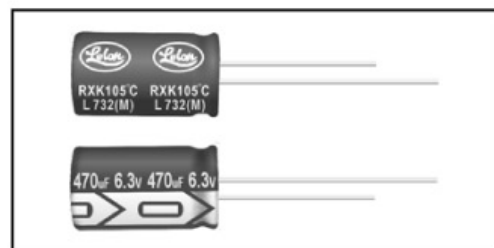


Features

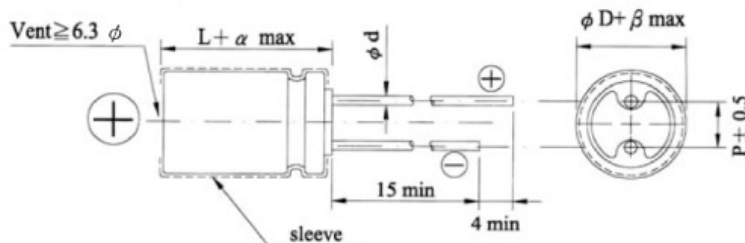
- 105°C, 2,000 ~ 5,000 hours assured
- Low ESR, suitable for switching power supplies
- Smaller size with large permissible ripple current
- RoHS Compliance



SPECIFICATIONS

Items	Performance																																										
Operating Temperature Range	-55℃ ~ +105℃																																										
Capacitance Tolerance	±20% (at 120Hz, 20℃)																																										
Leakage Current (at 20℃)	I = 0.01CV or 3 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF V = rated DC working voltage in V																																										
Dissipation Factor (Tan δ at 120Hz, 20℃)	<table><tr><td>Rated Voltage</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td></tr><tr><td>Tan δ (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></tr></table> When the capacitance exceeds 1,000 μF, 0.02 shall be added every 1,000 μF increase.	Rated Voltage	6.3	10	16	25	35	50	63	Tan δ (max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09																										
Rated Voltage	6.3	10	16	25	35	50	63																																				
Tan δ (max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09																																				
Low Temperature Characteristics (at 120Hz)	Impedance ratio shall not exceed the values given in the table below. <table><tr><td colspan="2">Rated Voltage</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td></tr><tr><td>Impedance Ratio</td><td>Z(-55℃)/Z(+20℃)</td><td>4</td><td>4</td><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td></tr></table>	Rated Voltage		6.3	10	16	25	35	50	63	Impedance Ratio	Z(-55℃)/Z(+20℃)	4	4	3	3	3	3	3																								
Rated Voltage		6.3	10	16	25	35	50	63																																			
Impedance Ratio	Z(-55℃)/Z(+20℃)	4	4	3	3	3	3	3																																			
Load Life Test	<table><tr><td>Test Time</td><td>2,000 hrs for φD ≤ 6.3 mm 3,000 hrs for φD = 8 mm 4,000 hrs for φD = 10 mm 5,000 hrs for φD ≥ 12.5 mm</td></tr><tr><td>Capacitance Change</td><td>Within ±20% of initial value</td></tr><tr><td>Dissipation Factor</td><td>Less than 200% of specified value</td></tr><tr><td>Leakage Current</td><td>Within specified value</td></tr></table> * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 3,000 ~ 5,000 hrs at 105℃.	Test Time	2,000 hrs for φD ≤ 6.3 mm 3,000 hrs for φD = 8 mm 4,000 hrs for φD = 10 mm 5,000 hrs for φD ≥ 12.5 mm	Capacitance Change	Within ±20% of initial value	Dissipation Factor	Less than 200% of specified value	Leakage Current	Within specified value																																		
Test Time	2,000 hrs for φD ≤ 6.3 mm 3,000 hrs for φD = 8 mm 4,000 hrs for φD = 10 mm 5,000 hrs for φD ≥ 12.5 mm																																										
Capacitance Change	Within ±20% of initial value																																										
Dissipation Factor	Less than 200% of specified value																																										
Leakage Current	Within specified value																																										
Shelf Life Test	<table><tr><td>Test Time</td><td>1,000 hrs</td></tr><tr><td>Capacitance Change</td><td>Within ±20% of initial value</td></tr><tr><td>Dissipation Factor</td><td>Less than 200% of specified value</td></tr><tr><td>Leakage Current</td><td>Within specified value</td></tr></table> * The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hrs at 105℃ without voltage applied.	Test Time	1,000 hrs	Capacitance Change	Within ±20% of initial value	Dissipation Factor	Less than 200% of specified value	Leakage Current	Within specified value																																		
Test Time	1,000 hrs																																										
Capacitance Change	Within ±20% of initial value																																										
Dissipation Factor	Less than 200% of specified value																																										
Leakage Current	Within specified value																																										
Ripple Current & Frequency Multipliers	<table><tr><th>Freq.(Hz)</th><th>60(50)</th><th>120</th><th>500</th><th>1K</th><th>10K</th><th>100K</th></tr><tr><th>Cap.(μF)</th><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Under 33</td><td>0.40</td><td>0.55</td><td>0.65</td><td>0.80</td><td>0.90</td><td>1.00</td></tr><tr><td>39 ~ 330</td><td>0.60</td><td>0.70</td><td>0.80</td><td>0.90</td><td>0.95</td><td>1.00</td></tr><tr><td>390 ~ 1,000</td><td>0.65</td><td>0.80</td><td>0.85</td><td>0.98</td><td>1.00</td><td>1.00</td></tr><tr><td>1,200 up above</td><td>0.80</td><td>0.90</td><td>0.95</td><td>0.98</td><td>1.00</td><td>1.00</td></tr></table>	Freq.(Hz)	60(50)	120	500	1K	10K	100K	Cap.(μF)							Under 33	0.40	0.55	0.65	0.80	0.90	1.00	39 ~ 330	0.60	0.70	0.80	0.90	0.95	1.00	390 ~ 1,000	0.65	0.80	0.85	0.98	1.00	1.00	1,200 up above	0.80	0.90	0.95	0.98	1.00	1.00
Freq.(Hz)	60(50)	120	500	1K	10K	100K																																					
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Under 33	0.40	0.55	0.65	0.80	0.90	1.00																																					
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1,200 up above	0.80	0.90	0.95	0.98	1.00	1.00																																					

