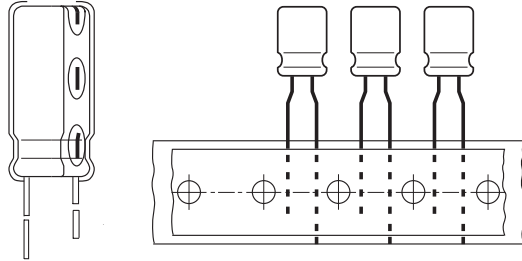


# Aluminum Capacitors Radial Style



Component outlines.

### FEATURES

- Polarized Aluminum electrolytic capacitor
- High C•U product
- Small dimensions
- Lead (Pb)-free / RoHS



RoHS  
COMPLIANT

### APPLICATIONS

- General uses, industrial electronics, automotive electronics, audio / video systems
- Smoothing, filtering, coupling, decoupling, timing elements
- Portable and mobile units

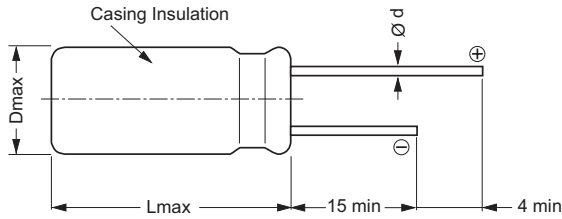
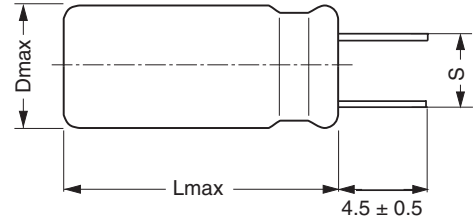
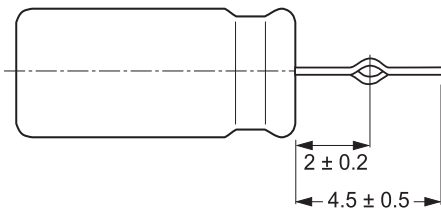
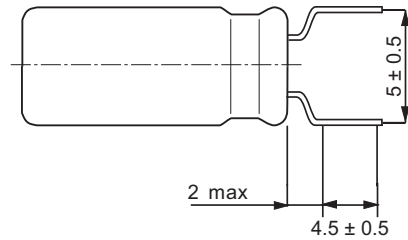
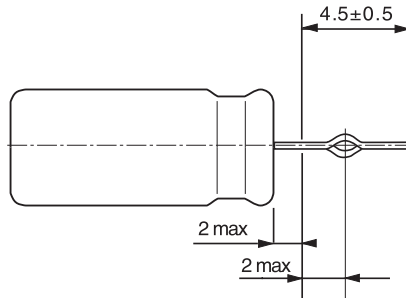
\*Replacement Product is EKA, please visit [www.vishay.com/doc?25014](http://www.vishay.com/doc?25014)

QUICK REFERENCE DATA			
DESCRIPTION	UNIT	VALUE	
Nominal case size (ØD × L)	mm	5 x 11 to 18 x 40	
Rated capacitance range C <sub>R</sub>	µF	0.47 to 10000	
Capacitance tolerance	%	± 20	
Rated voltage range	V	10 to 350	400, 450
Category temperature range	°C	- 40 to + 85	- 25 to + 85
Endurance test at upper category temp.	h	2000	
Useful life at 85°C and I <sub>R</sub> applied	h	3000	
Useful life at 40°C and I <sub>R</sub> applied	h	70000	
Failure rate	10 <sup>-9</sup> /h	≤ 90	
Based on sectional specification		IEC 60384-4/EN 130 300	
Climatic category IEC 60068		40/085/56	25/085/56

