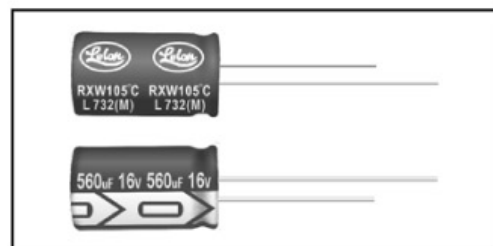


Feature

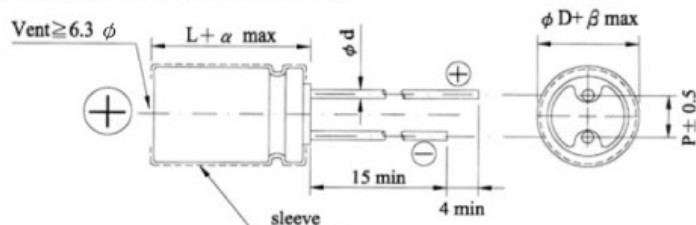
- 105°C, 4,000 ~ 7,000 hours assured
- Low ESR, suitable for switching power supplies
- Smaller size with large permissible ripple current
- RoHS Compliance



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 120 Hz, 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><td>100</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><td>0.08</td></tr></table> When the capacitance exceeds 1000 μ F, 0.02 shall be added every 1000 μ F increase.	Rated Voltage	6.3	10	16	25	35	50	63	100	Tan δ (max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08												
Rated Voltage	6.3	10	16	25	35	50	63	100																							
Tan δ (max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08																							
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><td>100</td></tr><tr><td>Impedance Ratio</td><td>Z(-55℃)/Z(+20℃)</td><td>3</td><td>3</td><td>3</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	100	Impedance Ratio	Z(-55℃)/Z(+20℃)	3	3	3	3	3	3	3	3										
Rated Voltage		6.3	10	16	25	35	50	63	100																						
Impedance Ratio	Z(-55℃)/Z(+20℃)	3	3	3	3	3	3	3	3																						
Load Life Test	<table><tr><td>Test Time</td><td>4,000 hrs for φ D ≤ 6.3 mm 5,000 hrs for φ D = 8 mm 6,000 hrs for φ D = 10 mm 7,000 hrs for φ D ≥ 12.5 mm</td></tr><tr><td>Capacitance Change</td><td>Within ±25% 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 4,000 ~ 7,000 hrs at 105℃.	Test Time	4,000 hrs for φ D ≤ 6.3 mm 5,000 hrs for φ D = 8 mm 6,000 hrs for φ D = 10 mm 7,000 hrs for φ D ≥ 12.5 mm	Capacitance Change	Within ±25% of initial value	Dissipation Factor	Less than 200% of specified value	Leakage Current	Within specified value																						
Test Time	4,000 hrs for φ D ≤ 6.3 mm 5,000 hrs for φ D = 8 mm 6,000 hrs for φ D = 10 mm 7,000 hrs for φ D ≥ 12.5 mm																														
Capacitance Change	Within ±25% 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 ±25% 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 ±25% of initial value	Dissipation Factor	Less than 200% of specified value	Leakage Current	Within specified value																						
Test Time	1,000 hrs																														
Capacitance Change	Within ±25% 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) Cap.(μF)</th><th>120</th><th>1K</th><th>10K</th><th>100K up</th></tr><tr><td>under ~ 33</td><td>0.42</td><td>0.70</td><td>0.90</td><td>1.0</td></tr><tr><td>39 ~ 270</td><td>0.5</td><td>0.73</td><td>0.92</td><td>1.0</td></tr><tr><td>330 ~ 680</td><td>0.55</td><td>0.77</td><td>0.94</td><td>1.0</td></tr><tr><td>820 ~ 1,800</td><td>0.6</td><td>0.80</td><td>0.96</td><td>1.0</td></tr><tr><td>2,200 ~ 15,000</td><td>0.7</td><td>0.85</td><td>0.98</td><td>1.0</td></tr></table>	Freq.(Hz) Cap.(μF)	120	1K	10K	100K up	under ~ 33	0.42	0.70	0.90	1.0	39 ~ 270	0.5	0.73	0.92	1.0	330 ~ 680	0.55	0.77	0.94	1.0	820 ~ 1,800	0.6	0.80	0.96	1.0	2,200 ~ 15,000	0.7	0.85	0.98	1.0
Freq.(Hz) Cap.(μF)	120	1K	10K	100K up																											
under ~ 33	0.42	0.70	0.90	1.0																											
39 ~ 270	0.5	0.73	0.92	1.0																											
330 ~ 680	0.55	0.77	0.94	1.0																											
820 ~ 1,800	0.6	0.80	0.96	1.0																											
2,200 ~ 15,000	0.7	0.85	0.98	1.0																											

