

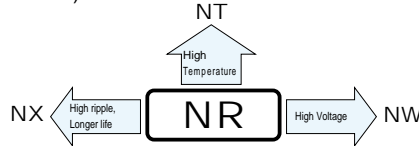
ALUMINUM ELECTROLYTIC CAPACITORS



NR Screw Terminal Type
series



- Load life of 5000 hours application of rated ripple current at 85°C .
- Extended range up to $\phi 100 \times 250L$ size.
- Available for adapted to the RoHS directive (2002/95/EC).

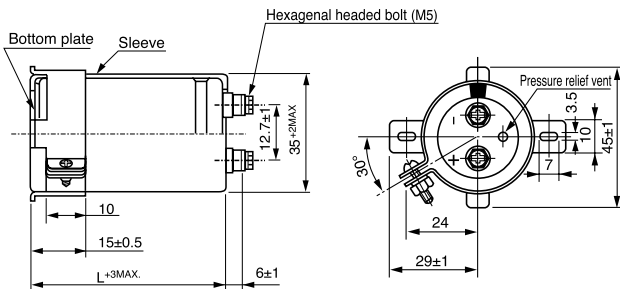


Specifications

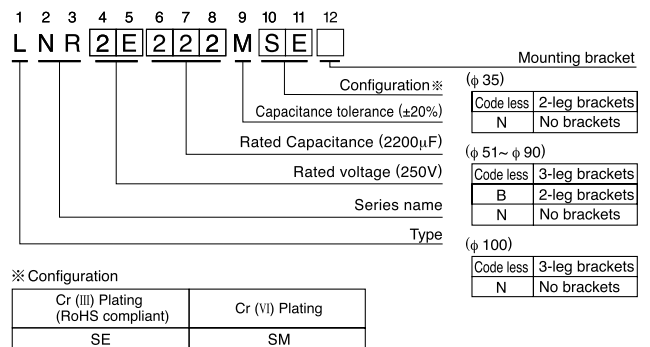
Item	Performance Characteristics																																																																																																																																
Category Temperature Range	- 40 ~ +85°C (10~100V) , - 25 ~ +85°C (160~250V)																																																																																																																																
Rated Voltage Range	10 ~ 250V																																																																																																																																
Rated Capacitance Range	1000 ~ 2200000µF																																																																																																																																
Capacitance Tolerance	± 20% at 120Hz, 20°C																																																																																																																																
Leakage Current	After 5 minutes' application of rated voltage, leakage current is not more than $3\sqrt{CV}$ (µA) or 5 mA, whichever is smaller (at 20°C) . [C:Rated Capacitance (µF) , V:Voltage(V)]																																																																																																																																
tan δ (MAX)	<table border="1"> <thead> <tr> <th rowspan="2">φD</th> <th rowspan="2">L</th> <th colspan="10">V</th> <th rowspan="2">Measurement frequency: 120Hz, Temperature : 20°C</th> </tr> <tr> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>80</th> <th>100</th> <th>160-250</th> </tr> </thead> <tbody> <tr> <td rowspan="2">35</td> <td>80~100</td> <td>0.6</td> <td>0.4</td> <td>0.35</td> <td>0.3</td> <td>0.25</td> <td>0.25</td> <td>0.2</td> <td>0.12</td> <td>0.15</td> <td>0.15</td> </tr> <tr> <td>120</td> <td>0.7</td> <td>0.55</td> <td>0.4</td> <td>0.3</td> <td>0.25</td> <td>0.25</td> <td>0.2</td> <td>0.15</td> <td>0.15</td> </tr> <tr> <td rowspan="2">51</td> <td>70~100</td> <td>0.9</td> <td>0.6</td> <td>0.45</td> <td>0.35</td> <td>0.25</td> <td>0.25</td> <td>0.2</td> <td>0.15</td> <td>0.15</td> </tr> <tr> <td>120~140</td> <td>1.0</td> <td>0.8</td> <td>0.5</td> <td>0.4</td> <td>0.3</td> <td>0.25</td> <td>0.2</td> <td>0.15</td> <td>0.15</td> </tr> <tr> <td rowspan="2">63.5</td> <td>100</td> <td>0.9</td> <td>—</td> <td>—</td> <td>0.5</td> <td>0.35</td> <td>0.3</td> <td>0.25</td> <td>—</td> <td>0.2</td> </tr> <tr> <td>120~140</td> <td>1.2</td> <td>0.75</td> <td>0.65</td> <td>—</td> <td>—</td> <td>0.3</td> <td>0.3</td> <td>0.2</td> <td>0.2</td> </tr> <tr> <td rowspan="2">76.2</td> <td>100</td> <td>1.6</td> <td>—</td> <td>—</td> <td>0.65</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>0.2</td> </tr> <tr> <td>120~140</td> <td>1.6</td> <td>1.1</td> <td>0.75</td> <td>0.75</td> <td>0.55</td> <td>0.5</td> <td>0.35</td> <td>0.3</td> <td>0.2</td> </tr> <tr> <td