SELECTION CHART FOR C <sub>R</sub> , U <sub>R</sub> AND RELEVANT NOMINAL CASE SIZES (ØD x L in mm)												
C <sub>R</sub> (µF)	RATED VOLTAGE [V]											
	10	16	25	35	50	63	100	160	250	350	400	450
0.47	-	-	-	-	5 x 11	-	5 x 11	-	-	-	-	-
1.0	-	-	-	-	5 x 11	-	5 x 11	6.3 x 11	-	-	-	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 12.5	10 x 12.5	10 x 16
4.7	-	-	-	-	5 x 11	5 x 11	5 x 11	8 x 11.5	10 x 12.5	10 x 12.5	10 x 16	10 x 20
10	-	-	-	-	5 x 11	5 x 11	6.3 x 11	10 x 12.5	10 x 16	10 x 20	12.5 x 20	12.5 x 20
22	-	-	-	-	5 x 11	6.3 x 11	8 x 11.5	10 x 20	12.5 x 20	12.5 x 25	12.5 x 25	16 x 25
33	-	-	-	5 x 11	6.3 x 11	6.3 x 11	10 x 12.5	12.5 x 20	12.5 x 25	12.5 x 25	16 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	12.5 x 20	12.5 x 25	16 x 25	16 x 35.5	16 x 35.5
100	5 x 11	6.3 x 11	6.3 x 11	8 x 11.5	8 x 11.5	10 x 12.5	10 x 20	16 x 25	16 x 31.5	18 x 40	-	-
220	6.3 x 11	8 x 11.5	8 x 11.5	10 x 12.5	10 x 16	10 x 20	12.5 x 25	18 x 35.5	-	-	-	-
330	8 x 11.5	8 x 11.5	10 x 12.5	10 x 16	10 x 20	12.5 x 20	16 x 25	-	-	-	-	-
470	8 x 11.5	10 x 12.5	10 x 16	10 x 20	12.5 x 20	12.5 x 25	16 x 31.5	-	-	-	-	-
1000	10 x 16	10 x 20	12.5 x 20	12.5 x 25	16 x 25	16 x 31.5	-	-	-	-	-	-
2200	12.5 x 20	12.5 x 25	16 x 25	16 x 31.5	18 x 35.5	-	-	-	-	-	-	-
3300	12.5 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	-	-	-	-	-	-	-	-	-	-	-
10000	18 x 35.5	-	-	-	-	-	-	-	-	-	-	-

special values/dimensions on request

± 10% capacitance tolerance on request

**DIMENSIONS** in millimeters **AND AVAILABLE FORMS**

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

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

 $10 \leq \text{ØD} \leq 18$  Leads shortened and formed EKO 06...

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

 Leads are solder-coated steel  
 Safety vent for  $\text{ØD} \geq 8\text{mm}$ 
 $5 \leq \text{ØD} \leq 8$  Leads bent open, shortened and formed EKO 06...  
 (S = 5mm)

<b>RADIAL STYLE: DIMENSIONS</b> in millimeters			
NOMINAL CASE SIZE $\text{ØD} \times \text{L}$	MAXIMUM SIZE $\text{D}_{\text{MAX.}} \times \text{L}_{\text{MAX.}}$	LEAD $\text{ØD} \pm 0.05$	LEAD SPACING $\text{S} \pm 0.05$
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
12.5 x 20	13.0 x 22.0	0.6	5.0
12.5 x 25	13.0 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
16 x 35.5	16.5 x 37.5	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 at  $T_a = 20\text{ }^\circ\text{C}$ ,  
 $P = 80$  to  $120\text{ kPa}$ ,  $RH = 45$  to  $75\%$ .

**ORDERING EXAMPLE**

EKO 2200  $\mu\text{F}$  / 25 V,  $\pm 20\%$ , size: 16mm x 25mm

Leads: Long - Ordering code: EKO 00JG422E00

Leads: Short - Ordering code: EKO 05...

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

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

The 14<sup>th</sup> place ( $\square$ ), not indicated in the following table, is an inter-company code and is not relevant to your order.

