



AKS series

Series	Voltage	Temperature	Case Φ x H [mm]	Applications
AKS	40-500V	-40°C,+85°C	30x40/45x100	Solder Pins High reliability Industrial application

Table 1-General

Mechanical Outlines:

- Case: aluminium made
- Terminals: soldering pins for PCBs
- Sealing: hermetic by beading on Rubber Bakelite Cover
- Pressure Release Vent: onto Aluminium Case
- Sleeve: self-extinguishing thermoshrinkable sleeve
- Size: see enclosed drawings
- Mounting: vertical by soldering

Specifications	Temperature Range	Capacitance
CECC 30301 IEC 384-4 ("long life grade") DIN40010 DIN 41240/DIN41238	Operating: -40°C/+85°C Climatic category : 40/85/56	Standard tolerance M=±20% Upon request X=10%+30%

Table 2-General Specifications

Leakage Current

After the rated voltage has been applied to the capacitor for 5 minutes the leakage current must be within limits given in Table 3-Leakage Current limits:

Maximum limit	@25°C	$I_f \leq 0,004 \times C \times V$
Operating limit	@25°C	$I_f \leq 0,002 \times C \times V$

Table 3-Leakage Current limits

Where:

- I_f =leakage current [μ A]
- C=capacitance [μ F]
- 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 not insulated 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

Surge Voltage limit for each working voltage is shown in Table 4-Surge Voltage values.

Working Voltage	40	50	63	75	100	160	200	250	350	400	450
Surge Voltage	46	58	73	86	115	185	230	290	385	440	495

Table 4-Surge Voltage values

Ripple Current

The allowable values of ripple current in Ampères, are related to the temperature and frequency by Equation 1:

$$I_{\text{Ripple}} = K_t \cdot K_f \cdot I_{\text{Ripple@85}^\circ\text{C}}$$

Equation 1

Where:

- $I_{\text{Ripple@85}^\circ\text{C}}$ is the limit given by tables, @ 85°C/100HZ
- K_t is the Temperature Correlation Factor, tabulated in Table 5-Kt Values
- K_f is the Frequency Correlation Factor, tabulated in Table 6-Kf Values

Note . Ripple current is function of the capacitance tolerance

°C	40	55	65	75	85
Kt	2.30	1.90	1.70	1.40	1.0

Table 5-Kt Values

Vn/Hz	Kf		
	V≤50	50<V<100	V≥100
50	0.90	0.88	0.88
100	1.00	1.00	1.00
300	1.14	1.20	1.20
400	1.18	1.25	1.25
500	1.20	1.35	1.35
>1000	1.25	1.40	1.40

