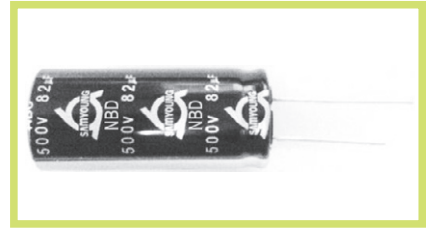
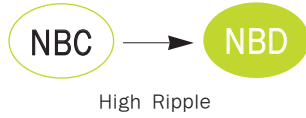


## NBD Series

• 105°C 10,000~12,000Hrs assured.

- Non-solvent proof
- High Ripple, Long Life, Low Temp.
- For SMPS, IP-Board, Adaptor, LED Lighting
- RoHS compliant.
- Halogen-free capacitors are also available.



### SPECIFICATIONS

Item	Characteristics												
Rated Voltage Range	160~500 V <sub>DC</sub>												
Operating Temperature Range	-40 ~ +105°C												
Capacitance Tolerance	±20%(M) (at 20°C, 120Hz)												
Leakage Current	<table border="1"> <thead> <tr> <th>C · V</th> <th>Time</th> <th>After 1 minute</th> <th>After 5 minutes</th> </tr> </thead> <tbody> <tr> <td>≤ 1000</td> <td></td> <td>I = 0.1CV + 40</td> <td>I = 0.03CV + 15</td> </tr> <tr> <td>&gt; 1000</td> <td></td> <td>I = 0.04CV + 100</td> <td>I = 0.02CV + 25</td> </tr> </tbody> </table> <p>Where, I: Max. Leakage current(µA) C: Nominal capacitance(µF) V: Rated voltage(V<sub>DC</sub>) (at 20°C)</p>	C · V	Time	After 1 minute	After 5 minutes	≤ 1000		I = 0.1CV + 40	I = 0.03CV + 15	> 1000		I = 0.04CV + 100	I = 0.02CV + 25
C · V	Time	After 1 minute	After 5 minutes										
≤ 1000		I = 0.1CV + 40	I = 0.03CV + 15										
> 1000		I = 0.04CV + 100	I = 0.02CV + 25										
Dissipation Factor(Tanδ)	<table border="1"> <thead> <tr> <th>Rated Voltage(V<sub>DC</sub>)</th> <th>160~250</th> <th>350~500</th> </tr> </thead> <tbody> <tr> <td>Tanδ(Max.)</td> <td>0.20</td> <td>0.24</td> </tr> </tbody> </table> <p>(at 20°C, 120Hz)</p>	Rated Voltage(V <sub>DC</sub> )	160~250	350~500	Tanδ(Max.)	0.20	0.24						
Rated Voltage(V <sub>DC</sub> )	160~250	350~500											
Tanδ(Max.)	0.20	0.24											
Temperature Characteristics (Max. Impedance ratio)	<table border="1"> <thead> <tr> <th>Rated Voltage(V<sub>DC</sub>)</th> <th>160~500</th> </tr> </thead> <tbody> <tr> <td>Z(-25°C)/Z(20°C)</td> <td>3</td> </tr> <tr> <td>Z(-40°C)/Z(20°C)</td> <td>6</td> </tr> </tbody> </table> <p>(at 120Hz)</p>	Rated Voltage(V <sub>DC</sub> )	160~500	Z(-25°C)/Z(20°C)	3	Z(-40°C)/Z(20°C)	6						
Rated Voltage(V <sub>DC</sub> )	160~500												
Z(-25°C)/Z(20°C)	3												
Z(-40°C)/Z(20°C)	6												
Load Life	<p>The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage with the rated ripple current is applied (the peak voltage shall not exceed the rated voltage) for 12,000 hours at 105°C. (where 10,000 hours for ø10)</p> <p>Capacitance change ≤ ±20 % of the initial value            Tanδ ≤ 200 % of the initial specified value            Leakage current ≤ The initial specified value</p>												
Shelf Life	<p>The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied. The rated voltage shall be applied to the capacitors for a minimum of 30 minutes, at least 24 hours and not more than 48 hours before the measurements.</p> <p>Capacitance change ≤ ±20 % of the initial value            Tanδ ≤ 200 % of the initial specified value            Leakage current ≤ 500 % of the initial specified value</p>												
Others	Satisfied characteristics KS C IEC 60384-4												

### DIMENSIONS OF NBD Series

Unit(mm)

Marking : DARK BLUE SLEEVE, SILVER INK

øD	10	12.5	16	18	20	22
ød	0.6	0.6	0.8	0.8	0.8	0.8
F	5.0	5.0	7.5	7.5	7.5	10.0
øD'	øD + 0.5 max.					
L'	L + 2.0 max.					