ELECTRICAL DATA AND ORDERING INFORMATION							
$U_R$ (V)	$C_R$ 120 Hz ( $\mu\text{F}$ )	NOMINAL CASE SIZE $\varnothing D \times L$ (mm)	$\tan \delta$ 120 Hz	$R_{ESR}$ 120 Hz ( $\Omega$ )	$I_R$ 120 Hz/85 $^\circ\text{C}$ (mA)	WEIGHT (g)	CATALOG NUMBER
10	100	5 x 11	0.20	3.18	157	0.5	EKO00AA310C00□
	220	6.3 x 11	0.20	1.45	267	0.8	EKO00BA322C00□
	330	8 x 11.5	0.20	0.97	386	1.1	EKO00PB333C00□
	470	8 x 11.5	0.20	0.68	460	1.1	EKO00PB347C00□
	1000	10 x 16	0.20	0.32	854	2.0	EKO00DD410C00□
	2200	12.5 x 20	0.22	0.16	1492	3.8	EKO00GE422C00□
	3300	12.5 x 25	0.24	0.12	1831	4.5	EKO00GG433C00□
	4700	16 x 25	0.26	0.09	2317	7.0	EKO00JG447C00□
	6800	16 x 31.5	0.30	0.07	2814	9.0	EKO00JS468C00□
	10000	18 x 35.5	0.36	0.06	3475	13.0	EKO00KL510C00□
16	100	6.3 x 11	0.16	2.55	201	0.8	EKO00BA310D00□
	220	8 x 11.5	0.16	1.16	352	1.1	EKO00PB322D00□
	330	8 x 11.5	0.16	0.77	431	1.1	EKO00PB333D00□
	470	10 x 12.5	0.16	0.54	598	1.5	EKO00DC347D00□
	1000	10 x 20	0.16	0.25	1042	2.5	EKO00DE410D00□
	2200	12.5 x 25	0.18	0.13	1713	4.5	EKO00GG422D00□
	3300	16 x 25	0.20	0.10	2194	7.0	EKO00JG433D00□
	4700	16 x 31.5	0.22	0.07	2718	9.0	EKO00JS447D00□
	6800	18 x 35.5	0.26	0.06	3360	13.0	EKO00KL468D00□
	25	47	5 x 11	0.14	4.74	131	0.5
100		6.3 x 11	0.14	2.23	220	0.8	EKO00BA310E00□
220		8 x 11.5	0.14	1.01	386	1.1	EKO00PB322E00□
330		10 x 12.5	0.14	0.68	549	1.5	EKO00DC333E00□
470		10 x 16	0.14	0.47	717	2.0	EKO00DD347E00□
1000		12.5 x 20	0.14	0.22	1340	3.8	EKO00GE410E00□
2200		16 x 25	0.16	0.12	2032	7.0	EKO00JG422E00□
3300		16 x 31.5	0.18	0.09	2546	9.0	EKO00JS433E00□
4700		18 x 35.5	0.20	0.07	3225	13.0	EKO00KL447E00□
35		33	5 x 11	0.12	5.79	123	0.5
	47	6.3 x 11	0.12	4.07	169	0.8	EKO00BA247F00□
	100	8 x 11.5	0.12	1.91	291	1.1	EKO00PB310F00□
	220	10 x 12.5	0.12	0.87	501	1.5	EKO00DC322F00□
	330	10 x 16	0.12	0.58	672	2.0	EKO00DC333F00□
	470	10 x 20	0.12	0.41	875	2.5	EKO00DE347F00□
	1000	12.5 x 25	0.12	0.19	1633	4.5	EKO00GG410F00□
	2200	16 x 31.5	0.14	0.10	2401	9.0	EKO00JS422F00□
	3300	18 x 35.5	0.16	0.08	3065	13.0	EKO00KL433F00□



