ZLS series

Low ESR | Low Profile | RoHS compliant | Solvent Proof

- ●105℃ 2,000~5,000Hrs assured.
- ●Low impedance
- ● For SMPS, IP-Board, Adaptor
- ● RoHS compliant
- ● Halogen-free capacitors are also available.

MLH ⇨ ZLS

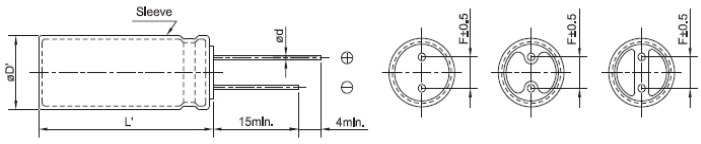
Low ESR / Long life

■ Specifications

Item	Characteristics
Rated Voltage Range	6.3 ~ 100Vdc
Operating Temperature Range	-55 ~ +105℃
Capacitance Tolerance	±20% (M) (at 20℃, 120Hz)
Leakage Current	I=0.01CV(μA)or 3μA, whichever is greater. Where, I:Max. Leakage current(μA), C:Nominal capacitance(μF), V:Rated voltage(VDC) (at 20℃, 2 minutes)
Dissipation Factor(Tanδ)	Rated Voltage(Vdc): 6.3 / 10 / 16 / 25 / 35 / 50 / 63 / 100 Tanδ(Max.): 0.22 / 0.19 / 0.16 / 0.14 / 0.12 / 0.10 / 0.08 / 0.07 If the capacitance exceeds 1,000uF, then Tanδ will be added 0.02 every 1000uF increase.(at 20℃, 120Hz)
Temperature characteristics (Max,impedance ratio)	Rated Voltage(Vdc): 6.3 / 10 / 16 / 25 / 35 / 50 / 63 / 100 △C(-55℃)/C(20℃): 30% Z(-55℃)/(20℃): 4 / 3 / 3 / 3 / 3 / 3 / 3 / 3 (at 120Hz)
Load life	The following specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage is applied for specified life times at 105℃. Capacitance change ≤±20%of the initial value Tan δ ≤200% of the initial specified value Leakage current ≤The initial specified value ØD: Life time — Ø5, Ø6.3: 2,000hrs; Ø8, Ø10: 3,000hrs; Ø12.5~: 5,000hrs
Shelf life	The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied. The rated voltage shall be applied to the capacitors for a minimum of 30 minutes at least 24 hours and not more than 48 hours before the measurements. Capacitance change ≤±20% of the initial value Tanδ ≤200% of the initial specified value Leakage current ≤200%The initial specified value

■ Dimensions

Unit(mm)



ØD	5	6.3	8		10	12.5	16	18
Ød	0.5	0.5	0.5	0.6	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5		5.0	5.0	7.5	7.5
ØD'	ØD+0.5 max.							
L'	L+1.5 max				L+2.0 max			

- ● Printed black color letter on PET green sleeve

■ Code numbering system

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

ZLS□□□M□□□□□□□□□□

- Taping, Cutting
- Terminal type
- Size (5X11: D11)
- Capacitance
- Capacitance tolerance(M:±20%, K:±10%, V :-10~20%)
- Working voltage(ex. 6.3V→6R3, 10V→010,63V→063)
- Series name

