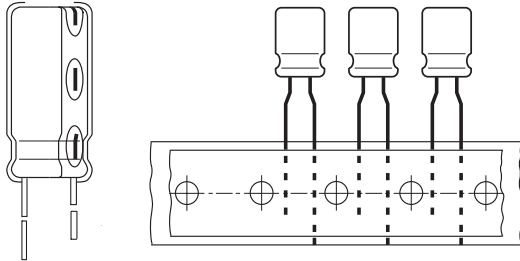


Aluminum Capacitors Radial Style



Component outlines.

FEATURES

- Polarized Aluminum electrolytic capacitor
- High C•U product
- Small dimensions
- Long lifetime
- Extended temperature range: 105 °C



RoHS
COMPLIANT

APPLICATIONS

- Industrial electronics, automotive electronics, telecommunication systems, audio / video systems
- Smoothing, filtering, timing elements
- Small space requirement
- Portable and mobile units

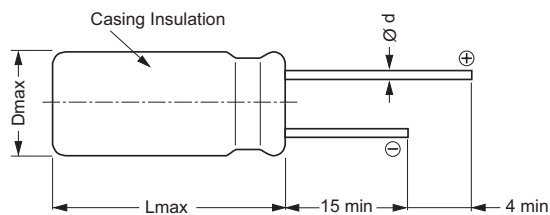
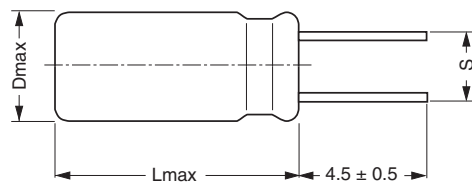
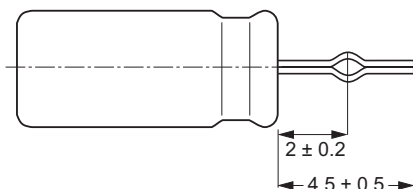
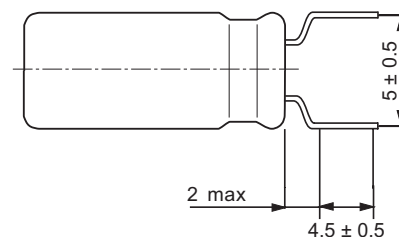
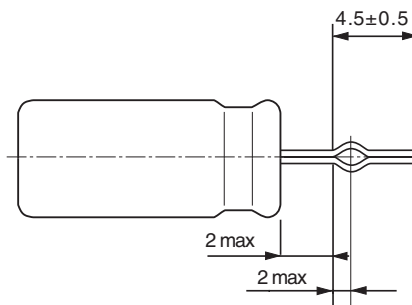
QUICK REFERENCE DATA

DESCRIPTION	UNIT	VALUE		
Nominal case size (ØD × L)	mm	5 x 11 to 8 x 11.5	10 x 12.5 to 18 x 40	
Rated capacitance range C _R	µF	0.47 to 10000		
Capacitance tolerance	%	± 20		
Rated voltage range	V	6.3 to 450		
Category temperature range	°C	6.3 to 100 V - 55 to 105	160 to 350 V - 40 to 105	400, 450 V - 25 to 105
Endurance test at upper category temp.	h	1000	2000	
Useful life at 105 °C and I _R applied	h	1500	2500	
Useful life at 85 °C and I _R applied	h	6000	10000	
Useful life at 40°C and I _R applied	h	140000	230000	
Failure rate	10 ⁻⁹ /h	≤ 45		
Based on sectional specifications		IEC 384-4, CECC 30300, GP grade		
Based on detailed specifications		similar to CECC 30301-037, similar to DIN 45910 part 124 without quality assessment		
Climatic category		-40 to 85	-40 to 85	-40 to 85
IEC 68		55/105/56	40/105/56	25/105/56
DIN 40040		FMF	GMF	HMF

SELECTION CHART FOR C_R, U_R AND RELEVANT NOMINAL CASE SIZES (ØD x L in mm)

