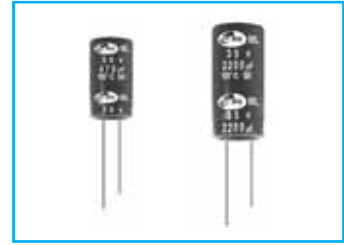


MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS



WL Extremely Low Impedance Series



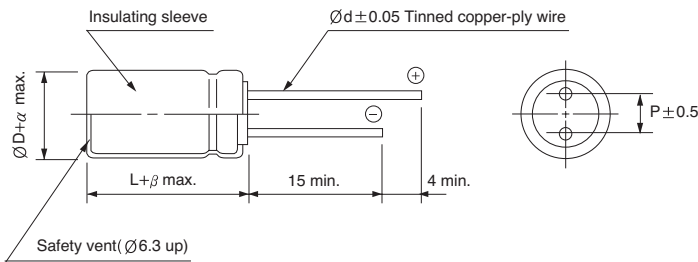
- Wide voltage compared with RZ series
- Operating temperature range of $-40 \sim +105^{\circ}\text{C}$
- Extremely low impedance at high frequency
- High reliability withstanding 5000 hours load life at 105°C
- For E-meter
- Complied to the RoHS directive



Item	Characteristics										
Operating temperature range	WV	6.3 ~ 450									
	Temperature range	$-40 \sim +105^{\circ}\text{C}$									
Leakage current max.	WV ≤ 100	WV > 100									
	$I = 0.01\text{CV}$ or $3\mu\text{A}$ whichever is greater (after 2 min.) $I = 0.03\text{CV}$ or $4\mu\text{A}$ whichever is greater (after 1 min.)										
Capacitance tolerance	$\pm 20\%$ at 120Hz, 20°C										
Dissipation factor max. (at 120Hz, 20°C)	Capacitance $> 1000\mu\text{F}$: $\tan\delta$ increases by 0.02 for each $1000\mu\text{F}$ from below value.										
	WV	6.3	10	16	25	35	50	63	100	160~250	350~500
Low temperature characteristics (Impedance ratio at 120Hz)	$\tan\delta$	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08	0.15	0.20
	WV	6.3	10	16	25 ~ 100	160 ~ 250	350 ~ 450	500			
	Z- $25^{\circ}\text{C}/Z+20^{\circ}\text{C}$	4	3	2	2	3	6	8			
	Z- $40^{\circ}\text{C}/Z+20^{\circ}\text{C}$	8	6	4	3	4	10	-			
Load life	After an application of DC bias voltage plus the rated AC ripple current for 5000 hours at 105°C . The measurement shall meet the following limits. The DC voltage plus the peak AC voltage combined must not exceed the rated voltage.										
	Leakage current	Less than specified value									
	Capacitance change	Within $\pm 25\%$ of initial value									
	$\tan\delta$	Less than 200% of specified value									
	Life time	$\varnothing D = 5, 6.3$	$\varnothing D = 8$	$\varnothing D \geq 10$							
WV ≤ 100	2000 hours	3000 hours	5000 hours								
WV > 100	2000 hours										
Shelf life (at 105°C)	After 1000 hours no load test, leakage current, capacitance and $\tan\delta$ are same as load life value. The measurement shall be performed at 20°C by the KS C 6035 clause 5.4.										

DRAWING

Unit : mm



$\varnothing D$	5	6.3	8	10	12.5	16	18	20	22
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5	10.0	10.0
$\varnothing d$	0.5	0.5	0.6	0.6	0.6	0.8	0.8	0.8	1.0
α	0.5							1.0	
β	1.5		2.0				3.0		

FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

μF	Frequency	120Hz	1kHz	10kHz	50kHz	100kHz \leq
~ 33		0.40	0.65	0.82	0.91	1.00
33 ~ 270		0.50	0.70	0.84	0.92	1.00
330 ~ 680		0.55	0.75	0.86	0.93	1.00
820 ~ 1800		0.60	0.80	0.88	0.94	1.00
2200 ~		0.70	0.85	0.90	0.95	1.00

