

CKH/CKE

+105°C General Purpose Radial Lead Aluminum Electrolytic Capacitors



- Standard case sizes
- Multiple case sizes
- Lead free leads
- Bypass
- coupling
- filtering

Operating Temperature Range		-55°C to +105°C (6.3 to 100 WVDC) -40°C to +105°C (160 to 400 WVDC) -25°C to +105°C (450 WVDC)													
Capacitance Tolerance		+20% at 120 Hz, 20°C													
Surge voltage	WVDC	6.3	10	16	25	35	50	63	100	160	200	250	350	400	450
	SVDC	7.9	13	20	32	44	63	79	125	200	250	300	400	450	500
Dissipation Factor	WVDC	6.3	10	16	25	35	50	63	100	160	200	250	350	400	450
	tan δ	.24	.20	.17	.15	.12	.1	.1	.08	.15	.15	.15	.2	.2	.2
		Add .02 for every 1000uF above 1000uF													
Leakage current		6.3 to 100 WVDC							160 to 450 WVDC						
		1 Minutes				2 Minutes			2 Minutes						
		.03CV or 4uA, Whichever is greater				.01CV or 3uA, Whichever is greater			.03CV+40uA						
Low temperature stability Impedance ratio (120 Hz)	Rated WVDC	6.3	10	16	25	35	50	63	100	160	200	250	350	400	450
	-25°C to +20°C	4	3	2	2	2	2	2	2	3	3	3	6	6	15
	-40°C to +20°C	10	8	6	4	3	3	3	3	4	4	4	10	10	-
Load Life		2000 hours at 105°C with rated WVDC applied													
		Capacitance change		<20% of initial measured value											
		Dissipation factor		<200% of maximum specified value											
		Leakage current		>100% of maximum specified value											
Shelf Life		1000 hours at 105°C with no voltage applied													
		Capacitance change		<20% initial measured value											
		Dissipation factor		<200% of maximum specified value											
		Insulation resistance		>100% of maximum specified value											
Ripple Current Multipliers						Frequency (Hz)				Temperature (°C)					
		WVDC		50	120	1k	10k+	+105	+85	+70	+60				
		6.3 to 25V		0.8	1.0	1.10	1.20	1.0	1.4	1.4	1.75				
		35 to 100V		0.8	1.0	1.15	1.25	1.0	1.4	1.4	1.75				
		160 to 250V		0.8	1.0	1.25	1.40	1.0	1.4	1.4	1.75				
350 to 450 V		0.7	1.0	1.30	1.80	1.0	1.4	1.4	1.75						



