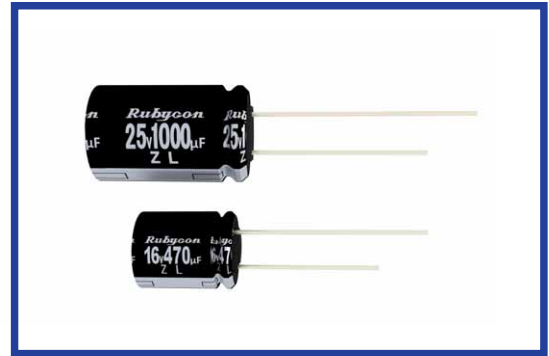


**ZL SERIES**

**105°C High Ripple Current, Low Impedance**

\*Load Life : 105°C 1000~5000 hours.



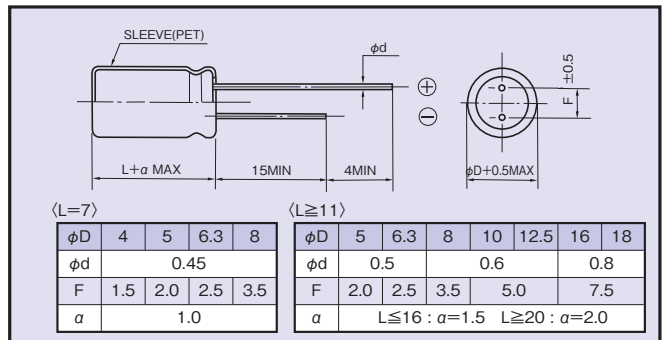
**◆ SPECIFICATIONS**

Items	Characteristics																														
Category Temperature Range	-40~+105°C																														
Rated Voltage Range	6.3~100Vdc																														
Capacitance Tolerance	±20% (20°C, 120Hz)																														
Leakage Current(MAX)	I=0.01CV or 3µA whichever is greater.(After 2 minutes) I=Leakage Current(µA)      C=Capacitance(µF)      V=Rated Voltage(Vdc)																														
Dissipation Factor(MAX) (tanδ)	<table border="1"> <tr> <td>Rated Voltage (Vdc)</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>(20°C, 120Hz)</td> </tr> <tr> <td>tanδ</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></td> </tr> </table> <p>When capacitance is over 1000µF, tanδ shall be added 0.02 to the listed value with increase of every 1000µF.</p>	Rated Voltage (Vdc)	6.3	10	16	25	35	50	63	100	(20°C, 120Hz)	tanδ	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08											
Rated Voltage (Vdc)	6.3	10	16	25	35	50	63	100	(20°C, 120Hz)																						
tanδ	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08																							
Endurance	<p>After applying rated voltage with rated ripple current for specified time at 105°C, the capacitors shall meet the following requirements.</p> <table border="1"> <tr> <td>Capacitance Change</td> <td>Within ±25% of the initial value.</td> <td rowspan="3"> <table border="1"> <tr> <th>Case Size</th> <th>Life Time (hrs)</th> </tr> <tr> <td>L=7</td> <td>1000</td> </tr> <tr> <td rowspan="4">L≥11</td> <td>φD≤6.3</td> <td>2000</td> </tr> <tr> <td>φD= 8</td> <td>3000</td> </tr> <tr> <td>φD= 10</td> <td>4000</td> </tr> <tr> <td>φD≥12.5</td> <td>5000</td> </tr> </table> </td> </tr> <tr> <td>Dissipation Factor</td> <td>Not more than 200% of the specified value.</td> </tr> <tr> <td>Leakage Current</td> <td>Not more than the specified value.</td> </tr> </table>	Capacitance Change	Within ±25% of the initial value.	<table border="1"> <tr> <th>Case Size</th> <th>Life Time (hrs)</th> </tr> <tr> <td>L=7</td> <td>1000</td> </tr> <tr> <td rowspan="4">L≥11</td> <td>φD≤6.3</td> <td>2000</td> </tr> <tr> <td>φD= 8</td> <td>3000</td> </tr> <tr> <td>φD= 10</td> <td>4000</td> </tr> <tr> <td>φD≥12.5</td> <td>5000</td> </tr> </table>	Case Size	Life Time (hrs)	L=7	1000	L≥11	φD≤6.3	2000	φD= 8	3000	φD= 10	4000	φD≥12.5	5000	Dissipation Factor	Not more than 200% of the specified value.	Leakage Current	Not more than the specified value.										