C _R (µF)	RATED VOLTAGE [V]											
	10	16	25	35	50	63	100	160	250	350	400	450
0.47	-	-	-	-	5 x 11	-	5 x 11	-	6.3 x 11	-	-	-
1.0	-	-	-	-	5 x 11	-	5 x 11	-	6.3 x 11	8 x 11.5	8 x 11.5	8 x 11.5
2.2	-	-	-	-	5 x 11	-	5 x 11	6.3 x 11	8 x 11.5	10 x 12.5	10 x 12.5	10 x 12.5
3.3	-	-	-	-	5 x 11	-	5 x 11	8 x 11.5	10 x 12.5	10 x 16	10 x 16	10 x 16
4.7	-	-	-	-	5 x 11	-	5 x 11	8 x 11.5	10 x 12.5	10 x 16	10 x 16	10 x 20
10	-	-	-	-	5 x 11	5 x 11	6.3 x 11	10 x 16	10 x 16	10 x 20	13 x 20	13 x 20
22	-	-	-	-	5 x 11	6.3 x 11	8 x 11.5	10 x 20	13 x 20	13 x 25	13 x 25	16 x 25
33	-	-	-	5 x 11	6.3 x 11	6.3 x 11	10 x 12.5	13 x 20	13 x 20	16 x 25	15 x 25	16 x 13.5
47	-	-	5 x 11	6.3 x 11	6.3 x 11	8 x 11.5	10 x 16	13 x 20	13 x 25	16 x 31.5	16 x 35.5	18 x 40
100	5 x 11	6.3 x 11	6.3 x 11	8 x 11.5	8 x 11.5	10 x 12.5	13 x 20	16 x 25	16 x 35.5	18 x 40	-	-
220	6.3 x 11	8 x 11.5	8 x 11.5	10 x 12.5	10 x 16	13 x 16	16 x 25	16 x 40	-	-	-	-
330	8 x 11.5	8 x 11.5	10 x 12.5	10 x 16	13 x 16	13 x 20	16 x 25	18 x 40	-	-	-	-
470	8 x 11.5	10 x 12.5	10 x 16	10 x 20	13 x 20	13 x 25	16 x 31.5	-	-	-	-	-
1000	10 x 16	10 x 20	13 x 20	13 x 25	16 x 25	16 x 31.5	-	-	-	-	-	-
2200	13 x 20	13 x 25	16 x 25	16 x 31.5	18 x 35.5	-	-	-	-	-	-	-
3300	13 x 25	16 x 25	16 x 31.5	18 x 35.5	-	-	-	-	-	-	-	-
4700	16 x 25	16 x 31.5	18 x 35.5	-	-	-	-	-	-	-	-	-
6800	16 x 31.5	16 x 40	-	-	-	-	-	-	-	-	-	-
10000	18 x 35.5	-	-	-	-	-	-	-	-	-	-	-

± 10% capacitance tolerance on request

DIMENSIONS in millimeters **AND AVAILABLE FORMS**

 $5 \leq \text{ØD} \leq 18$ Long leads EKS 00...

 $5 \leq \text{ØD} \leq 18$ Shortened leads EKS 05...
(S = 2 / 2.5 / 3.5 / 5 / 7.5 mm)

 $10 \leq \text{ØD} \leq 18$ Leads shortened and formed EKS 06...
(S = 5 / 7.5 mm)

 $5 \leq \text{ØD} \leq 8$ Leads bent open, shortened EKS 09...
(S = 5 mm)

 $5 \leq \text{ØD} \leq 8$ Leads bent open, shortened and formed EKS 09...
(S = 5 mm)

RADIAL STYLE: DIMENSIONS in millimeters

NOMINAL CASE SIZE ØD x L	MAXIMUM SIZE D _{MAX.} x L _{MAX.}	LEAD Ød ± 0.05	LEAD SPACING S ± 0.5
5 x 11	5.5 x 12.0	0.5	2.0
6.3 x 11	6.8 x 12.0	0.5	2.5
8 x 11.5	8.5 x 12.5	0.6	3.5
10 x 12.5	10.5 x 14.5	0.6	5.0
10 x 16	10.5 x 18.0	0.6	5.0
10 x 20	10.5 x 22.0	0.6	5.0
13 x 16	13.5 x 18.0	0.6	5.0
13 x 20	13.5 x 22.0	0.6	5.0
13 x 25	13.5 x 27.0	0.6	5.0
16 x 25	16.5 x 27.0	0.8	7.5
16 x 31.5	16.5 x 33.5	0.8	7.5
18 x 35.5	16.5 x 37.5	0.8	7.5
16 x 40	16.5 x 42.0	0.8	7.5
18 x 35.5	18.5 x 37.5	0.8	7.5
18 x 40	18.5 x 42.0	0.8	7.5

ELECTRICAL DATA

SYMBOL	DESCRIPTION
C_R	rated capacitance at 120 Hz
U_R	rated voltage
$\tan \delta$	max. dissipation factor at 120 Hz
R_{ESR}	max. equivalent series resistance at 120 Hz
I_R	rated alternating current (rms) at 120 Hz and upper category temperature

Note

1. Unless otherwise specified, all electrical values apply at
 $T_{amb} = 20^\circ\text{C}$, $P = 80$ to 120 kPa, $RH = 45$ to 75% .

