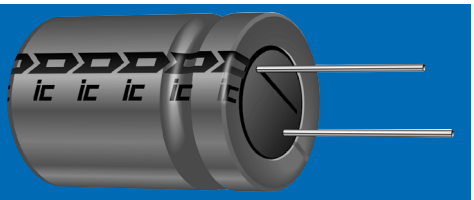
CKR/ CKS

+85°C General Purpose Aluminum Electrolytic Capacitors



FEATURES

- *Standardized Case Sizes*
- *Multiple Case Sizes*
- *Lead Free Leads*
- *Bypass*
- *Coupling*
- *Filtering*

SPECIFICATIONS

Operating Temperature Range		**-40°C to +85°C (6.3 to 400 WVDC) -25°C to +85°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	.22	.19	.16	.14	.12	.1	.09	.08	.15	.15	.15	.2	.2	.2
		Add .02 for every 1000µF above 1000µF													
Leakage Current		**6.3 to 100 WVDC**							**160 to 450 WVDC**						
		1 minutes				**2 minutes**			**2 minutes**						
		.03 CV or 4 µA, whichever is greater				.01 CV or 3 µA, whichever is greater			0.03CV + 40µA						
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/20°C	4	2	2	2	2	2	2	2	3	3	3	6	6	15
	-40°C/20°C	8	6	4	3	3	3	3	3	6	6	6	6	6	-
Load Life		**2,000 hours at 85°C with rated WVDC**													
		Capacitance change Dissipation factor Leakage current							< 20% of initial measured value ≤150% of maximum specified value <100% of maximum specified value						
Shelf Life		**1,000 hours at 85°C with no voltage applied.**													
		Capacitance change Dissipation factor Leakage current							< 20% of initial measured value ≤200% of maximum specified value <100% of maximum specified value						

Ripple Current Multipliers	**Frequency (Hz)**				**Temperature (°C)**		
WVDC	50	120	1k	10K	+85	+70	+60
6.3 to 25V	0.8	1.0	1.0	1.20	1.0	1.3	1.5
35 to 100V	0.8	1.0	1.15	1.25	1.0	1.3	1.5
160 to 250V	.75	1.0	1.25	1.40	1.0	1.3	1.5
350 to 450V	0.7	1.0	1.30	1.80	1.0	1.3	1.5

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PHYSICAL DIMENSIONS

WVDC (SV) / (µF)	6.3 (8)	10 (13)	16 (20)	25 (32)	35 (44)	50 (63)	63 (79)	100 (125)	160 (200)	200 (250)	250 (300)	350 (400)	400 (450)	450 (500)
0.1						5x11								
0.15						5x11								
0.22						5x11								
0.33						5x11								
0.47						5x11		5x11						
0.68						5x11								
1						5x11		5x11			6.3x11			8x11.5
1.5						5x11								
2.2						5x11		5x11			6.3x11 8x11.5	6.3x11	8x11.5	10x12.5 8x11.5
3.3						5x11		5x11		6.3x11	6.3x11 8x11.5	8x11.5	8x11.5 10x12.5	10x12.5 10x16
4.7						5x11		5x11	6.3x11 8x11.5	6.3x11 8x11.5	6.3x11 10x16	10x12.5	10x12.5	10x12.5
6.8							5x11							
10						5x11	5x11	5x11 6.3x11	8x11.5	10x12.5 8x11.5	10x12.5 10x16	10x12.5 10x20	10x16	10x20 12.5x20
15						5x11		8x11.5						
22						5x11	5x11 6.3x11	6.3x11 8x11.5	10x12.5 10x16	10x16 10x20	10x20 12.5x25	12.5x20	12.5x25	13x26 16x25
33						5x11 6.3x11	6.3x11	10x12.5 8x11.5	10x16 10x20	10x20	12.5x20	12.5x25	16x25	16x25 16x31.5
47					5x11	6.3x11	6.3x11 8x11.5	10x12.5 10x16	10x21 12.5x25	12.5x20	13x21 12.5x25	16x25	16x25 16x31.5	16x31.5 18x35.5
68							5x11							
100			5x11	5x11	6.3x11	8x11.5	10x12.5 8x11.5	10x16 10x20 12.5x20	12.5x25	16x25	16x25 16x31.5	18x35.5	18x35.5	18x40
150		6.3x11		8x11.5	10x12.5	10x16		12.5x20						
220		5x11 6.3x11	6.3x11	6.3x11 8x11.5	10x12.5 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	12.5x25 16x25	18x35.5	18x40				
470		6.3x11	8x11.5	10x12.5	10x16	10x20 12.5x20	12.5x20 12.5x25	16x25						
680			10x16		12.5x20	12.5x25								
1000	8x11.5	10x12.5	10x12.5 10x16	10x16 10x20 12.5x20	12.5x20 12.5x25	12.5x25 16x25	16x25 16x31.5	18x35.5						
1500		10x16	10x20	12.5x20	12.5x25 16x25	16x31.5								
2200	10x16	10x16 10x20	10x20 12.5x20	12.5x25 16x25	16x25 16x31.5	16x31.5 16x35.5 18x35.5	18x35.5							
3300	10x20 12.5x20	12.5x20 12.5x25	12.5x25 16x25	16x25	16x31.5 16x35.5 18x35.5	18x35.5								
4700	12.5x20	12.5x25	16x25	16x25 16x31.5 18x35.5	16x35.5 18x35.5									
6800	12.5x25	16x25	16x25 16x35.5 18x35.5	16x35.5 18x35.5	18x40									
10000	16x25	16x31.5	16x35.5 18x35.5	18x40										
15000	16x31.5 16x35.5	16x35.5 18x35.5	18x40											
22000	18x35.5	18x40												