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	5.0	7.5	7.5
ϕ d	0.5		0.6			0.8	
α	1.0			1.5			
β	0.5						

Dimension: ϕ D $\times$ L(mm)

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

DIMENSION & PERMISSIBLE RIPPLE CURRENT

VDC Contents μ F	6.3V (0J)				10V (1A)				16V (1C)				25V (1E)			
	ϕ D $\times$ L	Impedance (Ω , Max/100KHz)		Ripple Current (mA/rms, 105°C) 100KHz	ϕ D $\times$ L	Impedance (Ω , Max/100KHz)		Ripple Current (mA/rms, 105°C) 100KHz	ϕ D $\times$ L	Impedance (Ω , Max/100KHz)		Ripple Current (mA/rms, 105°C) 100KHz	ϕ D $\times$ L	Impedance (Ω , Max/100KHz)		Ripple Current (mA/rms, 105°C) 100KHz
		20°C	-10°C			20°C	-10°C			20°C	-10°C			20°C	-10°C	
4.7													5 $\times$ 11	0.6	1.2	180
10									5 $\times$ 11	0.6	1.2	180	5 $\times$ 11	0.6	1.2	180
22	5 $\times$ 11	0.6	1.2	180	5 $\times$ 11	0.6	1.2	180	5 $\times$ 11	0.6	1.2	180	5 $\times$ 11	0.6	1.2	180
33	5 $\times$ 11	0.6	1.2	180	5 $\times$ 11	0.6	1.2	180	5 $\times$ 11	0.6	1.2	180	5 $\times$ 11	0.6	1.2	180
39													5 $\times$ 11	0.6	1.2	180
47	5 $\times$ 11	0.6	1.2	180	5 $\times$ 11	0.6	1.2	180	5 $\times$ 11	0.6	1.2	180	5 $\times$ 11	0.6	1.2	180
56									5 $\times$ 11	0.6	1.2	180				
82					5 $\times$ 11	0.6	1.2	180					6.3 $\times$ 11	0.25	0.50	290
100	5 $\times$ 11	0.6	1.2	180	5 $\times$ 11	0.6	1.2	180	6.3 $\times$ 11	0.25	0.5	290	6.3 $\times$ 11	0.25	0.50	290
120									6.3 $\times$ 11	0.25	0.5	290	6.3 $\times$ 15	0.23	0.46	430
150	6.3 $\times$ 11	0.25	0.5	290	6.3 $\times$ 11	0.25	0.5	290	6.3 $\times$ 11	0.25	0.5	290	8 $\times$ 11.5	0.117	0.234	555
180					6.3 $\times$ 11	0.25	0.5	290	6.3 $\times$ 15	0.23	0.46	430				
220	6.3 $\times$ 11	0.25	0.5	290	6.3 $\times$ 11	0.25	0.5	290	8 $\times$ 11.5	0.117	0.234	555	8 $\times$ 11.5	0.117	0.234	555
					6.3 $\times$ 15	0.23	0.46	430								
330	6.3 $\times$ 11	0.25	0.500	290	8 $\times$ 11.5	0.117	0.234	555	8 $\times$ 11.5	0.117	0.234	555	10 $\times$ 12.5	0.090	0.18	755
	6.3 $\times$ 15	0.23	0.46	430									8 $\times$ 15	0.085	0.17	730
470	8 $\times$ 11.5	0.117	0.234	555	8 $\times$ 11.5	0.117	0.234	555	10 $\times$ 12.5	0.090	0.18	755	10 $\times$ 16	0.068	0.136	1,050
									8 $\times$ 15	0.085	0.17	730	8 $\times$ 20	0.065	0.130	995
560	8 $\times$ 11.5	0.117	0.234	555									10 $\times$ 20	0.052	0.104	1,220
680	10 $\times$ 12.5	0.090	0.180	755	10 $\times$ 12.5	0.090	0.180	755	10 $\times$ 16	0.068	0.136	1,050	10 $\times$ 20	0.052	0.104	1,220
					8 $\times$ 15	0.085	0.170	730	8 $\times$ 20	0.065	0.130	995				
820	8 $\times$ 15	0.085	0.170	730					10 $\times$ 20	0.052	0.104	1,220	10 $\times$ 25	0.045	0.090	1,440
	10 $\times$ 12.5	0.090	0.180	755												
1,000	10 $\times$ 12.5	0.090	0.180	755	10 $\times$ 16	0.068	0.136	1,050	10 $\times$ 20	0.052	0.104	1,220	12.5 $\times$ 20	0.038	0.076	1,655
