AKS SERIES

ALUMINIUM ELECTROLYTIC CAPACITORS FOR PRINTED WIRING BOARD

Series	Capacitance range	Voltage range	Temperature range	Case Φ x H	Applications
AKS	100 - 47000	40 - 450	-40°C , +85°C	30 x40 40 x 100	Solder pin mounting Industrial applications

MECHANICAL OUTLINES:
CASE: cylindrical aluminium made
TERMINALS: to be soldered, for printed wiring board
SEALING: hermetic by beading on a Rubber Bakelite covers
PRESSURE RELEASE VENT: directly on to the aluminium case
SLEEVE: self-extinguishing thermoshrinkable sleeve
MOUNTING: vertical, by soldering to printed circuit board.
SIZE: see enclosed drawings

SPECIFICATIONS	**TEMPERATURE RANGE**	**CAPACITANCE**
CECC 30301-805 IEC 384-4 ("long life grade") DIN 40010 DIN 41240 / DIN 41238	Operating: -40 °C/ +85 °C Climatic Category (IEC 68): 40/85/56	Tolerance shall be within the following limits: -20% + 20% (standard tolerance) or -10% +30% (available on request)

LEAKAGE CURRENT:
After the rated voltage has been applied to the capacitor for 5 minutes the leakage current must be:

Maximum limit	at 25 °C	$I_f \leq 0{,}004 * C * V$
Operating limit	at 25 °C:	$I_f \leq 0{,}002 * C * V$

where I_f = leakage current (μA)
C= capacitance (μF)
V= rated voltage (V)

IMPORTANT
When using high-capacitance and high-voltage electrolytic capacitors it is important to remember that the inner part (the rolled section) is notinsulated from can: between the negative pole and the aluminium can there is a variable and not defined resistance essentially due to the electrolyte used in capacitor manufacture.

SURGE VOLTAGE

Working Voltage	25	40	50	63	100	160	200	250	400	420	450
Surge Voltage	29	46	58	73	115	185	230	290	440	460	490

RIPPLE CURRENT:
The allowable values of ripple current in amperes, are related to the temperature and frequency by the formula:

$$I_r = K_t * K_f * I_{r85}$$

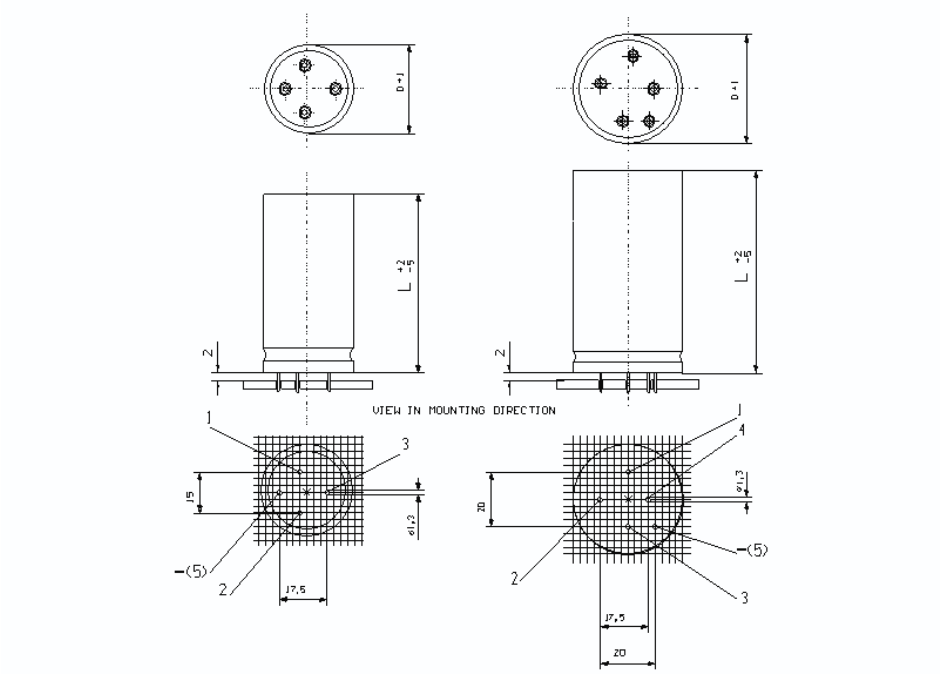
Where I_{r85} is the limit given by tables, referred to a temperature of 85 °C and to a frequency of 100 Hz and K_t or K_f are values here below tabulated:

