

# MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS



## WL Low Impedance Series



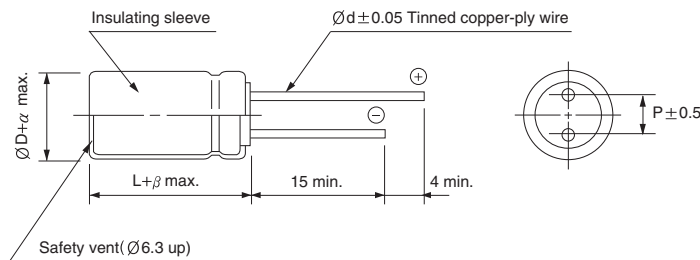
- Wide voltage compared with RZ series
- Operating temperature range of  $-40 \sim +105^{\circ}\text{C}$
- Low impedance at high frequency
- High reliability withstanding 5000 hours load life at  $105^{\circ}\text{C}$
- For E-meter
- Complied to the RoHS directive



Item	Characteristics										
Operating temperature range	WV	6.3 ~ 450									
	Temperature range	$-40 \sim +105^{\circ}\text{C}$									
Leakage current max.	WV ≤ 100										
	I = 0.01CV or 3µA whichever is greater (after 2 min.) I = 0.03CV or 4µA whichever is greater (after 1 min.)										
Capacitance tolerance	WV > 100										
	I = 0.02CV + 15µA (after 5 min.)										
Dissipation factor max. (at 120Hz, 20°C)	Capacitance > 1000µF : tanδ increases by 0.02 for each 1000µF from below value.										
	WV	6.3	10	16	25	35	50	63	100	160~250	350~500
Low temperature characteristics (Impedance ratio at 120Hz)	tanδ	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°C/Z+20°C	4	3	2	2	3	6	8			
	Z-40°C/Z+20°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 $105^{\circ}\text{C}$ . 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					
	tanδ					Less than 200% of specified value					
	Life time		ØD = 5, 6.3			ØD = 8			ØD ≥ 10		
WV ≤ 100		2000 hours			3000 hours			5000 hours			
WV > 100		2000 hours									
Shelf life (at $105^{\circ}\text{C}$ )	After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value. The measurement shall be performed at $20^{\circ}\text{C}$ by the KS C IEC 60384 - 4										

### ● DRAWING

Unit : mm



ØD	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
Ød	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			

MINIATURE TYPES

### ● FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

µF \ Frequency	120Hz	1kHz	10kHz	50kHz	100kHz ≤
~ 33	0.40	0.65	0.82	0.91	1.00
39 ~ 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 ALUMINUM ELECTROLYTIC CAPACITORS

**WL** series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV Item μF	6.3			10			16			25		
	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
10							5×11	0.90	180	5×11	0.90	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	0.20	450
220	6.3×11	0.30	280	6.3×11	0.30	280	8×11.5	0.14	450	8×11.5	0.20	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		
	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
1.0				5×11	3.0	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	0.90	180	5×11	2.3	90	5×11	2.0	76	5×11	2.5	76
10	5×11	0.90	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)	Ripple current (mA rms) 105°C 100kHz	ØD×L (mm)	Ripple current (mA rms) 105°C 100kHz	ØD×L (mm)	Ripple current (mA rms) 105°C 100kHz	ØD×L (mm)	Ripple current (mA rms) 105°C 100kHz
1	6.3×11	45						
10	10×16	230			10×20	300	10×20	180
22	10×20	440	10×20	440	12.5×20	480	12.5×20	270
33	10×20	560	12.5×20	590	12.5×25	630	16×20	600
47	12.5×20	725	12.5×20	780	12.5×25	630	16×25	700
68	12.5×25	950	12.5×25	950	16×25	1000	16×31.5	1100
82					16×25	1100	16×35.5	1130
100	16×25	1280	16×25	1280	16×31.5	1400	18×31.5	1170
120							18×35.5	1200
150	16×31.5	1300	16×25	1500	18×25 18×31.5	1450	18×40	1250
220	16×31.5	1500	18×31.5	1700	18×35.5 18×40	1485		
330	18×31.5	1700	18×35.5	1900				

WV Item μF	400		420		450		500	
	ØD×L (mm)	Ripple current (mA rms) 105°C 100kHz	ØD×L (mm)	Ripple current (mA rms) 105°C 100kHz	ØD×L (mm)	Ripple current (mA rms) 105°C 100kHz	ØD×L (mm)	Ripple current (mA rms) 105°C 100kHz
3.3					10×20	150		
4.7					12.5×20	200		
10	10×16 10×20	176 180			10×16 12.5×25	230 315	12.5×20 12.5×25	240 260
22	12.5×25	300			12.5×25 16×25	525 570	12.5×30 16×25	420 470
33	16×20	600			16×25	600	18×31.5	560
47	16×25	700	16×25	630	16×25 16×31.5 18×25	660 720 720	16×35.5 18×31.5 18×35.5	650 620 700
56			16×31.5 18×25	740	16×31.5 18×25	800 800	16×40	740
68	16×31.5	1100	16×35.5 18×25	810	16×35.5 18×31.5	900 900	16×45 18×40	820 900
82	16×35.5	1150	16×40 18×31.5	960 900	16×40 18×31.5 18×35.5	1115 1115 1200	16×50 18×40	1000 1000
100	18×35.5	1200	16×40 18×35.5	1100	16×40 18×35.5	1100 1200	16×50 18×45 20×41	1250 1250 1250
120	18×40	1270	16×50 18×40	1250 1200	16×50 18×40	1500 1500	22×45	1370
150	20×41	1380			20×41	1600		

MINIATURE TYPES