ALC12 Series 85°C

RoHS Compliant

- Compact Size
- 2000 hours at 85 °C (Ur, Ir applied)
- Excellent surge voltage capability
- Optimized designs available on request

APPLICATION

Designed for applications where high reliability and compact sizes are important such as switch mode power supplies and frequency converters.

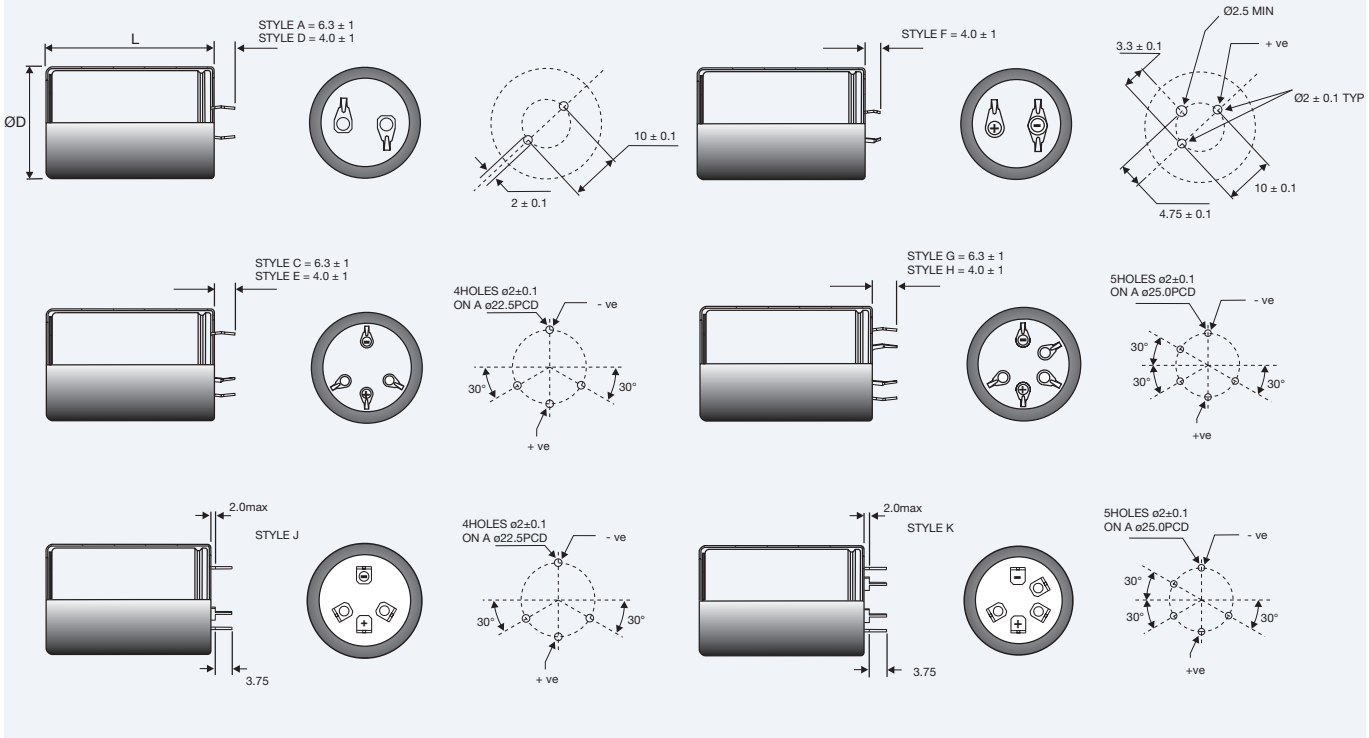
BASIC DESIGN

The ALC12 (85°C) is a high CV snap-in version of the ALC10 range. Both series are designed for applications where high reliability and compact sizes are important such as switch mode power supplies and frequency converters.

