voltage range** ..... 6.3V to 450V d.c.

**Temperature range** ..... -55°C to +85°C

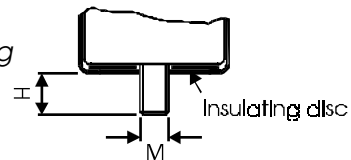
**Case sizes** ..... 36 x 49mm to 77 x 146mm

### ALS29



### ALS27

#### Stud Mounting



### DIMENSIONS (sleeved) mm

CASE CODE	D ±1	L ±2	S ±0.5	M THREAD	H ±1	T THREAD	MOUNTING CLIP
DY	36	49	12.7	M8	12	M4	2736
DB	36	62	12.7	M8	12	M4	2736
DE	36	82	12.7	M8	12	M4	2736
KB	51	62	22.2	M12	16	M5	2737
KE	51	82	22.2	M12	16	M5	2737
KJ	51	115	22.2	M12	16	M5	2737
MJ	66	115	28.5	M12	16	M5	2738
PJ	73	115	31.7	M12	16	M5	2739
NP	77	146	31.7	M12	16	M5	V11

### Terminations

Aluminium inserts with M4 or M5 threads, in accordance with NFC-UTE 83-110, max torque 2NM. Max torque for stud M8:4NM/M12:8NM.

# ALS27/29 SERIES

Screw Terminals - Plain and Stud Mountings

## TECHNICAL DATA

### Related documents

CECC 30301-016/-017  
NFC-UTE 83-110 Type 1  
IEC 384-4

### Temperature range

Storage -65°C to +85°C  
Operating -55°C to +85°C  
Environmental classification 55/085/56

### Surge voltage

1000 surges (30 seconds) at 85°C with surge voltage applied. See electrical characteristics.

### Charge/discharge

10<sup>6</sup> 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  $(0.003 C_R U_R + 4) \mu A$  where  $C_R$  is the rated capacitance in  $\mu F$  and  $U_R$  is the rated d.c. voltage.

### Vibration

10Hz to 55Hz at 0.75mm or 10g for 3x2hrs duration.

### Insulation resistance

$\geq 100M\Omega$  at 100V d.c., across insulating sleeve.

### Voltage proof

$\geq 2500V$  d.c., across insulating sleeve. See 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 Aerovox.

#### FREQUENCY CORRECTION

Capacitors shall withstand the rated r.m.s. ripple current as given in the tables 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

For ambient temperature other than 85°C the following correction factors should be employed.

AMBIENT TEMPERATURE	FACTOR
30°C	2.5
50°C	2.1
70°C	1.6
85°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 (mm)	LIFE EXPECTANCY (hours)
36	10000
51	23000
66	27000
73,77	28000

### Mounting

Any position but refer to mounting section on page 9. For details of mounting clips and stud mounting kits see page 68/69.

### 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  $\mu F$
2. Rated voltage d.c.
3. Polarity of terminations
4. Tolerance on rated capacitance
5. Date code/Batch code
6. BHC part number
7. Environmental classification

### Ordering information

For details of ordering see page 70.



# ALS27/29 SERIES

Screw Terminals - Plain and Stud Mountings

Rated voltage	Cap $\mu$ F	Case Size	ESR m $\Omega$ at 20°C 100Hz	Impedance m $\Omega$ at 20 °C,10 KHz	Ripple current A at 85°C		Type number (Excluding style ref)
					100 Hz	10 KHz	
6.3V d.c. (7.2V surge)	15000	36x49	33.0	32.0	5.9	6.4	ALS2-A153DY6R3
	22000	36x62	26.0	22.0	7.5	8.1	ALS2-A223DB6R3
	33000	36x82	16.0	14.0	9.4	10.1	ALS2-A333DE6R3
	47000	51x62	13.0	12.0	12.1	13.0	ALS2-A473KB6R3
	68000	51x82	11.0	9.5	14.7	16.0	ALS2-A683KE6R3
	100000	51x115	8.0	7.0	23.7	25.8	ALS2-A104KJ6R3
	150000	66x115	7.5	7.0	27.6	30.1	ALS2-A154MJ6R3
	220000	73x115	7.5	7.5	29.0	31.0	ALS2-A224PJ6R3
470000	77x146	7.5	6.5	37.0	40.0	ALS2-A474NP6R3	
10V d.c. (11.5V surge)	10000	36x49	34.0	27.0	6.0	6.5	ALS2-A103DY010
	15000	36x62	24.0	19.0	7.4	8.1	ALS2-A153DB010
	22000	36x82	20.0	18.0	9.3	10.0	ALS2-A223DE010
	33000	51x62	15.0	13.0	12.0	12.9	ALS2-A333KB010
	47000	51x82	11.0	10.0	14.6	15.8	ALS2-A473KE010
	68000	51x115	8.5	7.5	23.2	25.2	ALS2-A683KJ010
	100000	66x115	8.0	8.0	27.6	29.4	ALS2-A104MJ010
	150000	73x115	8.0	9.0	28.0	30.5	ALS2-A154PJ010
330000	77x146	7.5	6.5	36.7	39.9	ALS2-A334NP010	
16V d.c. (18.4V surge)	6800	36x49	43	34	5.3	5.9	ALS2-A682DY016
	10000	36x62	30.0	23.0	6.8	7.4	ALS2-A103DB016
	15000	36x82	19.0	14.0	8.4	9.2	ALS2-A153DE016
	22000	51x62	15.0	12.0	10.9	11.9	ALS2-A223KB016
	33000	51x82	12.0	9.5	13.4	14.6	ALS2-A333KE016
	47000	51x115	9.0	8.0	21.3	23.2	ALS2-A473KJ016
	68000	66x115	8.0	8.0	24.8	27.0	ALS2-A683MJ016
	100000	73x115	8.0	8.0	26.0	28.1	ALS2-A104PJ016
220000	77x146	7.5	6.5	33.5	35.9	ALS2-A224NP016	
25V d.c. (28.5V surge)	4700	36x49	46.0	35.0	5.3	5.9	ALS2-A472DY025
	6800	36x62	32.0	25.0	6.6	7.3	ALS2-A682DB025
	10000	36x82	21.0	15.0	8.2	9.1	ALS2-A103DE025
	15000	51x62	17.0	12.0	10.7	11.8	ALS2-A153KB025
	22000	51x82	13.0	9.5	13.0	14.4	ALS2-A223KE025
	33000	51x115	9.0	7.0	20.9	23.2	ALS2-A333KJ025
	47000	66x115	8.5	8.0	24.4	27.0	ALS2-A473MJ025
	68000	73x115	8.0	8.0	26.1	28.1	ALS2-A683PJ025
150000	77x146	7.5	6.0	33.0	36.0	ALS2-A154NP025	
40V d.c. (46V surge)	3300	36x49	48.0	32.0	5.2	5.9	ALS2-A332DY040
	4700	36x62	31.0	20.0	6.4	7.3	ALS2-A472DB040
	6800	36x82	26.0	17.0	8.0	9.0	ALS2-A682DE040
	10000	51x62	18.0	12.5	10.3	11.6	ALS2-A103KB040
	15000	51x82	15.0	11.0	12.6	14.1	ALS2-A153KE040
	22000	51x115	10.0	8.0	20.0	22.8	ALS2-A223KJ040
	33000	66x115	9.0	8.0	23.6	26.5	ALS2-A333MJ040
	47000	73x115	9.5	9.0	25.0	27.5	ALS2-A473PJ040
100000	77x146	9.0	7.0	31.6	35.9	ALS2-A104NP040	
63V d.c. (72V surge)	2200	36x49	74.0	45.0	4.8	5.8	ALS2-A222DY063
	3300	36x62	42.0	20.0	6.0	7.1	ALS2-A332DB063
	4700	36x82	32.0	16.0	7.5	8.9	ALS2-A472DE063
	6800	51x62	23.0	13.0	9.6	11.4	ALS2-A682KB063
	10000	51x82	13.0	9.0	16.8	20.2	ALS2-A103KE063
	15000	51x115	12.0	8.0	19.0	22.4	ALS2-A153KJ063
	22000	66x115	11.0	9.0	22.1	26.1	ALS2-A223MJ063
	33000	73x115	9.0	9.0	22.3	26.5	ALS2-A333PJ063
47000	77x146	9.0	8.0	29.5	35.0	ALS2-A473NP063	

