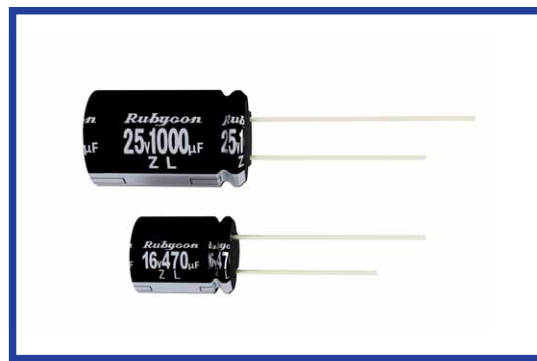


ZL SERIES

105°C High Ripple Current, Low Impedance

•Load Life : 105°C 1000~5000 hours.

RoHS
compliance



◆SPECIFICATIONS

Items	Characteristics																																				
Category Temperature Range	-40~+105℃																																				
Rated Voltage Range	6.3~100Vdc																																				
Capacitance Tolerance	±20% (20℃, 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></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></tr></table> (20℃, 120Hz) When capacitance is over 1000μF, tanδ shall be added 0.02 to the listed value with increase of every 1000μF.										Rated Voltage (Vdc)	6.3	10	16	25	35	50	63	100	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																													
tanδ	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08																													
Endurance	After applying rated voltage with rated ripple current for specified time at 105℃, the capacitors shall meet the following requirements. <table border="1"><tr><td>Capacitance Change</td><td>Within ±25% of the initial value.</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> <table border="1"><tr><td>Case Size</td><td>Life Time (hrs)</td></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>										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								
Capacitance Change	Within ±25% of the initial value.																																				
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L=7	1000																																				
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	φD≥12.5	5000																																			
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></tr><tr><td>Z(-25℃)/Z(20℃)</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℃)/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> (120Hz)										Rated Voltage (Vdc)	6.3	10	16	25	35	50	63	100	Z(-25℃)/Z(20℃)	2	2	2	2	2	2	2	2	Z(-40℃)/Z(20℃)	3	3	3	3	3	3	3	3
Rated Voltage (Vdc)	6.3	10	16	25	35	50	63	100																													
Z(-25℃)/Z(20℃)	2	2	2	2	2	2	2	2																													
Z(-40℃)/Z(20℃)	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

Technical drawing of a capacitor showing side and top views with dimensions.

Side View Dimensions:

- SLEEVE(PET):** Label for the sleeve component.
- ϕd :** Diameter of the terminal.
- $L+a$ MAX:** Maximum length of the capacitor body.
- 15MIN:** Minimum length of the terminal.
- 4MIN:** Minimum length of the lead wire.

Top View Dimensions:

- $\phi D \pm 0.5$ MAX:** Maximum diameter of the capacitor body with a tolerance of ± 0.5 .
- $F \pm 0.5$:** Thickness of the capacitor body with a tolerance of ± 0.5 .

〈L=7〉

ϕD	4	5	6.3	8
ϕd	0.45			
F	1.5	2.0	2.5	3.5
a	1.0			

〈L $\geq$ 11〉

ϕD	5	6.3	8	10	12.5	16	18
ϕd	0.5		0.6		0.8		
F	2.0	2.5	3.5	5.0	7.5		
a	L $\leq$ 16 : a=1.5 L $\geq$ 20 : a=2.0						

◆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

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
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 (μ F)	Size ϕ D×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 (μ F)	Size ϕ D×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