Convert to inches, divide by 25.4.

DxL(mm)

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CKR/CKS

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STANDARD PART LISTING

PLEASE NOTE: The CKR and CKS Series have been merged. **CHECK PART NUMBERS CAREFULLY.**

Capacitance (µF)	WVDC	IC PART NUMBER	Maximum ESR Ω 120Hz, +20°C	Maximum RMS Ripple Current (mA) 120Hz,+85°C	Dimensions DxL (mm)
0.1	50	104CKR050M	1657.864	1.5	5x11
0.15	50	154CKR050M	1105.243	2	5x11
0.22	50	224CKR050M	753.575	9	5x11
0.33	50	334CKR050M	502.383	10	5x11
0.47	50	474CKR050M	352.737	14	5x11
0.47	100	474CKR100M	282.190	16	5x11
0.68	50	684CKR050M	243.804	9	5x11
1	50	105CKR050M	165.786	20	5x11
1	100	105CKR100M	132.629	23	5x11
1	250	105CKR250M	248.680	22	6.3x11
1	450	105CKS450M	331.573	22	8x11.5
1.5	50	155CKR050M	110.524	18	5x11
2.2	50	225CKR050M	75.357	29	5x11
2.2	100	225CKS100M	60.286	34	5x11
2.2	250	225CKS250M	113.036	33	6.3x11
2.2	250	225CKR250M	113.036	31	8x11.5
2.2	350	225CKS350M	150.715	30	6.3x11
2.2	400	225CKS400M	150.715	33	8x11.5
2.2	450	225CKS450M	150.715	35	10x12.5
2.2	450	225CKS450MJM	150.715	28	8x11.5
3.3	50	335CKS050M	50.238	37	5x11
3.3	100	335CKS100M	40.191	42	5x11
3.3	250	335CKS250MGM	75.357	40	6.3x11
3.3	250	335CKS250M	75.357	46	8x11.5
3.3	350	335CKS350MJM	100.477	43	8x11.5
3.3	400	335CKS400M	100.477	45	10x12.5
3.3	400	335CKS400MJM	100.477	48	8x11.5
3.3	450	335CKS450MLM	100.477	40	10x12.5
3.3	450	335CKS450M	100.477	47	10x16
4.7	50	475CKR050M	35.274	42	5x11
4.7	100	475CKR100M	28.219	48	5x11
4.7	250	475CKS250MGM	52.911	50	6.3x11
4.7	250	475CKS250M	52.911	55	8x11.5
4.7	350	475CKS350M	70.547	50	10x12.5
4.7	350	475CKS350MJM	70.547	55	8x11.5
4.7	400	475CKS400MLN	70.547	60	10x12.5
4.7	400	475CKS400M	70.547	60	10x16
4.7	450	475CKS450MLN	70.547	46	10x12.5
4.7	450	475CKS450M	70.547	60	10x16
6.8	63	685CKR063M	24.380	51	5x11
10	50	106CKR050M	16.579	65	5x11
10	63	106CKR063M	13.263	67	5x11
10	100	106CKS100MEM	13.263	70	5x11
10	100	106CKS100M	13.263	80	6.3x11
10	160	106CKS160M	24.868	70	8x11.5

