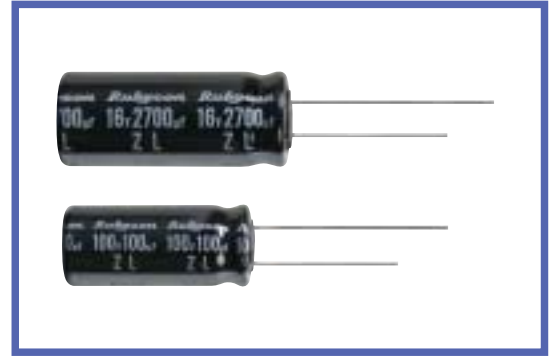


**ZL SERIES**
**105°C High ripple current, Low impedance.**
**◆ FEATURES**

- Enabled high ripple current by a reduction of impedance at high frequency range.
- Load Life : 105°C 1000 ~ 5000hours.
- RoHS compliance.


**◆ SPECIFICATIONS**

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

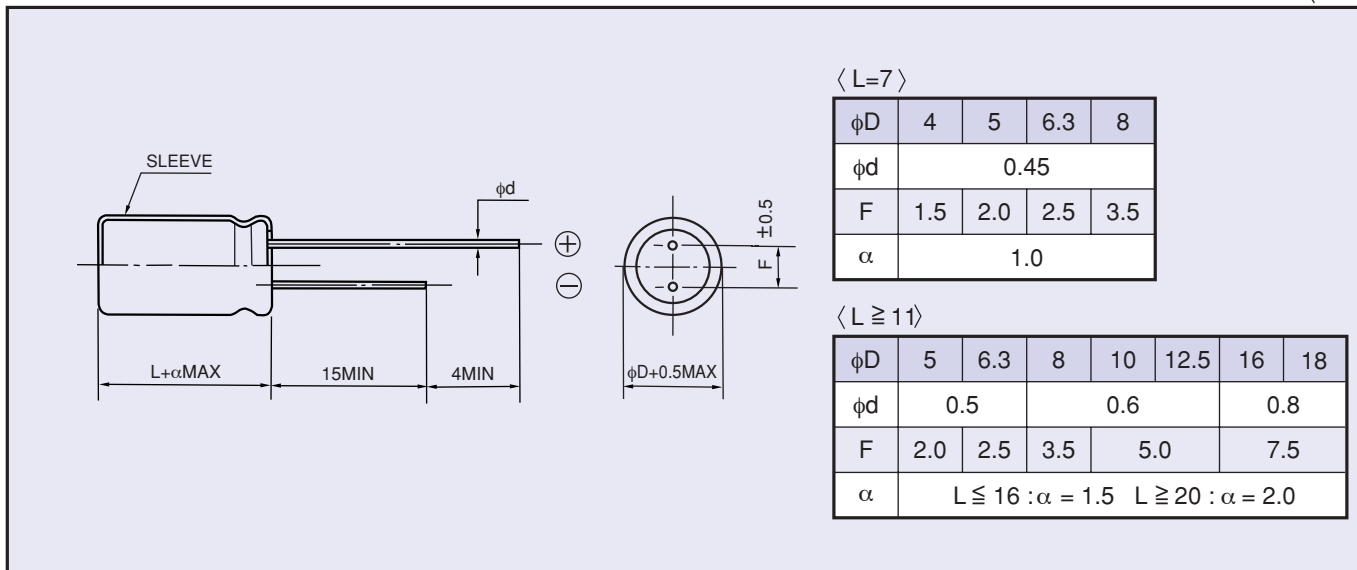
Frequency (Hz)		120	1k	10k	100k ≤
Coefficient	5.6 ~ 33 μF	0.42	0.70	0.90	1.00
	39 ~ 270 μF	0.50	0.73	0.92	1.00
	330 ~ 680 μF	0.55	0.77	0.94	1.00
	820 ~ 1800 μF	0.60	0.80	0.96	1.00
	2200 ~ 6800 μF	0.70	0.85	0.98	1.00

**◆ PART NUMBER**

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

◆ DIMENSIONS

(mm)



◆ STANDARD SIZE

Rated voltage 6.3V(0J)				
Rated capacitance ( $\mu\text{F}$ )	Size $\phi D \times L(\text{mm})$	Rated ripple current (mA r.m.s./105°C, 100kHz)	Impedance ( $\Omega\text{MAX}$ )	
			20°C, 100kHz	-10°C, 100kHz
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