MINIATURE TYPES

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

WL series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV Item μF	6.3			10			16			25		
	∅D×L (mm)	Impedance (Ω)max. 20°C 100kHz	Ripple current (mA rms) 105°C 100kHz	∅D×L (mm)	Impedance (Ω)max. 20°C 100kHz	Ripple current (mA rms) 105°C 100kHz	∅D×L (mm)	Impedance (Ω)max. 20°C 100kHz	Ripple current (mA rms) 105°C 100kHz	∅D×L (mm)	Impedance (Ω)max. 20°C 100kHz	Ripple current (mA rms) 105°C 100kHz
4.7										5×11	0.70	180
10							5×11	0.70	180	5×11	0.70	180
22	5×11	0.70	180	5×11	0.70	180	5×11	0.70	180	5×11	0.70	180
33	5×11	0.70	180	5×11	0.70	180	5×11	0.70	180	5×11	0.70	180
47	5×11	0.65	180	5×11	0.65	180	5×11	0.65	180	5×11	0.65	180
100	5×11	0.65	180	5×11	0.65	180	6.3×11	0.30	280	6.3×11	0.30	280
150	6.3×11	0.30	280	6.3×11	0.30	280	6.3×11	0.30	280	8×11.5	0.14	450
220	6.3×11	0.30	280	6.3×11	0.30	280	8×11.5	0.14	450	8×11.5	0.14	450
330	6.3×11	0.30	280	8×11.5	0.14	450	8×11.5	0.14	450	10×12.5	0.10	660
470	8×11.5	0.14	450	8×11.5	0.14	450	10×12.5	0.10	660	10×16	0.080	850
680	10×12.5	0.10	660	10×12.5	0.10	660	10×16	0.080	850	10×20	0.054	1100
1000	10×12.5	0.10	660	10×16	0.080	850	10×20	0.054	1100	12.5×20	0.050	1400
1500	10×20	0.054	1100	10×20	0.054	1100	12.5×20	0.050	1400	16×20	0.030	2100
2200	12.5×20	0.050	1400	12.5×20	0.050	1400	12.5×25	0.038	1700	16×25	0.030	2100
3300	12.5×20	0.050	1400	12.5×25	0.038	1700	16×25	0.030	2100	16×31.5	0.025	2600
4700	16×25	0.030	2100	16×25	0.030	2100	16×31.5	0.025	2600	18×35.5	0.022	3000
6800	16×25	0.030	2100	16×31.5	0.025	2600	18×35.5	0.022	3000			
10000	16×31.5	0.025	2600	18×35.5	0.022	3000						
15000	18×35.5	0.022	3000									

WV Item μF	35			50			63			100		
	∅D×L (mm)	Impedance (Ω)max. 20°C 100kHz	Ripple current (mA rms) 105°C 100kHz	∅D×L (mm)	Impedance (Ω)max. 20°C 100kHz	Ripple current (mA rms) 105°C 100kHz	∅D×L (mm)	Impedance (Ω)max. 20°C 100kHz	Ripple current (mA rms) 105°C 100kHz	∅D×L (mm)	Impedance (Ω)max. 20°C 100kHz	Ripple current (mA rms) 105°C 100kHz
0.22				5×11	8.0	18						
0.47				5×11	5.0	25						
1.0				5×11	3.5	40						
2.2				5×11	3.0	55				5×11	2.5	52
3.3				5×11	2.6	65	5×11	2.0	64	5×11	2.5	64
4.7	5×11	0.70	180	5×11	2.3	90	5×11	2.0	76	5×11	2.5	76
10	5×11	0.70	180	5×11	1.4	120	5×11	2.0	111	6.3×11	1.0	128
22	5×11	0.70	180	5×11	1.2	150	6.3×11	0.60	190	8×11.5	0.60	224
33	5×11	0.65	180	6.3×11	0.60	200	6.3×11	0.60	233	10×12.5	0.40	319
47	6.3×11	0.30	280	6.3×11	0.43	250	8×11.5	0.50	328	10×16	0.30	417
100	8×11.5	0.20	450	8×11.5	0.24	340	10×16	0.12	456	12.5×20	0.15	570
150	8×11.5	0.14	450	10×12.5	0.17	490	10×20	0.10	610	12.5×25	0.12	762
220	10×12.5	0.10	660	10×16	0.12	650	10×25	0.090	809	16×25	0.070	1250
330	10×16	0.080	850	10×20	0.10	810	12.5×20	0.085	1036	16×31.5	0.050	1404
470	10×20	0.054	1100	12.5×20	0.085	1100	16×20	0.050	1411	18×40	0.030	1980
680	12.5×20	0.050	1400	12.5×25	0.065	1200	16×25	0.043	1843	18×40	0.030	2050
820	12.5×25	0.045	1500	16×25	0.055	1300	18×25	0.035	1900	18×40	0.030	2215
1000	12.5×25	0.038	1700	16×25	0.043	1600	16×35.5	0.025	1967			
1500	16×25	0.030	2100	16×31.5	0.038	2000						
2200	16×31.5	0.025	2600	18×35.5	0.034	2300						
3300	18×35.5	0.022	3000									