Note: Values of E.S.R. and Impedance quoted above are maximum

# ALS27/29 SERIES

Screw Terminals - Plain and Stud Mountings

Rated voltage	Cap $\mu$ F	Case Size	ESR $m\Omega$ at 20°C 100Hz	Impedance $m\Omega$ at 20 °C, 10 KHz	Ripple current A at 85°C 100 Hz	Ripple current A at 85°C 10 KHz	Type number (Excluding style ref)
100V d.c. (115V surge)	1000	36x49	112.0	80.0	3.5	4.5	ALS2-A102DY100
	1500	36x62	57.0	50.0	4.5	5.6	ALS2-A152DB100
	2200	36x82	48.0	40.0	5.6	7.0	ALS2-A222DE100
	3300	51x62	51.0	28.0	7.2	9.0	ALS2-A332KB100
	4700	51x82	37.0	20.0	8.9	11.0	ALS2-A472KE100
	6800	51x115	26.0	14.0	13.8	17.6	ALS2-A682KJ100
	10000	66x115	20.0	12.0	16.8	20.8	ALS2-A103MJ100
	15000	73x115	17.0	11.0	18.4	22.0	ALS2-A153PJ100
	22000	77x146	13.0	9.0	22.8	27.8	ALS2-A223NP100
160V d.c. (184V surge)	470	36x49	230.0	80.0	3.0	3.7	ALS2-A471DY160
	680	36x62	160.0	50.0	3.7	4.6	ALS2-A681DB160
	1000	36x82	130.0	58.0	4.7	5.7	ALS2-A102DE160
	1500	51x62	74.0	25.0	6.1	8.3	ALS2-A152KB160
	2200	51x82	50.0	17.0	10.0	12.8	ALS2-A222KE160
	3300	51x115	36.0	14.0	11.7	14.7	ALS2-A332KJ160
	4700	66x115	27.0	12.0	14.1	17.0	ALS2-A472MJ160
	6800	73x115	22.0	12.0	15.2	18.1	ALS2-A682PJ160
	10000	77x146	17.0	10.0	19.1	22.8	ALS2-A103NP160
250V d.c. (287V surge)	220	36x49	680.0	270.0	1.9	2.6	ALS2-A221DY250
	330	36x62	405.0	200.0	2.5	3.3	ALS2-A331DB250
	470	36x82	240.0	85.0	3.2	4.7	ALS2-A471DE250
	680	51x62	195.0	90.0	4.1	5.3	ALS2-A681KB250
	1000	51x82	140.0	85.0	5.1	6.6	ALS2-A102KE250
	1500	51x115	90.0	45.0	7.6	10.0	ALS2-A152KJ250
	2200	66x115	64.0	32.0	10.1	12.8	ALS2-A222MJ250
	3300	73x115	45.0	24.0	11.3	13.8	ALS2-A332PJ250
	4700	77x146	32.0	18.0	14.9	18.0	ALS2-A472NP250
350V d.c. (385 V surge)	150	36x49	710.0	360.0	1.5	2.4	ALS2-A151DY350
	220	36x62	500.0	300.0	1.9	3.0	ALS2-A221DB350
	330	36x82	290.0	120.0	2.5	4.9	ALS2-A331DE350
	470	51x62	235.0	128.0	3.1	5.4	ALS2-A471KB350
	680	51x82	160.0	90.0	4.0	6.9	ALS2-A681KE350
	1000	51x115	110.0	60.0	5.8	10.0	ALS2-A102KJ350
	1500	66x115	76.0	45.0	7.9	12.9	ALS2-A152MJ350
	2200	73x115	55.0	36.0	9.1	14.3	ALS2-A222PJ350
	3300	77x146	38.0	26.0	12.1	18.2	ALS2-A332NP350
400V d.c. (440V surge)	100	36x49	1500.0	1100.0	1.1	1.5	ALS2-A101DY400
	150	36x62	1320.0	760.0	1.5	2.0	ALS2-A151DB400
	220	36x82	900.0	520.0	1.9	2.6	ALS2-A221DE400
	330	51x62	600.0	380.0	2.4	3.3	ALS2-A331KB400
	470	51x82	360.0	260.0	3.1	4.3	ALS2-A471KE400
	680	51x115	255.0	180.0	4.4	6.1	ALS2-A681KJ400
	1000	66x115	130.0	120.0	6.1	9.8	ALS2-A102MJ400
	1500	73x115	90.0	90.0	8.3	11.3	ALS2-A152PJ400
	2200	77x146	94.0	60.0	10.0	13.5	ALS2-A222NP400
450V d.c. (495V surge)	68	36x49	1860.0	1650.0	0.8	1.5	ALS2-A680DY450
	100	36x62	1300.0	1350.0	1.1	1.8	ALS2-A101DB450
	150	36x82	1100.0	1200.0	1.4	2.1	ALS2-A151DE450
	220	51x62	570.0	525.0	2.0	3.7	ALS2-A221KB450
	330	51x82	380.0	345.0	2.4	4.6	ALS2-A331KE450
	470	51x115	270.0	240.0	3.3	6.3	ALS2-A471KJ450
	680	51x115	260.0	150.0	4.0	6.6	ALS2-A681KJ450
	1000	66x115	180.0	173.0	5.3	8.4	ALS2-A102MJ450
	1500	73x115	120.0	120.0	6.8	10.5	ALS2-A152PJ450
	2200	77x146	80.0	83.0	9.1	13.9	ALS2-A222NP450