Aluminum Capacitors  
Radial Style

Vishay Roederstein

ELECTRICAL DATA AND ORDERING INFORMATION							
U <sub>R</sub> (V)	C <sub>R</sub> 120 Hz (μF)	NOMINAL CASE SIZE ∅D x L (mm)	Tan δ 120 Hz	R <sub>ESR</sub> 120 Hz (Ω)	I <sub>R</sub> 120 Hz/85 °C (mA)	WEIGHT (g)	CATALOG NUMBER
50	0.47	5 x 11	0.10	339.00	16	0.5	EKO00AA047H00□
	1	5 x 11	0.10	159.00	23	0.5	EKO00AA110H00□
	2.2	5 x 11	0.10	72.00	34	0.5	EKO00AA122H00□
	3.3	5 x 11	0.10	48.00	42	0.5	EKO00AA133H00□
	4.7	5 x 11	0.10	34.00	50	0.5	EKO00AA147H00□
	10	5 x 11	0.10	15.90	72	0.5	EKO00AA210H00□
	22	5 x 11	0.10	7.24	108	0.5	EKO00AA222H00□
	33	6.3 x 11	0.10	4.83	151	0.8	EKO00BA233H00□
	47	6.3 x 11	0.10	3.39	181	0.8	EKO00BA247H00□
	100	8 x 11.5	0.10	1.59	311	1.1	EKO00PB310H00□
	220	10 x 16	0.10	0.73	586	2.0	EKO00DD322H00□
	330	10 x 20	0.10	0.48	784	2.5	EKO00DE333H00□
	470	12.5 x 20	0.10	0.34	1098	3.8	EKO00GE347H00□
	1000	16 x 25	0.10	0.16	1937	7.0	EKO00JG410H00□
2200	18 x 35.5	0.12	0.09	2823	13.0	EKO00KL422H00□	
63	4.7	5 x 11	0.09	30.50	54	0.5	EKO00AA147J00□
	10	5 x 11	0.09	14.30	78	0.5	EKO00AA210J00□
	22	6.3 x 11	0.09	6.51	133	0.8	EKO00BA222J00□
	33	6.3 x 11	0.09	4.34	163	0.8	EKO00BA233J00□
	47	8 x 11.5	0.09	3.05	230	1.1	EKO00PB247J00□
	100	10 x 12.5	0.09	1.43	390	1.5	EKO00DC310J00□
	220	10 x 20	0.09	0.65	691	2.5	EKO00DE322J00□
	330	12.5 x 20	0.09	0.43	994	3.8	EKO00GE333J00□
	470	12.5 x 25	0.09	0.30	1893	4.5	EKO00GG347J00□
	1000	16 x 31.5	0.09	0.14	2289	9.0	EKO00JS410J00□
100	0.47	5 x 11	0.08	271.00	17	0.5	EKO00AA047L00□
	1	5 x 11	0.08	127.00	25	0.5	EKO00AA110L00□
	2.2	5 x 11	0.08	58.00	37	0.5	EKO00AA122L00□
	3.3	5 x 11	0.08	38.60	45	0.5	EKO00AA133L00□
	4.7	5 x 11	0.08	27.10	54	0.5	EKO00AA147L00□
	10	6.3 x 11	0.08	12.70	90	0.8	EKO00BA210L00□
	22	8 x 11.5	0.08	5.79	157	1.1	EKO00PB222L00□
	33	10 x 12.5	0.08	3.86	224	1.5	EKO00DC233L00□
	47	10 x 16	0.08	2.71	293	2.0	EKO00DD247L00□
	100	10 x 20	0.08	1.27	466	3.8	EKO00DE310L00□
	220	12.5 x 25	0.08	0.58	885	7.0	EKO00GG322L00□
	330	16 x 25	0.08	0.39	1202	7.0	EKO00JG333L00□
	470	16 x 31.5	0.08	0.27	1569	9.0	EKO00JS347L00□
	160	1	6.3 x 11	0.15	239.00	25	0.8
2.2		6.3 x 11	0.15	109.00	37	0.8	EKO00BA122M00□
3.3		8 x 11.5	0.15	72.00	53	1.1	EKO00PB133M00□
4.7		8 x 11.5	0.15	50.80	63	1.1	EKO00PB147M00□
10		10 x 12.5	0.15	23.90	107	1.5	EKO00DC210M00□
22		10 x 20	0.15	10.90	189	2.5	EKO00DE222M00□
33		12.5 x 20	0.15	7.24	272	3.8	EKO00GE233M00□
47		12.5 x 20	0.15	5.08	325	3.8	EKO00GE247M00□
100		16 x 25	0.15	2.39	573	7.0	EKO00JG310M00□
220		18 x 35.5	0.15	1.09	1047	13.0	EKO00KL322M00□
250	2.2	8 x 11.5	0.15	109.00	46	1.1	EKO00PB122N00□
	3.3	10 x 12.5	0.15	72.00	61	1.5	EKO00DC133N00□
	4.7	10 x 12.5	0.15	50.80	73	1.5	EKO00DC147N00□
	10	10 x 16	0.15	23.90	117	2.0	EKO00DD210N00□
	22	12.5 x 20	0.15	10.90	222	3.8	EKO00GE222N00□
	33	12.5 x 25	0.15	7.24	297	4.5	EKO00GG233N00□
	47	12.5 x 25	0.15	5.08	393	4.5	EKO00GG247N00□
100	16 x 31.5	0.15	2.39	627	9.0	EKO00JS310N00□	