Table 6-Kf Values



Dimensions

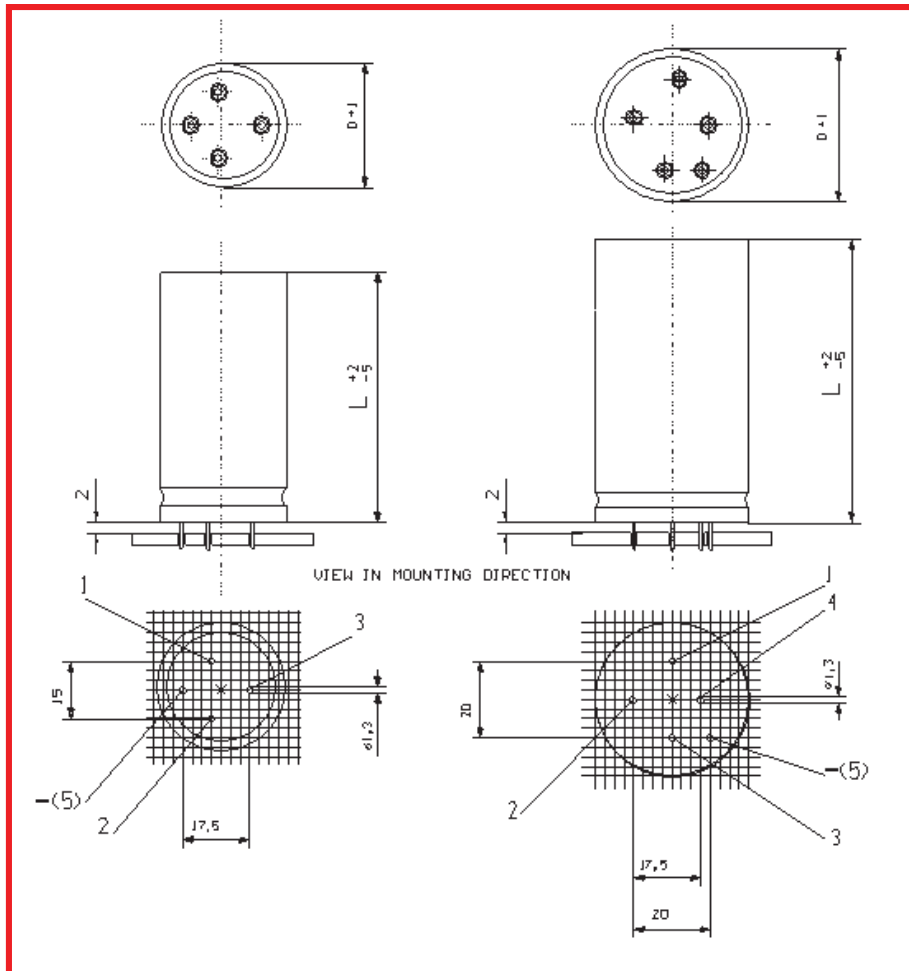


Table 7-General View

Case Code	ΦxL	Case Code	ΦxL	Case Code	ΦxL	Case Code	ΦxL
MB	30 x 40	NN	35 x 60	PN	40 x 60	QE	45 x 75
MC	30 x 50	NE	35 x 75	PG	40 x 100	QG	45 x 100
NB	35 x 40	PB	40 x 40	QC	45 x 50		
NC	35 x 50	PC	40 x 50	QN	45 X 60		