Note: Values of E.S.R. and Impedance quoted above are maximum

# ALS30/31 SERIES

## Screw Terminals - Plain and Stud Mountings

This range offers high CV per unit volume coupled with high ripple currents and long life performance. They are also capable of handling high peak voltages and currents.

**Capacitance range** ..... 68 $\mu$ F to 1,000,000 $\mu$ F

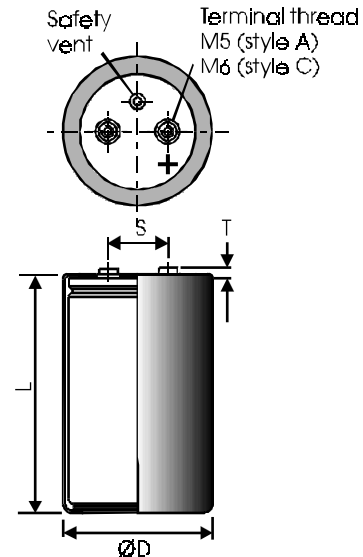
**Capacitance tolerance** .....  $\pm$ 20%

**Voltage range** ..... 10V to 600V d.c.

**Temperature range** ..... -40°C to +85°C

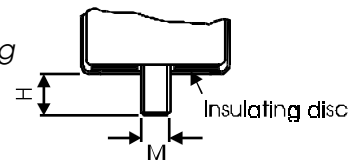
**Case sizes** ..... 36 x 52mm to 91 x 146mm

### ALS30



### ALS31

#### Stud Mounting



### DIMENSIONS (sleeved) mm

CASE CODE	D $\pm$ 1	L $\pm$ 2	S $\pm$ 0.5	T $\pm$ 0.8	M THREAD	H $\pm$ 1	MOUNTING CLIP
DA	36	52	12.7	6.4	M8	12	V3/H2/UTE2736
DB	36	62	12.7	6.4	M8	12	V3/H2/UTE2736
DE	36	82	12.7	6.4	M8	12	V3/H2/UTE2736
DF	36	105	12.7	6.4	M8	12	V3/H2/UTE2736
KE	51	82	22.2	5.0	M12	16	V4/UTE2737
KF	51	105	22.2	5.0	M12	16	V4/UTE2737
MF	66	105	28.5	5.0	M12	16	V10/UTE2738
ND	77	75	31.7	5.0	M12	16	V11
NF	77	105	31.7	5.0	M12	16	V11
NP	77	146	31.7	5.0	M12	16	V11
NT	77	220	31.7	5.0	M12	16	V11
RD	91	75	31.7	5.0	M12	16	V90
RH	91	98	31.7	5.0	M12	16	V90
RP	91	146	31.7	5.0	M12	16	V90

### Terminations

Aluminium inserts with M5 threads as standard, max torque 2NM. Optional M6 threaded inserts available on 77 & 91mm dia products, max torque 4NM. Max torque for stud M8:4NM/M12:8NM.

# ALS30/31 SERIES

Screw Terminals - Plain and Stud Mountings

## TECHNICAL DATA

### Related documents

IEC 384-4

### Temperature range

Storage -55°C to +85°C

Operating -40°C to +85°C

Environmental classification 40/085/56

### Surge voltage

1000 surges (30 seconds) at 85°C with surge voltage applied. See electrical characteristics.

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

10<sup>6</sup> 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<sub>r</sub> U<sub>r</sub> or 10mA whichever is the smaller. Where C<sub>r</sub> is the rated capacitance in µF and U<sub>r</sub> 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.