**ELECTRICAL DATA AND ORDERING INFORMATION**

$U_R$ (V)	$C_R$ 120 Hz ( $\mu$ F)	NOMINAL CASE SIZE $\varnothing D \times L$ (mm)	$\tan \delta$ 120 Hz	$R_{ESR}$ 120 Hz ( $\Omega$ )	$I_R$ 120 Hz/85 °C (mA)	WEIGHT (g)	CATALOG NUMBER
350	2.2	10 x 12.5	0.20	145.00	50	1.5	EKO00DC122O00□
	3.3	10 x 12.5	0.20	97.00	61	1.5	EKO00DC133O00□
	4.7	10 x 12.5	0.20	68.00	73	1.5	EKO00DC147O00□
	10	10 x 20	0.20	31.80	128	2.5	EKO00DE210O00□
	22	12.5 x 25	0.20	14.50	242	4.5	EKO00GG222O00□
	33	12.5 x 25	0.20	9.65	297	4.5	EKO00GG233O00□
	47	16 x 25	0.20	6.78	393	7.0	EKO00JG247O00□
400	100	18 x 40	0.20	3.18	741	16.0	EKO00KK310O00□
	2.2	10 x 12.5	0.20	145.00	50	1.5	EKA00DC122X00□
	3.3	10 x 12.5	0.20	97.00	61	1.5	EKO00DC133X00□
	4.7	10 x 16	0.20	68.00	80	2.0	EKO00DD147X00□
	10	12.5 x 20	0.20	31.80	150	3.8	EKO00GE210X00□
	22	12.5 x 25	0.20	14.50	282	4.5	EKO00GG222X00□
	33	16 x 25	0.20	9.65	329	7.0	EKO00JG233X00□
450	47	16 x 35.5	0.20	6.78	451	11.0	EKO00JL247X00□
	1.0	8 x 11.5	0.20	266.00	26	1.1	EKO00PB110P00□
	2.2	10 x 12.5	0.20	145.00	45	1.5	EKO00DC122P00□
	3.3	10 x 16	0.20	97.00	60	2.0	EKO00DD133P00□
	4.7	10 x 20	0.20	68.00	78	2.5	EKO00DE147P00□
	10	12.5 x 20	0.20	31.80	134	3.8	EKO00GE210P00□
	22	16 x 25	0.20	14.50	240	7.0	EKO00JG222P00□
450	33	16 x 31.5	0.20	9.65	322	9.0	EKO00JS233P00□
	47	16 x 35.5	0.20	6.78	403	11.0	EKO00JL247P00□

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

$T_2/T_1$	RATED VOLTAGE (V)								
	10	16	25	35 - 100	160	250	350	400	450
- 25 / - 20 °C	3	2	2	2	4	8	8	16	16
- 25 / + 20 °C	8	6	4	3	8	12	12	-	-

**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]      or 3  $\mu$ A      for  $U_R \leq 100$  V (whichever is greater)

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

**PACKAGING UNITS / MIN. ORDER QUANTITY**

SIZE CODES		BULK		AMMO	VOLTAGE CODES
		LONG LEADS	CUT LEADS		
AA	5 x 11	500/2000	500/2000	2000/2000	C = 10 V
BA	6.3 x 11	500/1500	500/1500	1500/1500	D = 16 V
PB	8 x 11.5	300/1200	300/1200	1000/1000	E = 25 V
DC	10 x 12.5	200/1000	800/800	500/1000	F = 35 V
DD	10 x 16	200/1000	700/1400	500/1000	H = 50 V
DE	10 x 20	200/1000	500/1000	500/1000	J = 63 V
GE	12.5 x 20	100/1000	300/1200	400/1200	L = 100 V
GG	12.5 x 25	100/1000	250/1000	400/1200	M = 160 V
JG	16 x 25	50/500	150/600	250/500	N = 250 V
JS	16 x 31.5	50/500	150/600	250/500	O = 350 V
JL	16 x 35.5	50/500	100/500	250/500	X = 400 V
KL	18 x 35.5	50/400	100/400	200/400	P = 450 V
KK	18 x 40	50/400	80/400	-	-



## Disclaimer

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