DIAGRAM OF DIMENSIONS



LEAD SPACING AND DIAMETER Unit: mm

φ D	5	6.3	8	10	12.5	16	18
P	2.0	2.5	3.5	5.0		7.5	
φ d	0.5		0.6			0.8	
α	1.0				1.5		
β				0.5			

Remark: 16 × 20 is used flat type rubber bung.

DIMENSION & PERMISSIBLE RIPPLE CURRENT

Dimension: $\phi D \times L$ (mm)

Ripple Current: mA/rms at 100K Hz, 105°C

V.DC μF	Item	6.3V (0J)					10V (1A)					16V (1C)				
		$\phi D \times L$	Impedance (Ω , Max/100K Hz)		Ripple Current (mA/rms, 105°C)		$\phi D \times L$	Impedance (Ω , Max/100K Hz)		Ripple Current (mA/rms, 105°C)		$\phi D \times L$	Impedance (Ω , Max/100K Hz)		Ripple Current (mA/rms, 105°C)	
			20°C	-10°C	120Hz	100KHz		20°C	-10°C	120Hz	100KHz		20°C	-10°C	120Hz	100KHz
56												5×11	0.72	1.8	116	165
68												5×11	0.72	1.8	126	180
82							5×11	0.72	1.8	116	165					
100							5×11	0.72	1.8	126	180					
120		5×11	0.72	1.8	116	165						6.3×11	0.38	0.95	179	255
180							6.3×11	0.38	0.95	179	255	6.3×15	0.27	0.68	231	330
220		6.3×11	0.38	0.95	179	255	6.3×11	0.38	0.95	196	280					
270		6.3×11	0.38	0.95	196	280	6.3×15	0.27	0.68	231	330	8×11.5	0.20	0.50	291	415
330												10×12.5	0.12	0.30	438	625
		6.3×15	0.27	0.68	231	330	8×11.5	0.20	0.50	291	415	8×11.5	0.20	0.50	315	450
390												8×15	0.16	0.40	347	495
												10×12.5	0.12	0.30	540	675
470		8×11.5	0.20	0.50	332	415	8×11.5	0.20	0.50	360	450					
560							10×12.5	0.12	0.30	500	625					
		8×11.5	0.20	0.50	360	450	8×15	0.16	0.40	396	495	8×15	0.16	0.40	472	590
680		10×12.5	0.12	0.30	500	625	10×12.5	0.12	0.30	540	675	8×20	0.11	0.28	512	640
												10×16	0.084	0.21	660	825
820		8×15	0.16	0.40	396	495	8×15	0.16	0.40	472	590	8×20	0.11	0.28	560	700
		10×12.5	0.12	0.30	540	675						10×16	0.084	0.21	728	910
1,000		10×16	0.084	0.21	660	825	8×20	0.11	0.28	512	640	10×20	0.062	0.16	904	1,130
							10×16	0.084	0.21	660	825	10×20	0.062	0.16	904	1,130
1,200		8×15	0.16	0.40	472	590	8×20	0.11	0.28	560	700	10×20	0.062	0.16	904	1,130
		8×20	0.11	0.28	512	640	10×16	0.084	0.21	728	910	10×25	0.052	0.13	1,008	1,260
1,500		10×16	0.084	0.21	728	910										
		8×20	0.11	0.28	560	700	10×20	0.062	0.16	832	1,040	10×25	0.052	0.13	1,112	1,390
1,800		10×20	0.062	0.16	936	1,040	10×20	0.062	0.16	1,017	1,130	10×30	0.044	0.11	1,296	1,440