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Standard Part Listing

Physical Dimensions

WVDC uF	6.3 (7.9)	10 (13)	16 (20)	25 (32)	35 (44)	50 (63)	63 (79)	100 (125)	160 (200)	200 (250)	250 (300)	350 (350)	400 (450)	450 (500)
0.1	-----	-----	-----	-----	----->	5x11								
0.15	-----	-----	-----	-----	----->	5x11								
0.22	-----	-----	-----	-----	----->	5x11								
0.33	-----	-----	-----	-----	----->	5x11								
0.47	-----	-----	-----	-----	-----	-----	----->	5x11	-----	----->	6.3x11			
0.68	-----	-----	-----	-----	----->	5x11	-----	-----	-----					
1	-----	-----	-----	-----	----->	5x11	----->	5x11	-----	----->	6.3x11	6.3x11	8x11.5	10x12.5
1.5	-----	-----	-----	-----	----->	5x11	-----	-----	-----					
2.2	-----	-----	-----	-----	----->	5x11	----->	5x11	-----	----->	6.3x11	6.3x11	8x11.5	10x12.5 8x11.5
3.3	-----	-----	-----	-----	----->	5x11	----->	5x11	----->	6.3x11	6.3x11 8x11.5	8x11.5	10x12.5 8x11.5	10x13 12.5x20
4.7	-----	-----	-----	-----	-----	-----	----->	5x11	6.3x11	6.3x11	10x12.5 6.3x11 8x11.5	10x12.5 8x11.5	10x12.5 10x16	10x12.5 10x20 12.5x20
6.8	-----	-----	-----	-----	----->	5x11	5x11	6.3x11	-----	----->	10x16			
10	-----	-----	-----	-----	----->	5x11	5x11	5x11 6.3x11	8x11.5	10x12.5 8x11.5	10x12.5 10x16	10x16 10x20	10x16 10x20	10x21 12.5x20
15	-----	-----	-----	-----	----->	5x11	6.3x11	8x11.5	10x16	----->	10x20			
22	-----	-----	-----	-----	----->	5x11	5x11 6.3x11	6.3x11 8x11.5	10x12.5 10x16	10x16 10x20	10x20 12.5x20	12.5x20	12.5x25	13x26 16x25 16x31.5
33	-----	-----	-----	-----	----->	5x11 6.3x11	6.3x11	10x12.5 8x11.5	10x16 10x20	10x20	12.5x20	12.5x25	16x25 16x31.5	16x25 18x35.5
47	-----	-----	----->	5x11	5x11	----->	6.3x11 8x11.5	10x12.5 10x16 8x11.5	10x20 12.5x20	12.5x20	12.5x25 13x21	16x25 16x35.5	16x25 16x31.5	16x31.5
68	-----	----->	5x11	6.3x11	----->	8x11.5	10x12.5	10x16	----->	16x25	16x31.5			
100	-----	----->	5x11	5x11	6.3x11	8x11.5	10x12.5 8x11.5	10x16 10x20	12.5x25	16x25	16x25 16x31.5	18x35.5 18x40	18x35.5	
150	----->	6.3x11	----->	8x11.5	10x12.5	10x16	10x20	12.5x20	16x31.5	16x35.5				
220	----->	5x11	6.3x11	6.3x11	8x11.5	10x12.5 10x16	10x16 10x20	12.5x20 12.5x25 16x25	16x31.5	16x35.5	18x35.5			
330	----->	6.3x11	6.3x11	8x11.5	10x12.5	10x16 10x20	10x20 12.5x20	12.5x25 16x25	18x35.5	18x40				
470	----->	6.3x11	10x12.5 8x11.5	10x12.5	10x16	10x20 12.5x20	12.5x20 12.5x25	16x25 16x31.5						
680	10x12.5	----->	10x16	----->	12.5x20	12.5x25	16x25							

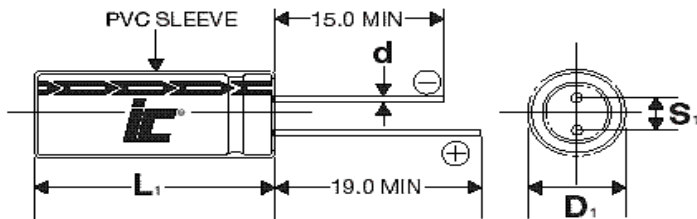


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Standard Part Listing

WVDC uF	6.3 (7.9)	10 (13)	16 (20)	25 (32)	35 (44)	50 (63)	63 (79)	100 (125)	160 (200)	200 (250)	250 (300)	350 (350)	400 (450)	450 (500)
1000	8x11.5	10x12.5	10x12.5 10x16 10x20	10x16 10x20	12.5x20	12.5x25 16x25	16x25 16x31.5	18x35.5 18x40						
1500	10x20	----->	12.5x20	12.5x25	16x25	18x31.5								
2200	10x16	10x16 10x20	10x20 12.5x20 12.5x25	12.5x25 16x25	16x25 16x31.5	16x31.5 16x35.5 18x35.5	18x35.5							
3300	10x20	12.5x20	12.5x25 16x25	16x25 16x31.5	16x31.5 16x35.5	18x35.5								
4700	----->	12.5x25 16x25	16x25 16x31.5	16x25 16x31.5 18x31.5	16x35.5 18x35.5									
6800	12.5x25	16x25	16x25 16x31.5	16x35.5 18x35.5	18x40									
10000	16x25 16x31.5	16x31.5 16x35.5 18x35.5	16x35.5 18x31.5	18x40										
15000	16x31.5 16x35.5	16x35.5 18x35.5	18x40											
22000	18x35.5	18x40												



