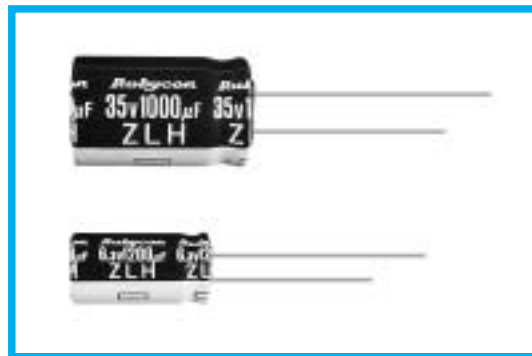


**ZLH SERIES**
**105°C Miniaturized, Long Life, Low impedance.**
**◆FEATURES**

- 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	6.3~50V.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( μ A)      C=Rated Capacitance( μ F)      V=Rated Voltage(V)																					
Dissipation Factor(MAX) (tan δ)	<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> </tr> </thead> <tbody> <tr> <td>tan δ</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> </tr> </tbody> </table> (20°C, 120Hz) When rated capacitance is over 1000 μ F, tan δ shall be added 0.02 to the listed value with increase of every 1000 μ F.	Rated Voltage (V)	6.3	10	16	25	35	50	tan δ	0.22	0.19	0.16	0.14	0.12	0.10							
Rated Voltage (V)	6.3	10	16	25	35	50																
tan δ	0.22	0.19	0.16	0.14	0.12	0.10																
Endurance	After life test with rated ripple current at conditions stated in the table below, the capacitors shall meet the following requirements. <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					
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																			
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> </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> </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> </tr> </tbody> </table> (120Hz)	Rated Voltage (V)	6.3	10	16	25	35	50	Z(-25°C)/Z(20°C)	2	2	2	2	2	2	Z(-40°C)/Z(20°C)	3	3	3	3	3	3
Rated Voltage (V)	6.3	10	16	25	35	50																
Z(-25°C)/Z(20°C)	2	2	2	2	2	2																
Z(-40°C)/Z(20°C)	3	3	3	3	3	3																

**◆MULTIPLIER FOR RIPPLE CURRENT**

Frequency coefficient

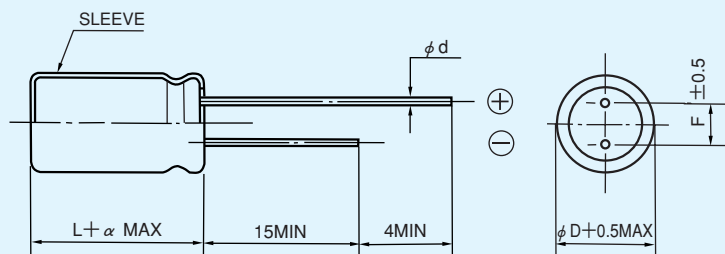
Frequency (Hz)		120	1k	10k	100k≤
Coefficient	27 μ F	0.42	0.70	0.90	1.00
	47~270 μ F	0.50	0.73	0.92	1.00
	330~680 μ F	0.55	0.77	0.94	1.00
	820~1800 μ F	0.60	0.80	0.96	1.00
	2200~8200 μ F	0.70	0.85	0.98	1.00

**◆PART NUMBER**

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

◆ **DIMENSIONS**

(mm)



$\phi D$	5	6.3	8	10	12.5	16
$\phi d$	0.5		0.6		0.8	
F	2.0	2.5	3.5	5.0		7.5
$\alpha$	L ≤ 16 : $\alpha = 1.5$			L ≥ 20 : $\alpha = 2.0$		

◆ **STANDARD SIZE**

Rated voltage 6.3V(0J)				
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
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 ( $\mu$ 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
150	5 $\times$ 11	345	0.22	0.80
330	6.3 $\times$ 11	540	0.094	0.35
680	8 $\times$ 11.5	945	0.056	0.19
1000	8 $\times$ 16	1250	0.045	0.15
1000	10 $\times$ 12.5	1330	0.039	0.14
1500	8 $\times$ 20	1500	0.029	0.11
1500	10 $\times$ 16	1760	0.028	0.10
1800	10 $\times$ 20	1960	0.020	0.060
2200	10 $\times$ 23	2250	0.018	0.054
3300	12.5 $\times$ 20	2480	0.017	0.043
3900	12.5 $\times$ 25	2900	0.015	0.038
4700	12.5 $\times$ 30	3450	0.013	0.033
4700	16 $\times$ 20	3250	0.015	0.038
5600	12.5 $\times$ 35	3570	0.012	0.031
6800	16 $\times$ 25	3630	0.013	0.035

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
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 ( $\mu$ 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
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 ( $\mu$ F)	Size $\phi$ D×L(mm)	Rated ripple current (mA r.m.s./105°C, 100kHz)	Impedance ( $\Omega$ 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 ( $\mu$ F)	Size $\phi$ D×L(mm)	Rated ripple current (mA r.m.s./105°C, 100kHz)	Impedance ( $\Omega$ 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