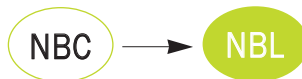


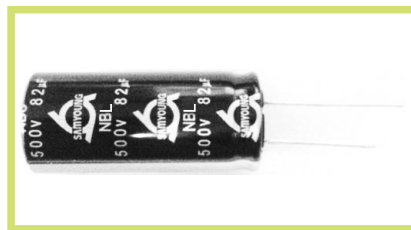
## NBL Series

• 105°C 15,000~20,000Hrs 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.



Long Life



• AEC-Q200 compliant : Please contact us for more details, test data, information.

## 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											
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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 20,000 hours at 105°C. (where 15,000 hours for ø10, ø12.5)</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 NBL 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	1.0
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 NBL Series

Vdc	160		200		250		350	
$\mu F$ \ Items	$\phi D \times L$ (mm)	Rated Ripple Current (mAmps/105°C, 120Hz)	$\phi D \times L$ (mm)	Rated Ripple Current (mAmps/105°C, 120Hz)	$\phi D \times L$ (mm)	Rated Ripple Current (mAmps/105°C, 120Hz)	$\phi D \times L$ (mm)	Rated Ripple Current (mAmps/105°C, 120Hz)
6.8					10 × 12	119	10 × 12	105
					10 × 12.5	119	10 × 12.5	105
10					10 × 12	160	10 × 16	149
					10 × 12.5	160		
15			10 × 12	150	10 × 16	220	10 × 20	197
			10 × 12.5	150				
22	10 × 12	221	10 × 16	243	10 × 20	240	12.5 × 20	297
	10 × 12.5	221						
	10 × 16	243						
27	10 × 16	264	10 × 20	280	10 × 20	270	12.5 × 20	314
33	10 × 16	270	10 × 20	308	12.5 × 20	323	12.5 × 25	325
39	10 × 20	320	10 × 25	350	12.5 × 20	354	12.5 × 25	352
47	10 × 20	369	10 × 33	450	12.5 × 25	460	12.5 × 30	451
			12.5 × 20	440				
68	10 × 33	480	12.5 × 25	594	12.5 × 30	610	16 × 31.5	623
82	10 × 33	520	12.5 × 30	640	12.5 × 35	680	18 × 25	688
	12.5 × 25	525	16 × 20	616				
100	12.5 × 25	575	12.5 × 35	740	16 × 25	717	18 × 31.5	817
			16 × 25	717				
120	10 × 50	700	12.5 × 40	850	16 × 31.5	804	18 × 35.5	924
	12.5 × 30	670	16 × 25	785				
150	16 × 25	825	16 × 31.5	813	16 × 35.5	902	18 × 40	1,083
180	16 × 25	891	16 × 35.5	951	18 × 31.5	1,012	18 × 45	1,230
220	16 × 31.5	968	18 × 31.5	1,100	18 × 35.5	1,121		
	18 × 25	968						
270	16 × 35.5	1,100	18 × 40	1,290				
330	18 × 31.5	1,231	18 × 45	1,390				
470	18 × 45	1,626						

Vdc	400		420		450		500	
$\mu F$ \ Items	$\phi D \times L$ (mm)	Rated Ripple Current (mAmps/105°C, 120Hz)	$\phi D \times L$ (mm)	Rated Ripple Current (mAmps/105°C, 120Hz)	$\phi D \times L$ (mm)	Rated Ripple Current (mAmps/105°C, 120Hz)	$\phi D \times L$ (mm)	Rated Ripple Current (mAmps/105°C, 120Hz)
3.3							10 × 12	63
							10 × 12.5	63
4.7					10 × 12	76	10 × 16	83
					10 × 12.5	76		
6.8					10 × 16	110	10 × 20	119
8.2	10 × 16	140	10 × 16	113	10 × 20	122	10 × 20	141
10	10 × 16	145	10 × 20	135	10 × 20	135	12.5 × 20	165
22	12.5 × 20	297	12.5 × 25	250	12.5 × 25	250	12.5 × 35	260
27	12.5 × 25	330	12.5 × 25	265	12.5 × 30	280	12.5 × 40	329
33	12.5 × 30	355	12.5 × 30	340	12.5 × 35	360	12.5 × 45	370
			16 × 20	345	16 × 25	361	16 × 31.5	380
39	12.5 × 35	400	12.5 × 35	380	12.5 × 40	400	12.5 × 50	420
			16 × 25	400	16 × 31.5	423	16 × 35.5	434
47	12.5 × 40	485	12.5 × 40	450	12.5 × 50	470	18 × 31.5	468
	16 × 25	480	16 × 25	450	16 × 31.5	478		
68	12.5 × 50	575	18 × 31.5	580	18 × 31.5	580	18 × 40	630
	16 × 35.5	627						
82	16 × 40	770	16 × 40	620	18 × 35.5	650	18 × 45	685
100	18 × 35.5	875	18 × 35.5	770	18 × 40	794	22 × 40	800
120	18 × 40	1,003	18 × 45	900	18 × 50	940	22 × 50	960
150	18 × 50	1,192						

## RATED RIPPLE CURRENT MULTIPLIERS

### Frequency Multipliers

Cap. ( $\mu F$ ) \ Freq.(Hz)	120	1k	10k	50k	100k
3.3~82	1.00	1.75	2.25	2.35	2.50
100~470	1.00	1.67	2.05	2.15	2.25