

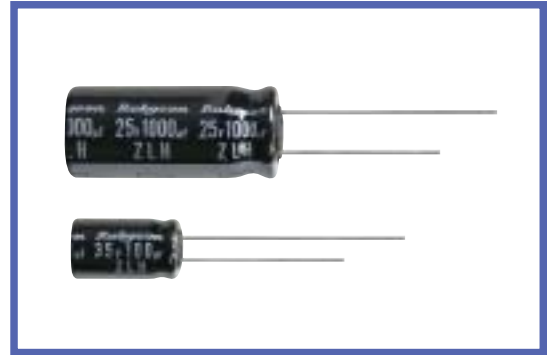
ZLH SERIES

UPGRADE

105°C Miniaturized, Long Life, Low impedance.

◆ FEATURES

- Achieved endurance improvement and miniaturization of ZL series, as well as high frequency impedance reduction.
- Load Life : 105°C 6000~10000hours.
- 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 3μA 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>80</th> <th>100</th> <th>(20°C, 120Hz)</th> </tr> </thead> <tbody> <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>0.08</td> <td></td> </tr> </tbody> </table> <p>When rated capacitance is over 1000μF, tanδ shall be added 0.02 to the listed value with increase of every 1000μF.</p>	Rated Voltage(V)	6.3	10	16	25	35	50	63	80	100	(20°C, 120Hz)	tanδ	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08	0.08												
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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> <th>Within ±25% of the initial value. (6.3v,10v : ±30%)</th> <th>Case size</th> <th>Life Time (hrs)</th> </tr> </thead> <tbody> <tr> <td>Dissipation Factor</td> <td>Not more than 200% of the specified value.</td> <td>φ D ≤ 6.3</td> <td>6000</td> </tr> <tr> <td>Leakage Current</td> <td>Not more than the specified value.</td> <td>φ D = 8</td> <td>8000</td> </tr> <tr> <td></td> <td></td> <td>φ D ≥ 10</td> <td>10000</td> </tr> </tbody> </table>	Capacitance Change	Within ±25% of the initial value. (6.3v,10v : ±30%)	Case size	Life Time (hrs)	Dissipation Factor	Not more than 200% of the specified value.	φ D ≤ 6.3	6000	Leakage Current	Not more than the specified value.	φ D = 8	8000			φ D ≥ 10	10000																	
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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>80</th> <th>100</th> <th>(120Hz)</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> <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>3</td> <td></td> </tr> </tbody> </table>	Rated Voltage(V)	6.3	10	16	25	35	50	63	80	100	(120Hz)	Z(-25°C)/Z(20°C)	2	2	2	2	2	2	2	2	2		Z(-40°C)/Z(20°C)	3	3	3	3	3	3	3	3	3	
Rated Voltage(V)	6.3	10	16	25	35	50	63	80	100	(120Hz)																								
Z(-25°C)/Z(20°C)	2	2	2	2	2	2	2	2	2																									
Z(-40°C)/Z(20°C)	3	3	3	3	3	3	3	3	3																									

◆ MULTIPLIER FOR RIPPLE CURRENT

Frequency coefficient

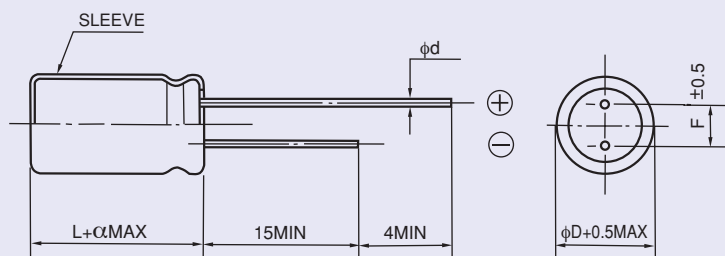
Frequency(Hz)		120	1k	10k	100k≤
Coefficient	8.2~33μF	0.42	0.70	0.90	1.00
	47~270μF	0.50	0.73	0.92	1.00
	330~680μF	0.55	0.77	0.94	1.00
	820~1800μF	0.60	0.80	0.96	1.00
	2200~8200μF	0.70	0.85	0.98	1.00

◆ PART NUMBER

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ZLH
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D×L
 Rated Voltage Series Rated Capacitance Capacitance Tolerance Option Lead Forming Case Size

◆ DIMENSIONS

(mm)



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	
α	$L \leq 16 : \alpha=1.5$						$L \geq 20 : \alpha=2.0$