Table 8-Dimensions

Unconnected pins serve as mountings and must be soldered to insulated pads

Expected Lifetime Vs Temperature and Ripple Current

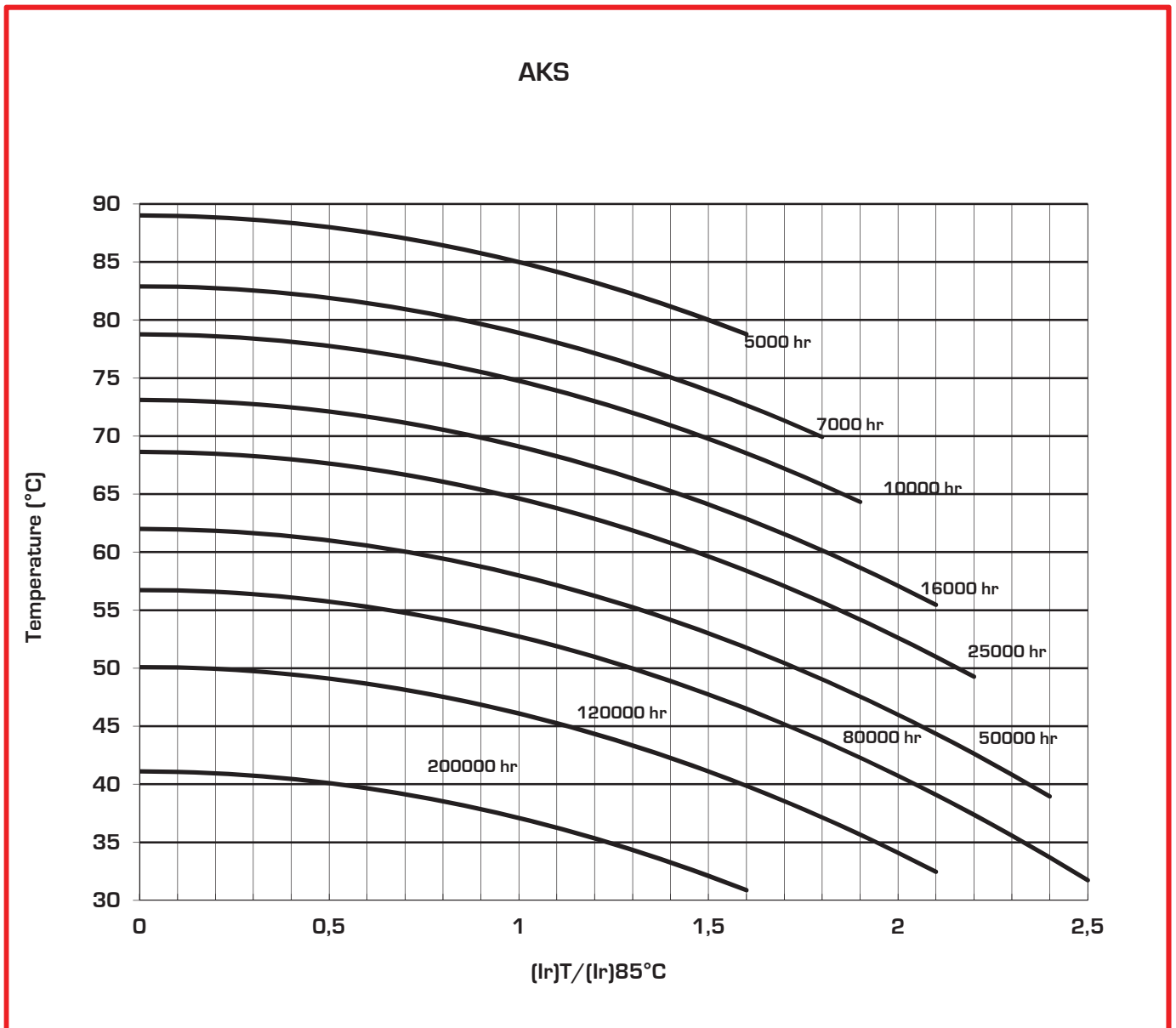


Table 9

Expected lifetime criteria: see introduction

VN=40V

Capacitance	Case	Tan δ	ESRmax/typ		Zmax	Iripple55°C/85°C		Part Number
		[%]@100Hz	[m Ω]@100Hz	[m Ω]@10KHz		[A]@100Hz	[A]@100Hz	
6800	MB	0,30	56	42	40	8,4	4,4	AKS682M040MB1
10000	MC	0,32	41	31	28	11	5,8	AKS103M040MC1
10000	NB	0,36	46	34	32	11,3	6	AKS103M040NB1
15000	NC	0,36	31	23	21	13,9	7,3	AKS153M040NC1
22000	PC	0,48	28	21	19	15,7	8,3	AKS223M040PC1

VN=63V

Capacitance	Case	Tan δ	ESRmax/typ		Zmax	Iripple55°C/85°C		Part Number
		[%]@100Hz	[m Ω]@100Hz	[m Ω]@10KHz		[A]@100Hz	[A]@100Hz	
4700	MB	0,21	57	43	46	8,5	4,5	AKS472M063MB1
6800	MC	0,21	39	30	32	11,2	5,9	AKS682M063MC1
6800	NB	0,24	45	34	37	11,4	6	AKS682M063NB1
10000	NC	0,24	31	23	25	13,9	7,3	AKS103M063NC1
12000	PC	0,29	31	23	25	15	7,9	AKS123M063PC1
15000	PE	0,29	25	18	21	23,2	12,2	AKS153M063PE1
22000	PG	0,29	17	13	21	26	13,8	AKS223M063PG1

Notes:

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VN=100V

Capacitance	Case	Tan δ	ESRmax/typ		Zmax	Iripple55°C/85°C		Part Number
			[μ F]@100Hz	[%]@100Hz		[m Ω]@100Hz	[m Ω]@10KHz	
1500	MB	0,09	76	57	66	7,1	3,7	AKS152M100MB1
2200	MC	0,10	58	43	57	8,4	4,4	AKS222M100MC1
2200	NB	0,11	64	48	57	9,2	4,8	AKS222M100NB1
3300	NC	0,12	46	35	38	11,3	5,9	AKS332M100NC1
4700	NC	0,12	33	24	26	13,4	7,1	AKS472M100NC1
5600	NC	0,12	27	20	32	14,7	7,7	AKS562M100NC1
6800	PE	0,12	22	17	26	24,2	12,7	AKS682M100PE1
10000	PG	0,12	15	11	26	25,8	13,8	AKS103M100PG1

VN=200V

Capacitance	Case	Tan δ	ESRmax/typ		Zmax	Iripple55°C/85°C		Part Number
			[μ F]@100Hz	[%]@100Hz		[m Ω]@100Hz	[m Ω]@10KHz	
470	MB	0,08	217	163	176	4,7	2,5	AKS471M200MB1
680	MB	0,08	150	112	122	5,7	3	AKS681M200MB1
1000	MC	0,08	102	76	82	7,6	4	AKS102M200MC1
1000	NB	0,08	102	76	82	8,3	4,4	AKS102M200NB1
1200	NB	0,08	85	64	80	9,1	4,8	AKS122M200NB1
1500	NC	0,08	68	51	56	10,1	5,3	AKS152M200NC1
1800	NC	0,08	57	42	56	11,1	5,8	AKS182M200NC1
3300	PG	0,08	31	23	38	22,5	11,8	AKS332M200PG1
2200	QC	0,08	46	35	38	14,2	7,5	AKS222M200QC1
3300	QE	0,08	31	23	38	20,7	10,9	AKS332M200QE1