Lead spacing VS. Case diameter

D	5	6.3	8	10	12.5	16	18
S	2	2.5	3.5	5	5	7.5	7.5
D	0.5	0.5	0.6	0.6	0.6	0.8	0.8

$L_1 = L + 1.5 \text{mm Max.}$ mm

$D_1 = D + 0.5 \text{mm Max.}$

$S_1 = S + 0.5 \text{mm}$



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Cap (uF)	VDC	PART #	Maximum ESR Ω 120Hz 20C	Maximum RMS ripple current (mA) 120Hz,105C	DxL (mm)
0.1	50	104CKH050M	1658.7049	5	5x11
0.15	50	154CKH050M	1105.8033	5	5x11
0.22	50	224CKH050M	753.9568	7	5x11
0.33	50	334CKH050M	502.6378	10	5x11
0.47	100	474CKH100M	282.3327	12	5x11
0.47	250	474CKH250M	529.3739	15	6.3x11
0.68	50	684CKH050M	243.9272	10	5x11
1	50	105CKH050M	165.8705	17	5x11
1	100	105CKE100M	132.6964	19	5x11
1	250	105CKE250M	248.8057	21	6.3x11
1	350	105CKE350M	331.7410	21	6.3x11
1	400	105CKE400M	331.7410	21	8x11.5
1	450	105CKE450M	331.7410	22	10x12.5
1.5	50	155CKH050M	110.5803	15	5x11
2.2	50	225CKH050M	75.3957	25	5x11
2.2	100	225CKE100M	60.3165	28	5x11
2.2	250	225CKH250M	113.0935	31	6.3x11
2.2	350	225CKE350M	150.7914	21	6.3x11
2.2	400	225CKE400M	150.7914	26	8x11.5
2.2	450	225CKH450M	150.7914	39	10x20
2.2	450	225CKE450MJM	150.7914	20	8x11.5
3.3	50	335CKE050M	50.2638	31	5x11
3.3	100	335CKE100M	40.2110	34	5x11
3.3	200	335CKE200M	75.3957	34	6.3x11
3.3	250	335CKE250MGM	75.3957	28	6.3x11
3.3	250	335CKE250M	75.3957	44	8x11.5
3.3	350	335CKE350MJM	100.5276	30	8x11.5
3.3	400	335CKE400M	100.5276	41	10x12.5
3.3	400	335CKE400MJM	100.5276	34	8x11.5
3.3	450	335CKE450MLN	100.5276	28	10x13
3.3	450	335CKE450M	100.5276	50	12.5x20
4.7	100	475CKE100M	28.2333	41	5x11
4.7	160	475CKE160M	52.9374	38	6.3x11
4.7	200	475CKE200M	52.9374	35	6.3x11
4.7	250	475CKH250M	52.9374	60	10x12.5
4.7	250	475CKE250MGM	52.9374	35	6.3x11
4.7	250	475CKE250M	52.9374	50	8x11.5
4.7	350	475CKE350M	70.5832	47	10x12.5
4.7	350	475CKE350MJM	70.5832	39	8x11.5
4.7	400	475CKE400MLN	70.5832	42	10x12.5

Cap (uF)	VDC	PART #	Maximum ESR Ω 120Hz 20C	Maximum RMS ripple current (mA) 120Hz,105C	DxL (mm)
4.7	400	475CKE400M	70.5832	55	10x16
4.7	450	475CKE450MLN	70.5832	32	10x12.5
4.7	450	475CKE450M	70.5832	43	10x20
4.7	450	475CKH450M	70.5832	60	12.5x20
6.8	50	685CKH050M	24.3927	40	5x11
6.8	63	685CKH063M	24.3927	42	5x11
6.8	100	685CKH100M	19.5142	52	6.3x11
6.8	250	685CKH250M	36.5891	65	10x16
10	50	106CKH050M	16.5870	55	5x11
10	63	106CKE063M	16.5870	55	5x11
10	100	106CKE100MEM	13.2696	50	5x11
10	100	106CKH100M	13.2696	65	6.3x11
10	160	106CKE160M	24.8806	65	8x11.5
10	200	106CKE200M	24.8806	75	10x12.5
10	200	106CKE200MJM	24.8806	57	8x11.5
10	250	106CKE250MLN	24.8806	71	10x12.5
10	250	106CKH250M	24.8806	90	10x16
10	350	106CKE350MLQ	33.1741	64	10x16
10	350	106CKE350M	33.1741	85	10x20
10	400	106CKE400MLQ	33.1741	64	10x16
10	400	106CKE400M	33.1741	73	10x20
10	450	106CKE450MLU	33.1741	27	10x21
10	450	106CKE450M	33.1741	65	12.5x20
15	50	156CKH050M	11.0580	58	5x11
15	63	156CKH063M	11.0580	65	6.3x11
15	100	156CKH100M	8.8464	80	8x11.5
15	160	156CKH160M	16.5870	80	10x16
15	250	156CKH250M	16.5870	90	10x20
22	50	226CKH050M	7.5396	80	5x11
22	63	226CKE063M	7.5396	80	5x11
22	63	226CKH063M	7.5396	85	6.3x11
22	100	226CKE100M	6.0317	100	6.3x11
22	100	226CKH100M	6.0317	110	8x11.5
22	160	226CKE160MLN	11.3094	92	10x12.5
22	160	226CKE160M	11.3094	110	10x16
22	200	226CKE200MLQ	11.3094	105	10x16
22	200	226CKH200M	11.3094	130	10x20
22	250	226CKE250MLU	11.3094	105	10x20
22	250	226CKE250M	11.3094	160	12.5x20
22	350	226CKE350MNU	15.0791	105	12.5x20