◆ STANDARD SIZE

Rated voltage 6.3V(0J)				
Rated capacitance (μF)	Size $\phi D \times L$ (mm)	Rated ripple current (mA r.m.s./105°C, 100kHz)	Impedance (Ω MAX)	
			20°C, 100kHz	-10°C, 100kHz
220	5×11	345	0.22	0.80
470	6.3×11	540	0.094	0.35
820	8×11.5	945	0.056	0.19
1200	8×16	1250	0.045	0.15
1200	10×12.5	1330	0.039	0.14
1500	8×20	1500	0.029	0.11
1800	10×16	1760	0.028	0.10
2200	10×20	1960	0.020	0.060
2700	10×23	2250	0.018	0.054
3900	12.5×20	2480	0.017	0.043
4700	12.5×25	2900	0.015	0.038
5600	12.5×30	3450	0.013	0.033
6800	16×20	3250	0.015	0.038
6800	12.5×35	3570	0.012	0.031
8200	16×25	3630	0.013	0.035

Rated voltage 10V(1A)				
Rated capacitance (μF)	Size $\phi D \times L$ (mm)	Rated ripple current (mA r.m.s./105°C, 100kHz)	Impedance (Ω MAX)	
			20°C, 100kHz	-10°C, 100kHz
150	5×11	345	0.22	0.80
330	6.3×11	540	0.094	0.35
680	8×11.5	945	0.056	0.19
1000	8×16	1250	0.045	0.15
1000	10×12.5	1330	0.039	0.14
1500	8×20	1500	0.029	0.11
1500	10×16	1760	0.028	0.10
1800	10×20	1960	0.020	0.060
2200	10×23	2250	0.018	0.054
3300	12.5×20	2480	0.017	0.043
3900	12.5×25	2900	0.015	0.038
4700	12.5×30	3450	0.013	0.033
4700	16×20	3250	0.015	0.038
5600	12.5×35	3570	0.012	0.031
6800	16×25	3630	0.013	0.035

Rated voltage 16V(1C)				
Rated capacitance (μF)	Size ϕ D \times L(mm)	Rated ripple current (mA r.m.s./105°C, 100kHz)	Impedance (Ω MAX)	
			20°C, 100kHz	-10°C, 100kHz
100	5 \times 11	345	0.22	0.80
220	6.3 \times 11	540	0.094	0.35
470	8 \times 11.5	945	0.056	0.19
680	8 \times 16	1250	0.045	0.15
680	10 \times 12.5	1330	0.039	0.14
1000	8 \times 20	1500	0.029	0.11
1000	10 \times 16	1760	0.028	0.10
1500	10 \times 20	1960	0.020	0.060
1800	10 \times 23	2250	0.018	0.054
2200	12.5 \times 20	2480	0.017	0.043
2700	12.5 \times 25	2900	0.015	0.038
3300	12.5 \times 30	3450	0.013	0.033
3300	16 \times 20	3250	0.015	0.038
3900	12.5 \times 35	3570	0.012	0.031
4700	16 \times 25	3630	0.013	0.035

Rated voltage 25V(1E)				
Rated capacitance (μF)	Size ϕ D \times L(mm)	Rated ripple current (mA r.m.s./105°C, 100kHz)	Impedance (Ω MAX)	
			20°C, 100kHz	-10°C, 100kHz
68	5 \times 11	345	0.22	0.80
150	6.3 \times 11	540	0.094	0.35
330	8 \times 11.5	945	0.056	0.19
390	8 \times 16	1250	0.045	0.15
470	10 \times 12.5	1330	0.039	0.14
560	8 \times 20	1500	0.029	0.11
680	10 \times 16	1760	0.028	0.10
820	10 \times 20	1960	0.020	0.060
1000	10 \times 23	2250	0.018	0.054
1500	12.5 \times 20	2480	0.017	0.043
1800	12.5 \times 25	2900	0.015	0.038
2200	12.5 \times 30	3450	0.013	0.033
2200	16 \times 20	3250	0.015	0.038
2700	12.5 \times 35	3570	0.012	0.031
3300	16 \times 25	3630	0.013	0.035

Rated voltage 35V(1V)				
Rated capacitance (μF)	Size ϕ D \times L(mm)	Rated ripple current (mA r.m.s./105°C, 100kHz)	Impedance (Ω MAX)	
			20°C, 100kHz	-10°C, 100kHz
47	5 \times 11	345	0.22	0.80
100	6.3 \times 11	540	0.094	0.35
220	8 \times 11.5	945	0.056	0.19
270	8 \times 16	1250	0.045	0.15
330	10 \times 12.5	1330	0.039	0.14
390	8 \times 20	1500	0.029	0.11
470	10 \times 16	1760	0.028	0.10
560	10 \times 20	1960	0.020	0.060
680	10 \times 23	2250	0.018	0.054
1000	12.5 \times 20	2480	0.017	0.043
1200	12.5 \times 25	2900	0.015	0.038
1500	12.5 \times 30	3450	0.013	0.033
1500	16 \times 20	3250	0.015	0.038
1800	12.5 \times 35	3570	0.012	0.031
2200	16 \times 25	3630	0.013	0.035