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VN=250V

Capacitance	Case	Tan δ	ESRmax/typ		Zmax	Iripple55°C/85°C		Part Number
		[%]@100Hz	[m Ω]@100Hz	[m Ω]@10KHz		[A]@100Hz	[A]@100Hz	
470	MB	0,09	217	163	190	4,7	2,5	AKS471M250MB1
680	MC	0,09	150	112	131	6,3	3,3	AKS681M250MC1
680	NB	0,09	150	112	131	6,8	3,6	AKS681M250NB1
1000	NB	0,09	102	76	120	8,3	4,4	AKS102M250NB1
1000	NC	0,09	102	76	89	8,3	4,4	AKS102M250NC1
2200	NE	0,09	46	35	89	14,7	7,7	AKS222M250NE1
1500	PC	0,09	68	51	59	11	5,8	AKS152M250PC1
2200	PG	0,09	46	35	38	18,4	9,7	AKS222M250PG1

VN=400V

Capacitance	Case	Tan δ	ESRmax/typ		Zmax	Iripple55°C/85°C		Part Number
		[%]@100Hz	[m Ω]@100Hz	[m Ω]@10KHz		[A]@100Hz	[A]@100Hz	
330	MC	0,10	309	232	270	4,4	2,3	AKS331M400MC1
470	MC	0,10	217	163	190	5,2	2,7	AKS471M400MC1
560	NC	0,10	182	136	143	6,2	3,3	AKS561M400NC1
680	NC	0,10	150	112	120	6,8	3,6	AKS681M400NC1
1200	NE	0,10	85	64	98	10,8	5,7	AKS122M400NE1
470	PB	0,10	217	163	82	5,6	3,3	AKS471M400PB1
680	PC	0,10	150	112	63	7,4	3,9	AKS681M400PC1
1000	PE	0,10	100	75	63	10,6	5,6	AKS102M400PE1
1500	PG	0,10	90	68	63	15,2	8	AKS152M400PG1
1500	QE	0,10	85	64	63	13,9	7,3	AKS152M400QE1

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VN=450V

Capacitance	Case	Tan δ	ESRmax/typ		Zmax	Iripple55°C/85°C		Part Number
			[μ F]@100Hz	[%]@100Hz		[m Ω]@100Hz	[m Ω]@10KHz	
330	MC	0,12	309	232	286	4	2,1	AKS331M450MC1
470	NC	0,12	217	163	185	6,3	3,3	AKS471M450NC1
680	NN	0,12	150	112	155	7,4	3,9	AKS681M450NN1
820	NE	0,12	124	93	128	8,5	4,5	AKS821M450NE1
680	PC	0,12	150	112	128	7	3,7	AKS681M450PC1
1000	PE	0,12	102	76	128	9,7	5,1	AKS102M450PE1
1500	PG	0,12	68	51	128	13,8	7,3	AKS152M450PG1
820	QC	0,12	124	93	128	7,9	4,2	AKS821M450QC1
1200	QE	0,12	85	64	128	11,4	6	AKS122M450QE1
1800	QG	0,12	57	42	128	16,2	8,5	AKS182M450QG1

VN=500V

Capacitance	Case	Tan δ	ESRmax/typ		Zmax	Iripple55°C/85°C		Part Number
			[μ F]@100Hz	[%]@100Hz		[m Ω]@100Hz	[m Ω]@10KHz	
150	MB	0,15	1274	955	790	1,5	0,8	AKS151M500MB1
220	MC	0,15	869	651	538	2	1,1	AKS221M500MC1
220	NB	0,15	869	651	538	2	1,1	AKS221M500NB1
330	NC	0,15	579	434	359	2,7	1,5	AKS331M500NC1
470	PC	0,15	407	305	252	3,6	2	AKS471M500PC1
680	PG	0,15	281	211	192	6,9	3,7	AKS681M500PG1

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