SPECIFICATION

Standards	IEC 60384-4 Long Life Grade 40/85/56,	
Capacitance range	150 – 8200 µF	
Capacitance tolerance	–20 to +20%	
Rated voltage U_R	200 - 450 VDC	
Surge voltage U_S	1.15 x U_R (for $U_R \leq 250$ VDC) 1.10 x U_R (for $U_R \geq 350$ VDC)	Test Condition: ≤ 30s surge, 1000 cycles @ 85°C
Surge voltage U_{SS} (Short duration)	U_R / U_{SS} 200 / 350 250 / 400 350 / 500 400 / 520 415 / 530 450 / 550 500 / 600	Test Condition: ≤ 500ms surge, 100 cycles @ 20°C
Leakage current I_L	= 0.006 x C_R x U_R (µA) or 6mA whichever is the smaller. Note, C_R is in µF.	Test Condition: U_R, 5mins., 20°C
Operational life time +85°C, U_R , I_R	Can Diameter 30, 35, 40, 45, 50 2000 hrs	End of Life requirement: ΔC/C ≤ ±10% ESR ≤ 2 x initial ESR value I_L ≤ initial specified limit
+85°C, U_R	Can Diameter 30, 35, 40, 45, 50 9000 hrs	
Shelf Life	2000 hrs at 0V +85°C, or 30000 hrs at 0V +40°C	
Temperature range	–40 to +85°C (Operating) -55°C to +85°C (Storage)	

SPECIFICATION



Mounting

These capacitors are designed to be mounted by their terminations alone, and may be used in any position.
Dummy pins must be isolated on 4 and 5 pin styles.

Terminal Style

Description Pin length Code DIA. mm -0+1	2 pin 6.3±1 A	2 pin 4.0±1 D	3 pin 4.0±1 F	4 pin 6.3±1 C	4 pin 4.0±1 E	5 pin 6.3±1 G	5 pin 4.0±1 H	4 pin 5.75 J	5 pin 5.75 K
30	•	•	•						
35	•	•	•	•	•			•	
40	•	•	•	•	•	•	•		•
45				•	•	•	•		
50				•	•	•	•		•

CASE CODE (COMPONENT WEIGHT grams - nominal)

Length mm ±2 Dia. mm -0+1	30	35	40	45	50	55	60	80	105
30	CB (35)	CC (40)	CD (45)	CE (50)	CF (55)				
35	DB (42)	DC (50)	DD (55)	DE (65)	DF (70)	DG (75)	DH (80)	DL (105)	
40	EB (49)	EC (57)	ED (65)	EE (80)	EF (82)	EG (95)	EH (98)	EL (131)	EP (170)
45	FB (62)	FC (72)	FD (82)	FE (92)	FF (103)	FG (113)	FH (123)	FL (164)	FP (215)
50	KB (75)	KC (88)	KD (100)	KE (113)	KF (126)	KG (138)	KH (151)	KL (201)	KP (264)

