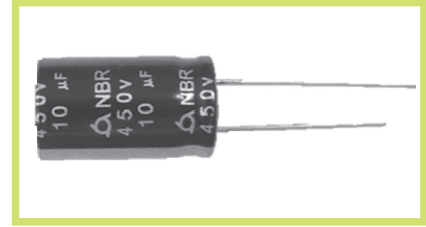
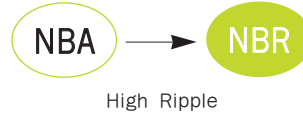


## NBR Series

• 105°C 3,000~5,000Hrs 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>	550 V <sub>dc</sub>									
Operating Temperature Range	-40 ~ +105°C	-25 ~ +105°C									
Capacitance Tolerance	±20%(M) (at 20°C, 120Hz)										
Leakage Current	<table border="1"> <thead> <tr> <th>C · V \ Time</th> <th>After 1 minute</th> <th>After 5 minutes</th> </tr> </thead> <tbody> <tr> <td>≤ 1000</td> <td>I = 0.1CV + 40</td> <td>I = 0.03CV + 15</td> </tr> <tr> <td>&gt; 1000</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>350~550</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	350~550	Tanδ(Max.)	0.20	0.24			
Rated Voltage(V <sub>dc</sub> )	160~250	350~550									
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> <th>550</th> </tr> </thead> <tbody> <tr> <td>Z(-25°C)/Z(+20°C)</td> <td>3</td> <td>6</td> </tr> <tr> <td>Z(-40°C)/Z(+20°C)</td> <td>6</td> <td>-</td> </tr> </tbody> </table> <p>(at 120Hz)</p>		Rated Voltage(V <sub>dc</sub> )	160~500	550	Z(-25°C)/Z(+20°C)	3	6	Z(-40°C)/Z(+20°C)	6	-
Rated Voltage(V <sub>dc</sub> )	160~500	550									
Z(-25°C)/Z(+20°C)	3	6									
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 5,000 hours at 105°C. (where 3,000hour for ø6.3)</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 then 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 NBR Series

Unit(mm)

Marking : DARK BLUE SLEEVE, SILVER INK

	6.3	8	10	12.5	16	18	20	22
øD	6.3	8	10	12.5	16	18	20	22
ød	0.5	0.6	0.6	0.6	0.8	0.8	0.8	0.8
F	2.5	3.5	0.5	5.0	7.5	7.5	7.5	10.0
øD'	øD + 0.5 max.							
L'	L + 1.5 max.				L + 2.0 max.			

※ ø10 x 12L, L' ≤ L + 1.5  
 ※ ø16 x 60L, L' ≤ L + 3.0



RATINGS OF NBR Series

Vdc		160		200		250		350	
Items	μF	∅ D×L(mm)	Rated Ripple Current (mArms/105°C, 120Hz)	∅ D×L(mm)	Rated Ripple Current (mArms/105°C, 120Hz)	∅ D×L(mm)	Rated Ripple Current (mArms/105°C, 120Hz)	∅ D×L(mm)	Rated Ripple Current (mArms/105°C, 120Hz)
4.7				8 × 11.5	85	8 × 15	88	8 × 11.5	102
6.8		8 × 11.5	99	8 × 15	113	8 × 20	117	8 × 15	111
						10 × 12	149		
						10 × 12.5	131		
10		8 × 15	133	8 × 11.5	124	10 × 12	176	10 × 12	160
				8 × 20	154	10 × 12.5	176	10 × 16	168
15		8 × 15	163	8 × 15	163	10 × 12	191	10 × 20	217
						10 × 12.5	191		
22		10 × 12	260	10 × 12	243	10 × 16	253	12.5 × 20	327
		10 × 12.5	260	10 × 12.5	243				
		10 × 16	316	10 × 16	267				
27		10 × 12	300	10 × 16	291	10 × 20	297	12.5 × 20	345
		10 × 12.5	300						
		10 × 16	343						
33		10 × 16	345	10 × 20	339	12.5 × 20	356	12.5 × 20	351
39		10 × 16	350	10 × 20	369	12.5 × 20	390	12.5 × 25	387
47		10 × 20	405	10 × 20	405	12.5 × 20	484	12.5 × 30	496
				12.5 × 20	484				
68		10 × 20	484	12.5 × 20	541	12.5 × 25	653	16 × 25	666
				12.5 × 25	653				
				12.5 × 25	678				
82		10 × 25	545	12.5 × 25	678	12.5 × 30	726	18 × 25	756
		12.5 × 20	545	16 × 20	678				
100		12.5 × 20	617	12.5 × 30	770	16 × 25	789	18 × 31.5	899
				16 × 25	789				
120		10 × 33	702	12.5 × 35	897	16 × 25	864	18 × 35.5	1016
		12.5 × 25	702	16 × 25	864				
150		16 × 25	908	16 × 25	920	18 × 25	992	18 × 35.5	1140
180		16 × 25	980	16 × 31.5	1029	18 × 31.5	1113	18 × 40	1272
220		16 × 31.5	1065	18 × 31.5	1210	18 × 31.5	1210		
		18 × 25	1065						
270		16 × 35.5	1210	18 × 35.5	1392				
330		16 × 40	1382	18 × 40	1513				
		18 × 31.5	1354						
470		18 × 40	1695						