°C	40	50	65	75	85
K_t	2.3	1.9	1.7	1.4	1.0

V_N	Hz	50	100	300	400	500	>1KHz
V≤50	**K_f**	0.90	1.00	1.14	1.18	1.20	1.25
50<V≤100		0.88	1.00	1.20	1.25	1.35	1.40
V>100		0.88	1.00	1.20	1.25	1.35	1.40

CAPACITORS DIMENSIONS AND DRILLING PLAN OF PRINTED WIRING BOARD

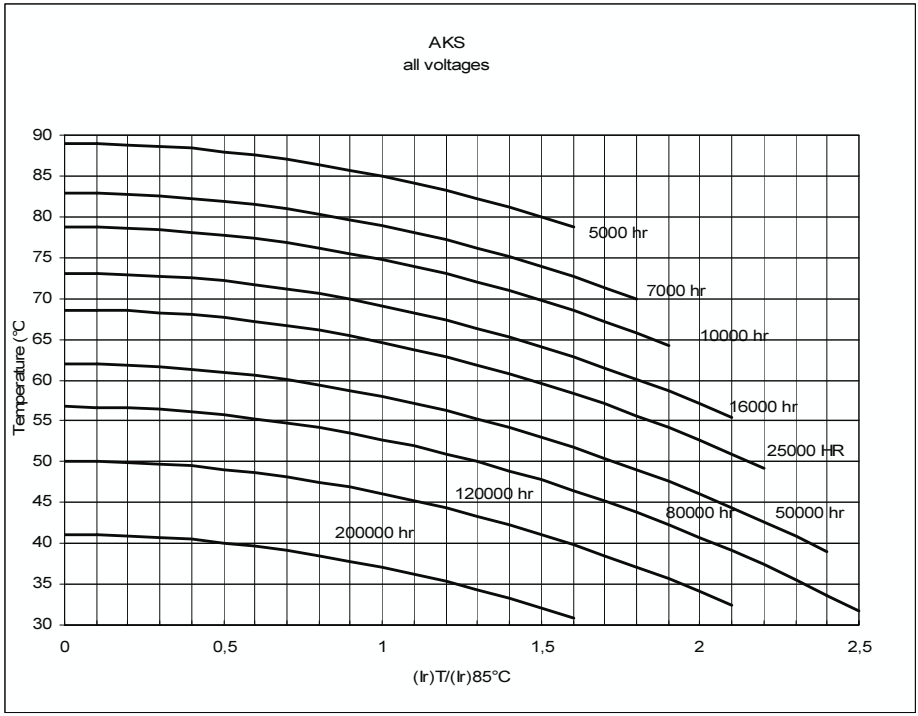
D= 30 / 35 mm. **D= 40 mm.**



CASE	**Φ X L**	**CASE**	**Φ X L**	**CASE**	**Φ X L**	**CASE**	**Φ X L**
MB	30 x 40	**NC**	35 x 50	**PB**	40 x 40	**PE**	40 x 75
NB	35 x 40	**NE**	35 x 75	**PC**	40 x 50	**PG**	40 x 100

- *Positive pole marked with << 1 >>*
- *The terminals marked with "2", "3", "4» are to be considered only as mechanical connections and must be soldered to insulated pads.*

EXPECTED LIFE AS A FUNCTION OF TEMPERATURE AND RIPPLE CURRENT



Expected life criteria: see introduction

CAP (µF)	Rated Voltage (Vn)	Case Code	Φ x h (mm)	TG δ 100Hz	ESR max 100Hz (mOhm)	ESR typ 100Hz (mOhm)	Z max 10Khz (mOhm)	I ripple 55°C 100Hz (A)	I ripple 85°C 100Hz (A)	CATALOGUE NUMBER
6800		MB	30 x 40	0,18	32	24	30	11,1	5,9	AKS682M040MB1
10000		NB	35 x 40	0,22	26	20	26	13,2	7,0	AKS103M040NB1
15000	**40**	NC	35 x 50	0,34	27	20	26	14,1	7,4	AKS153M040NC1
22000		PC	40 x 50	0,40	22	16	21	17,2	9,0	AKS223M040PC1
33000		PE	40 x 75	0,46	17	12	16	22,4	11,8	AKS333M040PE1
47000		PG	40 x 100	0,55	14	10	14	27,8	14,6	AKS473M040PG1