Capacitance Change	Within ±25% of the initial value.	<table border="1"> <tr> <th>Case Size</th> <th>Life Time (hrs)</th> </tr> <tr> <td>L=7</td> <td>1000</td> </tr> <tr> <td rowspan="4">L≥11</td> <td>φD≤6.3</td> <td>2000</td> </tr> <tr> <td>φD= 8</td> <td>3000</td> </tr> <tr> <td>φD= 10</td> <td>4000</td> </tr> <tr> <td>φD≥12.5</td> <td>5000</td> </tr> </table>	Case Size		Life Time (hrs)	L=7	1000	L≥11		φD≤6.3	2000	φD= 8	3000	φD= 10	4000	φD≥12.5	5000														
Case Size	Life Time (hrs)																														
L=7	1000																														
L≥11	φD≤6.3	2000																													
	φD= 8	3000																													
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	φD≥12.5	5000																													
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Leakage Current	Not more than the specified value.																														
Low Temperature Stability Impedance Ratio(MAX)	<table border="1"> <tr> <td>Rated Voltage (Vdc)</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>(120Hz)</td> </tr> <tr> <td>Z(-25°C)/Z(20°C)</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td></td> </tr> <tr> <td>Z(-40°C)/Z(20°C)</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> <td></td> </tr> </table>	Rated Voltage (Vdc)	6.3	10	16	25	35	50	63	100	(120Hz)	Z(-25°C)/Z(20°C)	2	2	2	2	2	2	2	2		Z(-40°C)/Z(20°C)	3	3	3	3	3	3	3	3	
Rated Voltage (Vdc)	6.3	10	16	25	35	50	63	100	(120Hz)																						
Z(-25°C)/Z(20°C)	2	2	2	2	2	2	2	2																							
Z(-40°C)/Z(20°C)	3	3	3	3	3	3	3	3																							

**◆ MULTIPLIER FOR RIPPLE CURRENT**

Frequency (Hz)		120	1k	10k	100k≤
Coefficient	5.6~68µF	0.40	0.70	0.90	1.00
	82~270µF	0.50	0.73	0.92	1.00
	330~680µF	0.55	0.77	0.94	1.00
	820~1800µF	0.60	0.80	0.96	1.00
	2200~6800µF	0.70	0.85	0.98	1.00

**◆ DIMENSIONS** (mm)



**◆ PART NUMBER**

□□□ ZL □□□□□ M □□□ □□ DXL  
 Rated Voltage Series Capacitance Capacitance Tolerance Option Lead Forming Case Size