							10×25	0.052	0.13	1,134	1,260	12.5×20	0.046	0.12	1,206	1,340
2,200		10×20	0.062	0.16	1,017	1,130	10×25	0.052	0.13	1,251	1,390	10×30	0.044	0.11	1,296	1,440
		10×25	0.052	0.13	1,134	1,260	10×30	0.044	0.11	1,296	1,440	12.5×20	0.046	0.12	1,305	1,450
2,700												12.5×25	0.034	0.085	1,521	1,690
		10×25	0.052	0.13	1,251	1,390	10×30	0.044	0.11	1,413	1,570	12.5×25	0.034	0.085	1,629	1,810
3,300							12.5×20	0.046	0.12	1,206	1,340					
		10×30	0.044	0.11	1,296	1,440	12.5×20	0.046	0.12	1,305	1,450	12.5×30	0.030	0.075	1,755	1,950
3,900		12.5×20	0.046	0.12	1,206	1,340	12.5×25	0.034	0.085	1,521	1,690	16×20	0.035	0.087	1,692	1,880
		10×30	0.044	0.11	1,413	1,570	12.5×25	0.034	0.085	1,629	1,810	12.5×30	0.030	0.075	1,917	2,130
4,700		12.5×20	0.046	0.12	1,305	1,450	12.5×30	0.030	0.075	1,755	1,950	12.5×35	0.027	0.068	2,151	2,390
		12.5×25	0.034	0.085	1,521	1,690						16×25	0.028	0.070	1,863	2,070
5,600		12.5×25	0.034	0.085	1,629	1,810	12.5×30	0.030	0.075	1,917	2,130	12.5×35	0.027	0.068	2,151	2,390
												12.5×40	0.024	0.060	2,196	2,440
6,800							12.5×35	0.027	0.068	1,980	2,200	16×25	0.028	0.070	2,025	2,250
		12.5×30	0.030	0.075	1,755	1,950	12.5×35	0.027	0.068	2,196	2,440	16×31.5	0.025	0.063	2,115	2,350
8,200							12.5×40	0.024	0.060	2,358	2,620					
							16×20	0.035	0.087	1,692	1,880					
10,000							16×25	0.028	0.070	1,863	2,070					
		12.5×30	0.030	0.075	1,917	2,130	12.5×40	0.024	0.060	2,358	2,620	16×31.5	0.025	0.055	2,295	2,550
		12.5×35	0.027	0.068	1,980	2,200	16×25	0.028	0.070	2,025	2,250	16×35.5	0.022	0.055	2,295	2,550
		16×20	0.035	0.087	1,440	1,600										
		12.5×35	0.027	0.068	2,151	2,390	16×31.5	0.025	0.063	2,115	2,350	16×35.5	0.022	0.055	2,448	2,720
		12.5×40	0.024	0.060	2,196	2,440						16×40	0.018	0.045	2,610	2,900
		16×25	0.028	0.070	1,863	2,070										
		12.5×40	0.024	0.060	2,358	2,620	16×31.5	0.025	0.063	2,295	2,550	16×40	0.018	0.045	2,844	3,160
		16×25	0.028	0.070	2,025	2,250	16×35.5	0.022	0.055	2,295	2,550	18×35.5	0.021	0.053	2,394	2,660
		16×31.5	0.025	0.063	2,115	2,350										
		16×31.5	0.025	0.063	2,295	2,550	16×35.5	0.022	0.055	2,448	2,720	18×35.5	0.021	0.053	2,601	2,890
		16×35.5	0.022	0.055	2,691	2,990										