※ ø10 x 12L, L' ≤ L+1.5

RATINGS OF NBD Series

V <sub>dc</sub>	160		200		250		350		
μF	Items	∅ D × L (mm)	Rated Ripple Current (mA <sub>rms</sub> /105°C, 120Hz)	∅ D × L (mm)	Rated Ripple Current (mA <sub>rms</sub> /105°C, 120Hz)	∅ D × L (mm)	Rated Ripple Current (mA <sub>rms</sub> /105°C, 120Hz)	∅ D × L (mm)	Rated Ripple Current (mA <sub>rms</sub> /105°C, 120Hz)
10					10 x 12	180	10 x 12	168	
					10 x 12.5	180	10 x 12.5	168	
					10 x 16	204	10 x 16	176	
15					10 x 12	204	10 x 20	228	
					10 x 12.5	204			
22	10 x 12	286	10 x 12	276	10 x 16	278	12.5 x 20	343	
	10 x 12.5	286	10 x 12.5	276					
	10 x 16	335	10 x 16	290					
27	10 x 12	330	10 x 16	315	10 x 20	327	12.5 x 20	362	
	10 x 12.5	330							
	10 x 16	368							
33	10 x 16	360	10 x 20	373	12.5 x 20	391	12.5 x 20	369	
39	10 x 16	365	10 x 20	405	12.5 x 20	429	12.5 x 25	406	
47	10 x 20	436	10 x 20	436	12.5 x 20	494	12.5 x 30	521	
			12.5 x 20	494					
			12.5 x 20	595					
68	10 x 20	515	12.5 x 20	595	12.5 x 25	665	16 x 25	699	
			12.5 x 25	665					
			12.5 x 25	711					
82	10 x 25	575	12.5 x 25	711	12.5 x 30	782	18 x 25	794	
	12.5 x 20	575	16 x 20	711					
100	12.5 x 20	650	12.5 x 30	835	16 x 25	828	18 x 31.5	944	
			16 x 25	835					
120	10 x 33	745	12.5 x 35	965	16 x 25	907	18 x 35.5	1067	
	12.5 x 25	745	16 x 25	927					
150	16 x 25	935	16 x 25	953	18 x 25	1042	18 x 35.5	1197	
180	16 x 25	1029	16 x 31.5	1080	18 x 31.5	1169	18 x 40	1336	
220	16 x 31.5	1118	18 x 31.5	1310	18 x 31.5	1271			
	18 x 25	1118							
270	16 x 35.5	1271	18 x 35.5	1461					
330	16 x 40	1451	18 x 40	1588					
	18 x 31.5	1422							
470	18 x 40	1780							

V <sub>dc</sub>	400		420		450		500		
μF	Items	∅ D × L (mm)	Rated Ripple Current (mA <sub>rms</sub> /105°C, 120Hz)	∅ D × L (mm)	Rated Ripple Current (mA <sub>rms</sub> /105°C, 120Hz)	∅ D × L (mm)	Rated Ripple Current (mA <sub>rms</sub> /105°C, 120Hz)	∅ D × L (mm)	Rated Ripple Current (mA <sub>rms</sub> /105°C, 120Hz)
6.8							10 x 16	125	
8.2	10 x 12	152	10 x 16	130	10 x 16	130	10 x 20	158	
	10 x 12.5	152							
10	10 x 16	168	10 x 20	160	10 x 20	160	12.5 x 20	185	
22	12.5 x 20	343	12.5 x 20	260	12.5 x 25	285	12.5 x 30	290	
27	12.5 x 20	362	12.5 x 20	288	12.5 x 25	325	12.5 x 40	368	
33	12.5 x 25	397	12.5 x 30	385	12.5 x 30	385	12.5 x 45	415	
			16 x 20	390	16 x 20	390	16 x 25	395	
			12.5 x 25	406	12.5 x 35	428	12.5 x 35	428	12.5 x 50
39	12.5 x 30	437	16 x 25	450	16 x 25	450	16 x 31.5	460	
47	12.5 x 35	533	12.5 x 40	520	12.5 x 40	520	16 x 35.5	525	
	16 x 25	554	16 x 25	520	16 x 25	520	18 x 31.5	525	
68	12.5 x 40	635	18 x 25	620	18 x 25	620	16 x 45	700	
	18 x 25	725			18 x 31.5	660	18 x 35.5	685	
82	18 x 31.5	889	18 x 25	678	16 x 40	730	16 x 50	760	
			18 x 31.5	730	18 x 31.5	730	18 x 40	745	
100	18 x 31.5	944	16 x 45	860	16 x 45	855	18 x 45	900	
	18 x 35.5	1,010	18 x 35.5	860	18 x 35.5	855	20 x 40	900	
120	18 x 35.5	1,067	16 x 50	950	16 x 50	950	18 x 50	1050	
	18 x 40	1,159	18 x 40	950	18 x 40	950			
150	18 x 40	1,296	16 x 50	1,150					
			18 x 45	1,150					
180	18 x 45	1,372							
	20 x 40	1,372							

RATED RIPPLE CURRENT MULTIPLIERS

Frequency Multipliers

Cap. (μF)	Freq. (Hz)	120	1k	10k	50k	100k
6.8~82		1.00	1.75	2.25	2.35	2.50
100~470		1.00	1.67	2.05	2.15	2.25