

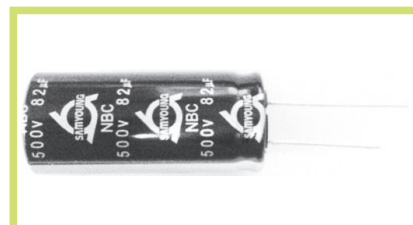
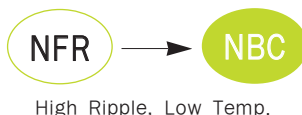


# MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

## NBC Series

• 105°C 5,000~12,000Hrs 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						
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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						
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Z(-25°C)/Z(20°C)	3												
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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 5,000 hours for ø6.3, 8,000 hours for ø8, 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 NBC Series

Unit(mm)

Marking : DARK BLUE SLEEVE, SILVER INK

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	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

RATINGS OF NBC Series

V <sub>DC</sub> μF	160		200		250		350	
	Items ∅ 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	77	8×15	80	8×11.5	93
6.8	8×11.5	90	8×15	103	8×20	106	8×15	101
					10×12	119		
					10×12.5	119		
10	8×15	121	8×11.5	113	10×12	160	10×12	153
			8×20	140	10×12.5	160	10×12.5	153
15	8×15	148	8×15	148	10×12	174	10×20	197
					10×12.5	174		
22	10×12	221	10×12	221	10×16	230	12.5×20	297
	10×12.5	221	10×12.5	221				
	10×16	243	10×16	243				
27	10×12	240	10×16	264	10×20	270	12.5×20	314
	10×12.5	240						
	10×16	264						
33	10×16	270	10×20	308	12.5×20	323	12.5×20	319
39	10×16	292	10×20	336	12.5×20	354	12.5×25	352
47	10×20	369	10×20	369	12.5×20	440	12.5×30	451
			12.5×20	440				
68	10×20	400	12.5×20	492	12.5×25	594	16×25	605
			12.5×25	594				
82	10×25	455	12.5×25	616	12.5×30	660	18×25	688
	12.5×20	495	16×20	616				
100	12.5×20	561	12.5×30	700	16×25	717	18×31.5	817
			16×25	717				
120	10×33	638	12.5×35	815	16×25	785	18×35.5	924
	12.5×25	638	16×25	785				
150	16×25	825	16×25	836	18×25	902	18×35.5	1,036
180	16×25	891	16×31.5	935	18×31.5	1,012	18×40	1,155
220	16×31.5	968	18×31.5	1,100	18×31.5	1,100		
	18×25	968						
270	16×35.5	1,100	18×35.5	1,265				
330	16×40	1,256	18×40	1,375				
	18×31.5	1,231						
470	18×40	1,541						

V <sub>DC</sub> μF	400		420		450		500	
	Items ∅ 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	22	6.3×11	17	6.3×11	17		
1.5	6.3×15	32	6.3×15	24	6.3×15	24		
	8×11.5	34	8×11.5	26	8×11.5	26		
2.2	8×11.5	41	8×11.5	30	8×15	33		
3.3	8×11.5	50	8×11.5	37	8×11.5	37	10×12	63
							10×12.5	63
4.7	8×11.5	60	8×11.5	44	10×12	76	10×12	75
					10×12.5	76	10×12.5	75
6.8	8×15	94	8×20	105	8×20	105	10×16	110
	8×20	119						
8.2	10×12	132	10×16	113	10×16	113	10×20	141
	10×12.5	132						
10	10×16	145	10×20	135	10×20	135	12.5×20	165
22	12.5×20	297	12.5×20	225	12.5×25	250	12.5×30	260
27	12.5×20	314	12.5×20	254	12.5×25	265	12.5×40	329
33	12.5×25	343	12.5×30	340	12.5×30	340	12.5×45	370
			16×20	345	16×20	345	16×25	350
39	12.5×25	352	12.5×35	380	12.5×35	380	12.5×50	420
	12.5×30	378	16×25	400	16×25	400	16×31.5	413
47	12.5×35	462	12.5×40	450	12.5×40	450	16×35.5	462
	16×25	480	16×25	450	16×25	450	18×31.5	468
68	12.5×40	550	18×25	520	18×25	560	16×45	630
	18×25	627	18×31.5	580	18×31.5	590	18×35.5	600
82	18×25	770	18×25	600	16×40	650	16×50	685
	18×31.5	770	18×31.5	650	18×31.5	650	18×40	670
100	18×31.5	817	16×45	770	16×45	770	18×45	800
	18×35.5	875	18×35.5	770	18×35.5	770	20×40	800
120	18×35.5	924	16×50	850	16×50	850	18×50	920
	18×40	1,003	18×40	850	18×40	850		
150	18×40	1,122	18×45	1,000				
180	18×45	1,188	20×40	1,000				
	20×40	1,188						

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

NBC Series