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Cap (uF)	VDC	PART #	Maximum ESR Ω 120Hz 20C	Maximum RMS ripple current (mA) 120Hz,105C	DxL (mm)
22	400	226CKE400M	15.0791	150	12.5x25
22	450	226CKE450MNV	15.0791	100	13x26
22	450	226CKE450M	15.0791	130	16x25
22	450	226CKH450M	15.0791	160	16x31.5
33	50	336CKE050M	5.0264	95	5x11
33	63	336CKE063M	5.0264	110	6.3x11
33	100	336CKH100M	4.0211	140	10x12.5
33	100	336CKE100M	4.0211	140	8x11.5
33	160	336CKE160MLQ	7.5396	125	10x16
33	160	336CKE160M	7.5396	150	10x20
33	200	336CKE200MLU	7.5396	140	10x20
33	250	336CKE250M	7.5396	190	12.5x20
33	350	336CKE350MNV	10.0528	170	12.5x25
33	400	336CKE400M	10.0528	160	16x25
33	400	336CKH400M	10.0528	210	16x31.5
33	450	336CKE450MQV	10.0528	120	16x25
33	450	336CKE450M	10.0528	230	18x35.5
47	25	476CKH025M	5.2937	95	5x11
47	35	476CKE035M	4.2350	110	5x11
47	50	476CKE050M	3.5292	130	6.3x11
47	63	476CKE063M	3.5292	130	6.3x11
47	63	476CKH063M	3.5292	135	8x11.5
47	100	476CKE100M	2.8233	180	10x12.5
47	100	476CKH100M	2.8233	190	10x16
47	100	476CKE100MJM	2.8233	140	8x11.5
47	160	476CKE160MLU	5.2937	150	10x20
47	160	476CKE160M	5.2937	190	12.5x20
47	200	476CKE200M	5.2937	210	12.5x20
47	250	476CKE250M	5.2937	250	12.5x25
47	250	476CKE250MNU	5.2937	190	13x21
47	350	476CKE350M	7.0583	190	16x25
47	350	476CKH350M	7.0583	250	16x35.5
47	400	476CKE400MQV	7.0583	200	16x25
47	400	476CKE400M	7.0583	210	16x31.5
47	450	476CKE450MQW	7.0583	155	16x31.5
68	16	686CKH016M	4.1468	95	5x11
68	25	686CKH025M	3.6589	105	6.3x11
68	50	686CKH050M	2.4393	165	8x11.5
68	63	686CKH063M	2.4393	190	10x12.5
68	100	686CKH100M	1.9514	255	10x16

