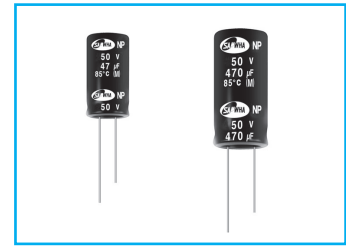
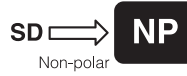
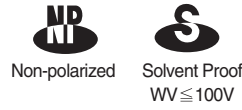


# MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

## NP Non-Polarized Series

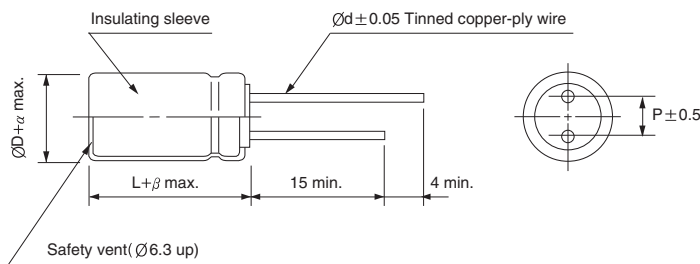
- Standard non-polarized series
- Designed for use in circuits with reversing polarity
- Higher voltage ratings available up to 250V
- Load life of 2000 hours at 85°C
- Complied to the RoHS directive



Item	Characteristics																							
Operating temperature range	-40 ~ +85°C																							
Leakage current max.	$I = 0.03CV$ or $3\mu A$ whichever is greater (after 5 minutes)																							
Capacitance tolerance	$\pm 20\%$ at 120Hz, 20°C																							
Dissipation factor max. (at 120Hz, 20°C)	Capacitance > 1000 $\mu F$ : $\tan\delta$ increases by 0.02 for each 1000 $\mu F$ 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>80</th> <th>100</th> <th>160</th> <th>200,250</th> </tr> </thead> <tbody> <tr> <td><math>\tan\delta</math></td> <td>0.25</td> <td>0.23</td> <td>0.20</td> <td>0.15</td> <td>0.15</td> <td>0.12</td> <td>0.12</td> <td>0.12</td> <td>0.12</td> <td>0.15</td> <td>0.20</td> </tr> </tbody> </table>	WV	6.3	10	16	25	35	50	63	80	100	160	200,250	$\tan\delta$	0.25	0.23	0.20	0.15	0.15	0.12	0.12	0.12	0.12	0.15
WV	6.3	10	16	25	35	50	63	80	100	160	200,250													
$\tan\delta$	0.25	0.23	0.20	0.15	0.15	0.12	0.12	0.12	0.12	0.15	0.20													
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> <th>160~250</th> </tr> </thead> <tbody> <tr> <td>Z-25°C/Z+20°C</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> <td>3</td> </tr> <tr> <td>Z-40°C/Z+20°C</td> <td>10</td> <td>8</td> <td>6</td> <td>4</td> <td>5</td> </tr> </tbody> </table>	WV	6.3	10	16	25~100	160~250	Z-25°C/Z+20°C	4	3	2	2	3	Z-40°C/Z+20°C	10	8	6	4	5					
	WV	6.3	10	16	25~100	160~250																		
	Z-25°C/Z+20°C	4	3	2	2	3																		
Z-40°C/Z+20°C	10	8	6	4	5																			
Load life (after application of the rated voltage for 2000 hours at 85°C)	<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 20\%</math> of initial value</td> </tr> <tr> <td><math>\tan\delta</math></td> <td>Less than 200% of specified value</td> </tr> <tr> <td>Test method</td> <td>Polarity reverse each 250 hours</td> </tr> </tbody> </table>	Leakage current	Less than specified value	Capacitance change	Within $\pm 20\%$ of initial value	$\tan\delta$	Less than 200% of specified value	Test method	Polarity reverse each 250 hours															
Leakage current	Less than specified value																							
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Test method	Polarity reverse each 250 hours																							
Shelf life (at 85°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 IEC 60384 - 4																							

### DRAWING

Unit : mm



ØD	5	6.3	8	10	12.5	16	18	22
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5	10.0
Ød	0.5	0.5	0.6	0.6	0.6	0.8	0.8	1.0
β	1.5		2.0		3.0			
α	0.5			1.0				

### FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

µF \ Frequency	50Hz	120Hz	1kHz	10kHz ≤
~ 47	0.75	1.00	1.55	2.00
68 ~ 680	0.80	1.00	1.34	1.50
1000 ~	0.85	1.00	1.13	1.15

