



FEATURES

- Low ESR at high frequency
- Life time: 10,000 hours at 105°C
- RoHS Compliant

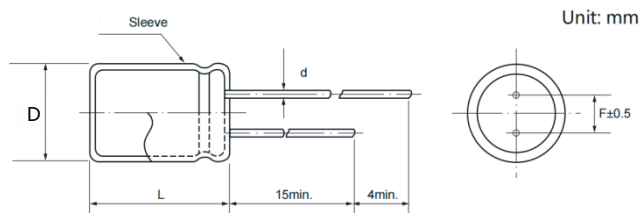
APPLICATIONS

- LED lighting
- main boards,
- switching power supply
- hi-fi acoustics
- color TV circuits, etc

SPECIFICATIONS

Item	Performance Characteristics																																														
Category Temperature Range	-40~+105℃							-25~+105℃																																							
Rated Voltage Range	6.3~100V _{dc}							160~450V _{dc}																																							
Nominal Capacitance Range	1~18000μF																																														
Capacitance Tolerance	±20% (+20℃,120Hz)																																														
Leakage Current	(at 20℃, after 2 minutes , Whichever is greater)							CV>1000:I=0.04CV+100(μA) max After 1 minute application of rated voltage at 20℃																																							
Dissipation Factor (+20℃,120Hz)	<table><tr><td>Rated Voltage(V_{dc})</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td><td>100</td><td>160-250</td><td>400-450</td></tr><tr><td>tgδ(Max.)</td><td>0.22</td><td>0.19</td><td>0.16</td><td>0.14</td><td>0.12</td><td>0.10</td><td>0.09</td><td>0.08</td><td>0.20</td><td>0.24</td></tr></table> When nominal capacitance exceeds 1000μF, add 0.02 to the value above for each 1000μF increase.											Rated Voltage(V _{dc})	6.3	10	16	25	35	50	63	100	160-250	400-450	tgδ(Max.)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08	0.20	0.24														
Rated Voltage(V _{dc})	6.3	10	16	25	35	50	63	100	160-250	400-450																																					
tgδ(Max.)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08	0.20	0.24																																					
Temperature characteristics (Impedance ratio at 120Hz)	<table><tr><td>Rated Voltage(V_{dc})</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td><td>100</td><td>160-250</td><td>400</td><td>450</td></tr><tr><td>Z(-25℃)/Z(+20℃)</td><td>4</td><td>3</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>3</td><td>5</td><td>6</td></tr><tr><td>Z(-40℃)/Z(+20℃)</td><td>8</td><td>6</td><td>4</td><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td><td>-</td><td>-</td><td>-</td></tr></table>											Rated Voltage(V _{dc})	6.3	10	16	25	35	50	63	100	160-250	400	450	Z(-25℃)/Z(+20℃)	4	3	2	2	2	2	2	2	3	5	6	Z(-40℃)/Z(+20℃)	8	6	4	3	3	3	3	3	-	-	-
Rated Voltage(V _{dc})	6.3	10	16	25	35	50	63	100	160-250	400	450																																				
Z(-25℃)/Z(+20℃)	4	3	2	2	2	2	2	2	3	5	6																																				
Z(-40℃)/Z(+20℃)	8	6	4	3	3	3	3	3	-	-	-																																				
Load Life	After applying rated voltage with specified ripple current for specified time at +105℃ and then resumed 16 hours: Capacitance change: ±20% of the initial value Dissipation factor: 200% of the initial specified value Leakage current: The initial specified value																																														
Shelf Life	After storage for 1000 hours at +105℃, and then resumed 16 hours: Capacitance change: ±20% of the initial value Dissipation factor: 200% of the initial specified value Leakage current: 200% of the initial specified value																																														

DIMENSIONS



D	5	6.3	8	10	12.5	16~18
F	2.0	2.5	3.5	5.0	5.0	7.5
d	0.5	0.5	0.5, 0.6	0.6	0.6	0.8

D	D+βmax	β	(L<20) 0.5 (L≥20) 1.0	α	(L<20) 1.5 (L≥20) 2.0
L	L+αmax				

MULTIPLIER FOR RIPPLE CURRENT

Frequency coefficient

(Hz) Frequency	120	1k	10k	100k
(μF) Cap.				
~180	0.40	0.75	0.90	1.00
220~560	0.50	0.85	0.94	1.00
680~1800	0.60	0.87	0.95	1.00
2200~3900	0.75	0.90	0.95	1.00
4700~18000	0.85	0.95	0.98	1.00

