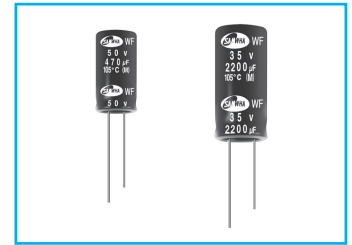


# MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS



## WF High ripple current, Extremely Low Impedance Series



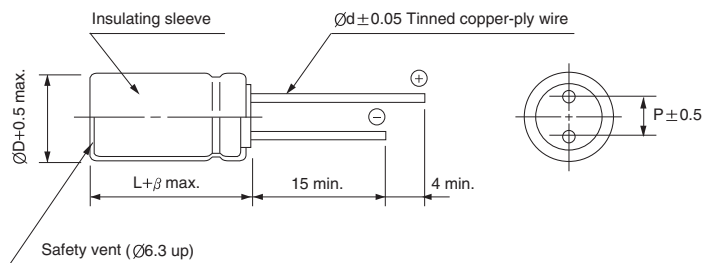
- Operating temperature range of  $-40 \sim +105^{\circ}\text{C}$
- Extremely low impedance at high frequency
- High reliability withstanding 10000 hours load life at  $105^{\circ}\text{C}$
- For E-meter
- Complied to the RoHS directive



Item	Characteristics																	
Operating temperature range	$-40 \sim +105^{\circ}\text{C}$																	
Leakage current max.	$I = 0.03\text{CV}$ or $3\mu\text{A}$ whichever is greater (after 2 minutes)																	
Capacitance tolerance	$\pm 20\%$ at 120Hz, $20^{\circ}\text{C}$																	
Dissipation factor max. (at 120Hz, $20^{\circ}\text{C}$ )	Capacitance > $1000\mu\text{F}$ : $\tan\delta$ increases by 0.02 for each $1000\mu\text{F}$ from below value.																	
	<table border="1"> <thead> <tr> <th>WV</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>100</th> </tr> </thead> <tbody> <tr> <td><math>\tan\delta</math></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> <td>0.09</td> <td>0.08</td> </tr> </tbody> </table>	WV	6.3	10	16	25	35	50	63	100	$\tan\delta$	0.22	0.19	0.16	0.14	0.12	0.10	0.09
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$\tan\delta$	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08										
Low temperature characteristics (Impedance ratio at 120Hz)	<table border="1"> <thead> <tr> <th>WV</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25 ~ 100</th> </tr> </thead> <tbody> <tr> <td>Z-<math>40^{\circ}\text{C}</math>/Z+<math>20^{\circ}\text{C}</math></td> <td>8</td> <td>6</td> <td>4</td> <td>3</td> </tr> </tbody> </table>	WV	6.3	10	16	25 ~ 100	Z- $40^{\circ}\text{C}$ /Z+ $20^{\circ}\text{C}$	8	6	4	3							
	WV	6.3	10	16	25 ~ 100													
Z- $40^{\circ}\text{C}$ /Z+ $20^{\circ}\text{C}$	8	6	4	3														
Load life	<p>After an application of DC bias voltage plus the rated AC ripple current for 10000 hours at <math>105^{\circ}\text{C}</math>. The measurement shall meet the following limits. The DC voltage plus the peak AC voltage combined must not exceed the rated voltage.</p> <table border="1"> <tbody> <tr> <td>Leakage current</td> <td>Less than specified value</td> </tr> <tr> <td>Capacitance change</td> <td>Within <math>\pm 25\%</math> of initial value</td> </tr> <tr> <td><math>\tan\delta</math></td> <td>Less than 200% of specified value</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th><math>\varnothing D</math></th> <th><math>\varnothing D = 5, 6.3</math></th> <th><math>\varnothing D = 8, 10</math></th> <th><math>\varnothing D \geq 12.5</math></th> </tr> </thead> <tbody> <tr> <td>Life time</td> <td>5000 hours</td> <td>7000 hours</td> <td>10000 hours</td> </tr> </tbody> </table>	Leakage current	Less than specified value	Capacitance change	Within $\pm 25\%$ of initial value	$\tan\delta$	Less than 200% of specified value	$\varnothing D$	$\varnothing D = 5, 6.3$	$\varnothing D = 8, 10$	$\varnothing D \geq 12.5$	Life time	5000 hours	7000 hours	10000 hours			
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Capacitance change	Within $\pm 25\%$ of initial value																	
$\tan\delta$	Less than 200% of specified value																	
$\varnothing D$	$\varnothing D = 5, 6.3$	$\varnothing D = 8, 10$	$\varnothing D \geq 12.5$															
Life time	5000 hours	7000 hours	10000 hours															
Shelf life (at $105^{\circ}\text{C}$ )	After 1000 hours no load test, leakage current, capacitance and $\tan\delta$ are same as load life value. The measurement shall be performed at $20^{\circ}\text{C}$ by the KS C IEC 60384 - 4																	

### DRAWING

Unit : mm



$\varnothing D$	5	6.3	8	10	12.5	16	18
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5
$\varnothing d$	0.5	0.5	0.6	0.6	0.6	0.8	0.8
$\beta$	1.5			2.0			

### FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

$\mu\text{F}$ \ Frequency	120Hz	1kHz	10kHz	50kHz	100kHz $\leq$
~ 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

**WF** series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV Item $\mu\text{F}$	6.3			10			16			25		
	$\varnothing\text{D} \times \text{L}$ (mm)	Impedance ( $\Omega$ )max. 20°C 100kHz	Ripple current (mA rms) 105°C 100kHz	$\varnothing\text{D} \times \text{L}$ (mm)	Impedance ( $\Omega$ )max. 20°C 100kHz	Ripple current (mA rms) 105°C 100kHz	$\varnothing\text{D} \times \text{L}$ (mm)	Impedance ( $\Omega$ )max. 20°C 100kHz	Ripple current (mA rms) 105°C 100kHz	$\varnothing\text{D} \times \text{L}$ (mm)	Impedance ( $\Omega$ )max. 20°C 100kHz	Ripple current (mA rms) 105°C 100kHz
33										5 × 11	0.90	150
47							5 × 11	0.90	150	5 × 11	0.90	150
100	5 × 11	0.90	150	5 × 11	0.90	150	6.3 × 11	0.40	250	6.3 × 11	0.40	250
220	6.3 × 11	0.40	250	6.3 × 11	0.40	250	8 × 11.5	0.25	400	8 × 11.5	0.25	400
330	6.3 × 11	0.40	250	8 × 11.5	0.25	400	8 × 11.5	0.25	400	10 × 12.5	0.16	580
470	8 × 11.5	0.25	400	8 × 11.5	0.25	400	10 × 12.5	0.16	580	10 × 16	0.120	770
1000	10 × 12.5	0.16	580	10 × 16	0.120	770	10 × 20	0.078	1050	12.5 × 20	0.062	1300
2200	12.5 × 20	0.062	1300	12.5 × 20	0.062	1300	12.5 × 25	0.048	1650	16 × 25	0.034	1850
3300	12.5 × 20	0.062	1300	12.5 × 25	0.048	1650	16 × 25	0.034	1850	16 × 31.5	0.029	2000
4700	16 × 25	0.034	1850	16 × 25	0.034	1850	16 × 31.5	0.029	2000	18 × 35.5	0.025	2200
6800	16 × 25	0.034	1850	16 × 31.5	0.029	2000	18 × 35.5	0.025	2200			
10000	16 × 31.5	0.029	2000	18 × 35.5	0.025	2200						
15000	18 × 35.5	0.025	2200									

WV Item $\mu\text{F}$	35			50			63			100		
	$\varnothing\text{D} \times \text{L}$ (mm)	Impedance ( $\Omega$ )max. 20°C 100kHz	Ripple current (mA rms) 105°C 100kHz	$\varnothing\text{D} \times \text{L}$ (mm)	Impedance ( $\Omega$ )max. 20°C 100kHz	Ripple current (mA rms) 105°C 100kHz	$\varnothing\text{D} \times \text{L}$ (mm)	Impedance ( $\Omega$ )max. 20°C 100kHz	Ripple current (mA rms) 105°C 100kHz	$\varnothing\text{D} \times \text{L}$ (mm)	Impedance ( $\Omega$ )max. 20°C 100kHz	Ripple current (mA rms) 105°C 100kHz
1.0				5 × 11	4.0	50				5 × 11	4.5	20
2.2				5 × 11	2.5	55				5 × 11	3.0	30
3.3				5 × 11	2.2	65				5 × 11	2.7	40
4.7				5 × 11	1.9	88				5 × 11	2.5	65
10				5 × 11	1.5	100	5 × 11	2.3	87	6.3 × 11	1.2	140
22				5 × 11	0.9	150	6.3 × 11	1.30	140	8 × 11.5	0.63	160
33	5 × 11	0.90	150	6.3 × 11	0.40	250	6.3 × 11	1.20	140	10 × 12.5	0.43	230
47	6.3 × 11	0.4	250	6.3 × 11	0.4	400	8 × 11.5	0.63	210	10 × 12.5	0.43	230
										10 × 16	0.31	290
100	8 × 11.5	0.25	400	8 × 11.5	0.25	500	10 × 12.5	0.43	300	12.5 × 16	0.23	750
										12.5 × 20	0.16	
220	10 × 12.5	0.16	580	10 × 16	0.12	770	10 × 25	0.210	520	16 × 25	0.073	900
330	10 × 16	0.120	770	10 × 20	0.08	1050	12.5 × 20	0.160	660	16 × 25	0.073	900
390	10 × 20	0.095	900	10 × 20	0.075	1170	12.5 × 25	0.140	700	12.5 × 34.5	0.073	1650
470	10 × 20	0.078	1050	12.5 × 20	0.062	1300	12.5 × 25	0.120	750			
1000	12.5 × 25	0.048	1650	16 × 25	0.034	1850	16 × 31.5	0.054	1390			
2200	16 × 31.5	0.029	2000	18 × 35.5	0.025	2200						
3300	18 × 35.5	0.025	2200									