Rated voltage 50V(1H)				
Rated capacitance (μ F)	Size ϕ D \times L(mm)	Rated ripple current (mA r.m.s./105°C, 100kHz)	Impedance (Ω MAX)	
			20°C, 100kHz	-10°C, 100kHz
27	5 \times 11	238	0.34	1.18
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 (μ F)	Size ϕ D \times L(mm)	Rated ripple current (mA r.m.s./105°C, 100kHz)	Impedance (Ω MAX)	
			20°C, 100kHz	-10°C, 100kHz
18	5 \times 11	173	0.88	3.5
47	6.3 \times 11	278	0.35	1.4
82	8 \times 11.5	525	0.22	0.88
100	8 \times 16	688	0.16	0.64
120	10 \times 12.5	725	0.15	0.60
150	8 \times 20	861	0.12	0.48
180	10 \times 16	998	0.11	0.44
270	10 \times 20	1200	0.078	0.31
270	12.5 \times 16	1200	0.082	0.27
330	10 \times 23	1410	0.069	0.28
390	12.5 \times 20	1570	0.060	0.19
470	12.5 \times 25	1990	0.043	0.14
560	12.5 \times 30	2410	0.035	0.13
560	16 \times 20	2100	0.043	0.14
680	12.5 \times 35	2620	0.033	0.11
820	12.5 \times 40	2940	0.027	0.090
820	16 \times 25	2730	0.032	0.096
820	18 \times 20	2500	0.038	0.10
1200	16 \times 31.5	2990	0.024	0.068
1200	18 \times 25	2800	0.031	0.084
1500	16 \times 35.5	3040	0.021	0.057
1500	18 \times 31.5	3300	0.025	0.068
1800	16 \times 40	3570	0.019	0.057
1800	18 \times 35.5	3570	0.020	0.054
2200	18 \times 40	3670	0.018	0.049

Rated voltage 80V(1K)				
Rated capacitance (μF)	Size ϕ D \times L(mm)	Rated ripple current (mA r.m.s./105°C, 100kHz)	Impedance (ΩMAX)	
			20°C, 100kHz	-10°C, 100kHz
12	5 \times 11	163	1.40	5.6
33	6.3 \times 11	267	0.57	2.3
56	8 \times 11.5	462	0.36	1.4
68	8 \times 16	585	0.25	1.0
82	10 \times 12.5	624	0.23	0.96
100	8 \times 20	735	0.19	0.76
120	10 \times 16	780	0.17	0.72
180	10 \times 20	1040	0.12	0.52
180	12.5 \times 16	975	0.13	0.43
220	10 \times 23	1170	0.11	0.47
270	12.5 \times 20	1430	0.085	0.31
330	12.5 \times 25	1620	0.060	0.23
390	12.5 \times 30	1950	0.051	0.21
390	16 \times 20	1750	0.058	0.21
470	12.5 \times 35	2140	0.043	0.17
560	12.5 \times 40	2340	0.036	0.15
560	16 \times 25	2210	0.044	0.16
560	18 \times 20	1950	0.054	0.18
680	16 \times 31.5	2400	0.033	0.12
820	16 \times 35.5	2600	0.029	0.10
820	18 \times 25	2270	0.038	0.13
1000	16 \times 40	2860	0.027	0.090
1000	18 \times 31.5	2470	0.031	0.11
1200	18 \times 35.5	2860	0.027	0.084
1500	18 \times 40	3510	0.026	0.076

Rated voltage 100V(2A)				
Rated capacitance (μ F)	Size ϕ D \times L(mm)	Rated ripple current (mA r.m.s./105°C, 100kHz)	Impedance (Ω MAX)	
			20°C, 100kHz	-10°C, 100kHz
8.2	5 \times 11	163	1.40	5.6
18	6.3 \times 11	267	0.57	2.3
33	8 \times 11.5	462	0.36	1.4
47	8 \times 16	585	0.25	1.0
56	10 \times 12.5	624	0.23	0.96
68	8 \times 20	735	0.19	0.76
82	10 \times 16	780	0.17	0.72
100	10 \times 20	1040	0.12	0.52
100	12.5 \times 16	975	0.13	0.43
120	10 \times 23	1170	0.11	0.47
150	12.5 \times 20	1430	0.085	0.31
220	12.5 \times 25	1620	0.060	0.23
270	12.5 \times 30	1950	0.051	0.21
270	16 \times 20	1750	0.058	0.21
330	12.5 \times 35	2140	0.043	0.17
390	12.5 \times 40	2340	0.036	0.15
390	16 \times 25	2210	0.044	0.16
390	18 \times 20	1950	0.054	0.18
470	16 \times 31.5	2400	0.033	0.12
470	18 \times 25	2270	0.038	0.13
560	16 \times 35.5	2600	0.029	0.10
560	18 \times 31.5	2470	0.031	0.11
680	16 \times 40	2860	0.027	0.090
680	18 \times 35.5	2860	0.027	0.084
820	18 \times 40	3510	0.026	0.076