CAP (µF)	Rated Voltage (Vn)	Case Code	Φ x h (mm)	TG δ 100Hz	ESR max 100Hz (mOhm)	ESR typ 100Hz (mOhm)	Z max 10Khz (mOhm)	I ripple 55°C 100Hz (A)	I ripple 85°C 100Hz (A)	CATALOGUE NUMBER
4700		MB	30 x 40	0,24	61	46	58	8,0	4,2	AKS472M063MB1
6800		NB	35 x 40	0,24	42	32	40	10,5	5,5	AKS682M063NB1
10000		NC	35 x 50	0,26	31	23	30	13,1	6,9	AKS103M063NC1
10000	**63**	PC	40 x 50	0,24	29	21	27	14,9	7,9	AKS103M063PC1
15000		PE	40 x 75	0,29	23	17	22	18,9	10,0	AKS153M063PE1
22000		PG	40 x 100	0,32	17	13	25	25,0	13,1	AKS223M063PG1

CAP (µF)	Rated Voltage (Vn)	Case Code	Φ x h (mm)	TG δ 100Hz	ESR max 100Hz (mOhm)	ESR typ 100Hz (mOhm)	Z max 10Khz (mOhm)	I ripple 55°C 100Hz (A)	I ripple 85°C 100Hz (A)	CATALOGUE NUMBER
1500		MB	30 x 40	0,09	72	54	58	7,4	3,9	AKS152M100MB1
2200		NB	35 x 40	0,11	60	45	47	8,9	4,7	AKS222M100NB1
3300		NC	35 x 50	0,11	40	30	31	11,9	6,3	AKS332M100NC1
4700	**100**	PC	40 x 50	0,13	33	25	28	13,7	7,2	AKS472M100PC1
6800		PE	40 x 75	0,13	23	17	19	18,9	10,0	AKS682M100PE1
10000		PG	40 x 100	0,13	16	12	13	26,1	13,7	AKS103M100PG1

CAP (µF)	Rated Voltage (Vn)	Case Code	Φ x h (mm)	TG δ 100Hz	ESR max 100Hz (mOhm)	ESR typ 100Hz (mOhm)	Z max 10Khz (mOhm)	I ripple 55°C 100Hz (A)	I ripple 85°C 100Hz (A)	CATALOGUE NUMBER
330		MB	30 x 40	0,09	326	244	252	3,6	1,9	AKS331M200MB1
470		NB	35 x 40	0,09	229	172	176	4,7	2,5	AKS471M200NB1
680	**200**	NC	35 x 50	0,09	158	119	122	6,2	3,3	AKS681M200NC1
1000		PC	40 x 50	0,09	107	81	82	8,1	4,3	AKS102M200PC1
1500		PE	40 x 75	0,09	72	54	55	11,4	6,0	AKS152M200PE1
2200		PG	40 x 100	0,09	49	37	38	15,7	8,3	AKS222M200PG1

CAP (µF)	Rated Voltage (Vn)	Case Code	Φ x h (mm)	TG δ 100Hz	ESR max 100Hz (mOhm)	ESR typ 100Hz (mOhm)	Z max 10Khz (mOhm)	I ripple 55°C 100Hz (A)	I ripple 85°C 100Hz (A)	CATALOGUE NUMBER
220		MB	30 x 40	0,09	489	366	406	3,0	1,6	AKS221M250MB1
330		NB	35 x 40	0,09	326	244	270	4,0	2,1	AKS331M250NB1
470		NC	35 x 50	0,09	229	172	190	5,2	2,7	AKS471M250NC1
680	**250**	PC	40 x 50	0,09	158	119	131	6,7	3,5	AKS681M250PC1
1000		PE	40 x 75	0,09	107	81	89	9,3	4,9	AKS102M250PE1
1500		PG	40 x 100	0,09	72	54	59	13,0	6,8	AKS152M250PG1

CAP (µF)	Rated Voltage (Vn)	Case Code	Φ x h (mm)	TG δ 100Hz	ESR max 100Hz (mOhm)	ESR typ 100Hz (mOhm)	Z max 10Khz (mOhm)	I ripple 55°C 100Hz (A)	I ripple 85°C 100Hz (A)	CATALOGUE NUMBER
150		MB	30 x 40	0,09	717	537	587	2,5	1,3	AKS151M385MB1
220		NB	35 x 40	0,09	489	366	405	3,2	1,7	AKS221M385NB1
330		NC	35 x 50	0,09	326	244	270	4,3	2,3	AKS331M385NC1
470	**385**	PB	40x 40	0,09	229	172	190	5,6	2,8	AKS471M385PB1
680		PC	40 x 50	0,09	158	119	130	8,6	4,5	AKS681M385PC1
1000		NE	40 x 75	0,09	107	81	130	9,3	4,9	AKS102M385NE1
1000		PE	40 x 75	0,09	107	81	89	10,6	5,6	AKS102M385PE1
1000		PG	40 x 100	0,09	107	81	89	11,0	5,8	AKS102M385PG1
1500		PG	40 x 100	0,09	72	54	66	12,4	6,5	AKS152M385PG1