■ STANDARD RATINGS

V(Code) Item		6.3(0J)			10(1A)			16(1C)			25(1E)		
		Case size D×L (mm)	Max Imp 20°C, 100kHz (Ω)	Rated ripple 105°C, 100kHz (mArms)	Case size D×L (mm)	Max Imp 20°C, 100kHz (Ω)	Rated ripple 105°C, 100kHz (mArms)	Case size D×L (mm)	Max Imp 20°C, 100kHz (Ω)	Rated ripple 105°C, 100kHz (mArms)	Case size D×L (mm)	Max Imp 20°C, 100kHz (Ω)	Rated ripple 105°C, 100kHz (mArms)
Cap.(μF)	Code												
2.2	2R2										5×11	1.500	80
4.7	4R7										5×11	1.200	90
10	100							5×11	1.300	90	5×11	1.200	95
22	220							5×11	0.650	120	5×11	1.100	125
47	470							5×11	0.450	130			
82	820										6.3×11	0.200	345
100	101	5×11	0.300	220	5×11	0.280	280	5×11	0.260	200	6.3×11	0.190	350
120	121				6.3×11	0.250	340	6.3×11	0.230	345			
150	151				6.3×11	0.198	345	6.3×11	0.220	355	8×11.5	0.117	645
180	181	6.3×11	0.198	345	6.3×11	0.198	350	6.3×11	0.220	365	8×11.5	0.117	665
220	221	6.3×11	0.190	350	6.3×11	0.198	355	6.3×11	0.198	420	8×11.5	0.117	685
270	271	6.3×11	0.180	355	6.3×11	0.220	365	8×11.5	0.117	675	8×11.5	0.130	695
330	331	8×11.5	0.117	645	8×11.5	0.117	645				10×12.5	0.072	870
390	391	8×11.5	0.110	655	8×11.5	0.117	655	8×11.5	0.117	695	8×16	0.068	840
470	471	8×11.5	0.110	675	8×11.5	0.090	665	10×12.5	0.072	895	10×12.5	0.068	990
560	561	8×11.5	0.100	685	8×11.5	0.090	685	8×14	0.080	800	8×20	0.065	1160
680	681	8×11.5	0.100	695	8×11.5	0.085	695	8×16	0.078	845	10×16	0.060	1250
820	821	8×11.5	0.100	720	8×16	0.078	845	8×16	0.060	880	10×20	0.041	1405
1000	102	10×12.5	0.072	870	8×16	0.075	865	10×16	0.065	955	10×20	0.032	1820
1200	122	10×12.5	0.072	885	10×12.5	0.070	895	10×12.5	0.065	1100	12.5×20	0.032	1905
1500	152	8×14	0.078	845	10×16	0.030	1300	8×20	0.062	1155	12.5×25	0.030	2225
1800	182	10×16	0.054	1225	10×20	0.041	1450	10×20	0.046	1400	10×20	0.046	1870
2200	222	10×20	0.046	1400	10×20	0.041	1500	10×25	0.038	1820	12.5×20	0.032	2220
2700	272				12.5×20	0.032	1905	12.5×20	0.035	1980	16×20	0.020	3035
3300	332	10×20	0.046	1400	10×20	0.041	1500	10×25	0.038	1655	12.5×25	0.030	2225
3900	392	12.5×20	0.032	1950	12.5×35	0.020	2750	16×25	0.025	2560	16×35	0.018	3130
4700	472	12.5×25	0.027	2130	12.5×25	0.027	2175	16×30	0.020	3035	18×35	0.017	3690
5600	562	16×20	0.032	2260	18×20	0.031	2505	18×30	0.018	3610			
6800	682	12.5×40	0.017	2650	16×30	0.020	3035	16×40	0.018	3620			
8200	822	16×30	0.020	3035	16×30	0.018	3130	18×35	0.017	3645			
10000	103	16×40	0.015	3895	18×40	0.014	3790						
12000	123	18×30	0.018	3610									
15000	153	18×35	0.017	3710									
18000	183	18×40	0.014	3790									