Vdc		400		420		450		500	
Items	μF	∅ D×L(mm)	Rated Ripple Current (mArms/105°C, 120Hz)	∅ D×L(mm)	Rated Ripple Current (mArms/105°C, 120Hz)	∅ D×L(mm)	Rated Ripple Current (mArms/105°C, 120Hz)	∅ D×L(mm)	Rated Ripple Current (mArms/105°C, 120Hz)
1		6.3 × 11	24	6.3 × 11	19	6.3 × 11	19		
1.5		6.3 × 15	35	6.3 × 15	26	6.3 × 15	26		
		8 × 11.5	37	8 × 11.5	29	8 × 11.5	29		
2.2		8 × 11.5	45	8 × 11.5	33	8 × 15	36		
3.3		8 × 11.5	55	8 × 11.5	41	8 × 11.5	41	10 × 12	69
								10 × 12.5	69
4.7		8 × 11.5	66	8 × 11.5	48	10 × 12	84	10 × 12	83
						10 × 12.5	84	10 × 12.5	83
6.8		8 × 15	103	8 × 20	116	8 × 20	116	10 × 16	121
		8 × 20	131	10 × 16	124			10 × 20	155
		10 × 12	145						
		10 × 12.5	145						
10		10 × 16	160	10 × 20	149	10 × 20	149	12.5 × 20	182
22		12.5 × 20	327	12.5 × 20	248	12.5 × 25	275	12.5 × 30	286
27		12.5 × 20	345	12.5 × 20	279	12.5 × 25	292	12.5 × 40	362
				12.5 × 30	374	12.5 × 30	374	12.5 × 45	407
33		12.5 × 25	378	16 × 20	380	16 × 20	380	16 × 25	385
				12.5 × 35	418	12.5 × 35	418	12.5 × 50	462
39		12.5 × 30	416	16 × 25	440	16 × 25	440	16 × 31.5	454
		12.5 × 35	508	12.5 × 40	495	12.5 × 40	495	16 × 35.5	508
47		16 × 25	528	16 × 25	495	16 × 25	495	18 × 31.5	515
		12.5 × 40	605	18 × 25	572	18 × 25	616	16 × 45	693
68		18 × 25	690	18 × 31.5	638	18 × 31.5	649	18 × 35.5	660
				18 × 25	660	16 × 40	715	16 × 50	754
82		18 × 31.5	847	18 × 31.5	715	18 × 31.5	715	18 × 40	737
				18 × 31.5	899	16 × 45	847	16 × 45	847
100		18 × 35.5	962	18 × 35.5	847	18 × 35.5	847	20 × 40	880
								22 × 35	880
120		18 × 35.5	1,016	16 × 50	935	16 × 50	935	18 × 50	1012
		18 × 40	1,104	18 × 40	935	18 × 40	935		
150		18 × 40	1,234	18 × 45	1,100				
				20 × 40	1,100				
180		18 × 45	1,307						
		20 × 40	1,307						

NBR Series

## RATINGS OF NBR Series

Vdc	550	
Items $\mu F$	$\varnothing D \times L$ (mm)	Rated Ripple Current (mA <sub>rms</sub> /105°C, 120Hz)
3.3	10x12	46
	10x12.5	46
4.7	10x16	60
6.8	10x20	78
8.2	10x20	85
10	10x25	102
	12.5x20	104
22	12.5x30	178
27	12.5x35	207
	16x25	207
33	12.5x40	241
	16x31.5	241
	18x25	241
39	12.5x50	281
	16x35.5	281
47	16x40	312
	18x31.5	312
68	16x50	408
	18x40	408
82	16x60	486
	18x50	486

## RATED RIPPLE CURRENT MULTIPLIERS

Frequency Multipliers

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