### 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 Aerovox.

### FREQUENCY CORRECTION

Capacitors shall withstand the rated r.m.s. ripple current as given in the tables 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

For ambient temperatures 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

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 (mm)	LIFE EXPECTANCY (hours)
36	11000
51	18000
66	19000
77,91	20000

### Mounting

Any position but refer to mounting section on page 9. For details of mounting clips and stud mounting kits see page 68/69.

### 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 code
6. BHC part number
7. Environmental classification

### Ordering information

For details of ordering see page 70.

# ALS30/31 SERIES

Screw Terminals - Plain and Stud Mountings

Rated voltage	Cap $\mu$ F	Case Size	ESR m $\Omega$ at 20°C 100Hz	Impedance m $\Omega$ at 20 °C, 10 KHz	Ripple current A at 85°C 100 Hz	Ripple current A at 85°C 10 KHz	Type number (Excluding style ref)
10V d.c. (11.5V surge)	33000	36x52	20	18	8.4	8.87	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
	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	39.6	41.7	ALS3--684NP010
	1000000	91x146	4	4	45.3	45.6	ALS3--105RP010
1000000	77x220	4	4	62.8	63.3	ALS3--105NT010	
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	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	62.3	63.2	ALS3--684NT016	
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	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	60.5	61.1	ALS3--474NT025	
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	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	54.4	54.8	ALS3--334NT040	

Note: Values of E.S.R. and Impedance quoted above are maximum

# ALS30/31 SERIES

Screw Terminals - Plain and Stud Mountings

Rated voltage	Cap $\mu$ F	Case Size	ESR $m\Omega$ at 20°C 100Hz	Impedance $m\Omega$ at 20 °C, 10 KHz	Ripple current A at 85°C 100 Hz	Ripple current A at 85°C 10 KHz	Type number (Excluding style ref)
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	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	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	55.2	56.3	ALS3--154NT063
	100V d.c. (115V surge)	2200	36x52	69	55	4.9	5.4
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		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
200V d.c. (230V surge)		470	36x52	286	227	3.1	4.3
	680	36x62	199	158	3.9	5.4	ALS3--681DB200
	1000	36x82	135	107	5.1	7.1	ALS3--102DE200
	1500	36x105	90	72	6.7	9.1	ALS3--152DF200
	2200	51x82	73	60	8.2	9.7	ALS3--222KE200
	3300	51x105	48	40	11.0	13.1	ALS3--332KF200
	4700	77x75	48	42	10.6	11.5	ALS3--472ND200
	4700	66x105	33	27	15.9	19.1	ALS3--472MF200
	6800	66x105	27	23	15.7	17.7	ALS3--682MF200
	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
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	7.5	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	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

Note: Values of E.S.R. and Impedance quoted above are maximum

# ALS30/31 SERIES

Screw Terminals - Plain and Stud Mountings

Rated voltage	Cap $\mu$ F	Case Size	ESR m $\Omega$ at 20°C 100Hz	Impedance m $\Omega$ at 20 °C, 10 KHz	Ripple current A at 85°C 100 Hz	10 KHz	Type number (Excluding style ref)
350V d.c. (385V surge)	330	36x52	325	226	2.4	4.2	ALS3--331DA350
	470	36x82	223	154	3.4	6.2	ALS3--471DE350
	680	36x105	154	107	4.4	8.0	ALS3--681DF350
	1000	51x82	116	82	6.1	9.3	ALS3--102KE350
	1500	51x105	77	55	8.2	12.5	ALS3--152KF350
	2200	77x75	66	50	9.1	11.5	ALS3--222ND350
	2200	66x105	52	37	11.9	18.2	ALS3--222MF350
	3300	66x105	39	29	12.8	17.2	ALS3--332MF350
	3300	91x75	47	36	11.7	14.2	ALS3--332RD350
	4700	77x105	35	27	13.4	15.8	ALS3--472NF350
	4700	91x98	31	24	16.3	20.3	ALS3--472RH350
	6800	77x146	23	18	19.3	23.2	ALS3--682NP350
	6800	91x146	20	15	24.9	32.5	ALS3--682RP350
	10000	77x220	15	11	31.7	39.3	ALS3--103NT350
400V d.c. (440V surge)	220	36x52	570	387	1.9	3.8	ALS3--221DA400
	330	36x62	382	260	2.5	4.7	ALS3--331DB400
	470	36x82	267	182	3.2	6.2	ALS3--471DE400
	680	36x105	185	126	4.1	7.9	ALS3--681DF400
	1000	51x82	139	98	5.8	8.9	ALS3--102KE400
	1500	51x105	92	65	7.8	12.0	ALS3--152KF400
	1500	77x75	97	70	8.3	11.9	ALS3--152ND400
	2200	66x105	62	44	11.2	17.4	ALS3--222MF400
	2200	91x75	69	50	10.7	14.9	ALS3--222RD400
	3300	77x105	49	36	12.7	16.5	ALS3--332NF400
	3300	91x98	45	32	14.9	20.9	ALS3--332RH400
	4700	77x146	33	24	18.0	24.2	ALS3--472NP400
	6800	91x146	24	17	23.2	30.3	ALS3--682RP400
	6800	77x220	22	15	29.0	40.7	ALS3--682NT400
415V d.c. (456V surge)	220	36x52	555	368	1.9	3.8	ALS3--221DA415
	330	36x62	372	247	2.4	4.8	ALS3--331DB415
	470	36x82	261	173	3.2	6.3	ALS3--471DE415
	680	36x105	180	120	4.1	8.0	ALS3--681DF415
	1000	51x82	136	94	5.7	8.8	ALS3--102KE415
	1500	51x105	90	62	7.6	11.9	ALS3--152KF415
	1500	77x75	96	68	8.1	11.7	ALS3--152ND415
	2200	66x105	61	42	11.0	17.2	ALS3--222MF415
	2200	91x75	68	49	10.5	14.6	ALS3--222RD415
	3300	77x105	48	36	12.4	16.2	ALS3--332NF415
	3300	91x98	45	32	14.6	20.5	ALS3--332RH415
	4700	77x146	33	24	17.6	23.7	ALS3--472NP415
	6800	91x146	23	17	22.7	29.7	ALS3--682RP415
	6800	77x220	21	15	28.5	40.1	ALS3--682NT415
450V d.c. (495V surge)	150	36x52	735	485	1.6	3.5	ALS3--151DA450
	220	36x62	502	332	2.0	4.4	ALS3--221DB450
	330	36x82	335	221	2.6	5.8	ALS3--331DE450
	470	36x105	235	155	3.4	7.4	ALS3--471DF450
	680	51x82	175	117	4.9	8.9	ALS3--681KE450
	1000	51x105	118	79	6.5	12.0	ALS3--102KF450
	1500	77x75	95	65	7.8	11.3	ALS3--152ND450
	1500	66x105	81	52	9.5	17.4	ALS3--152MF450
	2200	91x75	67	47	10.1	14.1	ALS3--222RD450
	2200	77x105	59	41	11.4	17.5	ALS3--222NF450
	3300	91x98	44	30	14.1	19.9	ALS3--332RH450
	3300	77x146	39	27	16.1	25.1	ALS3--332NP450
	4700	91x146	29	19	21.0	31.8	ALS3--472RP450
	6800	77x220	21	14	27.4	38.8	ALS3--682NT450