Other sizes available upon request

ARTICLE TABLE ALC12 (85°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	
200 VDC (U_R)						
560	30x30	342	224	1.75	2.81	ALC12A561CB200
680	30x35	278	181	2.06	3.36	ALC12A681CC200
1000	30x40	201	135	2.52	3.81	ALC12A102CD200
1000	35x35	218	151	2.58	3.63	ALC12A102DC200
1200	30x50	162	107	3.09	4.86	ALC12A122CF200
1200	35x40	181	125	2.96	4.18	ALC12A122DD200
1200	40x30	243	186	2.26	2.75	ALC12A122EB200
1500	40x35	190	145	2.73	3.35	ALC12A152EC200
1800	35x50	128	91	3.70	5.01	ALC12A182DF200
1800	40x40	156	119	3.17	3.90	ALC12A182ED200
2200	35x60	107	76	4.21	5.65	ALC12A222DH200
2200	40x45	132	101	3.54	4.32	ALC12A222EE200
2700	35x80	93	68	4.99	6.90	ALC12A272DL200
2700	40x55	104	79	4.27	5.26	ALC12A272EG200
3300	40x60	96	75	4.48	5.33	ALC12A332EH200
3900	40x80	78	60	5.55	6.90	ALC12A392EL200
5600	40x105	43	31	8.39	12.08	ALC12A562EP200
6800	45x105	38	28	8.85	12.05	ALC12G682FP200
8200	50x105	34	26	9.21	11.90	ALC12G822KP200
250 VDC (U_R)						
390	30x30	456	299	1.56	2.66	ALC12A391CB250
470	30x35	375	244	1.82	3.17	ALC12A471CC250
560	30x40	314	204	2.12	3.69	ALC12A561CD250
680	35x35	285	194	2.34	3.56	ALC12A681DC250
680	40x30	316	225	2.12	2.94	ALC12A681EB250
820	30x50	219	144	2.75	4.62	ALC12A821CF250
820	35x40	236	160	2.69	4.09	ALC12A821DD250
1000	40x35	232	170	2.58	3.41	ALC12A102EC250
1200	35x50	167	115	3.38	4.96	ALC12A122DF250
1200	40x40	192	140	2.99	3.96	ALC12A122ED250
1500	35x60	136	95	3.87	5.58	ALC12A152DH250
1500	40x45	160	118	3.36	4.35	ALC12A152EE250
1800	40x55	128	93	4.02	5.32	ALC12A182EG250
2200	35x80	94	66	4.79	6.81	ALC12A222DL250
2200	40x60	115	86	4.28	5.43	ALC12A222EH250
2700	40x80	85	61	5.28	7.01	ALC12A272EL250
3900	40x105	48	32	7.72	12.08	ALC12A392EP250
4700	45x105	42	29	8.22	12.11	ALC12G472FP250
5600	50x105	38	27	8.63	12.03	ALC12G562KP250
350 VDC (U_R)						
220	30x30	643	397	1.30	2.55	ALC12A221CB350
270	30x35	522	321	1.52	3.01	ALC12A271CC350
390	30x40	370	231	1.90	3.55	ALC12A391CD350
390	35x35	384	243	2.02	3.51	ALC12A391DC350
470	30x50	304	188	2.31	4.42	ALC12A471CF350
470	40x30	368	249	1.95	2.85	ALC12A471EB350
560	35x40	279	181	2.44	3.97	ALC12A561DD350
560	40x35	299	199	2.32	3.50	ALC12A561EC350
680	35x50	225	144	2.92	4.93	ALC12A681DF350
680	40x40	246	164	2.68	4.04	ALC12A681ED350
820	40x45	207	139	3.02	4.50	ALC12A821EE350
1000	35x60	163	107	3.51	5.45	ALC12A102DH350
1000	40x50	175	118	3.39	4.92	ALC12A102EF350
1200	40x60	146	99	3.89	5.62	ALC12A122EH350
1500	35x80	111	73	4.37	6.64	ALC12A152DL350
1800	40x80	100	68	4.85	6.89	ALC12A182EL350
2200	40x105	81	55	5.61	7.99	ALC12A222EP350
3300	45x105	49	32	7.53	11.79	ALC12G332FP350
3900	50x105	44	29	7.95	11.73	ALC12G392KP350

Termination Style A,C,D,E,F,G,H,J or K *

Not for new design. Use PEH506 or ELH Series.