Rated voltage 10V(1A)				
Rated capacitance ( $\mu$ F)	Size $\phi$ D $\times$ L(mm)	Rated ripple current (mA r.m.s./105°C, 100kHz)	Impedance ( $\Omega$ MAX)	
			20°C, 100kHz	-10°C, 100kHz
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

Rated voltage 16V(1C)				
Rated capacitance ( $\mu$ F)	Size $\phi$ D $\times$ L(mm)	Rated ripple current (mA r.m.s./105°C, 100kHz)	Impedance ( $\Omega$ MAX)	
			20°C, 100kHz	-10°C, 100kHz
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

Rated voltage 25V(1E)				
Rated capacitance ( $\mu$ F)	Size $\phi$ D $\times$ L(mm)	Rated ripple current (mA r.m.s./105°C, 100kHz)	Impedance ( $\Omega$ MAX)	
			20°C, 100kHz	-10°C, 100kHz
15	4 $\times$ 7	130	0.94	2.9
27	5 $\times$ 7	210	0.46	1.4
47	5 $\times$ 11	250	0.30	1.0
56	6.3 $\times$ 7	300	0.24	0.72
100	8 $\times$ 7	380	0.15	0.45
100	6.3 $\times$ 11	405	0.13	0.41
220	8 $\times$ 11.5	760	0.072	0.22
330	8 $\times$ 16	995	0.056	0.17
330	10 $\times$ 12.5	1030	0.053	0.16
470	8 $\times$ 20	1250	0.041	0.13
470	10 $\times$ 16	1430	0.038	0.12
680	10 $\times$ 20	1820	0.023	0.069
820	10 $\times$ 23	2150	0.022	0.066
1000	12.5 $\times$ 20	2360	0.021	0.053
1500	12.5 $\times$ 25	2770	0.018	0.045
1800	12.5 $\times$ 30	3290	0.016	0.041
1800	16 $\times$ 20	3140	0.018	0.045
2200	12.5 $\times$ 35	3400	0.015	0.039
2700	16 $\times$ 25	3460	0.016	0.043

Rated voltage 35V(1V)				
Rated capacitance ( $\mu$ F)	Size $\phi$ D $\times$ L(mm)	Rated ripple current (mA r.m.s./105°C, 100kHz)	Impedance ( $\Omega$ MAX)	
			20°C, 100kHz	-10°C, 100kHz
10	4 $\times$ 7	130	0.96	2.9
18	5 $\times$ 7	210	0.47	1.5
33	5 $\times$ 11	250	0.30	1.0
39	6.3 $\times$ 7	300	0.25	0.75
56	8 $\times$ 7	380	0.16	0.48
56	6.3 $\times$ 11	405	0.13	0.41
150	8 $\times$ 11.5	760	0.072	0.22
220	8 $\times$ 16	995	0.056	0.17
220	10 $\times$ 12.5	1030	0.053	0.16
270	8 $\times$ 20	1250	0.041	0.13
330	10 $\times$ 16	1430	0.038	0.12
470	10 $\times$ 20	1820	0.023	0.069
560	10 $\times$ 23	2150	0.022	0.066
680	12.5 $\times$ 20	2360	0.021	0.053
1000	12.5 $\times$ 25	2770	0.018	0.045
1200	12.5 $\times$ 30	3290	0.016	0.041
1200	16 $\times$ 20	3140	0.018	0.045
1500	12.5 $\times$ 35	3400	0.015	0.039
1800	16 $\times$ 25	3460	0.016	0.043

