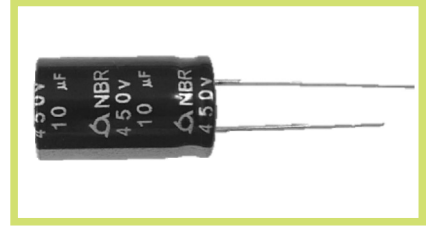
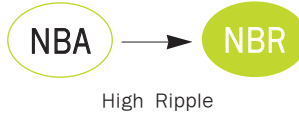


NBR Series

• 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 _{DC}	550 V _{DC}									
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>> 1000</td> <td>I = 0.04CV + 100</td> <td>I = 0.02CV + 25</td> </tr> </tbody> </table>		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									
Where, I:Max. Leakage current(μA) C:Nominal capacitance(μF) V:Rated voltage(V _{DC}) (at 20°C)											
Dissipation Factor(Tanδ)	<table border="1"> <thead> <tr> <th>Rated Voltage(V_{DC})</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>		Rated Voltage(V _{DC})	160~250	350~550	Tanδ(Max.)	0.20	0.24			
	Rated Voltage(V _{DC})	160~250	350~550								
Tanδ(Max.)	0.20	0.24									
(at 20°C, 120Hz)											
Temperature Characteristics (Max. Impedance ratio)	<table border="1"> <thead> <tr> <th>Rated Voltage(V_{DC})</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>		Rated Voltage(V _{DC})	160~500	550	Z(-25°C)/Z(+20°C)	3	6	Z(-40°C)/Z(+20°C)	6	-
	Rated Voltage(V _{DC})	160~500	550								
	Z(-25°C)/Z(+20°C)	3	6								
Z(-40°C)/Z(+20°C)	6	-									
(at 120Hz)											
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 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 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	1.0
F	2.5	3.5	5.0	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

V _{DC} μF	160		200		250		350	
	Items ØD × L(mm)	Rated ripple current (mA _{rms} /105°C, 120Hz)	Items ØD × L(mm)	Rated ripple current (mA _{rms} /105°C, 120Hz)	Items ØD × L(mm)	Rated ripple current (mA _{rms} /105°C, 120Hz)	Items ØD × L(mm)	Rated ripple current (mA _{rms} /105°C, 120Hz)
4.7			8x11.5	85	8x15	88	8x11.5	102
6.8	8x11.5	99	8x15	113	8x20	117	8x15	111
					10x12	149		
					10x12.5	131		
10	8x15	133	8x11.5	124	10x12	176	10x12	160
			8x20	154	10x12.5	176	10x12.5	160
15	8x15	163	8x15	163	10x12	191	10x16	168
					10x12.5	191	10x20	217
22	10x12	260	10x12	243	10x16	253	12.5x20	327
	10x12.5	260	10x12.5	243				
	10x16	316	10x16	267				
27	10x12	300	10x16	291	10x20	297	12.5x20	345
	10x12.5	300						
	10x16	343						
33	10x16	345	10x20	339	12.5x20	356	12.5x20	351
39	10x16	350	10x20	369	12.5x20	390	12.5x25	387
47	10x20	405	10x20	405	12.5x20	484	12.5x30	496
			12.5x20	484				
68	10x20	484	12.5x20	541	12.5x25	653	16x25	666
			12.5x25	653				
82	10x25	545	12.5x25	678	12.5x30	726	18x25	756
	12.5x20	545	16x20	678				
100	12.5x20	617	12.5x30	770	16x25	789	18x31.5	899
			16x25	789				
120	10x33	702	12.5x35	897	16x25	864	18x35.5	1016
	12.5x25	702	16x25	864				
150	16x25	908	16x25	920	18x25	992	18x35.5	1140
180	16x25	980	16x31.5	1029	18x31.5	1113	18x40	1272
220	16x31.5	1065	18x31.5	1210	18x31.5	1210		
	18x25	1065						
270	16x35.5	1210	18x35.5	1392				
330	16x40	1382	18x40	1513				
	18x31.5	1354						
470	18x40	1695						

V _{DC} μF	400		420		450		500	
	Items ØD × L(mm)	Rated ripple current (mA _{rms} /105°C, 120Hz)	Items ØD × L(mm)	Rated ripple current (mA _{rms} /105°C, 120Hz)	Items ØD × L(mm)	Rated ripple current (mA _{rms} /105°C, 120Hz)	Items ØD × L(mm)	Rated ripple current (mA _{rms} /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	10x12	69
							10x12.5	69
4.7	8×11.5	66	8×11.5	48	10x12	84	10x12	83
					10x12.5	84	10x12.5	83
5.6							8x20	88(300/100kHz)
6.8	8x15	103	8x20	116	8×20	116	10×16	121
	8x20	131	10x16	124	10x16	124	10x20	155
10x12	145							
10x12.5	145							
10	10x16	160	10x20	149	10x20	149	12.5x20	182
22	12.5x20	327	12.5x20	248	12.5x25	275	12.5x30	286
27	12.5x20	345	12.5x20	279	12.5x25	292	12.5x40	362
33	12.5x25	378	12.5x30	374	12.5x30	374	12.5x45	407
			16x20	380	16x20	380	16x25	385
39	12.5x25	387	12.5x35	418	12.5x35	418	12.5x50	462
	12.5x30	416	16x25	440	16x25	440	16x31.5	454
47	12.5x35	508	12.5x40	495	12.5x40	495	16x35.5	508
	16x25	528	16x25	495	16x25	495	18x31.5	515
68	12.5x40	605	18x25	572	18x25	616	16x45	693
	18x25	690	18x31.5	638	18x31.5	649	18x35.5	660
82	18x31.5	847	18x25	660	16x40	715	16x50	754
			18x31.5	715	18x31.5	715	18x40	737
100	18x31.5	899	16x45	847	16x45	847	18x45	880
	18x35.5	962	18x35.5	847	18x35.5	847	20x40	880
120	18x35.5	1016	16x50	935	16x50	935	22x35	880
	18x40	1104	18x40	935	18x40	935	18x50	1012
150	18x40	1234	18x45	1100				
			20x40	1100				
180	18x45	1307						
	20x40	1307						

RATINGS OF NBR Series

V _{DC}	550	
Items μF	∅ D × L (mm)	Rated Ripple Current (mA _{RMS} /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. (μF) \ 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