Cap (uF)	VDC	PART #	Maximum ESR Ω 120Hz 20C	Maximum RMS ripple current (mA) 120Hz,105C	DxL (mm)
68	200	686CKH200M	3.6589	235	16x25
68	250	686CKH250M	3.6589	255	16x31.5
100	16	107CKE016M	2.8198	130	5x11
100	25	107CKE025MEM	2.4881	125	5x11
100	35	107CKE035M	1.9904	170	6.3x11
100	50	107CKH050M	1.6587	220	8x11.5
100	63	107CKH063M	1.6587	240	10x12.5
100	63	107CKE063MJM	1.6587	200	8x11.5
100	100	107CKE100MLQ	1.3270	240	10x16
100	100	107CKE100M	1.3270	320	10x20
100	160	107CKE160M	2.4881	310	12.5x25
100	200	107CKE200M	2.4881	340	16x25
100	250	107CKE250MQV	2.4881	310	16x25
100	250	107CKE250M	2.4881	410	16x31.5
100	350	107CKE350MRY	3.3174	370	18x35.5
100	350	107CKE350M	3.3174	410	18x40
100	400	107CKE400M	3.3174	310	18x35.5
150	10	157CKH010M	2.2116	125	6.3x11
150	25	157CKH025M	1.6587	180	8x11.5
150	35	157CKH035M	1.3270	230	10x12.5
150	50	157CKH050M	1.1058	260	10x16
150	63	157CKH063M	1.1058	315	10x20
150	100	157CKH100M	0.8846	410	12.5x20
150	160	157CKH160M	1.6587	330	16x31.5
150	200	157CKH200M	1.6587	350	16x35.5
220	10	227CKE010M	1.5079	180	5x11
220	16	227CKE016M	1.2817	220	6.3x11
220	25	227CKE025MGM	1.1309	200	6.3x11
220	35	227CKE035M	0.9047	300	8x11.5
220	50	227CKE050M	0.7540	350	10x12.5
220	50	227CKH050M	0.7540	360	10x16
220	63	227CKE063M	0.7540	390	10x16
220	63	227CKH063M	0.7540	400	10x20
220	100	227CKE100MNU	0.6032	390	12.5x20
220	100	227CKE100M	0.6032	560	12.5x25
220	100	227CKH100M	0.6032	540	16x25
220	160	227CKE160MQW	1.1309	410	16x31.5
220	200	227CKE200M	1.1309	500	16x35.5
220	250	227CKE250M	1.1309	485	18x35.5
330	10	337CKE010M	1.0053	250	6.3x11



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Standard Part Listing

Cap (uF)	VDC	PART #	Maximum ESR Ω 120Hz 20C	Maximum RMS ripple current (mA) 120Hz,105C	DxL (mm)
330	16	337CKE016MGM	0.8545	225	6.3x11
330	25	337CKE025M	0.7540	330	8x11.5
330	35	337CKE035M	0.6032	390	10x12.5
330	50	337CKE050M	0.5026	480	10x16
330	50	337CKH050M	0.5026	490	10x20
330	63	337CKE063M	0.5026	520	10x20
330	63	337CKH063M	0.5026	530	12.5x20
330	100	337CKE100M	0.4021	690	12.5x25
330	100	337CKH100M	0.4021	660	16x25
330	160	337CKE160M	0.7540	550	18x35.5
330	200	337CKE200M	0.7540	675	18x40
470	10	477CKE010M	0.7058	290	6.3x11
470	16	477CKH016M	0.6000	370	10x12.5
470	16	477CKE016M	0.6000	370	8x11.5
470	25	477CKE025M	0.5294	420	10x12.5
470	35	477CKE035M	0.4235	520	10x16
470	50	477CKE050M	0.3529	630	10x20
470	50	477CKH050M	0.3529	630	12.5x20
470	63	477CKE063M	0.3529	670	12.5x20
470	63	477CKH063M	0.3529	690	12.5x25
470	100	477CKE100M	0.2823	830	16x25
470	100	477CKH100M	0.2823	870	16x31.5
680	6.3	687CKH6R3M	0.5854	375	10x12.5
680	16	687CKH016M	0.4147	490	10x16
680	35	687CKH035M	0.2927	695	12.5x20
680	50	687CKH050M	0.2439	825	12.5x25
680	63	687CKH063M	0.2439	925	16x25
1000	6.3	108CKE6R3M	0.3981	460	8x11.5
1000	10	108CKE010M	0.3317	530	10x12.5
1000	16	108CKE016MLN	0.2820	500	10x12.5
1000	16	108CKE016M	0.2820	630	10x16
1000	16	108CKH016M	0.2820	660	10x20
1000	25	108CKE025MLQ	0.2488	610	10x16
1000	25	108CKE025M	0.2488	740	10x20
1000	35	108CKH035M	0.1990	890	12.5x20
1000	50	108CKE050M	0.1659	1070	12.5x25
1000	50	108CKH050M	0.1659	1010	16x25
1000	63	108CKE063M	0.1659	1080	16x25
1000	63	108CKH063M	0.1659	1120	16x31.5
1000	100	108CKE100MRY	0.1327	1000	18x35.5

