

# Non-Polar Aluminum Electrolytic Capacitor

## WS series

- Nk Series for crossover networks of high-pitched, mean and low-pitched sounds in high-fidelity sound systems
- The series offers excellent frequency characteristics and minimal capacitance deviation with frequency
- For the special designing requirement, please contact us.

## Specifications

Item	Performance Characteristics																																				
Operating Temperature Range	-40 to +105°C	-25 to +105°C																																			
Rated Voltage Range	6.3 to 100 VDC	160 to 250 VDC																																			
Capacitance Range	0.47 to 3300uF	0.47 to 47uF																																			
Capacitance Tolerance	±20%(120Hz,+20°C)																																				
Leakage Current (±20°C,max)	I ≤ 0.01 CV or 3(uF) After 1 minutes, whichever is greater measured with rated working voltage applied.																																				
Dissipation Factor(tanδ) (+20°C, at 120Hz)	<table border="1"> <thead> <tr> <th>Working Voltage(VDC)</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> <th>160</th> <th>200</th> <th>250</th> </tr> </thead> <tbody> <tr> <td>D.F.(%)max</td> <td>25</td> <td>25</td> <td>20</td> <td>15</td> <td>15</td> <td>13</td> <td>10</td> <td>10</td> <td>15</td> <td>15</td> <td>20</td> </tr> </tbody> </table>		Working Voltage(VDC)	6.3	10	16	25	35	50	63	100	160	200	250	D.F.(%)max	25	25	20	15	15	13	10	10	15	15	20											
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Low Temperature Characteristics (120Hz)	impedance ratio max.	<table border="1"> <thead> <tr> <th>Working Voltage(VDC)</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>Z-25°C/Z+20°C</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z-40°C/Z+20°C</td> <td>8</td> <td>6</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Working Voltage(VDC)</th> <th>160</th> <th>200</th> <th>250</th> </tr> </thead> <tbody> <tr> <td>Z-40°C/Z+20°C</td> <td>4</td> <td>3</td> <td>3</td> </tr> </tbody> </table> <p>For Capacitance&gt;1000uF, add 0.5 per another 1000uF for -25°C/+20°C add 1 per another 1000uF for -40°C/+20°C</p>	Working Voltage(VDC)	6.3	10	16	25	35	50	63	100	Z-25°C/Z+20°C	4	3	2	2	2	2	2	2	Z-40°C/Z+20°C	8	6	4	3	3	3	3	3	Working Voltage(VDC)	160	200	250	Z-40°C/Z+20°C	4	3	3
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Load Life	Test conditions Duration time : 2000 Hrs Ambient temperature : +105°C Applied voltage : Rated DC working voltage After test requirements at +20°C Capacitance change : ≤ ±15% of the initial measured value Dissipation factor : ≤ 150% of the initial specified value Leakage current : ≤ The initial specified value																																				
Shelf Life	Test conditions Duration time : 1000Hrs Ambient temperature : +105°C Applied voltage : None After test requirements at +20°C : Same limits as Load life Pre-treatment for measurements shall be conducted after application of DC working voltage for 30 minutes																																				

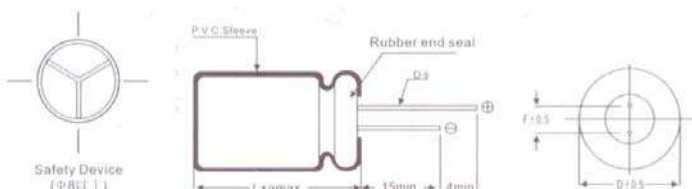
## Multiplier for Ripple Current vs.Frequency

CAP(uF) \ Frequency(Hz)	50(60)	120	400	1K	10K	50K~100K
CAP ≤ 10	0.8	1	1.30	1.45	1.65	1.70
10 < CAP ≤ 100	0.8	1	1.23	1.36	1.48	1.53
100 < CAP ≤ 1000	0.8	1	1.16	1.25	1.35	1.38

## Multiplier for Ripple Current vs.Temperature

Temperature(°C)	45	60	70	85	95	105
Multiplier	2.1	1.9	1.65	1.4	1.25	1

## Diagram of Dimensions:(unit:mm)



Dø	5	6.3	8	10	13	16
F	2	2.5	3.5	5.0	5.0	7.5
dø	0.5			0.6		0.8
a	1.0			1.5		

# Non-Polar Aluminum Electrolytic Capacitor

## ■ Case Size

øD×L (mm)

WV(SV) uF	6.3(8)		10(13)		16(20)		25(32)		35(44)	
	Size	Ripple	Size	Ripple	Size	Ripple	Size	Ripple	Size	Ripple
10							5×11	34	5×11	38
22					5×11	53	6.3×11	55	6.3×11	65
33			5×11	59	5×11	62	6.3×11	72	8×11	75
47			5×11	79	6.3×11	90	6.3×11	96	8×12	107
100	5×11	99	6.3×11	99	6.3×11	99	8×11	152	10×13	198
					8×12	123				
220	8×11	149	8×11	157	8×12	200	10×13	245	10×20	320
					10×13	234				
330	8×11	190	10×13	235	10×13	255	10×16	310	13×20	370
470	10×13	280	10×13	290	10×16	360	13×20	420	13×25	495
1000	10×16	352	10×20	430	13×20	511				
2200	13×20	645	16×25	830	16×31	950				
3300	16×25	950	16×31	1150						

WV(SV) uF	50(63)		63(79)		100(125)		160(200)	
	Size	Ripple	Ripple	Size	Size	Ripple	Size	Ripple
0.47	5×11	8	5×11	9	5×11	10	5×11	12
1	5×11	12	5×11	14	5×11	15	6.3×11	18
2.2	5×11	17	5×11	20	5×11	20	8×12	28
					6.3×11	22		
3.3	5×11	23	6.3×11	25	6.3×11	28	8×12	37
4.7	5×11	30	6.3×11	30	6.3×11	32	10×13	45
					8×12	36		
10	6.3×11	50	6.3×11	52	8×12	52	10×16	79
					10×13	55		
22	8×11	85	8×12	88	10×16	120	13×20	140
			10×13	92				
33	8×12	89	10×13	115	10×20	175	13×20	200
47	10×13	123	10×16	150	13×20	187	13×25	215
100	10×16	198	13×20	295	16×25	399		
	10×20	220						
220	13×20	340	13×25	420				
	13×25	375						
330	16×25	500						

WV(SV) uF	200(250)		250(300)	
	Size	Ripple	Ripple	Size
0.47	6.3×11	17	6.3×11	22
1	8×12	21	8×12	25
2.2	8×12	32	10×13	39
3.3	10×13	40	10×16	43
4.7	10×16	52	10×20	65
10	10×20	86	10×20	109
22	13×20	160	13×25	189
33	13×25	213	16×25	250

Ripple Current (mA,rms) at 105°C 1120Hz