Note: Values of E.S.R. and Impedance quoted above are maximum

# ALS30/31 SERIES

Screw Terminals - Plain and Stud Mountings

Rated voltage	Cap $\mu$ F	Case Size	ESR $m\Omega$ at 20°C 100Hz	Impedance $m\Omega$ at 20 °C, 10 KHz	Ripple current A at 85°C 100 Hz	Ripple current A at 85°C 10 KHz	Type number (Excluding style ref)
500V d.c. (550V surge)	100	36x52	1231	847	1.1	2.3	ALS3--101DA500
	150	36x62	823	566	1.4	2.9	ALS3--151DB500
	220	36x82	560	386	1.8	3.9	ALS3--221DE500
	330	36x105	374	258	2.4	5.0	ALS3--331DF500
	470	51x82	276	194	3.5	6.7	ALS3--471KE500
	680	51x105	190	133	4.6	9.0	ALS3--681KF500
	1000	77x75	173	109	5.9	9.7	ALS3--102ND500
	1000	66x105	137	96	6.7	13.0	ALS3--102MF500
	1500	91x75	91	65	8.5	14.4	ALS3--152NF500
	1500	77x105	119	76	7.8	12.2	ALS3--152RD500
	2200	91x98	80	50	10.7	17.1	ALS3--222RH500
	2200	77x146	62	44	11.9	20.6	ALS3--222NP500
	3300	91x146	51	32	15.8	26.4	ALS3--332RP500
	4700	77x220	37	24	21.0	33.3	ALS3--472NT500
550V d.c. (605V surge)	68	36x52	2178	1176	0.9	1.3	ALS3--680DA550
	150	36x82	988	534	1.4	2.3	ALS3--151DE550
	220	36x105	674	364	2.0	2.9	ALS3--221DF550
	330	51x82	458	251	3.0	4.4	ALS3--331KE550
	470	51x105	321	175	3.9	5.8	ALS3--471KF550
	680	77x75	230	129	4.5	7.3	ALS3--681ND550
	680	66x105	221	121	5.4	8.3	ALS3--681MF550
	1000	66x105	154	86	5.8	9.6	ALS3--102MF550
	1200	77x105	130	73	7.7	11.1	ALS3--122NF550
	1500	77x146	103	57	9.0	14.8	ALS3--152NP550
	1800	77x146	87	49	11.0	15.6	ALS3--182NP550
	2200	77x220	70	39	13.9	23.1	ALS3--222NT550
	3300	77x220	48	27	16.5	25.8	ALS3--332NT550
	600V d.c. (640V surge)	68	36x52	2772	1662	0.7	1.3
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	21.9	ALS3--222NT600

Note: Values of E.S.R. and Impedance quoted above are maximum



# ALS40/41 SERIES

## Screw Terminals - Plain and Stud Mountings

This range offers high CV per unit volume coupled with high ripple currents and long life performance at 105°C. They are also capable of handling high peak voltages and currents.

**Capacitance range** ..... 100µF to 1,000,000µF

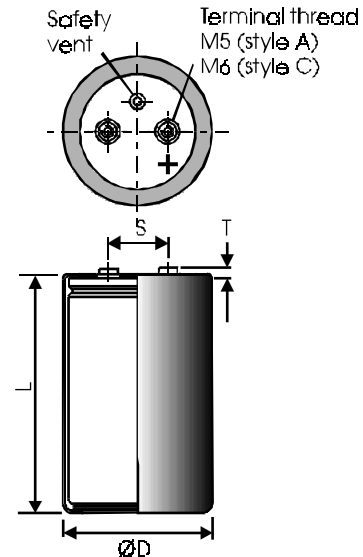
**Capacitance tolerance** ..... ±20%

**Voltage range** ..... 10V to 500V d.c.

**Temperature range** ..... -40°C to +105°C

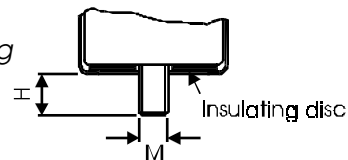
**Case sizes** ..... 36 x 52mm to 91 x 146mm