Capacitance (µF)	WVDC	IC PART NUMBER	Maximum ESR Ω 120Hz, +20°C	Maximum RMS Ripple Current (mA) 120Hz,+85°C	Dimensions DxL (mm)
10	200	106CKS200M	24.868	80	10x12.5
10	200	106CKS200MJM	24.868	80	8x11.5
10	250	106CKS250MLN	24.868	100	10x12.5
10	250	106CKS250M	24.868	95	10x16
10	350	106CKS350MLQ	33.157	90	10x12.5
10	350	106CKS350M	33.157	95	10x20
10	400	106CKS400MLQ	33.157	90	10x16
10	450	106CKS450MLU	33.157	80	10x20
10	450	106CKS450M	33.157	100	12.5x20
15	50	156CKR050M	11.052	78	5x11
15	100	156CKR100M	8.842	98	8x11.5
22	50	226CKR050M	7.536	95	5x11
22	63	226CKS063M	7.536	100	5x11
22	63	226CKR063M	6.029	110	6.3x11
22	100	226CKS100M	6.029	120	6.3x11
22	100	226CKR100M	6.029	135	8x11.5
22	160	226CKS160MLN	11.304	130	10x12.5
22	160	226CKS160M	11.304	120	10x16
22	200	226CKS200MLQ	11.304	150	10x16
22	200	226CKS200M	11.304	150	10x20
22	250	226CKS250MLU	11.304	150	10x20
22	350	226CKS350M	15.071	150	12.5x20
22	400	226CKS400M	15.071	170	12.5x25
22	450	226CKS450MNV	15.071	140	13x26
22	450	226CKS450M	15.071	160	16x25
33	50	336CKS050M	5.024	125	5x11
33	50	336CKR050M	5.024	130	6.3x11
33	63	336CKR063M	5.024	130	6.3x11
33	100	336CKR100M	4.019	190	10x12.5
33	100	336CKS100M	4.019	170	8x11.5
33	160	336CKS160MLQ	7.536	180	10x16
33	160	336CKS160M	7.536	170	10x20
33	200	336CKS200MLU	7.536	200	10x20
33	250	336CKS250M	7.536	210	12.5x20
33	350	336CKS350M	10.048	200	12.5x25
33	400	336CKS400M	10.048	200	16x25
33	450	336CKS450MQV	10.048	180	16x25
33	450	336CKS450M	10.048	220	16x31.5
47	35	476CKS035M	4.233	130	5x11
47	50	476CKR050M	3.527	150	6.3x11
47	63	476CKS063M	3.527	170	6.3x11
47	63	476CKR063M	3.527	180	8x11.5
47	100	476CKS100M	2.822	230	10x12.5
47	100	476CKR100M	2.822	240	10x16
47	100	476CKS100MJM	2.822	200	8x11.5

CKR/CKS

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STANDARD PART LISTING

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Capacitance (µF)	WVDC	PART NUMBER	Maximum ESR Ω 120Hz, +20°C	Maximum RMS Ripple Current (mA) 120Hz,+85°C	Dimensions DxL (mm)
47	160	476CKS160MLU	5.291	210	10x21
47	160	476CKR160M	5.291	220	12.5x25
47	250	476CKS250MNU	5.291	270	12.5x20
47	250	476CKS250M	5.291	280	12.5x25
47	250	476CKR250M	5.291	260	16x25
47	350	476CKS350M	7.055	230	16x25
47	400	476CKS400MQV	7.055	280	16x25
47	400	476CKR400M	7.055	270	16x31.5
47	450	476CKS450MQW	7.055	220	16x31.5
47	450	476CKS450M	7.055	290	18x35.5
68	25	686CKR025M	3.413	170	6.3x11
68	50	686CKR050M	2.438	200	8x11.5
68	63	686CKR063M	1.950	215	10x12.5
68	100	686CKR100M	1.950	282	10x16
100	16	107CKS016M	2.653	160	5x11
100	25	107CKS025MEM	2.321	180	5x11
100	35	107CKS035M	1.989	210	6.3x11
100	50	107CKR050M	1.658	255	8x11.5
100	63	107CKR063M	1.658	296	10x12.5
100	63	107CKS063MJM	1.658	280	8x11.5
100	100	107CKS100MLQ	1.326	340	10x16
100	100	107CKS100M	1.326	370	10x20
100	100	107CKR100M	1.326	440	12.5x20
100	160	107CKS160M	2.487	350	12.5x25
100	250	107CKS250MQV	2.487	440	16x25
100	250	107CKS250M	2.487	440	16x31.5
100	350	107CKS350M	3.316	420	18x35.5
100	400	107CKS400M	3.316	440	18x35.5
100	450	107CKS450M	3.316	280	18x40
150	10	157CKR010M	2.210	188	6.3x11
150	25	157CKR025M	1.547	258	8x11.5
150	35	157CKR035M	1.326	291	10x12.5
150	50	157CKR050M	1.105	330	10x16
150	100	157CKR100M	0.884	425	12.5x20
220	10	227CKS010M	1.507	240	5x11
220	10	227CKR010M	1.507	250	6.3x11
220	16	227CKS016M	1.206	260	6.3x11
220	25	227CKS025MGM	1.055	280	6.3x11
220	25	227CKR025M	1.055	340	8x11.5
220	35	227CKR035M	0.904	390	10x12.5
220	35	227CKS035M	0.904	385	8x11.5
220	50	227CKS050M	0.754	430	10x12.5
220	50	227CKR050M	0.754	470	10x16
220	63	227CKS063M	0.754	490	10x16
220	63	227CKR063M	0.754	530	10x20