ORDERING EXAMPLE

EKS 100 μF / 25 V, $\pm 20\%$, size: 6.3 mm x 11 mm

Leads: Long - Ordering code: EKS 00BA42210E00

Leads: Short (4.5 mm $\pm$ 0.5 mm) - Ordering code: EKS 05...

Leads: Bent open, shortened - Ordering code: EKS 09...

Leads: Bent open, shortened and formed - Ordering code:
EKS 06...

ELECTRICAL DATA AND ORDERING INFORMATION

U_R (V)	C_R 120 Hz (μF)	NOMINAL CASE SIZE $\varnothing D \times L$ (mm)	$\tan \delta$ 120 Hz	R_{ESR} 120 Hz (Ω)	I_R 100 kHz/105 $^\circ\text{C}$ (mA)	WEIGHT (g)	CATALOG NUMBER
10	100	5 x 11	0.19	2.52	105	0.5	EKS00AA310C00
	220	6.3 x 11	0.19	1.15	180	0.8	EKS00BA322C00
	330	8 x 11.5	0.19	0.76	259	1.1	EKS00PB333C00
	470	8 x 11.5	0.19	0.54	310	1.1	EKS00PB347C00
	1000	10 x 16	0.19	0.25	575	2.0	EKS00DD410C00
	2200	13 x 20	0.21	0.13	891	3.8	EKS00GE422C00
	3300	13 x 25	0.24	0.10	1137	4.5	EKS00GG433C00
	4700	16 x 25	0.26	0.07	1444	7.0	EKS00JG447C00
	6800	16 x 31.5	0.31	0.06	1765	9.0	EKS00JS468C00
16	10000	18 x 35.5	0.37	0.05	2193	13.0	EKS00KL510C00
	100	6.3 x 11	0.16	2.12	131	0.8	EKS00BA310D00
	220	8 x 11.5	0.16	0.97	229	1.1	EKS00PB322D00
	330	8 x 11.5	0.16	0.65	280	1.1	EKS00PB333D00
	470	10 x 12.5	0.16	0.45	388	1.5	EKS00DC347D00
	1000	10 x 20	0.16	0.21	677	2.5	EKS00DE410D00
	2200	13 x 25	0.18	0.11	1050	4.5	EKS00GG422D00
	3300	16 x 25	0.20	0.08	1353	7.0	EKS00JG433D00
	4700	16 x 31.5	0.23	0.06	1685	9.0	EKS00JS447D00
25	6800	16 x 40	0.28	0.05	2055	15.0	EKS00KL468D00
	47	5 x 11	0.14	3.95	81	0.5	EKS00AA247E00
	100	6.3 x 11	0.14	1.86	137	0.8	EKS00BA310E00
	220	8 x 11.5	0.14	0.85	239	1.1	EKS00PB322E00
	330	10 x 12.5	0.14	0.56	340	1.5	EKS00DC333E00
	470	10 x 16	0.14	0.40	444	2.0	EKS00DD347E00
	1000	13 x 20	0.14	0.19	830	3.8	EKS00GE410E00
	2200	16 x 25	0.16	0.10	1198	7.0	EKS00JG422E00
	3300	16 x 31.5	0.21	0.085	1519	9.0	EKS00JS433E00
35	4700	18 x 35.5	0.23	0.07	1914	13.0	EKS00KL447E00
	33	5 x 11	0.12	4.83	75	0.5	EKS00AA233F00
	47	6.3 x 11	0.12	3.39	104	0.8	EKS00BA247F00
	100	8 x 11.5	0.12	1.58	178	1.1	EKS00PB310F00
	220	10 x 12.5	0.12	0.73	307	1.5	EKS00DC322F00
	330	10 x 16	0.12	0.48	412	2.0	EKS00DD333F00
	470	10 x 20	0.12	0.34	536	2.5	EKS00DE347F00
	1000	13 x 25	0.12	0.16	1001	4.5	EKS00GG410F00
	2200	16 x 31.5	0.14	0.09	1351	9.0	EKS00JS422F00
35	3300	18 x 35.5	0.17	0.08	1757	13.0	EKS00KL433F00