					8 $\times$ 20	0.065	0.130	995					10 $\times$ 30	0.035	0.070	1,815
1,200	8 $\times$ 20	0.065	0.130	955	10 $\times$ 20	0.052	0.104	1,220	10 $\times$ 25	0.045	0.090	1,440				
	10 $\times$ 16	0.068	0.136	1,050												
1,500	10 $\times$ 20	0.052	0.104	1,220	10 $\times$ 20	0.052	0.104	1,220	12.5 $\times$ 20	0.038	0.076	1,655	16 $\times$ 25	0.022	0.044	2,555
					10 $\times$ 25	0.045	0.090	1,440	10 $\times$ 30	0.035	0.070	1,815	12.5 $\times$ 25	0.030	0.060	1,945
1,800													12.5 $\times$ 30	0.025	0.050	2,310
													16 $\times$ 20	0.029	0.058	2,205
2,200	10 $\times$ 25	0.045	0.090	1,440	12.5 $\times$ 20	0.038	0.076	1,655	12.5 $\times$ 25	0.030	0.06	1,945	16 $\times$ 25	0.022	0.044	2,555
	12.5 $\times$ 20	0.038	0.076	1,815	10 $\times$ 30	0.035	0.070	1,815					18 $\times$ 20	0.028	0.056	2,490
													12.5 $\times$ 35	0.022	0.044	2,510
2,700	10 $\times$ 30	0.035	0.070	1,815	12.5 $\times$ 25	0.030	0.060	1,945	12.5 $\times$ 30	0.025	0.05	2,310	16 $\times$ 25	0.022	0.044	2,555
									16 $\times$ 20	0.029	0.058	2,205				
3,300	12.5 $\times$ 20	0.038	0.076	1,655	12.5 $\times$ 25	0.030	0.060	1,945	16 $\times$ 25	0.022	0.044	2,555	16 $\times$ 31.5	0.018	0.036	3,010
					12.5 $\times$ 30	0.025	0.050	2,310	12.5 $\times$ 35	0.022	0.044	2,510	18 $\times$ 25	0.020	0.040	2,740
3,900	12.5 $\times$ 25	0.030	0.060	1,945	12.5 $\times$ 35	0.022	0.044	2,510	16 $\times$ 25	0.022	0.044	2,555	16 $\times$ 35.5	0.016	0.032	3,150
					16 $\times$ 20	0.029	0.058	2,205	18 $\times$ 20	0.028	0.056	2,490	18 $\times$ 31.5	0.016	0.032	3,635
4,700	16 $\times$ 25	0.022	0.044	2,555	16 $\times$ 25	0.022	0.044	2,555	16 $\times$ 31.5	0.018	0.036	3,010	18 $\times$ 35.5	0.015	0.030	3,680
	12.5 $\times$ 30	0.025	0.050	2,310					18 $\times$ 25	0.020	0.040	2,740				
5,600	12.5 $\times$ 35	0.022	0.044	2,510	16 $\times$ 25	0.022	0.044	2,555	18 $\times$ 35.5	0.016	0.032	3,150				
	16 $\times$ 20	0.029	0.058	2,205	18 $\times$ 20	0.028	0.056	2,490	18 $\times$ 31.5	0.016	0.032	3,635				
6,800	16 $\times$ 25	0.022	0.044	2,555	16 $\times$ 31.5	0.018	0.036	3,010	18 $\times$ 35.5	0.015	0.030	3,680	18 $\times$ 40	0.014	0.028	3,800
	18 $\times$ 20	0.028	0.056	2,490	18 $\times$ 25	0.020	0.040	2,740								
8,200	16 $\times$ 31.5	0.018	0.036	3,010	16 $\times$ 35.5	0.016	0.032	3,150	18 $\times$ 35.5	0.015	0.030	3,680				
					18 $\times$ 31.5	0.016	0.032	3,635								
10,000	16 $\times$ 31.5	0.016	0.032	3,150	18 $\times$ 35.5	0.015	0.030	3,680	18 $\times$ 40	0.014	0.028	3,800				
	18 $\times$ 25	0.020	0.040	2,740												
12,000	18 $\times$ 31.5	0.016	0.032	3,635												
15,000	18 $\times$ 35.5	0.015	0.030	3,680	18 $\times$ 40	0.014	0.028	3,800								