**◆ OPTION**

PET Sleeve	Code
	EFC

**◆STANDARD SIZE**

Rated Voltage (Vdc)	Capacitance (μF)	Size φD×L(mm)	Rated ripple current (mA r.m.s./105°C, 100kHz)	Impedance (Ω MAX)	
				20°C, 100kHz	-10°C, 100kHz
6.3	39	4×7	130	0.85	2.6
	68	5×7	210	0.43	1.3
	150	6.3×7	300	0.23	0.69
	150	5×11	250	0.30	1.0
	220	8×7	380	0.15	0.45
	330	6.3×11	405	0.13	0.41
	560	8×11.5	760	0.072	0.22
	820	8×16	995	0.056	0.17
	1000	10×12.5	1030	0.053	0.16
	1200	8×20	1250	0.041	0.13
	1200	10×16	1430	0.038	0.12
	1500	10×20	1820	0.023	0.069
	2200	10×23	2150	0.022	0.066
	3300	12.5×20	2360	0.021	0.053
	3900	12.5×25	2770	0.018	0.045
	4700	12.5×30	3290	0.016	0.041
5600	12.5×35	3400	0.015	0.039	
5600	16×20	3140	0.018	0.045	
6800	16×25	3460	0.016	0.043	
10	27	4×7	130	0.89	2.7
	56	5×7	210	0.44	1.4
	100	5×11	250	0.30	1.0
	120	6.3×7	300	0.23	0.69
	180	8×7	380	0.15	0.45
	220	6.3×11	405	0.13	0.41
	470	8×11.5	760	0.072	0.22
	680	8×16	995	0.056	0.17
	680	10×12.5	1030	0.053	0.16
	1000	8×20	1250	0.041	0.13
	1000	10×16	1430	0.038	0.12
	1200	10×20	1820	0.023	0.069
	1500	10×23	2150	0.022	0.066
	2200	12.5×20	2360	0.021	0.053
	3300	12.5×25	2770	0.018	0.045
	3900	12.5×30	3290	0.016	0.041
3900	16×20	3140	0.018	0.045	
4700	12.5×35	3400	0.015	0.039	
5600	16×25	3460	0.016	0.043	
16	18	4×7	130	0.92	2.8
	33	5×7	210	0.45	1.4
	56	5×11	250	0.30	1.0
	68	6.3×7	300	0.24	0.72
	120	8×7	380	0.15	0.45
	120	6.3×11	405	0.13	0.41
	330	8×11.5	760	0.072	0.22
	470	8×16	995	0.056	0.17
	470	10×12.5	1030	0.053	0.16
	680	8×20	1250	0.041	0.13
	680	10×16	1430	0.038	0.12
	1000	10×20	1820	0.023	0.069
	1200	10×23	2150	0.022	0.066
	1500	12.5×20	2360	0.021	0.053
	2200	12.5×25	2770	0.018	0.045
	2700	12.5×30	3290	0.016	0.041
2700	16×20	3140	0.018	0.045	
3300	12.5×35	3400	0.015	0.039	
3900	16×25	3460	0.016	0.043	
25	15	4×7	130	0.94	2.9
	27	5×7	210	0.46	1.4
	47	5×11	250	0.30	1.0
	56	6.3×7	300	0.24	0.72
	100	8×7	380	0.15	0.45
	100	6.3×11	405	0.13	0.41
	220	8×11.5	760	0.072	0.22
	330	8×16	995	0.056	0.17
	330	10×12.5	1030	0.053	0.16
	470	8×20	1250	0.041	0.13
	470	10×16	1430	0.038	0.12
	680	10×20	1820	0.023	0.069
	820	10×23	2150	0.022	0.066
	1000	12.5×20	2360	0.021	0.053
	1500	12.5×25	2770	0.018	0.045
	1800	12.5×30	3290	0.016	0.041
1800	16×20	3140	0.018	0.045	
2200	12.5×35	3400	0.015	0.039	
2700	16×25	3460	0.016	0.043	