■ STANDARD RATINGS

Cap.(μF)	V(Code) Item Code	35(1V)			50(1H)			63(1J)			100(2A)		
		Case size D×L (mm)	Max Imp 20°C, 100kHz (Ω)	Rated ripple 105°C, 100kHz (mArms)	Case size D×L (mm)	Max Imp 20°C, 100kHz (Ω)	Rated ripple 105°C, 100kHz (mArms)	Case size D×L (mm)	Max Imp 20°C, 100kHz (Ω)	Rated ripple 105°C, 100kHz (mArms)	Case size D×L (mm)	Max Imp 20°C, 100kHz (Ω)	Rated ripple 105°C, 100kHz (mArms)
1	010				5×11	2.900	80						
2.2	2R2				5×11	2.500	90						
3.3	3R3				5×11	2.000	100						
4.7	4R7	5×11	0.850	158	5×11	1.700	105				5×11	1.800	105
10	100				5×11	1.700	115						
15	150										6.3×11	0.864	300
22	220	5×11	0.650	180	5×11	1.200	160	6.3×11	0.960	260	8×11.5	0.750	370
					6.3×11	0.360	220						
27	270							6.3×11	0.950	275	8×11.5	0.454	375
33	330	5×11	0.600	200	6.3×11	0.270	300	6.3×11	0.860	300	8×11.5	0.454	385
39	390				6.3×11	0.265	310	8×11.5	0.450	460	8×16	0.324	460
					8×11.5	0.260	510						
47	470	6.3×11	0.360	210	6.3×11	0.250	320	8×11.5	0.435	480	10×12.5	0.344	500
56	560	6.3×11	0.350	300	8×11.5	0.160	560	8×11.5	0.430	520	8×20	0.238	610
68	680	6.3×11	0.340	365	8×11.5	0.153	575	8×11.5	0.420	550	10×16	0.223	700
82	820	8×11.5	0.250	645	8×11.5	0.153	585	10×12.5	0.344	680	10×20	0.151	765
100	101	8×11.5	0.220	655	8×11.5	0.153	720	8×16	0.300	780	10×20	0.135	970
					10×12.5	0.112	753	10×12.5	0.330	790	12.5×12.5	0.135	970
120	121	8×11.5	0.200	665	8×16	0.108	735	10×16	0.248	850	12.5×20	0.115	1050
					10×12.5	0.108	765						
150	151	8×11.5	0.180	675	10×16	0.076	1055	8×20	0.238	1050	12.5×25	0.090	1180
180	181	8×11.5	0.160	685	8×20	0.082	915	10×20	0.151	1190	12.5×25	0.098	1210
		10×12.5	0.150	865	10×16	0.076	1100	12.5×15	0.166	1180	18×16	0.086	1200
220	221	8×11.5	0.102	695	10×16	0.072	1150	10×20	0.151	1400	12.5×25	0.096	1700
		10×12.5	0.072	885	10×12.5	0.085	950	12.5×20	0.135	1550	16×20	0.066	1750
270	271	10×16	0.060	1210	10×25	0.055	1440	12.5×20	0.128	1590	12.5×35	0.059	1960
											16×25	0.052	1940
330	331	8×20	0.069	1050	10×20	0.043	1270	10×25	0.108	1570	12.5×30	0.051	2050
		10×12.5	0.065	905	12.5×20	0.041	1665	12.5×20	0.115	1650	16×25	0.058	2150
390	391	10×16	0.060	1255	12.5×20	0.041	1695	12.5×25	0.090	1780	16×30	0.039	2310
		10×20	0.050	1405							18×25	0.041	2280
470	471	10×16	0.048	1400	10×20	0.055	1350	12.5×20	0.075	1720	16×35	0.032	2900
		12.5×12.5	0.048	1450	12.5×25	0.031	1955	12.5×25	0.072	2000	18×30	0.034	2900
560	561	10×20	0.045	1565	12.5×25	0.031	2015	16×25	0.052	2350	18×40	0.029	3300
680	681	10×20	0.046	1685	12.5×30	0.027	2320	12.5×25	0.059	2500	18×35	0.029	3150
		12.5×20	0.043	1905	16×20	0.031	2220	16×25	0.052	2700			
820	821	10×25	0.042	1650	12.5×35	0.023	2520	12.5×40	0.051	2760	18×40	0.026	3460
		12.5×20	0.042	1965	18×20	0.032	2500	16×30	0.039	2760			
1000	102	12.5×20	0.041	2015	12.5×35	0.019	2555	16×30	0.039	2785	18×40	0.026	3490
		12.5×25	0.035	2230	12.5×25	0.032	2250	16×35	0.032	2950			
1200	122	12.5×30	0.023	2530	16×30	0.020	3020	16×40	0.029	3450			
		16×20	0.032	2220	18×25	0.023	2750	18×30	0.034	3480			
1500	152	12.5×35	0.020	2750	16×35	0.017	3160	18×35	0.029	3750			
		16×25	0.025	2560									
1800	182	12.5×40	0.017	3200	16×40	0.017	3600	18×40	0.026	3880			
		16×25	0.025	2590	18×30	0.019	3500						
2200	222	16×25	0.028	2630	18×30	0.019	3550						
		18×25	0.022	2780	18×35	0.016	3690						
2700	272	16×35	0.018	3130	18×40	0.014	3810						
		18×30	0.018	3610									
3300	332	18×35	0.017	3695									
3900	392	18×40	0.014	3790									