### ALS40



### ALS41

#### Stud Mounting



### DIMENSIONS (sleeved) mm

CASE CODE	D ±1	L ±2	S ±0.5	T ±0.8	M THREAD	H ±1	MOUNTING CLIP
DA	36	52	12.7	6.4	M8	12	V3/H2/UTE2736
DB	36	62	12.7	6.4	M8	12	V3/H2/UTE2736
DE	36	82	12.7	6.4	M8	12	V3/H2/UTE2736
DF	36	105	12.7	6.4	M8	12	V3/H2/UTE2736
KE	51	82	22.2	5.0	M12	16	V4/UTE2737
KF	51	105	22.2	5.0	M12	16	V4/UTE2737
MF	66	105	28.5	5.0	M12	16	V10/UTE2738
ND	77	75	31.7	5.0	M12	16	V11
NF	77	105	31.7	5.0	M12	16	V11
NP	77	146	31.7	5.0	M12	16	V11
NT	77	220	31.7	5.0	M12	16	V11
RD	91	75	31.7	5.0	M12	16	V90
RH	91	98	31.7	5.0	M12	16	V90
RP	91	146	31.7	5.0	M12	16	V90

### Terminations

Aluminium inserts with M5 threads as standard, max torque 2NM. Optional M6 threaded inserts available on 77 & 91mm dia products, max torque 4NM. Max torque for stud M8:4NM/M12:8NM.

# ALS40/41 SERIES

Screw Terminals - Plain and Stud Mountings

## TECHNICAL DATA

### Related documents

IEC 384-4

### Temperature range

Storage -55°C to +105°C

Operating -40°C to +105°C

Environmental classification 40/105/56

### Surge voltage

1000 surges (30 seconds) at 105°C with surge voltage applied. See electrical characteristics.

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

10<sup>6</sup> 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 0.003 C<sub>R</sub> U<sub>R</sub> or 10mA whichever is the smaller. Where C<sub>R</sub> is the rated capacitance in µF and U<sub>R</sub> 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.

### 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 Aerovox.

### FREQUENCY CORRECTION

Capacitors shall withstand the rated r.m.s. ripple current as given in the tables 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

For ambient temperatures 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 (mm)	LIFE EXPECTANCY (hours)
36	6000
51	7000
66	8000
77,91	9000

### Mounting

Any position but refer to mounting section on page 9. For details of mounting clips and stud mounting kits see page 68/69.

### 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 code
6. BHC part number
7. Environmental classification

### Ordering information

For details of ordering see page 70.

# ALS40/41 SERIES

Screw Terminals - Plain and Stud Mountings

Rated voltage	Cap $\mu$ F	Case Size	ESR $m\Omega$ at 20°C 100Hz	Impedance $m\Omega$ at 20 °C,10 KHz	Ripple current A at 105°C 100 Hz	Ripple current A at 105°C 10 KHz	Type number (Excluding style ref)
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
	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	32.6	32.8	ALS4--684NP010
	1000000	91x146	4	4	38.3	38.5	ALS4--105RP010
1000000	77x220	4	4	53.1	53.5	ALS4--105NT010	
16V d.c. (18.4V surge)	22000	36x52	24	20	7.0	7.4	ALS4--223DA016
	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	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	53.0	53.4	ALS4--684NT016	
25V d.c. (28.5V surge)	15000	36x52	24	20	6.9	7.3	ALS4--153DA025
	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	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	51.2	51.6	ALS4--474NT025	
40V d.c. (46V surge)	10000	36x52	23	19	6.6	6.9	ALS4--103DA040
	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	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	50.9	51.6	ALS4--224NT040	

Note: Values of E.S.R. and Impedance quoted above are maximum

# ALS40/41 SERIES

Screw Terminals - Plain and Stud Mountings

Rated voltage	Cap $\mu$ F	Case Size	ESR $m\Omega$ at 20°C 100Hz	Impedance $m\Omega$ at 20 °C, 10 KHz	Ripple current A at 105°C 100 Hz	Ripple current A at 105°C 10 KHz	Type number (Excluding style ref)
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	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	47.3	48.5	ALS4--104NT063
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	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
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	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
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	91x98	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