Ø5	D
Ø6.3	E
Ø8	F
Ø10	G
Ø12.5	X
Ø16	J
Ø18	K

ZLS series

■Standard Ratings

Note1) Imp. = Ωmax./20℃,100kHz 2) Ripple current = mArms/105℃,100kHz

WV (Vdc)	Cap (uF)	Size ØxL(mm)	Imp.[1)]	Ripple[2)]	Code No
6.3	120	5 x 11	0.72	167	ZLS6R3□121D11CS□□□
	220	6.3 x 11	0.38	256	ZLS6R3□221E11CS□□□
	330	6.3 x 15	0.27	333	ZLS6R3□331E15CS□□□
		8 x 11.5	0.19	487	ZLS6R3□331F12CS□□□
	470	10 x 12.5	0.12	625	ZLS6R3□471G13CS□□□
	560	8 x 15	0.16	498	ZLS6R3□561F15CS□□□
	680	10 x 16	0.084	826	ZLS6R3□681G16CS□□□
	820	8 x 20	0.110	650	ZLS6R3□821F20CS□□□
	1,200	10 x 20	0.061	1,060	ZLS6R3□122G20CS□□□
	1,500	10 x 25	0.052	1,280	ZLS6R3□152G25CS□□□
	2,200	10 x 30	0.044	1,450	ZLS6R3□222G30CS□□□
	2,700	12.5 x 25	0.033	1,690	ZLS6R3□272X25CS□□□
	3,300	12.5 x 30	0.032	1,790	ZLS6R3□332X30CS□□□
	3,900	12.3 x 30	0.030	1,950	ZLS6R3□392X30CS□□□
	4,700	12.5 x 35	0.027	2,210	ZLS6R3□472X35CS□□□
	5,600	12.5 x 42.5	0.024	2,390	ZLS6R3□562X43CS□□□
	5,600	16 x 25	0.028	2,080	ZLS6R3□562J25CS□□□
	6,800	16 x 31.5	0.026	2,350	ZLS6R3□682J32CS□□□
	6,800	18 x 25	0.029	2,140	ZLS6R3□682K25CS□□□
	8,200	16 x 35.5	0.023	2,550	ZLS6R3□822J36CS□□□
	10,000	18 x 31.5	0.025	2,420	ZLS6R3□103K32CS□□□
	12,000	18 x 35.5	0.024	2,660	ZLS6R3□123K36CS□□□
	15,000	18 x 40	0.019	3,020	ZLS6R3□153K40CS□□□
10	82	5 x 11	0.72	167	ZLS010□820D11CS□□□
	180	6.3 x 11	0.38	256	ZLS010□181E11CS□□□
	270	6.3 x 15	0.27	333	ZLS010□271E15CS□□□
		8 x 11.5	0.19	487	ZLS010□271F12CS□□□
	470	8 x 11.5	0.25	330	ZLS010□471F12CS□□□
		8 x 15	0.16	495	ZLS010□471F15CS□□□
	680	8 x 20	0.11	640	ZLS010□681F20CS□□□
		10 x 16	0.084	825	ZLS010□681G16CS□□□
	1,000	10 x 20	0.062	1,040	ZLS010□102G20CS□□□
	1,200	10 x 25	0.052	1,260	ZLS010□122G25CS□□□
	1,500	10 x 30	0.044	1,440	ZLS010□152G30CS□□□
	1,800	12.5 x 20	0.046	1,340	ZLS010□182X20CS□□□
	2,200	12.5 x 25	0.034	1,690	ZLS010□222X25CS□□□
	2,700	12.5 x 30	0.030	1,950	ZLS010□272X30CS□□□
	3,300	12.5 x 35	0.027	2,200	ZLS010□332X35CS□□□
		16 x 20	0.039	1,630	ZLS010□332J20CS□□□
	3,900	12.5 x 42.5	0.024	2,390	ZLS010□392X43CS□□□
		16 x 25	0.029	2,070	ZLS010□392J25CS□□□
	4,700	16 x 31.5	0.025	2,280	ZLS010□472J32CS□□□
	5,600	16 x 31.5	0.026	2,350	ZLS010□562J32CS□□□
		18 x 25	0.029	2,130	ZLS010□562K25CS□□□
	6,800	16 x 35.5	0.023	2,550	ZLS010□682J36CS□□□
		18 x 31.5	0.026	2,410	ZLS010□682K32CS□□□
	8,200	18 x 35.5	0.023	2,660	ZLS010□822K36CS□□□
	10,000	18 x 40	0.019	3,010	ZLS010□103K40CS□□□
16	56	5 x 11	0.72	165	ZLS016□560D11CS□□□
	120	6.3 x 11	0.38	255	ZLS016□121E11CS□□□
	180	6.3 x 15	0.27	330	ZLS016□181E15CS□□□
		8 x 11.5	0.19	485	ZLS016□181F12CS□□□
	270	10 x 12.5	0.12	625	ZLS016□271G13CS□□□
	330	8 x 15	0.16	495	ZLS016□331F15CS□□□
	470	8 x 20	0.11	640	ZLS016□471F20CS□□□
		10 x 16	0.084	825	ZLS016□471G16CS□□□
	680	10 x 20	0.062	1,040	ZLS016□681G20CS□□□
	820	10 x 25	0.052	1,260	ZLS016□821G25CS□□□
	1,000	10 x 30	0.047	1,360	ZLS016□102G30CS□□□

