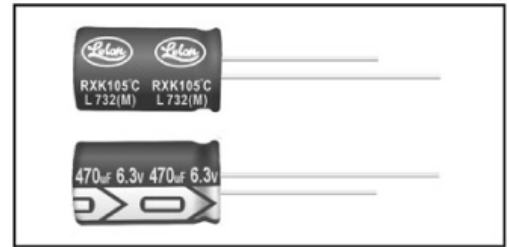


Features

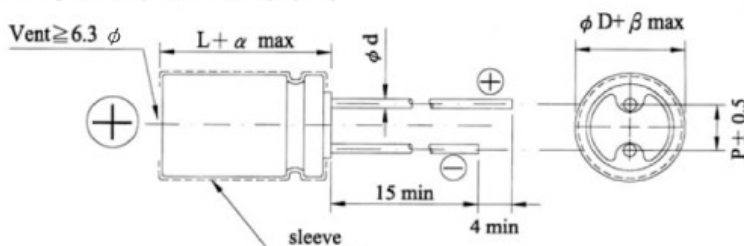
- 105°C, 2,000 ~ 5,000 hours assured
- Low ESR, suitable for switching power supplies
- Smaller size with large permissible ripple current
- RoHS Compliance



SPECIFICATIONS

Items	Performance																																										
Operating Temperature Range	-55°C ~ +105°C																																										
Capacitance Tolerance	±20% (at 120Hz, 20°C)																																										
Leakage Current (at 20°C)	$I = 0.01CV$ or $3 (\mu A)$ 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°C)	<table border="1"> <tr> <th>Rated Voltage</th> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> </tr> <tr> <th>Tan δ (max)</th> <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> <p>When the capacitance exceeds 1,000 μF, 0.02 shall be added every 1,000 μF increase.</p>	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																										
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Tan δ (max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09																																				
Low Temperature Characteristics (at 120Hz)	<p>Impedance ratio shall not exceed the values given in the table below.</p> <table border="1"> <tr> <th colspan="2">Rated Voltage</th> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> </tr> <tr> <th>Impedance Ratio</th> <th>Z(-55°C)/Z(+20°C)</th> <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°C)/Z(+20°C)	4	4	3	3	3	3	3																								
Rated Voltage		6.3	10	16	25	35	50	63																																			
Impedance Ratio	Z(-55°C)/Z(+20°C)	4	4	3	3	3	3	3																																			
Load Life Test	<table border="1"> <tr> <th>Test Time</th> <td>2,000 hrs for $\phi D \leq 6.3$ mm 3,000 hrs for $\phi D = 8$ mm 4,000 hrs for $\phi D = 10$ mm 5,000 hrs for $\phi D \geq 12.5$ mm</td> </tr> <tr> <th>Capacitance Change</th> <td>Within $\pm 20\%$ of initial value</td> </tr> <tr> <th>Dissipation Factor</th> <td>Less than 200% of specified value</td> </tr> <tr> <th>Leakage Current</th> <td>Within specified value</td> </tr> </table> <p>* The above specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage applied with rated ripple current for 3,000 ~ 5,000 hrs at 105°C.</p>	Test Time	2,000 hrs for $\phi D \leq 6.3$ mm 3,000 hrs for $\phi D = 8$ mm 4,000 hrs for $\phi D = 10$ mm 5,000 hrs for $\phi D \geq 12.5$ mm	Capacitance Change	Within $\pm 20\%$ of initial value	Dissipation Factor	Less than 200% of specified value	Leakage Current	Within specified value																																		
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Leakage Current	Within specified value																																										
Shelf Life Test	<table border="1"> <tr> <th>Test Time</th> <td>1,000 hrs</td> </tr> <tr> <th>Capacitance Change</th> <td>Within $\pm 20\%$ of initial value</td> </tr> <tr> <th>Dissipation Factor</th> <td>Less than 200% of specified value</td> </tr> <tr> <th>Leakage Current</th> <td>Within specified value</td> </tr> </table> <p>* The above specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hrs at 105°C without voltage applied.</p>	Test Time	1,000 hrs	Capacitance Change	Within $\pm 20\%$ of initial value	Dissipation Factor	Less than 200% of specified value	Leakage Current	Within specified value																																		
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Ripple Current & Frequency Multipliers	<table border="1"> <tr> <th rowspan="2">Cap. (μF)</th> <th colspan="7">Freq. (Hz)</th> </tr> <tr> <th>60(50)</th> <th>120</th> <th>500</th> <th>1K</th> <th>10K</th> <th>100K</th> </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>	Cap. (μF)	Freq. (Hz)							60(50)	120	500	1K	10K	100K	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
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DIAGRAM OF DIMENSIONS



LEAD SPACING AND DIAMETER Unit: mm

ϕD	5	6.3	8	10	12.5	16	18
P	2.0	2.5	3.5	5.0		7.5	
ϕd	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 Item μF	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	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
											8×15	0.16	0.40	347	495
390	8×11.5	0.20	0.50	332	415	8×11.5	0.20	0.50	360	450	10×12.5	0.12	0.30	540	675
											10×12.5	0.12	0.30	500	625
470	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
	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
560	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
680	10×16	0.084	0.21	660	825	8×20	0.11	0.28	512	640	10×20	0.062	0.16	832	1,040
						10×16	0.084	0.21	660	825					
820	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
	10×16	0.084	0.21	728	910										
1,000	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
1,200	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
1,500	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	1,413	1,570
	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
											12.5×25	0.034	0.085	1,521	1,690
1,800	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
						12.5×20	0.046	0.12	1,206	1,340					
2,200	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
	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	1,485	1,650
	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
2,700	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	1,980	2,200
	12.5×25	0.034	0.085	1,521	1,690						16×25	0.028	0.070	1,863	2,070
	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
3,300											12.5×40	0.024	0.060	2,196	2,440
						12.5×35	0.027	0.068	1,980	2,200	16×25	0.028	0.070	2,025	2,250
						12.5×35	0.027	0.068	2,196	2,440	16×31.5	0.025	0.063	2,115	2,350
3,900						12.5×40	0.024	0.060	2,151	2,390					
						16×20	0.035	0.087	1,692	1,880					
						16×25	0.028	0.070	1,863	2,070					
4,700	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										
5,600	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										
6,800	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										
8,200	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
10,000	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 Item μF	25V (1E)					35V (1V)					50V (1H)				
	$\phi D \times L$	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
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
100	6.3×11	0.38	0.95	196	280	10×12.5	0.16	0.40	371	530	10×12.5	0.16	0.40	336	480
											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	10×16	0.12	0.30	588	840
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					
						10×20	0.062	0.16	904	1,130	10×30	0.059	0.15	882	1,260
330	8×15	0.16	0.40	413	590	10×20	0.062	0.16	904	1,130	12.5×20	0.059	0.15	833	1,190
	8×20	0.11	0.28	448	640										
	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	1,190
	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
	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
820	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
						16×25	0.028	0.070	1,863	2,070					
1,500	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
						16×25	0.028	0.070	2,025	2,250					
1,800	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
	16×25	0.028	0.070	1,863	2,070										
2,200	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
	16×25	0.028	0.070	2,025	2,250										
2,700	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					
						18×35.5	0.021	0.053	2,394	2,660					
3,300	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					
	16×35.5	0.022	0.055	2,448	2,720	18×40	0.017	0.043	2,934	3,260					
3,900	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	63V(1J)				
	$\phi D \times L$	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
470	12.5×30	0.068	0.170	1,120	1,400
	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