■ STANDARD RATINGS

V(Code) Item Cap.(μF) Code		160(2C)			200(2D)			250(2E)		
		Case size D×L (mm)	Max Imp 20°C, 100kHz (Ω)	Rated ripple 105°C, 100kHz (mArms)	Case size D×L (mm)	Max Imp 20°C, 100kHz (Ω)	Rated ripple 105°C, 100kHz (mArms)	Case size D×L (mm)	Max Imp 20°C, 100kHz (Ω)	Rated ripple 105°C, 100kHz (mArms)
1	010	6.3×11	18.8	50	6.3×11	18.2	50	6.3×11	18.7	50
2.2	2R2	6.3×11	12.5	74	6.3×11	12.4	74	6.3×11	12.6	74
3.3	3R3	6.3×11	10.3	91	6.3×11	10.2	91	6.3×11	10.2	91
4.7	4R7	6.3×11	8.84	109	8×11.5	8.28	127	8×11.5	8.28	127
5.6	5R6	8×11.5	6.96	138	8×11.5	7.80	138	8×11.5	7.80	138
6.8	6R8	8×11.5	7.50	153	8×16	7.20	176	8×16	7.20	176
10	100	8×11.5	8.04	185	8×16	5.10	214	8×16	5.16	214
22	220	10×16	2.28	339	10×16	2.34	339	10×20	2.40	374
33	330	10×16	1.68	416	10×20	1.80	458	12.5×20	1.80	498
47	470	10×20	1.18	547	12.5×20	1.20	595	12.5×25	1.20	656
56	560	12.5×20	1.02	649	12.5×20	1.08	649	12.5×25	1.08	716
68	680	12.5×25	0.84	789	12.5×25	0.90	789	16×25	0.86	906
100	101	16×25	0.66	1099	16×25	0.72	1099	16×30	0.72	1190
120	121	16×20	0.60	1095	16×25	0.65	1204	16×30	0.65	1303
150	151	16×25	0.48	1346	16×30	0.54	1457	16×35	0.58	1561
180	181	16×30	0.39	1451	16×35	0.42	1554	18×35	0.42	1623
220	221	16×35	0.34	1512	18×35	0.36	1579	18×40	0.36	1675
330	331	18×35	0.22	1933	18×40	0.24	2052			

V(Code) Item Cap.(μF) Code		400(2G)			420(2M)			450(2W)		
		Case size D×L (mm)	Max Imp 20°C, 100kHz (Ω)	Rated ripple 105°C, 100kHz (mArms)	Case size D×L (mm)	Max Imp 20°C, 100kHz (Ω)	Rated ripple 105°C, 100kHz (mArms)	Case size D×L (mm)	Max Imp 20°C, 100kHz (Ω)	Rated ripple 105°C, 100kHz (mArms)
1	010	6.3×11	19.8	50	6.3×11	19.00	47	6.3×11	19.00	45
2.2	2R2	6.3×11	17.6	74	8×11.5	16.50	82	8×11.5	16.50	78
3.3	3R3	8×11.5	13.2	106	8×11.5	12.50	100	8×16	12.50	110
4.7	4R7	8×11.5	8.80	127	8×16	8.50	138	10×16	8.50	140
5.6	5R6	8×16	8.25	160	10×16	7.50	161	10×16	7.50	153
6.8	6R8	10×16	7.70	189	10×16	6.50	178	10×20	6.50	186
10	100	10×16	5.50	229	10×20	5.30	238	10×20	5.30	226
22	220	12.5×20	2.59	407	12.5×25	2.50	423	12.5×25	2.80	401
33	330	12.5×25	1.87	549	16×25	1.80	595	16×25	1.80	565
47	470	16×25	1.38	753	16×30	1.25	769	16×30	1.25	730
56	560	16×30	1.10	890	16×35	1.05	899	16×35	1.05	853
68	680	16×30	0.94	981	18×30	0.90	967	18×35	0.90	981
100	101	18×35	0.74	1330	18×40	0.70	1331	18×40	0.74	1263
120	121	18×40	0.61	1547						
150	151	18×45	0.55	1824						