Dimension: $\phi D \times L(mm)$

Ripple Current: mA/rms at 100K Hz, 105°C

DIMENSION & PERMISSIBLE RIPPLE CURRENT

V DC μ F	Item	25V (1E)				35V (1V)				50V (1H)						
		ϕ D×L	Impedance (Ω , Max/100K Hz)		Ripple Current (mA/rms, 105°C)		ϕ D×L	Impedance (Ω , Max/100K Hz)		Ripple Current (mA/rms, 105°C)		ϕ D×L	Impedance (Ω , Max/100K Hz)		Ripple Current (mA/rms, 105°C)	
			20°C	-10°C	120Hz	100KHz		20°C	-10°C	120Hz	100KHz		20°C	-10°C	120Hz	100KHz
18												5×11	1.1	3.3	72	130
22												5×11	1.1	3.3	83	150
27						5×11	0.72	1.8	91	165						
33						5×11	0.72	1.8	99	180						
39		5×11	0.72	1.8	116	165						6.3×11	0.56	1.6	154	220
47		5×11	0.72	1.8	126	180						6.3×11	0.56	1.6	161	230
56							6.3×11	0.38	0.95	179	255	6.3×15	0.41	1.2	217	310
68							6.3×11	0.38	0.95	196	280	8×11.5	0.29	0.84	238	340
82		6.3×11	0.38	0.95	179	255	6.3×15	0.27	0.68	231	330	8×11.5	0.29	0.84	249	355
												8×15	0.25	0.75	329	470
												10×12.5	0.16	0.40	336	480
100		6.3×11	0.38	0.95	196	280						10×12.5	0.16	0.40	371	530
120		6.3×15	0.27	0.68	231	330	8×11.5	0.20	0.50	291	415	8×15	0.25	0.75	392	560
							10×12.5	0.12	0.30	438	625	8×20	0.18	0.52	427	610
												10×16	0.12	0.30	529	755
150		8×11.5	0.20	0.50	291	415	8×11.5	0.20	0.50	315	450	10×16	0.12	0.30	588	840
							10×12.5	0.12	0.30	473	675					
180		8×11.5	0.20	0.50	315	450	8×15	0.16	0.40	347	495	8×20	0.18	0.52	525	750
		10×12.5	0.12	0.30	438	625						10×20	0.088	0.22	662	945
220		8×15	0.16	0.40	347	495	8×15	0.16	0.40	413	590	10×20	0.088	0.22	728	1,040
		10×12.5	0.12	0.30	473	675	8×20	0.11	0.28	448	640	10×25	0.068	0.17	805	1,150
							10×16	0.084	0.21	578	825					
270							8×20	0.11	0.28	490	700	10×25	0.068	0.17	896	1,280
							10×16	0.084	0.21	637	910					
330		8×15	0.16	0.40	413	590	10×20	0.062	0.16	728	1,040	10×30	0.059	0.15	882	1,260
		8×20	0.11	0.28	448	640						12.5×20	0.059	0.15	833	1190
		10×16	0.084	0.21	578	825										
390		8×20	0.11	0.28	560	700	10×20	0.062	0.16	904	1,130	12.5×20	0.059	0.15	952	1190
		10×16	0.084	0.21	728	910	10×25	0.052	0.13	1,008	1,260					
470		10×20	0.062	0.16	832	1,040	10×25	0.052	0.13	1,112	1,390	10×30	0.059	0.15	1,176	1,470
												12.5×25	0.045	0.11	1,192	1,490
560		10×20	0.062	0.16	904	1,130	10×30	0.044	0.11	1,152	1,440	12.5×25	0.045	0.11	1,304	1,630
		10×25	0.052	0.13	1,008	1,260	12.5×20	0.046	0.12	1,072	1,340	12.5×30	0.039	0.098	1,376	1,720