## NP series

### ● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV μF	6.3	10	16	25	35	50	63	80	100	160	200	250
1.0						5 × 11 18	5 × 11 18	5 × 11 18	5 × 11 18			
1.5						5 × 11 21	5 × 11 21	5 × 11 21	5 × 11 21			
2.2						5 × 11 26	5 × 11 26	5 × 11 26	5 × 11 26			
3.3						5 × 11 32	5 × 11 32	5 × 11 32	5 × 11 32	10 × 16 49	10 × 16 42	10 × 20 46
4.7						5 × 11 38	5 × 11 38	5 × 11 38	6.3 × 11 44	10 × 16 59	10 × 20 55	12.5 × 20 63
6.8						5 × 11 46	5 × 11 46	6.3 × 11 52	8 × 11.5 62	10 × 20 77	12.5 × 20 78	12.5 × 20 78
10						5 × 11 55	6.3 × 11 64	6.3 × 11 64	8 × 11.5 75	12.5 × 20 109	12.5 × 20 95	12.5 × 25 103
15					5 × 11 61	6.3 × 11 78	6.3 × 11 78	8 × 11.5 92	10 × 12.5 107	12.5 × 20 134	12.5 × 25 127	16 × 25 140
22				5 × 11 73	6.3 × 11 84	6.3 × 11 94	8 × 11.5 111	10 × 12.5 129	10 × 16 142	12.5 × 25 177	16 × 25 170	16 × 31.5 186
33			5 × 11 78	6.3 × 11 103	6.3 × 11 103	8 × 11.5 136	10 × 12.5 158	10 × 16 173	10 × 20 189	16 × 25 240	16 × 35.5 239	18 × 35.5 256
47		5 × 11 87	6.3 × 11 107	6.3 × 11 123	8 × 11.5 145	10 × 12.5 189	10 × 16 207	10 × 20 226	12.5 × 20 265	16 × 35.5 329	18 × 40 321	
68	5 × 11 100	6.3 × 11 120	6.3 × 11 129	8 × 11.5 175	10 × 12.5 203	10 × 16 249	10 × 20 272	12.5 × 20 319	12.5 × 25 348	18 × 35.5 425		
100	6.3 × 11 139	6.3 × 11 145	8 × 11.5 184	10 × 12.5 247	10 × 16 270	10 × 20 329	10 × 20 329	12.5 × 20 387	16 × 25 468			
150	6.3 × 11 171	8 × 11.5 210	10 × 12.5 262	10 × 16 331	10 × 20 361	10 × 20 404	12.5 × 20 474	12.5 × 25 516	16 × 25 573			
220	8 × 11.5 244	10 × 12.5 295	10 × 16 347	10 × 20 437	10 × 20 437	12.5 × 20 574	12.5 × 25 625	16 × 25 694	16 × 35.5 797			
330	10 × 12.5 347	10 × 16 396	10 × 20 464	10 × 20 535	12.5 × 20 628	16 × 25 850	16 × 25 850	16 × 35.5 976	18 × 40 1098			
470	10 × 16 454	10 × 20 516	10 × 20 553	12.5 × 20 750	12.5 × 25 818	16 × 31.5 1110	16 × 35.5 1164	18 × 40 1311	22 × 41 1443			
680	10 × 20 595	12.5 × 20 729	12.5 × 20 781	12.5 × 25 984	16 × 25 1091	18 × 35.5 1503	18 × 40 1577	22 × 41 1736				
1000	12.5 × 20 847	12.5 × 20 883	12.5 × 25 1033	16 × 25 1323	16 × 35.5 1519	18 × 40 1912	22 × 41 2105					
1500	12.5 × 20 999	12.5 × 25 1132	16 × 25 1338	16 × 35.5 1748	18 × 40 1968	22 × 41 2386						
2200	12.5 × 25 1272	16 × 25 1463	16 × 35.5 1781	18 × 40 2254	22 × 41 2481							
3300	16 × 25 1672	16 × 35.5 1985	18 × 40 2360	22 × 41 2890								
4700	16 × 35.5 2221	18 × 40 2579	22 × 41 2987									
6800	18 × 41 2840	22 × 41 3214										
10000	22 × 41 3516	← Case size ØD × L (mm) ← Ripple current (mA rms) at 85°C, 120Hz										