Aluminum Capacitors
Radial Style

Vishay Roederstein

ELECTRICAL DATA AND ORDERING INFORMATION

U_R (V)	C_R 120 Hz (μ F)	NOMINAL CASE SIZE $\varnothing D \times L$ (mm)	$\tan \delta$ 120 Hz	R_{ESR} 120 Hz (Ω)	I_R 100 kHz/105 °C (mA)	WEIGHT (g)	CATALOG NUMBER
50	0.47	5 x 11	0.10	283	10	0.5	EKS00AA047H00
	1	5 x 11	0.10	133	15	0.5	EKS00AA110H00
	2.2	5 x 11	0.10	61	22	0.5	EKS00AA122H00
	3.3	5 x 11	0.10	41	27	0.5	EKS00AA133H00
	4.7	5 x 11	0.10	29	32	0.5	EKS00AA147H00
	10	5 x 11	0.10	13.30	47	0.5	EKS00AA210H00
	22	5 x 11	0.10	6.03	70	0.5	EKS00AA222H00
	33	6.3 x 11	0.10	4.02	98	0.8	EKS00BA233H00
	47	6.3 x 11	0.10	2.83	117	0.8	EKS00BA247H00
	100	8 x 11.5	0.10	1.33	202	1.1	EKS00PB310H00
	220	10 x 16	0.10	0.61	381	2.0	EKS00DD322H00
	330	13 x 16	0.10	0.41	551	2.5	EKS00GD333H00
	470	13 x 20	0.10	0.29	704	3.8	EKS00GE347H00
	1000	16 x 25	0.10	0.14	1259	7.0	EKS00JG410H00
	2200	18 x 35.5	0.12	0.08	1626	13.0	EKS00KL422H00
63	10	5 x 11	0.09	11.95	47	0.5	EKS00AA210J00
	22	6.3 x 11	0.09	5.43	80	0.8	EKS00BA222J00
	33	6.3 x 11	0.09	3.62	98	0.8	EKS00BA233J00
	47	8 x 11.5	0.09	2.54	138	1.1	EKS00PB247J00
	100	10 x 12.5	0.09	1.20	235	2.5	EKS00DC310J00
	220	13 x 16	0.09	0.55	450	2.5	EKS00GD322J00
	330	13 x 20	0.09	0.37	598	3.8	EKS00GE333J00
	470	13 x 25	0.09	0.26	779	4.5	EKS00GG347J00
	1000	16 x 31.5	0.09	0.12	1377	9.0	EKS00JS410J00
100	0.47	5 x 11	0.08	226	11	0.5	EKS00AA047L00
	1	5 x 11	0.08	107	16	0.5	EKS00AA110L00
	2.2	5 x 11	0.08	49	24	0.5	EKS00AA122L00
	3.3	5 x 11	0.08	32.2	29	0.5	EKS00AA133L00
	4.7	5 x 11	0.08	22.6	35	0.5	EKS00AA147L00
	10	6.3 x 11	0.08	10.7	58	0.8	EKS00BA210L00
	22	8 x 11.5	0.08	4.83	102	1.1	EKS00PB222L00
	33	10 x 12.5	0.08	3.22	146	1.5	EKS00DC233L00
	47	10 x 16	0.08	2.26	190	2.0	EKS00DD247L00
	100	13 x 20	0.08	1.07	356	3.8	EKS00GE310L00
	220	16 x 25	0.08	0.49	638	7.0	EKS00JG322L00
	330	16 x 25	0.08	0.33	781	7.0	EKS00JG333L00
	470	16 x 31.5	0.08	0.23	1020	9.0	EKS00JS347L00
160	2.2	6.3 x 11	0.15	91	20	0.8	EKS00BA122M00
	3.3	8 x 11.5	0.15	61	28	1.1	EKS00PB133M00
	4.7	8 x 11.5	0.15	43	34	1.1	EKS00PB147M00
	10	10 x 16	0.15	20	63	2.0	EKS00DD210M00
	22	10 x 20	0.15	9.10	102	2.5	EKS00DE222M00
	33	13 x 20	0.15	6.10	146	3.8	EKS00GE233M00
	47	13 x 20	0.15	4.24	174	3.8	EKS00GE247M00
	100	16 x 25	0.15	2	307	7.0	EKS00JG310M00
	220	16 x 40	0.15	0.91	550	15.0	EKS00JK322M00
	220	18 x 40	0.15	0.61	722	16.0	EKS00KK333M00
250	0.47	6.3 x 11.5	0.15	424	9	0.8	EKS00BA047N00
	2	6.3 x 11	0.15	200	13	0.8	EKS00BA110N00
	2.2	8 x 11.5	0.15	91	23	1.1	EKS00PB122N00
	3.3	10 x 12.5	0.15	61	33	1.5	EKS00DC133N00
	4.7	10 x 12.5	0.15	43	39	1.5	EKS00DC147N00
	10	10 x 16	0.15	20	63	2.0	EKS00DD210N00
	22	13 x 20	0.15	9.10	119	3.8	EKS00GE222N00
	33	13 x 20	0.15	6.10	146	3.8	EKS00GE233N00
	47	13 x 25	0.15	4.24	190	4.5	EKS00GG247N00
	100	16 x 35.5	0.15	2	353	11.0	EKS00JL310N00