ARTICLE TABLE ALC12 (85°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	
400 VDC (U_R)						
180	30x30	794	509	1.21	2.38	ALC12A181CB400
220	30x35	648	414	1.42	2.82	ALC12A221CC400
270	30x40	529	339	1.66	3.28	ALC12A271CD400
330	35x35	457	299	1.91	3.35	ALC12A331DC400
330	40x30	485	326	1.79	2.86	ALC12A331EB400
390	30x50	370	238	2.16	4.17	ALC12A391CF400
390	35x40	385	252	2.18	3.85	ALC12A391DD400
470	40x35	352	240	2.21	3.38	ALC12A471EC400
560	35x50	270	178	2.75	4.72	ALC12A561DF400
560	40x40	295	200	2.54	3.92	ALC12A561ED400
680	35x60	226	149	3.14	5.34	ALC12A681DH400
680	40x45	245	168	2.87	4.37	ALC12A681EE400
820	40x50	207	143	3.22	4.80	ALC12A821EF400
1000	35x80	155	102	3.90	6.52	ALC12A102DL400
1000	40x60	172	119	3.71	5.46	ALC12A102EH400
1500	40x80	115	80	4.64	6.71	ALC12A152EL400
1800	40x105	82	53	6.11	11.06	ALC12A182EP400
2700	45x105	59	39	7.11	11.40	ALC12G272FP400
3300	50x105	51	35	7.60	11.38	ALC12G332KP400
450 VDC (U_R)						
150	30x30	861	548	1.15	2.34	ALC12A151CB450
220	30x35	596	382	1.45	2.83	ALC12A221CC450
270	30x40	486	312	1.70	3.30	ALC12A271CD450
270	35x35	500	324	1.82	3.30	ALC12A271DC450
330	30x50	395	252	2.08	4.10	ALC12A331CF450
330	35x40	410	266	2.10	3.79	ALC12A331DD450
330	40x30	460	313	1.79	2.74	ALC12A331EB450
390	40x35	379	255	2.13	3.35	ALC12A391EC450
470	35x50	292	190	2.64	4.66	ALC12A471DF450
470	40x40	314	211	2.45	3.88	ALC12A471ED450
560	40x45	265	178	2.76	4.34	ALC12A561EE450
680	35x60	206	136	3.23	5.22	ALC12A681DH450
680	40x50	220	150	3.10	4.76	ALC12A681EF450
820	35x80	182	123	3.69	6.26	ALC12A821DL450
820	40x60	180	120	3.62	5.44	ALC12A821EH450
1000	40x80	156	107	4.21	6.69	ALC12A102EL450
1500	40x105	96	63	5.77	10.51	ALC12A152EP450
1800	45x105	82	55	6.27	10.87	ALC12G182FP450
2200	50x105	70	47	6.81	11.12	ALC12G222KP450

Termination Style A,C,D,E,F,G,H,J or K *

OPERATIONAL DATA

Operational Lifetime
Please see separate BHC application notes TD003 for calculating operational life expectancy under customer specific conditions.

RELIABILITY

The failure rate is derived from our periodic test results. The failure rate (λ_R) is therefore only given at test temperature for life tests. An estimation is also given at 40°C. The expected failure rate for this capacitor range is based on our periodic test results for capacitors with structural similarity. Failure rate is frequently quoted in FIT (Failures In Time) where 1 FIT = 1 x 10^{-9} failures per hour.

T_a	Failure rate per hour
85°C	250 FIT
40°C	12 FIT

Failure rate per hour for catastrophic plus parametric failures.

MECHANICAL DATA

Mounting position
The capacitor can be mounted upright or inclined to a horizontal position.

Vibration
10Hz to 500Hz at 0.75mm or 10g for 3x2hrs duration. 10Hz to 55Hz at 0.35mm or 5g for 3x0.5hrs duration (45/50mm diameter cans).

Insulating resistance
≥ 100 Mohms at 100V d.c., across insulating sleeve.

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

Safety vent
A safety vent for over pressure is featured on either the base (opposing end to the terminals) or on the the side of the can. This is in the form of a grooved section on the surface of the can which is a weakened area and is designed to relieve build up of internal pressure due to over stress or catastrophic failure.

Statements of suitability for certain applications are based on our knowledge of typical operating conditions for such applications, but are not intended to constitute – and we specifically disclaim – any warranty concerning suitability for a specific customer application or use. This Information is intended for use only by customers who have the requisite experience and capability to determine the correct products for their application. Any technical advice inferred from this Information or otherwise provided by us with reference to the use of our products is given gratis, and we assume no obligation or liability for the advice given or results obtained.