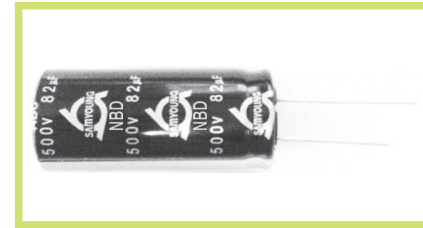
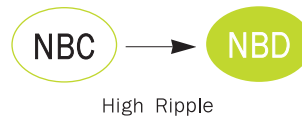


NBD Series

• 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 _{DC}											
Operating Temperature Range	-40 ~ +105℃											
Capacitance Tolerance	±20%(M) (at 20℃, 120Hz)											
Leakage Current	<table><tr><td> C · V Time </td><td>After 1 minute</td><td>After 5 minutes</td></tr><tr><td>≤ 1000</td><td>I = 0.1CV + 40</td><td>I = 0.03CV + 15</td></tr><tr><td>> 1000</td><td>I = 0.04CV + 100</td><td>I = 0.02CV + 25</td></tr></table> Where, I:Max. Leakage current(μA) C:Nominal capacitance(μF) V:Rated voltage(V_{DC}) (at 20℃)	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><tr><td>Rated Voltage(V_{DC})</td><td>160~250</td><td>350~500</td></tr><tr><td>Tanδ(Max.)</td><td>0.20</td><td>0.24</td></tr></table> (at 20℃, 120Hz)	Rated Voltage(V _{DC})	160~250	350~500	Tanδ(Max.)	0.20	0.24					
Rated Voltage(V _{DC})	160~250	350~500										
Tanδ(Max.)	0.20	0.24										
Temperature Characteristics (Max. Impedance ratio)	<table><tr><td>Rated Voltage(V_{DC})</td><td>160~500</td></tr><tr><td>Z(- 25℃)/Z(20℃)</td><td>3</td></tr><tr><td>Z(- 40℃)/Z(20℃)</td><td>6</td></tr></table> (at 120Hz)	Rated Voltage(V _{DC})	160~500	Z(- 25℃)/Z(20℃)	3	Z(- 40℃)/Z(20℃)	6					
Rated Voltage(V _{DC})	160~500											
Z(- 25℃)/Z(20℃)	3											
Z(- 40℃)/Z(20℃)	6											
Load Life	The following specifications shall be satisfied when the capacitors are restored to 20℃ 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℃. (where 10,000 hours for Ø10) Capacitance change ≤ ±20 % of the initial value Tanδ ≤ 200 % of the initial specified value Leakage current ≤ The initial specified value											
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ 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. Capacitance change ≤ ±20 % of the initial value Tanδ ≤ 200 % of the initial specified value Leakage current ≤ 500 % of the initial specified value											
Others	Satisfied characteristics KS C IEC 60384-4											

DIMENSIONS OF NBD Series

Unit(mm)

Technical drawing of a capacitor showing side and end views with dimensions:

- Side View:**
 - Safety vent:** Indicated by a dashed line and an arrow.
 - Sleeve:** Indicated by a dashed line and an arrow.
 - Dimensions:**
 - $\varnothing D'$ (Outer diameter)
 - L' (Length)
 - 15min. (Distance from sleeve to terminal)
 - 4min. (Distance from terminal to end)
 - $\varnothing d \pm 0.05$ (Terminal diameter)
- End Views:**
 - Left End View:**
 - $\varnothing 10$ (Diameter)
 - $F \pm 0.5$ (Terminal spacing)
 - Middle End View:**
 - $\varnothing 12.5$ (Diameter)
 - $F \pm 0.5$ (Terminal spacing)
 - Right End View:**
 - $\varnothing 20$ (Diameter)
 - $F \pm 0.5$ (Terminal spacing)

Marking : DARK BLUE SLEEVE, SILVER INK

$\varnothing D$	10	12.5	16	18	20	22
$\varnothing d$	0.6	0.6	0.8	0.8	0.8	1.0
F	5.0	5.0	7.5	7.5	7.5	10.0
$\varnothing D'$	$\varnothing D + 0.5 \text{ max.}$					
L'	$L + 2.0 \text{ max.}$					

※ $\varnothing 10 \times 12L$, $L' \leq L + 1.5$



MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

RATINGS OF NBD Series

Vdc	160		200		250		350	
Items μF	ø D×L(mm)	Rated Ripple Current (mAmps/105°C, 120Hz)	ø D×L(mm)	Rated Ripple Current (mAmps/105°C, 120Hz)	ø D×L(mm)	Rated Ripple Current (mAmps/105°C, 120Hz)	ø D×L(mm)	Rated Ripple Current (mAmps/105°C, 120Hz)
10					10 x 12	180	10 x 12	168
					10 x 12.5	180	10 x 12.5	168
15					10 x 12	204	10 x 16	176
					10 x 12.5	204	10 x 20	228
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				
68	10 x 20	515	12.5 x 20	595	12.5 x 25	665	16 x 25	699
			12.5 x 25	665				
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						

Vdc	400		420		450		500	
Items μF	ø D×L(mm)	Rated Ripple Current (mAmps/105°C, 120Hz)	ø D×L(mm)	Rated Ripple Current (mAmps/105°C, 120Hz)	ø D×L(mm)	Rated Ripple Current (mAmps/105°C, 120Hz)	ø D×L(mm)	Rated Ripple Current (mAmps/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
39	12.5 x 25	406	12.5 x 35	428	12.5 x 35	428	12.5 x 50	470
	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				
180	18 x 45	1,372	18 x 45	1,150				
	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