Note: Values of E.S.R. and Impedance quoted above are maximum

# ALS40/41 SERIES

Screw Terminals - Plain and Stud Mountings

Rated voltage	Cap $\mu$ F	Case Size	ESR m $\Omega$ at 20°C 100Hz	Impedance m $\Omega$ at 20 °C, 10 KHz	Ripple current A at 105°C 100 Hz	Ripple current A at 105°C 10 KHz	Type number (Excluding style ref)
350V d.c. (385V surge)	220	36x52	457	303	1.7	3.3	ALS4--221DA350
	330	36x62	307	204	2.2	4.1	ALS4--331DB350
	470	36x82	215	143	2.8	5.4	ALS4--471DE350
	680	36x105	149	99	3.6	6.9	ALS4--681DF350
	1000	51x82	113	78	5.0	7.8	ALS4--102KE350
	1500	51x105	75	52	6.8	10.5	ALS4--152KF350
	2200	77x75	66	49	7.4	9.4	ALS4--222ND350
	2200	66x105	51	35	9.8	15.2	ALS4--222MF350
	2200	91x75	56	40	9.4	13.0	ALS4--222RD350
	3300	77x105	41	30	11.1	14.5	ALS4--332NF350
	4700	91x98	31	23	13.3	16.6	ALS4--472RH350
	4700	77x146	27	20	15.7	21.2	ALS4--472NP350
	6800	91x146	19	14	20.3	26.6	ALS4--682RP350
	6800	77x220	18	12	25.4	35.7	ALS4--682NT350
400V d.c. (440V surge)	220	36x52	542	349	1.6	3.3	ALS4--221DA400
	220	36x62	537	344	1.7	3.7	ALS4--221DB400
	470	36x82	254	164	2.7	5.4	ALS4--471DE400
	470	36x105	251	161	2.9	6.2	ALS4--471DF400
	680	51x82	183	121	4.2	7.5	ALS4--681KE400
	1000	51x105	124	81	5.6	10.2	ALS4--102KF400
	1500	77x75	93	64	6.9	10.2	ALS4--152ND400
	2200	66x105	60	41	9.1	14.4	ALS4--222MF400
	2200	91x75	67	47	8.7	12.1	ALS4--222RD400
	2200	77x105	62	42	9.8	14.9	ALS4--222NF400
	3300	91x98	44	31	12.1	17.0	ALS4--332RH400
	4700	77x146	33	23	14.5	19.6	ALS4--472NP400
	6800	91x146	23	17	18.7	24.5	ALS4--682RP400
	6800	77x220	21	15	23.5	33.3	ALS4--682NT400
415V d.c. (456V surge)	220	36x52	530	331	1.6	3.3	ALS4--221DA415
	220	36x62	524	325	1.7	3.7	ALS4--221DB415
	330	36x82	349	217	2.2	5.0	ALS4--331DE415
	470	36x105	245	152	2.8	6.3	ALS4--471DF415
	680	51x82	180	115	4.1	7.5	ALS4--681KE415
	1000	51x105	122	77	5.5	10.2	ALS4--102KF415
	1500	77x75	95	65	6.6	9.5	ALS4--152ND415
	2200	66x105	60	39	8.9	14.2	ALS4--222MF415
	2200	91x75	67	47	8.5	11.9	ALS4--222RD415
	2200	77x105	61	41	9.5	14.7	ALS4--222NF415
	3300	91x98	44	30	11.8	16.7	ALS4--332RH415
	3300	77x146	40	27	13.5	21.1	ALS4--332NP415
	4700	91x146	29	19	17.6	26.7	ALS4--472RP415
	6800	77x220	21	14	23.0	32.5	ALS4--682NT415
450V d.c. (495V surge)	150	36x52	721	360	1.2	3.3	ALS4--151DA450
	150	36x62	715	356	1.2	3.7	ALS4--151DB450
	220	36x82	487	242	1.6	4.8	ALS4--221DE450
	330	36x105	325	162	2.1	6.3	ALS4--331DF450
	470	51x82	239	123	3.2	7.4	ALS4--471KE450
	680	51x105	164	84	4.2	10.0	ALS4--681KF450
	1000	77x75	125	69	5.3	9.4	ALS4--102ND450
	1500	66x105	79	42	7.0	14.0	ALS4--152MF450
	1500	91x75	87	49	7.0	11.7	ALS4--152RD450
	1500	77x105	80	43	7.6	14.5	ALS4--152NF450
	2200	91x98	58	32	9.6	16.6	ALS4--222RH450
	2200	77x146	54	29	10.7	20.9	ALS4--222NP450
	3300	91x146	37	20	14.2	26.1	ALS4--332RP450
	4700	77x220	27	15	18.8	32.0	ALS4--472NT450

Note: Values of E.S.R. and Impedance quoted above are maximum

# ALS40/41 SERIES

Screw Terminals - Plain and Stud Mountings

Rated voltage	Cap $\mu$ F	Case Size	ESR $m\Omega$ at 20°C 100Hz	Impedance $m\Omega$ at 20 °C, 10 KHz	Ripple current A at 105°C 100 Hz	Ripple current A at 105°C 10 KHz	Type number (Excluding style ref)
500V d.c. (550V surge)	100	36x52	1499	829	0.9	2.0	ALS4--101DA500
	150	36x62	1002	555	1.1	2.6	ALS4--151DB500
	220	36x82	683	378	1.5	3.4	ALS4--221DE500
	330	36x105	456	252	1.9	4.4	ALS4--331DF500
	470	51x82	332	189	2.9	5.8	ALS4--471KE500
	680	51x105	228	129	3.8	7.8	ALS4--681KF500
	680	77x75	234	134	4.2	8.1	ALS4--681ND500
	1000	66x105	155	88	5.5	11.2	ALS4--102MF500
	1000	91x75	161	93	5.6	10.5	ALS4--102RD500
	1500	77x105	110	65	6.9	12.1	ALS4--152NF500
	1500	91x98	107	62	7.8	14.5	ALS4--152RH500
	2200	77x146	74	43	9.7	17.3	ALS4--222NP500
	3300	91x146	51	30	13.0	22.1	ALS4--332RP500
	3300	77x220	49	28	15.4	28.4	ALS4--332NT500

Note: Values of E.S.R. and Impedance quoted above are maximum

# ALS60/61 SERIES

## Screw Terminals - Plain and Stud Mountings

This range offers high temperature operation with high ripple currents and long life performance

**Capacitance range** ..... 1000 $\mu$ F to 150,000 $\mu$ F

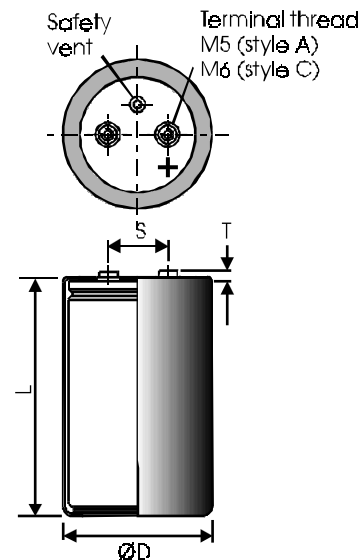
**Capacitance tolerance** .....  $\pm$ 20%

**Voltage range** ..... 16V to 100V d.c.

**Temperature range** ..... -55°C to +125°C

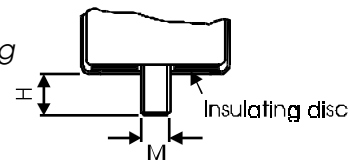
**Case sizes** ..... 36 x 52mm to 77 x 146mm

### ALS60



### ALS61

#### Stud Mounting



### DIMENSIONS (sleeved) mm

CASE CODE	D +2-1	L $\pm$ 2	S $\pm$ 0.5	T $\pm$ 0.8	M THREAD	H $\pm$ 1	MOUNTING CLIP
DA	36	52	12.7	6.4	M8	12	V3/H2/UTE2736
DB	36	62	12.7	6.4	M8	12	V3/H2/UTE2736
DE	36	82	12.7	6.4	M8	12	V3/H2/UTE2736
DF	36	105	12.7	6.4	M8	12	V3/H2/UTE2736
KE	51	82	22.2	5.0	M12	16	V4/UTE2737
KF	51	105	22.2	5.0	M12	16	V4/UTE2737
MF	66	105	28.5	5.0	M12	16	V10/UTE2738
NF	77	105	31.7	5.0	M12	16	V11
NP	77	146	31.7	5.0	M12	16	V11

### Terminations

Aluminium inserts with M5 threads as standard, max torque 2NM. Optional M6 threaded inserts available on 77mm dia products, max torque 4NM. Max torque for stud M8:4NM/M12:8NM.