**◆STANDARD SIZE**

Rated Voltage (Vdc)	Capacitance (μF)	Size φD×L(mm)	Rated ripple current (mA r.m.s./105°C, 100kHz)	Impedance (Ω MAX)	
				20°C, 100kHz	-10°C, 100kHz
35	10	4×7	130	0.96	2.9
	18	5×7	210	0.47	1.5
	33	5×11	250	0.30	1.0
	39	6.3×7	300	0.25	0.75
	56	8×7	380	0.16	0.48
	56	6.3×11	405	0.13	0.41
	150	8×11.5	760	0.072	0.22
	220	8×16	995	0.056	0.17
	220	10×12.5	1030	0.053	0.16
	270	8×20	1250	0.041	0.13
	330	10×16	1430	0.038	0.12
	470	10×20	1820	0.023	0.069
	560	10×23	2150	0.022	0.066
	680	12.5×20	2360	0.021	0.053
	1000	12.5×25	2770	0.018	0.045
	1200	12.5×30	3290	0.016	0.041
1200	16×20	3140	0.018	0.045	
1500	12.5×35	3400	0.015	0.039	
1800	16×25	3460	0.016	0.043	
50	5.6	4×7	130	1.0	3.0
	10	5×7	210	0.50	1.5
	22	6.3×7	300	0.26	0.78
	22	5×11	238	0.34	1.18
	33	8×7	380	0.17	0.51
	56	6.3×11	385	0.14	0.50
	100	8×11.5	724	0.074	0.22
	120	8×16	950	0.061	0.18
	150	10×12.5	979	0.061	0.18
	180	8×20	1190	0.046	0.14
	220	10×16	1370	0.042	0.12
	270	10×20	1580	0.030	0.090
	330	10×23	1870	0.028	0.085
	470	12.5×20	2050	0.027	0.068
	560	12.5×25	2410	0.023	0.059
	680	12.5×30	2860	0.021	0.052
820	12.5×35	2960	0.019	0.051	
820	16×20	2730	0.023	0.059	
1000	16×25	3010	0.021	0.056	

Rated Voltage (Vdc)	Capacitance (μF)	Size φD×L(mm)	Rated ripple current (mA r.m.s./105°C, 100kHz)	Impedance (Ω MAX)	
				20°C, 100kHz	-10°C, 100kHz
63	15	5×11	165	0.88	3.5
	33	6.3×11	265	0.35	1.4
	56	8×11.5	500	0.22	0.88
	82	8×16	665	0.16	0.64
	82	10×12.5	685	0.15	0.60
	120	8×20	820	0.12	0.48
	120	10×16	945	0.11	0.44
	180	10×20	1100	0.080	0.32
	180	12.5×16	1135	0.082	0.27
	220	10×23	1300	0.073	0.29
	270	12.5×20	1495	0.060	0.20
	330	12.5×25	1850	0.043	0.14
	470	12.5×30	2250	0.039	0.13
	470	16×20	1990	0.045	0.14
	560	12.5×35	2450	0.033	0.11
	560	16×25	2550	0.032	0.096
	680	12.5×40	2780	0.029	0.096
	680	18×20	2450	0.038	0.10
	820	16×31.5	2810	0.026	0.078
	820	18×25	2780	0.031	0.084
1000	16×35.5	2835	0.021	0.063	
1000	18×31.5	3270	0.025	0.068	
1200	16×40	3340	0.019	0.057	
1200	18×35.5	3310	0.020	0.054	
1500	18×40	3420	0.018	0.049	
100	6.8	5×11	125	1.4	5.6
	15	6.3×11	205	0.57	2.3
	27	8×11.5	355	0.36	1.4
	39	8×16	450	0.25	1.0
	47	10×12.5	450	0.24	0.96
	56	8×20	565	0.19	0.76
	68	10×16	580	0.18	0.72
	82	10×20	750	0.13	0.52
	82	12.5×16	735	0.13	0.43
	100	10×23	880	0.12	0.48
	120	12.5×20	1045	0.094	0.31
	180	12.5×25	1195	0.071	0.23
	220	12.5×30	1410	0.063	0.21
	220	16×20	1295	0.071	0.21
	270	12.5×35	1560	0.052	0.17
	270	16×25	1600	0.053	0.16
	270	18×20	1470	0.069	0.19
	330	12.5×40	1700	0.046	0.15
	390	16×31.5	1750	0.041	0.12
	390	18×25	1620	0.049	0.13
470	16×35.5	1890	0.033	0.10	
470	18×31.5	1775	0.039	0.11	
560	16×40	2080	0.030	0.090	
560	18×35.5	2060	0.031	0.084	
680	18×40	2570	0.028	0.076	