WV (Vdc)	Cap (uF)	Size ØxL(mm)	Imp.[1)]	Ripple[2)]	Code No
16	1,200	10 x 30	0.044	1,440	ZLS016□122G30CS□□□
		12.5 x 20	0.046	1,340	ZLS016□122X20CS□□□
	1,500	12.5 x 25	0.034	1,690	ZLS016□152X25CS□□□
	2,200	12.5 x 30	0.030	1,950	ZLS016□222X30CS□□□
		16 x 20	0.039	1,630	ZLS016□222J20CS□□□
	2,700	12.5 x 35	0.027	2,200	ZLS016□272X35CS□□□
		16 x 25	0.029	2,070	ZLS016□272J25CS□□□
	3,300	12.5 x 42.5	0.024	2,390	ZLS016□332X43CS□□□
		18 x 20	0.038	1,750	ZLS016□332K20CS□□□
	3,900	16 x 31.5	0.026	2,350	ZLS016□392J32CS□□□
		18 x 25	0.029	2,130	ZLS016□392K25CS□□□
	4,700	16 x 35.5	0.023	2,550	ZLS016□472J36CS□□□
	5,600	18 x 31.5	0.026	2,410	ZLS016□562K32CS□□□
	6,800	18 x 35.5	0.023	2,660	ZLS016□682K36CS□□□
	8,200	18 x 40	0.019	3,010	ZLS016□822K40CS□□□
25	39	5 x 11	0.72	165	ZLS025□390D11CS□□□
	47	5 x 11	0.72	194	ZLS025□470D11CS□□□
	82	6.3 x 11	0.38	255	ZLS025□820E11CS□□□
	100	6.3 x 11	0.35	280	ZLS025□101E11CS□□□
	120	6.3 x 15	0.27	330	ZLS025□121E15CS□□□
		8 x 11.5	0.19	485	ZLS025□121F12CS□□□
	180	10 x 12.5	0.12	625	ZLS025□181G13CS□□□
	220	8 x 15	0.16	495	ZLS025□221F15CS□□□
	330	8 x 20	0.11	640	ZLS025□331F20CS□□□
		10 x 16	0.084	825	ZLS025□331G16CS□□□
	470	10 x 20	0.062	1,150	ZLS025□471G20CS□□□
	560	10 x 25	0.052	1,260	ZLS025□561G25CS□□□
	680	10 x 30	0.048	1,330	ZLS025□681G30CS□□□
	820	12.5 x 20	0.046	1,440	ZLS025□821X20CS□□□
	1,000	12.5 x 25	0.034	1,690	ZLS025□102X25CS□□□
	1,500	12.5 x 30	0.030	1,950	ZLS025□152X30CS□□□
		16 x 20	0.039	1,630	ZLS025□152J20CS□□□
	1,800	12.5 x 35	0.027	2,200	ZLS025□182X35CS□□□
		16 x 25	0.029	2,070	ZLS025□182J25CS□□□
	2,200	12.5 x 42.5	0.024	2,390	ZLS025□222X43CS□□□
		18 x 20	0.038	1,750	ZLS025□222K20CS□□□
	2,700	16 x 31.5	0.026	2,350	ZLS025□272J32CS□□□
		18 x 25	0.029	2,130	ZLS025□272K25CS□□□
	3,300	16 x 35.5	0.023	2,550	ZLS025□332J36CS□□□
		18 x 31.5	0.026	2,410	ZLS025□332K32CS□□□
	3,900	18 x 35.5	0.023	2,660	ZLS025□392K36CS□□□
	4,700	18 x 40	0.019	3,010	ZLS025□472K40CS□□□
35	27	5 x 11	0.72	165	ZLS035□270D11CS□□□
	47	6.3 x 11	0.50	233	ZLS035□470E11CS□□□
	56	6.3 x 11	0.38	255	ZLS035□560E11CS□□□
	68	6.3 x 11	0.38	255	ZLS035□680E11CS□□□
	82	6.3 x 15	0.27	330	ZLS035□820E15CS□□□
		8 x 11.5	0.19	485	ZLS035□820F12CS□□□
	100	8 x 15	0.16	566	ZLS035□101F15CS□□□
	120	10 x 12.5	0.12	625	ZLS035□121G13CS□□□
	180	8 x 15	0.16	495	ZLS035□181F15CS□□□
	220	8 x 20	0.11	640	ZLS035□221F20CS□□□
		10 x 16	0.084	825	ZLS035□221G16CS□□□
	330	10 x 20	0.062	1,040	ZLS035□331G20CS□□□
	390	10 x 25	0.052	1,260	ZLS035□391G25CS□□□
	470	10 x 30	0.048	1,320	ZLS035□471G30CS□□□
	560	10 x 30	0.044	1,440	ZLS035□561G30CS□□□
		12.5 x 20	0.046	1,340	ZLS035□561X20CS□□□
	680	12.5 x 25	0.034	1,690	ZLS035□681X25CS□□□