Cap (uF)	VDC	PART #	Maximum ESR Ω 120Hz 20C	Maximum RMS ripple current (mA) 120Hz,105C	DxL (mm)
1000	100	108CKE100M	0.1327	1580	18x40
1500	6.3	158CKH6R3M	0.2875	585	10x20
1500	16	158CKH016M	0.2101	800	12.5x20
1500	25	158CKH025M	0.1880	905	12.5x25
1500	35	158CKH035M	0.1548	1140	16x25
1500	50	158CKH050M	0.1327	1250	18x31.5
2200	6.3	228CKE6R3M	0.2111	760	10x16
2200	10	228CKE010MLQ	0.1809	705	10x16
2200	10	228CKE010M	0.1809	910	10x20
2200	16	228CKE016MLU	0.1583	710	10x20
2200	16	228CKE016M	0.1583	1050	12.5x20
2200	16	228CKH016M	0.1583	1090	12.5x25
2200	25	228CKE025M	0.1433	1220	12.5x25
2200	25	228CKH025M	0.1433	1210	16x25
2200	35	228CKE035M	0.1206	1350	16x25
2200	35	228CKH035M	0.1206	1440	16x31.5
2200	50	228CKE050MQW	0.1056	1410	16x31.5
2200	50	228CKE050M	0.1056	1700	16x35.5
2200	50	228CKH050M	0.1056	1700	18x35.5
2200	63	228CKE063M	0.1056	1650	18x35.5
3300	6.3	338CKE6R3M	0.1508	990	10x20
3300	10	338CKE010M	0.1307	1140	12.5x20
3300	16	338CKE016M	0.1156	1340	12.5x25
3300	16	338CKH016M	0.1156	1270	16x25
3300	25	338CKE025M	0.1056	1420	16x25
3300	25	338CKH025M	0.1056	1530	16x31.5
3300	35	338CKE035MQW	0.0905	1500	16x31.5
3300	35	338CKE035M	0.0905	1810	16x35.5
3300	50	338CKE050M	0.0804	2060	18x35.5
4700	10	478CKE010M	0.0847	1420	12.5x25
4700	10	478CKH010M	0.0988	1350	16x25
4700	16	478CKE016M	0.0741	1510	16x25
4700	16	478CKH016M	0.0882	1560	16x31.5
4700	25	478CKE025MQV	0.0812	1570	16x25
4700	25	478CKE025M	0.0812	1740	16x31.5
4700	25	478CKH025M	0.0812	1780	18x31.5
4700	35	478CKE035MQY	0.0706	1780	16x35.5
4700	35	478CKE035M	0.0706	2110	18x35.5
6800	6.3	688CKE6R3M	0.0585	1500	12.5x25
6800	10	688CKE010M	0.0488	1600	16x25



CKH/CKE

+105°C Radial lead
General Purpose
Aluminum Electrolytic
Capacitor

Standard Part Listing

Cap (uF)	VDC	PART #	Maximum ESR Ω 120Hz 20C	Maximum RMS ripple current (mA) 120Hz,105C	DxL (mm)
6800	16	688CKE016MQV	0.0707	1600	16x25
6800	16	688CKE016M	0.0707	1860	16x31.5
6800	25	688CKE025MQY	0.0659	1850	16x35.5
6800	25	688CKE025M	0.0659	2170	18x35.5
6800	35	688CKE035M	0.0585	2000	18x40
10000	6.3	109CKE6R3M	0.0398	1660	16x25
10000	6.3	109CKH6R3M	0.0697	1730	16x31.5
10000	10	109CKE010MQW	0.0630	1820	16x31.5
10000	10	109CKE010M	0.0630	2040	16x35.5
10000	10	109CKH010M	0.0630	2030	18x35.5

Cap (uF)	VDC	PART #	Maximum ESR Ω 120Hz 20C	Maximum RMS ripple current (mA) 120Hz,105C	DxL (mm)
10000	16	109CKE016MQY	0.0581	1930	16x35.5
10000	16	109CKE016M	0.0581	1960	18x31.5
10000	25	109CKE025M	0.0547	2000	18x40
15000	6.3	159CKE6R3MQW	0.0575	1820	16x31.5
15000	6.3	159CKE6R3M	0.0575	2140	16x35.5
15000	10	159CKE010MQY	0.0531	2050	16x35.5
15000	10	159CKE010M	0.0531	2370	18x35.5
15000	16	159CKE016M	0.0498	2210	18x40
22000	6.3	229CKE6R3MRY	0.0498	2280	18x35.5
22000	10	229CKE010M	0.0467	2420	18x40