Remark: The case size of 16 $\times$ 20, 18 $\times$ 20 and 18 $\times$ 25 are used flat type rubber bung.

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

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

DIMENSION & PERMISSIBLE RIPPLE CURRENT

VDC Contents μF	35V (1V)				50V (1H)				63V (1J)				100V (2A)			
	$\phi D \times L$	Impedance (Ω , Max/100KHz)		Ripple Current (mA/rms, 105°C) 100KHz	$\phi D \times L$	Impedance (Ω , Max/100KHz)		Ripple Current (mA/rms, 105°C) 100KHz	$\phi D \times L$	Impedance (Ω , Max/100KHz)		Ripple Current (mA/rms, 105°C) 100KHz	$\phi D \times L$	Impedance (Ω , Max/100KHz)		Ripple Current (mA/rms, 105°C) 100KHz
		20°C	-10°C			20°C	-10°C			20°C	-10°C			20°C	-10°C	
0.47													5×11	43	86	20
1													5×11	20	40	30
2.2													5×11	9.8	19.6	44
3.3													5×11	6.6	13.2	58
4.7	5×11	0.6	1.2	180	5×11	2.3	4.6	90	5×11	4.7	9.4	68	5×11	4.6	9.2	74
6.8									5×11	2.5	5.0	95	5×11	3.5	7.0	95
10	5×11	0.6	1.2	180	5×11	1.4	2.8	120	5×11	2.1	4.2	110	6.3×11	1.8	3.6	130
12									5×11	2.0	4.0	145				
15									6.3×11	1.2	2.4	160	8×11.5	0.83	1.66	180
18					5×11	1.3	2.6	155					6.3×15	0.80	1.60	200
22	5×11	0.6	1.2	180	5×11	1.2	2.4	170	6.3×11	0.71	1.42	250	8×11.5	0.68	1.36	230
27	5×11	0.6	1.2	180												
33	5×11	0.6	1.2	180	6.3×11	0.43	0.86	300	6.3×11	0.71	1.42	250	10×12.5	0.46	0.92	320
39													8×15	0.45	0.90	360
47	6.3×11	0.25	0.5	290	6.3×11	0.43	0.86	300	6.3×15	0.70	1.40	330				
56	6.3×11	0.25	0.5	290	6.3×15	0.40	0.80	360	8×11.5	0.342	0.684	405	10×16	0.37	0.74	420
68													8×20	0.37	0.74	420
82	6.3×15	0.23	0.46	430	8×11.5	0.234	0.468	485					10×20	0.30	0.60	490
100	8×11.5	0.117	0.234	555	8×11.5	0.234	0.468	485	10×12.5	0.256	0.512	535	10×25	0.25	0.50	540
									8×15	0.230	0.460	535	12.5×20	0.18	0.36	580
120					8×15	0.155	0.310	635	10×16	0.194	0.388	600				
					10×12.5	0.162	0.324	615								
150	8×11.5	0.117	0.234	555	10×12.5	0.162	0.324	615	10×16	0.194	0.388	660	12.5×25	0.13	0.26	710
180					8×20	0.120	0.240	860	10×20	0.147	0.294	885	12.5×30	0.12	0.24	790
					10×16	0.119	0.238	850	12.5×16	0.150	0.300	1,020	16×20	0.13	0.26	750