ZLS series

■Standard Ratings

Note1) Imp. = Ωmax./20℃,100kHz 2) Ripple current = mArms/105℃,100kHz

WV (Vdc)	Cap (uF)	Size ØxL(mm)	Imp.[1)]	Ripple[2)]	Code No
35	1,000	12.5 x 25	0.040	1,690	ZLS035□102X25CS□□□
		12.5 x 30	0.030	1,950	ZLS035□102X30CS□□□
	1,200	12.5 x 35	0.027	2,200	ZLS035□122X35CS□□□
		16 x 25	0.029	2,070	ZLS035□122J25CS□□□
	1,500	12.5 x 42.5	0.024	2,390	ZLS035□152X43CS□□□
		18 x 20	0.038	1,750	ZLS035□152K20CS□□□
	1,800	16 x 31.5	0.026	2,350	ZLS035□182J32CS□□□
		18 x 25	0.029	2,130	ZLS035□182K25CS□□□
	2,200	16 x 35.5	0.023	2,550	ZLS035□222J36CS□□□
		18 x 31.5	0.026	2,410	ZLS035□222K32CS□□□
	2,700	18 x 35.5	0.023	2,660	ZLS035□272K36CS□□□
	3,300	18 x 40	0.019	3,010	ZLS035□332K40CS□□□
50	4.7	5 x 11	3.0	100	ZLS050□4R7D11CS□□□
	10	5 x 11	1.4	124	ZLS050□100D11CS□□□
	18	5 x 11	1.1	130	ZLS050□180D11CS□□□
	22	6.3 x 11	0.91	180	ZLS050□220E11CS□□□
	39	6.3 x 11	0.56	220	ZLS050□390E11CS□□□
	47	6.3 x 11	0.56	300	ZLS050□470E11CS□□□
	56	6.3 x 15	0.41	310	ZLS050□560E15CS□□□
		8 x 11.5	0.33	368	ZLS050□560F12CS□□□
	82	8 x 15	0.25	470	ZLS050□820F15CS□□□
		10 x 12.5	0.16	480	ZLS050□820G13CS□□□
	120	8 x 20	0.18	610	ZLS050□121F20CS□□□
		10 x 16	0.12	755	ZLS050□121G16CS□□□
	180	10 x 20	0.088	945	ZLS050□181G20CS□□□
	220	10 x 25	0.068	1,150	ZLS050□221G25CS□□□
	330	10 x 30	0.059	1,260	ZLS050□331G30CS□□□
		12.5 x 20	0.059	1,190	ZLS050□331X20CS□□□
	470	12.5 x 25	0.045	1,490	ZLS050□471X25CS□□□
	560	12.5 x 30	0.039	1,720	ZLS050□561X30CS□□□
	680	12.5 x 35	0.038	1,890	ZLS050□681X35CS□□□
		16 x 20	0.044	1,420	ZLS050□681J20CS□□□
	820	12.5 x 42.5	0.029	2,030	ZLS050□821X43CS□□□
		16 x 25	0.034	1,880	ZLS050□821J25CS□□□
		18 x 20	0.041	1,520	ZLS050□821K20CS□□□
	1,000	16 x 31.5	0.030	2,150	ZLS050□102J32CS□□□
		18 x 25	0.032	1,930	ZLS050□102K25CS□□□
	1,200	16 x 35.5	0.027	2,320	ZLS050□122J36CS□□□
	1,500	18 x 31.5	0.028	2,200	ZLS050□152K32CS□□□
	1,800	18 x 35.5	0.024	2,400	ZLS050□182K36CS□□□
	2,200	18 x 40	0.022	2,610	ZLS050□222K40CS□□□