Capacitance (µF)	WVDC	PART NUMBER	Maximum ESR Ω 120Hz, +20°C	Maximum RMS Ripple Current (mA) 120Hz,+85°C	Dimensions DxL (mm)
220	100	227CKS100MNU	0.603	550	12.5x20
220	100	227CKS100M	0.603	680	12.5x25
220	100	227CKR100M	0.603	690	16x25
220	160	227CKS160MQW	1.130	580	16x31.5
220	200	227CKS200M	1.130	700	16x35.5
220	250	227CKS250M	1.130	680	18x35.5
330	10	337CKS010M	1.005	290	6.3x11
330	16	337CKS016MGM	0.804	320	6.3x11
330	25	337CKS025M	0.703	440	8x11.5
330	35	337CKS035M	0.603	490	10x12.5
330	50	337CKS050M	0.502	585	10x16
330	50	337CKR050M	0.502	650	10x20
330	63	337CKS063M	0.502	710	10x20
330	100	337CKS100M	0.402	840	12.5x25
330	100	337CKR100M	0.402	840	16x25
330	160	337CKS160M	0.754	800	18x35.5
330	200	337CKS200M	0.754	950	18x40
470	10	477CKS010M	0.705	370	6.3x11
470	16	477CKS016M	0.564	470	8x11.5
470	25	477CKS025M	0.494	545	10x12.5
470	35	477CKS035M	0.423	645	10x16
470	50	477CKS050M	0.353	755	10x20
470	50	477CKR050M	0.353	850	12.5x20
470	63	477CKS063M	0.353	900	12.5x20
470	63	477CKR063M	0.353	930	12.5x25
470	100	477CKS100M	0.282	1010	16x25
680	16	687CKR016M	0.390	596	10x16
680	35	687CKR035M	0.293	770	12.5x20
680	50	687CKR050M	0.244	810	12.5x25
1000	6.3	108CKS6R3M	0.398	580	8x11.5
1000	10	108CKS010M	0.332	650	10x12.5
1000	16	108CKS016MLN	0.332	700	10x12.5
1000	16	108CKS016M	0.332	785	10x16
1000	25	108CKS025MLQ	0.232	860	10x16
1000	25	108CKS025M	0.232	955	10x20
1000	25	108CKR025M	0.232	1050	12.5x20
1000	35	108CKS035M	0.199	1130	12.5x20
1000	35	108CKR035M	0.199	1300	12.5x25
1000	50	108CKS050M	0.166	1310	12.5x25
1000	50	108CKR050M	0.166	1340	16x25
1000	63	108CKS063M	0.166	1310	16x25
1000	63	108CKR063M	0.166	1460	16x31.5
1000	100	108CKS100MRY	0.133	1350	18x35.5
1500	10	158CKS010M	0.243	897	10x16
1500	16	158CKS016M	0.199	1075	10x20