CAP (µF)	Rated Voltage (Vn)	Case Code	Φ x h (mm)	TG δ 100Hz	ESR max 100Hz (mOhm)	ESR typ 100Hz (mOhm)	Z max 10Khz (mOhm)	I ripple 55°C 100Hz (A)	I ripple 85°C 100Hz (A)	CATALOGUE NUMBER
150		MB	30 x 40	0,09	717	537	587	2,5	1,3	AKS151M400MB1
220		NB	35 x 40	0,09	489	366	405	3,2	1,7	AKS221M400NB1
330		NC	35 x 50	0,09	326	244	270	4,3	2,3	AKS331M400NC1
470		PB	40x 40	0,09	229	172	190	5,6	2,8	AKS471M400PB1
680	**400**	PC	40 x 50	0,09	158	119	130	8,6	4,5	AKS681M400PC1
1000		NE	40 x 75	0,09	107	81	130	9,3	4,9	AKS102M400NE1
1000		PE	40 x 75	0,09	107	81	89	10,6	5,6	AKS102M400PE1
1000		PG	40 x 100	0,09	107	81	89	11,0	5,8	AKS102M400PG1
1500		PG	40 x 100	0,09	72	54	66	12,4	6,5	AKS152M400PG1

CAP (µF)	Rated Voltage (Vn)	Case Code	Φ x h (mm)	TG δ 100Hz	ESR max 100Hz (mOhm)	ESR typ 100Hz (mOhm)	Z max 10Khz (mOhm)	I ripple 55°C 100Hz (A)	I ripple 85°C 100Hz (A)	CATALOGUE NUMBER
150		MB	30 x 40	0,09	717	537	587	2,5	1,3	AKS151M420MB1
220		NB	35x 40	0,09	489	366	405	3,2	1,7	AKS221M420NB1
330		NC	35 x 50	0,09	326	244	270	4,3	2,3	AKS331M420NC1
680		PC	40 x 50	0,09	158	119	118	7,4	3,9	AKS681M420PC1
1000	**420**	NE	35 x 75	0,09	107	81	130	8,2	4,3	AKS102M420NE1
1000		PE	40 x 75	0,09	107	81	130	8,9	4,7	AKS102M420PE1
1000		PG	40 x 100	0,09	107	81	89	10,6	5,6	AKS102M420PG1
1500		PG	40 x 100	0,09	72	54	66	12,4	6,5	AKS152M420PG1

CAP (µF)	Rated Voltage (Vn)	Case Code	Φ x h (mm)	TG δ 100Hz	ESR max 100Hz (mOhm)	ESR typ 100Hz (mOhm)	Z max 10Khz (mOhm)	I ripple 55°C 100Hz (A)	I ripple 85°C 100Hz (A)	CATALOGUE NUMBER
100		MB	30 x 40	0,10	1194	896	869	1,9	1,0	AKS101M450MB1
150		NB	35 x 40	0,10	796	597	579	2,6	1,3	AKS151M450NB1
220		NC	35 x 50	0,10	543	407	394	3,4	1,8	AKS221M450NC1
330		NC	35 x 50	0,10	362	271	263	4,1	2,2	AKS331M450NC1
330	**450**	PC	40 x 50	0,10	362	271	263	4,5	2,3	AKS331M450PC1
470		NC	35 x 50	0,10	254	191	185	4,9	2,6	AKS471M450NC1
470		PC	40 x 50	0,10	254	191	185	5,3	2,8	AKS471M450PC1
680		NE	35 x 75	0,10	176	132	139	6,5	3,4	AKS681M450NE1
680		PE	40 x 75	0,10	176	132	127	7,3	3,8	AKS681M450PE1
1000		PE	40 x 75	0,10	119	90	108	8,2	4,3	AKS102M450PE1
1000		PG	40 x 100	0,10	119	90	94	9,7	5,1	AKS102M450PG1
1500		PG	40 x 100	0,10	80	60	80	11,2	5,8	AKS152M450PG1

Itelcond s.r.l.

GENERAL CONDITIONS

1)
The general conditions presently in force are applicable to all purchases effected by the Client (Buyer) from Itelcond S.r.l. (Seller). These general conditions must not be exceeded, modified, deferred or, in any other way, altered, except if an official document is underwritten and signed by the Seller. Under no circumstances the general conditions adopted by the Buyer, printed on his purchase orders or any other document, will be deemed applicable to none of the purchase orders placed with the Seller. The execution, also partial, of the Buyer's order, or any other fulfilment from the Seller's side towards the Buyer, will not be valid and therefore not interpreted as tacit or implicit acceptance of any general condition decided by the Buyer, unless specifically agreed upon the Seller's legal representative.