rowspan="2">90</td> <td>140~220</td> <td>2.0</td> <td>1.5</td> <td>1.0</td> <td>0.9</td> <td>0.75</td> <td>0.6</td> <td>0.4</td> <td>0.3</td> <td>0.25</td> </tr> <tr> <td>250</td> <td>2.4</td> <td>1.5</td> <td>1.0</td> <td>0.9</td> <td>0.75</td> <td>0.6</td> <td>0.4</td> <td>0.3</td> <td>0.25</td> </tr> </tbody> </table>	φD	L	V										Measurement frequency: 120Hz, Temperature : 20°C	10	16	25	35	50	63	80	100	160-250	35	80~100	0.6	0.4	0.35	0.3	0.25	0.25	0.2	0.12	0.15	0.15	120	0.7	0.55	0.4	0.3	0.25	0.25	0.2	0.15	0.15	51	70~100	0.9	0.6	0.45	0.35	0.25	0.25	0.2	0.15	0.15	120~140	1.0	0.8	0.5	0.4	0.3	0.25	0.2	0.15	0.15	63.5	100	0.9	—	—	0.5	0.35	0.3	0.25	—	0.2	120~140	1.2	0.75	0.65	—	—	0.3	0.3	0.2	0.2	76.2	100	1.6	—	—	0.65	—	—	—	—	0.2	120~140	1.6	1.1	0.75	0.75	0.55	0.5	0.35	0.3	0.2	90	140~220	2.0	1.5	1.0	0.9	0.75	0.6	0.4	0.3	0.25	250	2.4	1.5	1.0	0.9	0.75	0.6	0.4	0.3	0.25
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Stability at Low Temperature	Measurement frequency : 120Hz																																																																																																																																
	Rated voltage(V)	10~100 160~250																																																																																																																															
	Impedance ratio ZT/Z20(MAX.)	Z - 40°C / Z+20°C Z - 25°C / Z+20°C																																																																																																																															
Endurance	After an application of DC voltage (in the range of rated DC voltage even after over-lapping the specified rated ripple current) for 5000 hours at 85°C, capacitors meet the characteristic requirements listed at right.	Capacitance change	Within ±15% of initial value																																																																																																																														
		tan δ	175% or less of initial specified value																																																																																																																														
		Leakage current	Initial specified value or less																																																																																																																														
Shelf Life	After storing the capacitors under no load at 85°C for 1000 hours, and after performing voltage treatment based on JIS C 5101-4 clause 4.1 at 20°C, they will meet the requirements listed at right.	Capacitance change	Within ±20% of initial value																																																																																																																														
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		Leakage current	Initial specified value or less																																																																																																																														
Marking	Printed with black color letter on light blue sleeve.																																																																																																																																

Drawing

φ35 Screw terminal type



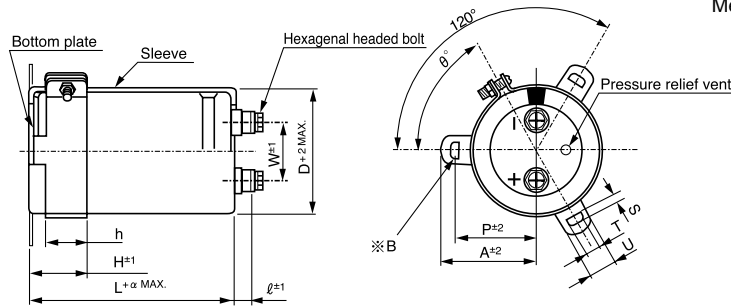
Type numbering system (Example : 250V 2200µF)