ELECTRICAL DATA AND ORDERING INFORMATION

U_R (V)	C_R 120 Hz (μ F)	NOMINAL CASE SIZE $\varnothing D \times L$ (mm)	$\tan \delta$ 120 Hz	R_{ESR} 120 Hz (Ω)	I_R 100 kHz/105 °C (mA)	WEIGHT (g)	CATALOG NUMBER
350	1	8 x 11.5	0.20	266	16	1.1	EKS00PB110O00
	2.2	10 x 12.5	0.20	121	28	1.5	EKS00DC122O00
	3.3	10 x 16	0.20	81	38	2.0	EKS00DD133O00
	4.7	10 x 16	0.20	57	45	2.0	EKS00DD147O00
	10	10 x 20	0.20	26.54	72	2.5	EKS00DE210O00
	22	13 x 25	0.20	12.10	137	4.5	EKS00GG222O00
	33	16 x 25	0.20	8.05	186	7.0	EKS00JG233O00
	47	16 x 31.5	0.20	5.65	243	9.0	EKS00JS247O00
	100	18 x 40	0.20	2.66	419	16.0	EKS00KK310O00
400	1	8 x 11.5	0.20	266	16	1.1	EKS00PB110X00
	2.2	10 x 12.5	0.20	121	28	1.5	EKS00DC122X00
	3.3	10 x 16	0.20	81	38	2.0	EKS00DD133X00
	4.7	10 x 16	0.20	57	45	2.5	EKS00DD147X00
	10	13 x 20	0.20	26.54	85	3.8	EKS00GE210X00
	22	13 x 25	0.20	12.10	137	4.5	EKS00GG222X00
	33	16 x 25.5	0.20	8.05	186	7.0	EKS00JG233X00
	47	16 x 35.5	0.20	5.65	255	11.0	EKS00JL247X00
450	1.0	8 x 11.5	0.20	266	15	1.1	EKS00PB110P00
	2.2	10 x 12.5	0.20	121	26	1.5	EKS00DC122P00
	1	10 x 16	0.20	81	34	2.5	EKS00DD133P00
	4.7	10 x 20	0.20	57	45	2.5	EKS00DE147P00
	10	13 x 25	0.20	26.54	77	4.5	EKS00GG210P00
	22	16 x 31.5	0.20	12.10	138	9.0	EKS00JS222P00
	33	16 x 40	0.20	8.05	184	15.0	EKS00JK233P00
	47	18 x 40	0.20	5.65	260	16.0	EKS00KK247P00

LOW TEMPERATURE BEHAVIOUR**IMPEDANCE RATIO $Z(T_2) / Z(T_1)$ AT 120 Hz**

T2/T1	RATED VOLTAGE (V)						
	10	16	25 - 100	160	250	350	400 / 450
- 25 / + 20 °C	3	2	2	3	3	3	8
- 25 / + 20 °C	6	4	3	4	4	4	-

LEAKAGE CURRENT

Formula for calculation of the maximum leakage current for acceptance tests I_L :

[Test conditions: U_R , 20 °C, 2 minutes ($U_R \leq 100$ V) / 5 minutes ($U_R > 100$ V)]

$$I_{L2} [\mu A] \leq 0.01 \cdot C_R [\mu F] \cdot U_R [V] \quad \text{or } 3 \mu A \quad \text{for } U_R \leq 100 \text{ V (whichever is greater)}$$

$$I_{L5} [\mu A] \leq 0.02 \cdot C_R [\mu F] \cdot U_R [V] \quad + 15 \mu A \quad \text{for } U_R > 100 \text{ V}$$



Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.