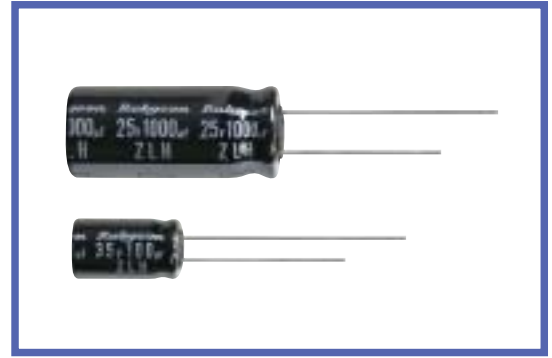


ZLH SERIES
UPGRADE
105°C Miniaturized, Long Life, Low impedance.
◆ FEATURES

- 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><tr><td>Rated Voltage(V)</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td><td>80</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><td>0.08</td></tr></table> (20°C, 120Hz) When rated capacitance is over 1000μF, tanδ shall be added 0.02 to the listed value with increase of every 1000μF.										Rated Voltage(V)	6.3	10	16	25	35	50	63	80	100	tanδ	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08	0.08										
Rated Voltage(V)	6.3	10	16	25	35	50	63	80	100																															
tanδ	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08	0.08																															
Endurance	After life test with rated ripple current at conditions stated in the table below, the capacitors shall meet the following requirements. <table><tr><td>Capacitance Change</td><td>Within ±25% of the initial value. (6.3v, 10v : ±30%)</td><td>Case size</td><td>Life Time (hrs)</td></tr><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></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														
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																																					
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Low Temperature Stability Impedance Ratio(MAX)	<table><tr><td>Rated Voltage(V)</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td><td>80</td><td>100</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>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><td>3</td></tr></table> (120Hz)										Rated Voltage(V)	6.3	10	16	25	35	50	63	80	100	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																															
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

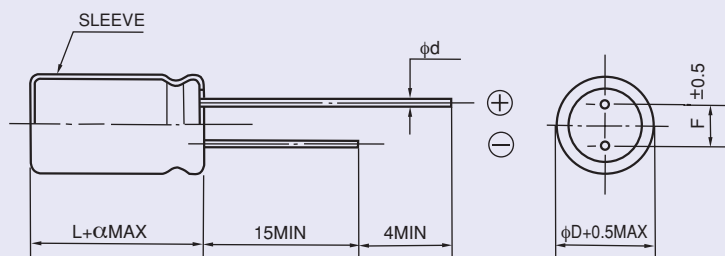
Frequency(Hz)		120	1k	10k	100k≤
Coefficient	8.2~33μF	0.42	0.70	0.90	1.00
	47~270μF	0.50	0.73	0.92	1.00
	330~680μF	0.55	0.77	0.94	1.00
	820~1800μF	0.60	0.80	0.96	1.00
	2200~8200μF	0.70	0.85	0.98	1.00

◆ PART NUMBER

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

◆ DIMENSIONS

(mm)



ϕ D	5	6.3	8	10	12.5	16	18
ϕ d	0.5		0.6			0.8	
F	2.0	2.5	3.5	5.0		7.5	
α	$L \leq 16 : \alpha = 1.5 \quad L \geq 20 : \alpha = 2.0$						

◆ STANDARD SIZE

Rated voltage 6.3V(0J)				
Rated capacitance (μF)	Size φ D×L(mm)	Rated ripple current (mA r.m.s./105°C, 100kHz)	Impedance (ΩMAX)	
			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 φ D×L(mm)	Rated ripple current (mA r.m.s./105°C, 100kHz)	Impedance (ΩMAX)	
			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 (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
100	5×11	345	0.22	0.80
220	6.3×11	540	0.094	0.35
470	8×11.5	945	0.056	0.19
680	8×16	1250	0.045	0.15
680	10×12.5	1330	0.039	0.14
1000	8×20	1500	0.029	0.11
1000	10×16	1760	0.028	0.10
1500	10×20	1960	0.020	0.060
1800	10×23	2250	0.018	0.054
2200	12.5×20	2480	0.017	0.043
2700	12.5×25	2900	0.015	0.038
3300	12.5×30	3450	0.013	0.033
3300	16×20	3250	0.015	0.038
3900	12.5×35	3570	0.012	0.031
4700	16×25	3630	0.013	0.035