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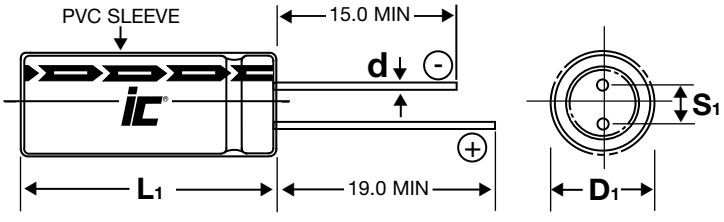
Capacitance (µF)	WVDC	PART NUMBER	Maximum ESR Ω 120Hz, +20°C	Maximum RMS Ripple Current (mA) 120Hz,+85°C	Dimensions DxL (mm)
1500	25	**158CKS025M**	0.177	1340	12.5x20
1500	35	**158CKS035M**	0.155	1590	12.5x25
1500	35	**158CKR035M**	0.155	1110	16x25
1500	50	**158CKS050M**	0.133	1650	16x31.5
2200	6.3	**228CKS6R3M**	0.211	930	10x16
2200	10	**228CKS010MLQ**	0.181	990	10x16
2200	10	**228CKS010M**	0.181	1140	10x20
2200	16	**228CKS016MLU**	0.151	1000	10x21
2200	16	**228CKS016M**	0.151	1295	12.5x20
2200	25	**228CKS025M**	0.136	1510	12.5x25
2200	25	**228CKR025M**	0.136	1650	16x25
2200	35	**228CKS035M**	0.121	1785	16x25
2200	35	**228CKR035M**	0.121	1830	16x31.5
2200	50	**228CKS050MQW**	0.106	1980	16x31.5
2200	50	**228CKS050M**	0.106	2075	16x35.5
2200	50	**228CKR050M**	0.106	2210	18x35.5
2200	63	**228CKS063M**	0.106	2300	18x35.5
3300	6.3	**338CKS6R3M**	0.151	1250	10x20
3300	6.3	**338CKR6R3M**	0.151	1380	12.5x20
3300	10	**338CKS010M**	0.131	1390	12.5x20
3300	10	**338CKR010M**	0.131	1560	12.5x25
3300	16	**338CKS016M**	0.111	1680	12.5x25
3300	16	**338CKR016M**	0.111	1830	16x25
3300	25	**338CKS025M**	0.100	1975	16x25
3300	35	**338CKS035MQW**	0.090	2100	16x31.5
3300	35	**338CKS035M**	0.090	2275	16x35.5
3300	35	**338CKR035M**	0.090	2330	18x35.5
3300	50	**338CKS050M**	0.080	2510	18x35.5

Capacitance (µF)	WVDC	PART NUMBER	Maximum ESR Ω 120Hz, +20°C	Maximum RMS Ripple Current (mA) 120Hz,+85°C	Dimensions DxL (mm)
4700	10	**478CKS010M**	0.099	1760	12.5x25
4700	16	**478CKS016M**	0.085	2090	16x25
4700	25	**478CKS025MQV**	0.078	2200	16x25
4700	25	**478CKS025M**	0.078	2420	16x31.5
4700	25	**478CKR025M**	0.078	2430	18x35.5
4700	35	**478CKS035MQY**	0.071	2500	16x35.5
4700	35	**478CKS035M**	0.071	2700	18x35.5
6800	6.3	**688CKS6R3M**	0.088	1915	12.5x25
6800	10	**688CKS010M**	0.078	2220	16x25
6800	16	**688CKS016MQY**	0.068	2250	16x25
6800	16	**688CKS016M**	0.068	2520	16x35.5
6800	16	**688CKR016M**	0.068	2580	18x35.5
6800	25	**688CKS025MQY**	0.063	2600	16x35.5
6800	25	**688CKS025M**	0.063	2880	18x35.5
6800	35	**688CKS035M**	0.059	2800	18x40
10000	6.3	**109CKS6R3M**	0.066	2330	16x25
10000	10	**109CKS010MQW**	0.063	2550	16x31.5
10000	16	**109CKS016MQY**	0.056	2710	16x35.5
10000	16	**109CKS016M**	0.056	2920	18x35.5
10000	25	**109CKS025M**	0.053	2800	18x40
15000	6.3	**159CKS6R3MQW**	0.057	2550	16x31.5
15000	6.3	**159CKS6R3M**	0.057	2845	16x35.5
15000	10	**159CKS010MQY**	0.053	2880	16x35.5
15000	10	**159CKS010M**	0.053	3080	18x35.5
15000	16	**159CKS016M**	0.053	3100	18x40
22000	6.3	**229CKS6R3MRY**	0.050	3200	18x35.5
22000	10	**229CKS010M**	0.048	3400	18x40



NOTE: Case Vent is standard on all diameter ≥8.0mm

LEAD INFORMATION V.S. CASE DIAMETER

D	5.0	6.3	8.0	10.0	12.5	16.0	18.0
S	2.0	2.5	3.5	5.0	5.0	7.5	7.5
d	0.5	0.5	0.6	0.6	0.6	0.8	0.8

L_1=L + 1.5 mm Max. mm
D_1=D+0.5 Max.
S_1=S±0.5 mm