WL series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV Item μF	160			200			250			350		
	ØD×L (mm)	Impedance (Ω)max. 20°C 100kHz	Ripple current (mA rms) 105°C 100kHz	ØD×L (mm)	Impedance (Ω)max. 20°C 100kHz	Ripple current (mA rms) 105°C 100kHz	ØD×L (mm)	Impedance (Ω)max. 20°C 100kHz	Ripple current (mA rms) 105°C 100kHz	ØD×L (mm)	Impedance (Ω)max. 20°C 100kHz	Ripple current (mA rms) 105°C 100kHz
1	6.3×11	3.5	45									
10	10×16	3.0	230				10×20	3.5	300	10×20	2.9	180
22	10×20	1.3	440	10×20	1.5	440	12.5×20	2.3	480	12.5×20	2.1	270
33	10×20	1.3	560	12.5×20	0.91	590	12.5×25	1.7	630	16×20	0.91	600
47	12.5×20	0.91	725	12.5×20	0.91	780	12.5×25	1.7	630	16×25	0.73	700
68	12.5×25	0.63	950	12.5×25	0.63	950	16×25	1.0	1000	16×31.5	0.49	1100
82							16×25	1.0	1100	16×35.5	0.45	1130
100	16×25	0.45	1280	16×25	0.45	1280	16×31.5	0.63	1400	18×31.5	0.40	1170
120										18×35.5	0.37	1200
150	16×31.5	0.35	1300	16×25	0.35	1500	18×25 18×31.5	0.42	1450	18×40	0.35	1250
220	16×31.5	0.30	1300	18×31.5	0.30	1700	18×35.5 18×40	0.39 0.35	1485			
330	18×31.5	0.25	1700	18×35.5	0.21	1900						

WV Item μF	400			420			450			500		
	ØD×L (mm)	Impedance (Ω)max. 20°C 100kHz	Ripple current (mA rms) 105°C 100kHz	ØD×L (mm)	Impedance (Ω)max. 20°C 100kHz	Ripple current (mA rms) 105°C 100kHz	ØD×L (mm)	Impedance (Ω)max. 20°C 100kHz	Ripple current (mA rms) 105°C 100kHz	ØD×L (mm)	Impedance (Ω)max. 20°C 100kHz	Ripple current (mA rms) 105°C 100kHz
3.3							10×20	6.5	150			
4.7							12.5×20	3.6	200			
10	10×16 10×20	3.5 2.9	176 180				10×16 12.5×25	5.0 2.5	230 315	12.5×25	3.5	260
22	12.5×25	1.3	300				12.5×25 16×25	2.0 1.7	525 570	12.5×30 16×25	2.3 2.2	420 470
33	16×20	0.91	600				16×25	1.7	600	18×31.5	1.8	560
47	16×25	0.73	700	16×25	1.9	630	16×25 16×31.5 18×25	1.7 1.6 1.5	660 720 720	16×35.5 18×35.5	1.7 1.5	650 700
56				16×31.5 18×25	1.8	740	18×25	1.5	800	16×40	1.3	740
68	16×31.5	0.49	1100	16×35.5 18×25	1.5	810	16×35.5 18×31.5	1.3 0.93	900 900	16×45 18×40	1.2 1.1	820 900
82	16×35.5	0.42	1150	16×40 18×31.5	1.0 1.0	960 900	16×40 18×31.5 18×35.5	0.93 0.83 0.75	1000 1000 1200	16×50 18×40	1.1 1.0	940 1000
100	18×35.5	0.34	1200	16×40 18×35.5	0.8	1100	18×35.5	0.71	1200	18×45 20×41	1.0 0.8	1200 1250
120	18×40	0.34	1270	16×50 18×40	0.71 0.71	1250 1200	18×40	0.50	1500	22×45	0.8	1370
150	20×41	0.33	1380				20×41	0.32	1600			

MINIATURE TYPES