Rated voltage 25V(1E)				
Rated 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
68	5×11	345	0.22	0.80
150	6.3×11	540	0.094	0.35
330	8×11.5	945	0.056	0.19
390	8×16	1250	0.045	0.15
470	10×12.5	1330	0.039	0.14
560	8×20	1500	0.029	0.11
680	10×16	1760	0.028	0.10
820	10×20	1960	0.020	0.060
1000	10×23	2250	0.018	0.054
1500	12.5×20	2480	0.017	0.043
1800	12.5×25	2900	0.015	0.038
2200	12.5×30	3450	0.013	0.033
2200	16×20	3250	0.015	0.038
2700	12.5×35	3570	0.012	0.031
3300	16×25	3630	0.013	0.035

Rated voltage 35V(1V)				
Rated 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
47	5×11	345	0.22	0.80
100	6.3×11	540	0.094	0.35
220	8×11.5	945	0.056	0.19
270	8×16	1250	0.045	0.15
330	10×12.5	1330	0.039	0.14
390	8×20	1500	0.029	0.11
470	10×16	1760	0.028	0.10
560	10×20	1960	0.020	0.060
680	10×23	2250	0.018	0.054
1000	12.5×20	2480	0.017	0.043
1200	12.5×25	2900	0.015	0.038
1500	12.5×30	3450	0.013	0.033
1500	16×20	3250	0.015	0.038
1800	12.5×35	3570	0.012	0.031
2200	16×25	3630	0.013	0.035

Rated voltage 50V(1H)				
Rated 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
27	5×11	238	0.34	1.18
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 63V(1J)				
Rated 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
18	5×11	173	0.88	3.5
47	6.3×11	278	0.35	1.4
82	8×11.5	525	0.22	0.88
100	8×16	688	0.16	0.64
120	10×12.5	725	0.15	0.60
150	8×20	861	0.12	0.48
180	10×16	998	0.11	0.44
270	10×20	1200	0.078	0.31
270	12.5×16	1200	0.082	0.27
330	10×23	1410	0.069	0.28
390	12.5×20	1570	0.060	0.19
470	12.5×25	1990	0.043	0.14
560	12.5×30	2410	0.035	0.13
560	16×20	2100	0.043	0.14
680	12.5×35	2620	0.033	0.11
820	12.5×40	2940	0.027	0.090
820	16×25	2730	0.032	0.096
820	18×20	2500	0.038	0.10
1200	16×31.5	2990	0.024	0.068
1200	18×25	2800	0.031	0.084
1500	16×35.5	3040	0.021	0.057
1500	18×31.5	3300	0.025	0.068
1800	16×40	3570	0.019	0.057
1800	18×35.5	3570	0.020	0.054
2200	18×40	3670	0.018	0.049

Rated voltage 80V(1K)				
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
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×L(mm)	Rated ripple current (mA r.m.s./105°C, 100kHz)	Impedance (Ω MAX)	
			20°C, 100kHz	−10°C, 100kHz
8.2	5×11	163	1.40	5.6
18	6.3×11	267	0.57	2.3
33	8×11.5	462	0.36	1.4
47	8×16	585	0.25	1.0
56	10×12.5	624	0.23	0.96
68	8×20	735	0.19	0.76
82	10×16	780	0.17	0.72
100	10×20	1040	0.12	0.52
100	12.5×16	975	0.13	0.43
120	10×23	1170	0.11	0.47
150	12.5×20	1430	0.085	0.31
220	12.5×25	1620	0.060	0.23
270	12.5×30	1950	0.051	0.21
270	16×20	1750	0.058	0.21
330	12.5×35	2140	0.043	0.17
390	12.5×40	2340	0.036	0.15
390	16×25	2210	0.044	0.16
390	18×20	1950	0.054	0.18
470	16×31.5	2400	0.033	0.12
470	18×25	2270	0.038	0.13
560	16×35.5	2600	0.029	0.10
560	18×31.5	2470	0.031	0.11
680	16×40	2860	0.027	0.090
680	18×35.5	2860	0.027	0.084
820	18×40	3510	0.026	0.076