		10×25	0.052	0.13	1,112	1,390	10×30	0.044	0.11	1,256	1,570	12.5×30	0.039	0.098	1,520	1,900
680							12.5×20	0.046	0.12	1,160	1,450	12.5×35	0.033	0.083	1,512	1,890
							12.5×25	0.034	0.085	1,352	1,690	16×20	0.048	0.120	1,248	1,560
							12.5×25	0.034	0.085	1,448	1,810	12.5×35	0.033	0.083	1,656	2,070
820		10×30	0.044	0.11	1,152	1,440	12.5×25	0.034	0.085	1,448	1,810	12.5×35	0.033	0.083	1,656	2,070
		12.5×20	0.046	0.12	1,072	1,340						12.5×40	0.029	0.073	1,624	2,030
												16×25	0.033	0.083	1,504	1,880
1,000		10×30	0.044	0.11	1,256	1,570	12.5×30	0.030	0.075	1,560	1,950	12.5×40	0.029	0.073	1,800	2,250
		12.5×20	0.046	0.12	1,160	1,450	16×20	0.035	0.087	1,376	1,720	16×25	0.033	0.083	1,664	2,080
		12.5×25	0.034	0.085	1,352	1,690						16×31.5	0.029	0.073	1,720	2,150
1,200		12.5×25	0.034	0.085	1,629	1,810	12.5×30	0.030	0.075	1,917	2,130	16×31.5	0.029	0.073	2,088	2,320
							12.5×35	0.027	0.068	1,980	2,200	16×35.5	0.025	0.063	2,115	2,350
1,500							16×25	0.028	0.070	1,863	2,070					
		12.5×30	0.030	0.075	1,755	1,950	12.5×35	0.027	0.068	2,151	2,390	16×35.5	0.025	0.063	2,286	2,540
		16×20	0.035	0.087	1,539	1,710	12.5×40	0.024	0.060	2,196	2,440	16×40	0.021	0.063	2,336	2,595
1,800							16×25	0.028	0.070	2,025	2,250					
		12.5×30	0.030	0.075	1,917	2,130	12.5×40	0.024	0.060	2,358	2,620	16×40	0.021	0.063	2,466	2,740
		12.5×35	0.027	0.068	1,980	2,200	16×31.5	0.025	0.063	2,115	2,350	18×35.5	0.023	0.058	2,160	2,400
2,200		16×25	0.028	0.070	1,863	2,070										
		12.5×35	0.027	0.068	2,151	2,390	16×31.5	0.025	0.063	2,295	2,550	18×35.5	0.023	0.058	2,349	2,610
		12.5×40	0.024	0.060	2,196	2,440	16×35.5	0.022	0.055	2,295	2,550	18×40	0.020	0.050	2,385	2,650
2,700		16×25	0.028	0.070	2,025	2,250										
		16×31.5	0.025	0.063	2,115	2,350	16×35.5	0.022	0.055	2,448	2,720					
							16×40	0.018	0.045	2,610	2,900					
3,300							18×35.5	0.021	0.053	2,394	2,660					
		16×31.5	0.025	0.063	2,295	2,550	18×35.5	0.021	0.053	2,601	2,890					
		16×35.5	0.022	0.055	2,295	2,550	18×40	0.017	0.043	2,709	3,010					
3,900		16×35.5	0.022	0.055	2,448	2,720	18×40	0.017	0.043	2,934	3,260					
		16×40	0.018	0.045	2,610	2,900										
		18×35.5	0.021	0.053	2,394	2,660										
4,700		18×35.5	0.021	0.053	2,601	2,890										
		18×40	0.017	0.043	2,709	3,010										
5,600		18×40	0.017	0.043	2,934	3,260										

