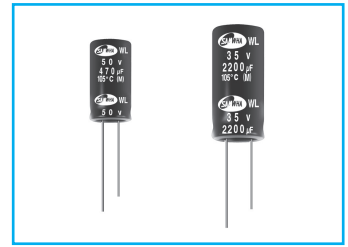


## WL Extremely Low Impedance Series

Long Life  
 Solvent Proof WV ≤ 100V  
 Low Impedance



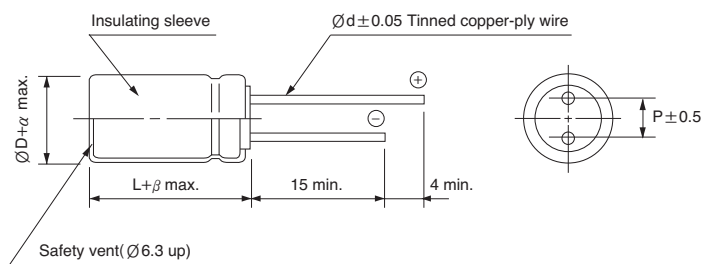
- Wide voltage compared with RZ series
- Operating temperature range of -40 ~ +105°C
- Extremely low impedance at high frequency
- High reliability withstanding 5000 hours load life at 105°C (2000/3000 hours for smaller case size as specified below)
- Complied to the RoHS directive

$\Rightarrow$  Long life

Item	Characteristics										
Operating temperature range	WV	6.3 ~ 100			160 ~ 450			500			
	Temperature range	-40 ~ +105°C			-40 ~ +105°C			-25 ~ +105°C			
Leakage current max.	WV ≤ 100					WV > 100					
	I = 0.01CV or 3µA whichever is greater (after 2 min.) I = 0.03CV or 4µA whichever is greater (after 1 min.)					I = 0.02CV + 15µA (after 5 min.)					
Capacitance tolerance	± 20% at 120Hz, 20°C										
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
tanδ	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08	0.15	0.20	
Low temperature characteristics (Impedance ratio at 120Hz)	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°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 ± 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°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°C by the KS C 6035 clause 5.4.										

### ● 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		

### ● FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

µF \ Frequency	120Hz	1kHz	10kHz	50kHz	100kHz ≤
~ 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 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		
	∅D×L (mm)	Impedance (Ω)max. 20°C 100kHz	Ripple current (mA rms) 105°C	∅D×L (mm)	Impedance (Ω)max. 20°C 100kHz	Ripple current (mA rms) 105°C	∅D×L (mm)	Impedance (Ω)max. 20°C 100kHz	Ripple current (mA rms) 105°C
1	6.3 × 11	3.5	45						
10	10 × 16	3	230				10 × 20	3.5	300
22	10 × 20	1.3	440	10 × 20	1.5	440	12.5 × 20	2.3	480
33	10 × 20	1.3	560	12.5 × 20	0.91	590	12.5 × 25	1.7	630
47	12.5 × 20	0.91	725	12.5 × 20	0.91	780	12.5 × 25	1.7	630
68	12.5 × 25	0.63	950	12.5 × 25	0.63	950	16 × 25	1.0	1000
82							16 × 25	1.0	1100
100	16 × 25	0.45	1280	16 × 25	0.45	1280	16 × 31.5	0.63	1400
150	16 × 31.5	0.35	1300	16 × 25	0.35	1500	18 × 25	0.42	1450
							18 × 31.5		
220	16 × 31.5	0.30	1300	18 × 31.5	0.30	1700	18 × 35.5	0.39	1485
							18 × 40	0.35	
330	18 × 31.5	0.25	1700	18 × 35.5	0.21	1900			

WV Item μF	350			400			450		
	∅D×L (mm)	Impedance (Ω)max. 20°C 100kHz	Ripple current (mA rms) 105°C	∅D×L (mm)	Impedance (Ω)max. 20°C 100kHz	Ripple current (mA rms) 105°C	∅D×L (mm)	Impedance (Ω)max. 20°C 100kHz	Ripple current (mA rms) 105°C
3.3							10 × 20	6.5	150
4.7							12.5 × 20	3.6	200
10	10 × 20	2.9	180	10 × 16	3.5	176	12.5 × 25	2.5	315
				10 × 20	2.9	180			
22	12.5 × 20	2.1	270	12.5 × 25	1.3	300	12.5 × 25	2.0	525
33	16 × 20	0.91	600	16 × 20	0.91	600	16 × 25	1.7	570
47	16 × 25	0.73	700	16 × 25	0.73	700	16 × 25	1.7	660
							16 × 31.5	1.6	720
56							18 × 25	1.5	720
68	16 × 31.5	0.49	1100	16 × 31.5	0.49	1100	18 × 25	1.5	800
							16 × 35.5	1.3	900
							18 × 31.5	0.93	900
82	16 × 35.5	0.45	1130	16 × 35.5	0.42	1150	16 × 40	0.93	1000
							18 × 31.5	0.83	1000
							18 × 35.5	0.75	1200
100	18 × 31.5	0.40	1170	18 × 35.5	0.34	1200	16 × 40	0.93	1100
							18 × 35.5	0.71	1200
120	18 × 35.5	0.37	1200	18 × 40	0.34	1270	18 × 40	0.50	1500
150	18 × 40	0.35	1250	20 × 41	0.33	1380	20 × 41	0.32	1600

WV Item μF	500		
	∅D×L (mm)	Impedance (Ω)max. 20°C 100kHz	Ripple current (mA rms) 105°C
10	12.5 × 25	3.0	260
22	12.5 × 30	2.3	420
	16 × 25	2.2	470
33	18 × 31.5	1.8	560
47	16 × 35.5	1.7	650
	18 × 35.5	1.5	700
56	16 × 40	1.3	740
68	16 × 45	1.2	820
	18 × 40	1.1	900
82	16 × 50	1.1	940
	18 × 40	1.0	1000
100	18 × 45	1.0	1200
	20 × 41	0.8	1250
120	22 × 45	0.8	1370