Rated voltage 50V(1H)				
Rated capacitance ( $\mu$ F)	Size $\phi$ D $\times$ L(mm)	Rated ripple current (mA r.m.s./105°C, 100kHz)	Impedance ( $\Omega$ MAX)	
			20°C, 100kHz	-10°C, 100kHz
5.6	4 $\times$ 7	130	1.0	3.0
10	5 $\times$ 7	210	0.50	1.5
22	6.3 $\times$ 7	300	0.26	0.78
22	5 $\times$ 11	238	0.34	1.18
33	8 $\times$ 7	380	0.17	0.51
56	6.3 $\times$ 11	385	0.14	0.50
100	8 $\times$ 11.5	724	0.074	0.22
120	8 $\times$ 16	950	0.061	0.18
150	10 $\times$ 12.5	979	0.061	0.18
180	8 $\times$ 20	1190	0.046	0.14
220	10 $\times$ 16	1370	0.042	0.12
270	10 $\times$ 20	1580	0.030	0.090
330	10 $\times$ 23	1870	0.028	0.085
470	12.5 $\times$ 20	2050	0.027	0.068
560	12.5 $\times$ 25	2410	0.023	0.059
680	12.5 $\times$ 30	2860	0.021	0.052
820	12.5 $\times$ 35	2960	0.019	0.051
820	16 $\times$ 20	2730	0.023	0.059
1000	16 $\times$ 25	3010	0.021	0.056

Rated voltage 63V(1J)				
Rated capacitance ( $\mu$ F)	Size $\phi$ D $\times$ L(mm)	Rated ripple current (mA r.m.s./105°C, 100kHz)	Impedance ( $\Omega$ MAX)	
			20°C, 100kHz	-10°C, 100kHz
15	5 $\times$ 11	165	0.88	3.5
33	6.3 $\times$ 11	265	0.35	1.4
56	8 $\times$ 11.5	500	0.22	0.88
82	8 $\times$ 16	665	0.16	0.64
82	10 $\times$ 12.5	685	0.15	0.60
120	8 $\times$ 20	820	0.12	0.48
120	10 $\times$ 16	945	0.11	0.44
180	10 $\times$ 20	1100	0.080	0.32
180	12.5 $\times$ 16	1135	0.082	0.27
220	10 $\times$ 23	1300	0.073	0.29
270	12.5 $\times$ 20	1495	0.060	0.20
330	12.5 $\times$ 25	1850	0.043	0.14
470	12.5 $\times$ 30	2250	0.039	0.13
470	16 $\times$ 20	1990	0.045	0.14
560	12.5 $\times$ 35	2450	0.033	0.11
560	16 $\times$ 25	2550	0.032	0.096
680	12.5 $\times$ 40	2780	0.029	0.096
680	18 $\times$ 20	2450	0.038	0.10
820	16 $\times$ 31.5	2810	0.026	0.078
820	18 $\times$ 25	2780	0.031	0.084
1000	16 $\times$ 35.5	2835	0.021	0.063
1000	18 $\times$ 31.5	3270	0.025	0.068
1200	16 $\times$ 40	3340	0.019	0.057
1200	18 $\times$ 35.5	3310	0.020	0.054
1500	18 $\times$ 40	3420	0.018	0.049

Rated voltage 100V(2A)				
Rated capacitance ( $\mu$ F)	Size $\phi$ D $\times$ L(mm)	Rated ripple current (mA r.m.s./105°C, 100kHz)	Impedance ( $\Omega$ MAX)	
			20°C, 100kHz	-10°C, 100kHz
6.8	5 $\times$ 11	125	1.40	5.6
15	6.3 $\times$ 11	205	0.57	2.3
27	8 $\times$ 11.5	355	0.36	1.4
39	8 $\times$ 16	450	0.25	1.0
47	10 $\times$ 12.5	450	0.24	0.96
56	8 $\times$ 20	565	0.19	0.76
68	10 $\times$ 16	580	0.18	0.72
82	10 $\times$ 20	750	0.13	0.52
82	12.5 $\times$ 16	735	0.13	0.43
100	10 $\times$ 23	880	0.12	0.48
120	12.5 $\times$ 20	1045	0.094	0.31
180	12.5 $\times$ 25	1195	0.071	0.23
220	12.5 $\times$ 30	1410	0.063	0.21
220	16 $\times$ 20	1295	0.071	0.21
270	12.5 $\times$ 35	1560	0.052	0.17
270	16 $\times$ 25	1600	0.053	0.16
270	18 $\times$ 20	1470	0.069	0.19
330	12.5 $\times$ 40	1700	0.046	0.15
390	16 $\times$ 31.5	1750	0.041	0.12
390	18 $\times$ 25	1620	0.049	0.13
470	16 $\times$ 35.5	1890	0.033	0.10
470	18 $\times$ 31.5	1775	0.039	0.11
560	16 $\times$ 40	2080	0.030	0.090
560	18 $\times$ 35.5	2060	0.031	0.084
680	18 $\times$ 40	2570	0.028	0.076