220	10×12.5	0.090	0.18	755	10×16	0.119	0.238	850	10×20	0.147	0.294	885	16×25	0.10	0.20	890
	8×15	0.085	0.17	730	10×20	0.090	0.180	1,030	10×25	0.130	0.260	1,050	18×20	0.11	0.22	850
270					10×25	0.082	0.164	1,200	16×16	0.090	0.180	1,410				
330	10×16	0.068	0.136	1,050	10×20	0.090	0.180	1,030	12.5×20	0.085	0.170	1,285	16×25	0.090	0.180	1,080
	8×20	0.065	0.130	995	10×30	0.060	0.120	1,610								
390	10×20	0.052	0.104	1,220	12.5×20	0.063	0.126	1,480	12.5×25	0.070	0.140	1,720	18×25	0.083	0.166	1,260
									18×16	0.086	0.172	1,690				
470	10×20	0.052	0.104	1,220					12.5×25	0.070	0.140	1,720	16×31.5	0.076	0.152	1,310
					12.5×20	0.060	0.120	1,500	12.5×30	0.055	0.110	2,090				
									16×20	0.059	0.118	1,765				
560	10×25	0.045	0.090	1,440	12.5×25	0.050	0.100	1,832	16×25	0.050	0.100	2,160	18×31.5	0.068	0.136	1,370
													18×35.5	0.064	0.128	1,410
680	12.5×20	0.038	0.076	1,655	12.5×25	0.050	0.100	1,832	12.5×35	0.047	0.094	2,265				
	10×30	0.035	0.070	1,815	16×20	0.048	0.096	1,835	18×20	0.055	0.110	2,290				
820					12.5×35	0.034	0.068	2,285	16×31.5	0.043	0.086	2,670	18×40	0.047	0.094	1,520
					18×20	0.042	0.084	2,420	18×25	0.043	0.086	2,585				
1,000	12.5×25	0.030	0.060	1,945	16×25	0.034	0.068	2,235	16×31.5	0.043	0.086	2,670				
									16×35.5	0.036	0.072	2,770				
1,200	12.5×30	0.025	0.050	2,310	16×31.5	0.028	0.056	2,700	18×31.5	0.032	0.064	2,950				
	16×20	0.029	0.058	2,205	18×25	0.029	0.058	2,610								
1,500	16×25	0.022	0.044	2,555	16×31.5	0.028	0.056	2,700	18×35.5	0.030	0.060	3,095				
	12.5×35	0.022	0.044	2,510	16×35.5	0.025	0.05	2,790								
1,800	16×25	0.022	0.044	2,555	18×31.5	0.025	0.05	3,000								
	18×20	0.028	0.056	2,490												
2,200	16×31.5	0.018	0.036	3,010	18×35.5	0.023	0.046	3,100	18×40	0.028	0.056	3,200				
	18×25	0.020	0.040	2,740												
2,700	16×35.5	0.016	0.032	3,150												
	18×31.5	0.016	0.032	3,635												
3,300	18×35.5	0.015	0.030	3,680												
4,700	18×40	0.014	0.028	3,800												

Remark: The case size of 16×20, 18×20 and 18×25 are used flat type rubber bung.