2)
The products manufactured or sold by the Seller are not designed to be used into devices or equipments to be inserted surgically into the human body or, in other words, suitable to examine or preserve the human life, or used in devices or systems for the nuclear applications. If the Buyer intends to utilise the Seller's products for its application in medical, nuclear, military and/or aero spatial fields, he may do so only with prior request and receipt of a document signed by the Seller's managing director, certifying that these products are suitable to be applied in the above fields,

3)
The Seller will accept purchase orders only after written confirmation of the order, sent to the Buyer.

4)
Delivery dates shown in the confirmation order are only indicative and not binding. The Seller will do his utmost in order to respect the confirmed delivery date but, at the same time, does not take any responsibility for the eventual non-observance of the date. The delivery is linked to the payment of eventual amounts which are due and are related to previous supplies. Likewise also prices indicated in the confirmation order might vary according to increases in the energy or raw materials prices or changes in currency rates.

5)
In absence of written agreements, orders are considered fulfilled with a tolerance of plus/minus 3% or plus/minus 5 pieces.

6)
The technical specifications of the Seller's products are those contained in his last **"Data Book"** and are also traceable on his **Web Site: www.itelcond.it .**
The technical specifications may also be those agreed upon between Seller and Buyer.

7)
Seller's products will be free from vices and will be guaranteed for a period of **12 months** from delivery date to the Buyer. The law decree No.24 of 02,02,2002 will not be enforced as these products are not considered as consumer goods. The warranty is effective exclusively towards the Seller's direct Buyer. Damages claimed by third parties, although if requested by Seller's direct Buyer, will be turned down.

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GENERAL CONDITIONS

8)
The warranty does not cover products which are used incorrectly. Certain types of electric products, designed and manufactured to be used as basic components to be inserted in other electric devices, are anyway such that their performance is widely related to the way they are integrated in the final product and by its general characteristics. In the range of these basic components are included both active and passive components and notably the electrolytic capacitors.

9)
Eventual defects or vices of goods vill be promptly notified in writing and anyhow not after 8 days from the date of receipt of goods. In case of hidden defects, the above timing will start from the date of the discovery of these defects. In case of vices ascertained and reported in due time, defects or lack in quantity or quality of products, the Seller is entitled to the sole substitution of such products, repair or writing back of such products at his choice.
In line with the most ample applicability of the law, any different and further responsibility is excluded for damages occurring to the buyer or third parties with regard to the utilization of the Seller's products.
Samples, prototypes and products in development, will be delivered as they are and uncovered from warranty

10)
In case of missed and damaged products and units considered not in line with the technical specifications, the Buyer is entitled to inform immediately the Seller, who will decide how to proceed about the matter. No rejected goods will be accepted, unless previously authorized by the Seller.
If an authorization number for the rejection **(RMA)** has been notified to the Buyer, such a number must be reported both on packaging and on documents accompanying the units rejected to the Seller.
Products, travelling at Buyer's risk and danger, must be returned complete, not tampered with, non welded, with their eventual accessories and adequately packed and delivered free factory of Seller.
The assignment of the authorization number for rejection does not allow the Buyer to obtain the substitution of products, the credit of their value, and whatsoever responsibility on the Seller's side is not admitted.
The Buyer is obliged to comply with the rules related to the re-exportation of the products to clients or countries, if the italian law forbids export and sale towards them.

11)
Goods are sold free factory of Seller and therefore the transportation risk is at total Buyer's charge. The delivery of products will be considered in every respect accomplished once the products are collected by the carrier or by the same Buyer at the Seller's warehouse.

12)
The sold products will remain property of the Seller until totally paid by the Buyer. In case of delayed or missed payment the Seller may, at his discretion, request to re-enter into possession of unpaid products.

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GENERAL CONDITIONS

13)
The Seller will not be liable if events, not due to his will, will prevent him to accomplish, partially or totaly, the contractual obligations undertaken. The Seller will not assume responsibility for his products after the same are assembled on Buyer's equipments. The Seller will not be liable, no limitations admitted, for damages caused by the loss of warranty, contracts, or other legal matters, including loss of value, profit, capital, or expenses for the substitution of equipments.

14)
Any dispute will be submitted to the law-court of Milan (Italy). Under any circumstance the contract will be exclusively governed by the Italian law.