Dimension: $\phi D \times L(\text{mm})$

Ripple Current: mA/rms at 100K Hz, 105°C

DIMENSION & PERMISSIBLE RIPPLE CURRENT

V. DC Item μF	$\phi D \times L$	63V(1J)			
		Impedance (Ω , Max/100K Hz)		Ripple Current (mA/rms, 105°C)	
		20°C	-10°C	120Hz	100KHz
12	5×11	1.90	4.78	55	100
27	6.3×11	1.10	2.78	88	160
33	6.3×11	1.10	2.75	96	175
39	6.3×15	0.62	1.55	161	230
47	8×11.5	0.49	1.23	193	275
56	8×11.5	0.49	1.23	203	290
	10×12.5	0.27	0.675	294	420
68	8×15	0.34	0.850	252	360
	10×12.5	0.27	0.675	354	505
	10×16	0.21	0.525	366	523
82	8×20	0.21	0.525	350	500
100	8×15	0.34	0.850	308	440
120	10×16	0.210	0.525	455	650
	10×20	0.160	0.400	490	700
150	8×20	0.210	0.525	476	680
	10×25	0.130	0.325	546	780
180	10×20	0.160	0.400	553	790
	10×30	0.100	0.250	672	960
220	10×25	0.130	0.325	648	925
	12.5×20	0.110	0.275	609	870
270	10×30	0.100	0.250	812	1,160
	12.5×25	0.074	0.185	805	1,150
330	12.5×20	0.110	0.275	746	1,065
390	12.5×25	0.074	0.185	1,088	1,360
	12.5×30	0.068	0.170	1,024	1,280
	12.5×30	0.068	0.170	1,120	1,400
470	12.5×35	0.063	0.158	1,112	1,390
	16×20	0.059	0.148	1,080	1,350
	16×25	0.055	0.138	1,184	1,480
560	12.5×40	0.051	0.128	1,224	1,530
	16×25	0.055	0.138	1,296	1,620
680	12.5×35	0.063	0.158	1,336	1,670
	16×31.5	0.046	0.115	1,376	1,720
820	12.5×40	0.051	0.128	1,480	1,850
	16×31.5	0.046	0.115	1,512	1,890
	16×35.5	0.040	0.100	1,528	1,910
1,000	16×35.5	0.040	0.100	1,688	2,110
	18×35.5	0.040	0.100	1,576	1,970
1,500	18×35.5	0.040	0.100	2,169	2,410