# ALS60/61 SERIES

Screw Terminals - Plain and Stud Mountings

## TECHNICAL DATA

### Related documents

IEC 384-4

### Temperature range

Storage -65°C to +125°C

Operating -55°C to +125°C

Environmental classification 55/125/56

### Surge voltage

1000 surges (30 seconds) at 125°C with surge voltage applied. See electrical characteristics.

### Charge/discharge

10<sup>6</sup> 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 0.003 C<sub>R</sub> U<sub>R</sub> or 10mA whichever is the smaller. Where C<sub>R</sub> is the rated capacitance in µF and U<sub>R</sub> is the rated d.c. voltage.

### Vibration

10Hz to 55Hz at 0.75mm or 10g for 3x2hrs duration.

### Insulation resistance

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

### Voltage proof

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

### 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 Aerovox.

#### FREQUENCY CORRECTION

Capacitors shall withstand the rated r.m.s. ripple current as given in the tables 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

For ambient temperatures other than 125°C the following multipliers should be applied to the 125°C ripple current.

AMBIENT TEMPERATURE	FACTOR
50°C	2.9
60°C	2.7
70°C	2.5
85°C	2.2
105°C	1.7
125°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 (mm)	LIFE EXPECTANCY (hours)
36	6000
51	7000
66	7000
77	8000

### Mounting

Any position but refer to mounting section on page 9. For details of mounting clips and stud mounting kits see page 68/69.

### 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 code
6. BHC part number
7. Environmental classification

### Ordering information

For details of ordering see page 70.



# ALS60/61 SERIES

Screw Terminals - Plain and Stud Mountings

Rated voltage	Cap $\mu\text{F}$	Case Size	ESR $\text{m}\Omega$ at 20°C 100Hz	Impedance $\text{m}\Omega$ at 20 °C, 10 KHz	Ripple current A at 125°C 100 Hz	Ripple current A at 125°C 10 KHz	Type number (Excluding style ref)
16V d.c. (18.4V surge)	10000	36x52	32	20	4.8	5.1	ALS6--103DA016
	15000	36x82	24	16	7.1	7.7	ALS6--153DE016
	22000	36x105	16	14	9.1	9.9	ALS6--223DF016
	33000	51x82	14	12	10.7	11.1	ALS6--333KE016
	47000	51x105	10	8	14.4	15.1	ALS6--473KF016
	68000	66x105	7	6	20.9	21.9	ALS6--683MF016
	100000	77x105	6	6	22.2	22.8	ALS6--104NF016
	150000	77x146	4	4	31.0	31.8	ALS6--154NP016
25V d.c. (28.5V surge)	4700	36x52	46	38	4.4	4.8	ALS6--472DA025
	10000	36x82	22	18	7.3	8.0	ALS6--103DE025
	15000	36x105	15	12	9.4	10.2	ALS6--153DF025
	22000	51x82	14	12	10.3	10.7	ALS6--223KE025
	33000	51x105	10	9	13.9	14.5	ALS6--333KF025
	47000	66x105	7	6	20.3	21.2	ALS6--473MF025
	68000	77x105	7	6	20.9	21.5	ALS6--683NF025
	100000	77x146	5	4	29.3	30.1	ALS6--104NP025
40V d.c. (46V surge)	4700	36x82	26	21	6.7	7.6	ALS6--472DE040
	10000	36x105	13	11	9.4	10.4	ALS6--103DF040
	15000	51x82	14	12	9.7	10.1	ALS6--153KE040
	22000	51x105	10	9	13.0	13.6	ALS6--223KF040
	33000	66x105	7	6	18.9	19.7	ALS6--333MF040
	47000	77x105	7	6	18.9	19.3	ALS6--473NF040
	68000	77x146	5	5	26.6	27.3	ALS6--683NP040
	63V d.c. (72.5V surge)	2200	36x52	47	37	3.9	4.5
3300		36x82	32	25	5.6	6.6	ALS6--332DE063
4700		36x105	22	18	7.1	8.4	ALS6--472DF063
6800		51x82	20	17	8.6	10.0	ALS6--682KE063
10000		51x105	13	11	11.6	12.7	ALS6--103KF063
15000		66x105	10	8	16.7	18.4	ALS6--153MF063
22000		77x105	9	8	17.9	19.0	ALS6--223NF063
33000		77x146	6	5	25.0	26.5	ALS6--333NP063
100V d.c. (115V surge)	1000	36x52	106	86	2.9	3.6	ALS6--102DA100
	2200	36x82	51	41	4.8	5.8	ALS6--222DE100
	3300	51x82	48	41	6.2	6.9	ALS6--332KE100
	4700	51x105	32	27	8.4	9.5	ALS6--472KF100
	6800	66x105	21	18	12.2	13.9	ALS6--682MF100
	10000	77x105	21	18	12.6	13.5	ALS6--103NF100
	15000	77x146	14	13	17.6	18.8	ALS6--153NP100

Note: Values of E.S.R. and Impedance quoted above are maximum