WV (Vdc)	Cap (uF)	Size ØxL(mm)	Imp.[1)]	Ripple[2)]	Code No
63	0.47	5 x 11	65.2	38	ZLS063□R47D11CS□□□
	0.68	5 x 11	47.0	45	ZLS063□R68D11CS□□□
	1.0	5 x 11	31.8	53	ZLS063□1R0D11CS□□□
	1.5	5 x 11	22.6	65	ZLS063□1R5D11CS□□□
	2.2	5 x 11	15.1	78	ZLS063□2R2D11CS□□□
	3.3	5 x 11	11.1	98	ZLS063□3R3D11CS□□□
	4.7	5 x 11	10.8	115	ZLS063□4R7D11CS□□□
	6.8	5 x 11	4.3	120	ZLS063□6R8D11CS□□□
	10	5 x 11	2.9	134	ZLS063□100D11CS□□□
	15	6.3 x 11	2.7	188	ZLS063□150E11CS□□□
	22	6.3 x 11	1.36	228	ZLS063□220E11CS□□□
	33	8 x 11.5	0.66	330	ZLS063□330F12CS□□□
	47	10 x 12.5	0.58	327	ZLS063□470G13CS□□□
	68	10 x 16	0.36	431	ZLS063□680G16CS□□□
	82	10 x 20	0.32	506	ZLS063□820G20CS□□□
	100	10 x 20	0.29	570	ZLS063□101G20CS□□□
	150	10 x 25	0.20	765	ZLS063□151G25CS□□□
	220	12.5 x 20	0.16	994	ZLS063□221X20CS□□□
	330	12.5 x 25	0.10	1,327	ZLS063□331X25CS□□□
	470	16 x 31.5	0.091	1,518	ZLS063□471J32CS□□□
	680	16 x 35.5	0.065	2,060	ZLS063□681J36CS□□□
	1,000	16 x 35.5	0.049	2,250	ZLS063□102J36CS□□□
100	0.47	5 x 11	31.2	38	ZLS100□R47D11CS□□□
	0.68	5 x 11	22.1	45	ZLS100□R68D11CS□□□
	1.0	5 x 11	14.7	53	ZLS100□1R0D11CS□□□
	1.5	5 x 11	9.8	65	ZLS100□1R5D11CS□□□
	2.2	5 x 11	5.4	78	ZLS100□2R2D11CS□□□
	3.3	5 x 11	4.6	98	ZLS100□3R3D11CS□□□
	4.7	5 x 11	3.9	115	ZLS100□4R7D11CS□□□
	6.8	6.3 x 11	3.2	128	ZLS100□6R8E11CS□□□
	10	6.3 x 11	1.7	154	ZLS100□100E11CS□□□
	15	8 x 11.5	1.2	222	ZLS100□150F12CS□□□
	22	8 x 11.5	0.82	270	ZLS100□220F12CS□□□
	33	10 x 12.5	0.41	384	ZLS100□330G13CS□□□
	47	10 x 16	0.37	400	ZLS100□470G16CS□□□
	68	10 x 20	0.27	470	ZLS100□680G20CS□□□
	82	10 x 25	0.26	572	ZLS100□820G25CS□□□
	100	12.5 x 20	0.27	670	ZLS100□101X20CS□□□
	150	12.5 x 25	0.21	894	ZLS100□151X25CS□□□
	220	16 x 25	0.17	1,200	ZLS100□221J25CS□□□
	330	16 x 31.5	0.11	1,470	ZLS100□331J32CS□□□
	470	16 x 35.5	0.091	1,680	ZLS100□471J36CS□□□
	680	18 x 40	0.071	2,120	ZLS100□681K40CS□□□
	1,000	18 x 40	0.051	2,900	ZLS100□102K40CS□□□

■ Rated ripple current multipliers

Rated voltage (Vdc)	ØD (mm)	Frequency (Hz)				
		120	1K	10K	50K	100K
6.3~10	Ø5~Ø8	0.65	0.83	0.95	0.97	1.00
	Ø10~Ø12.5	0.70	0.85	0.96	0.98	1.00
	Ø16~Ø18	0.85	0.92	0.97	0.99	1.00
16~25	Ø5~Ø8	0.55	0.76	0.91	0.95	1.00
	Ø10~Ø12.5	0.65	0.83	0.93	0.96	1.00
	Ø16~Ø18	0.70	0.87	0.96	0.98	1.00
35~50	Ø5~Ø8	0.40	0.66	0.85	0.90	1.00
	Ø10~Ø12.5	0.50	0.73	0.89	0.94	1.00
	Ø16~Ø18	0.60	0.81	0.94	0.97	1.00
63~100	Ø5~Ø8	0.20	0.55	0.80	0.88	1.00
	Ø10~Ø12.5	0.35	0.65	0.85	0.92	1.00
	Ø16~Ø18	0.50	0.75	0.90	0.95	1.00