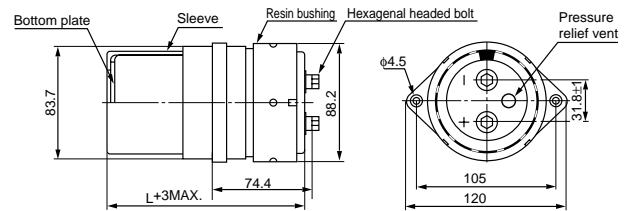
● Dimension table in next page.

NR series

Screw terminal types for $\phi 51$ and larger



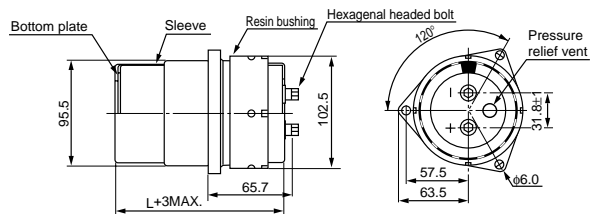
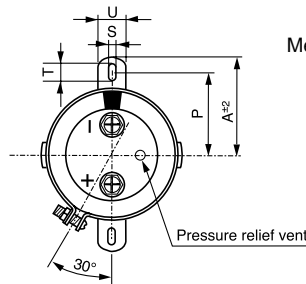
Method to mount resin bushing ($\phi 76.2$) (Apply to L=150 or more)



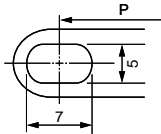
Note:

Capacitors with body dia. $\phi 51$ or larger are furnished with 3-leg brackets shown above as standard.
If these capacitors are preferred to have 2-leg brackets as shown right, add "B" in the 12th digit of type numbering system.

Method to mount resin bushing ($\phi 90$) (Apply to L=150 or more)



※B
3-leg brackets for $\phi 90$ capacitors have different hole shapes from the ordinary ones as illustrated below.



● Dimension of terminal pitch (W) and length (ℓ) and Nominal dia. of bolt (mm)

ϕD	W	ℓ	α	Nominal dia. of bolt
51	22.0	6	3	M5
63.5	28.6	6	3	M5
76.2	31.8	6	3	M5
90	31.8	6	3	M5
100	41.5	10	4	M8

● Dimensions of mounting bracket (mm)

Symbol	Leg Shape ϕD	3-Legs					2-Legs			
		51	63.5	76.2	90	100	51	63.5	76.2	90
P		32.5	38.1	44.5	50.8	56.3	33.2	40.5	46.5	53
A		38.5	43	49.2	58.5	62	40	46.5	53	59
T		7.5	8.0	7.0	8.0	8.0	6.0	7.0	6.0	6.0
S		5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5
U		12	14	14	18	16	14	14	14	14
θ°		60	60	60	60	60	30	30	30	30
H		20	25	30	35	36	25	35	35	35
h		15	20	24	25	30	15	20	20	20

■ Dimensions

V(Code)		10V (1A)			16V (1C)			25V (1E)		
Surge		13V			20V			32V		
Cap. (μF)	Code	Case size	$\phi D \times L$ (mm)	Rated ripple	Case size	$\phi D \times L$ (mm)	Rated ripple	Case size	$\phi D \times L$ (mm)	Rated ripple
33000	333								35×80	6.2
47000	473		35×80	6.0		35×80	6.4		35×100	8.2
68000	683		35×80	7.2		35×100	7.9		35×120	9.4
100000	104		35×100	8.8		35×120	10.6		51×100	12.0
150000	154		51×80	10.7		51×100	11.5		51×120	15.3
220000	224		51×100	13.0		51×120	15.6		63.5×120	18.9
330000	334		63.5×100	15.9		63.5×120	25.1		76.2×120	24.8
470000	474		63.5×120	19.0		76.2×120	30.5		90×170	30.8
680000	684		76.2×120	22.8		90×170	33.0		90×220	33.3
1000000	105		90×170	27.7		90×220	36.0		100×250	36.4
1500000	155		90×220	33.9		100×250	39.7			
2200000	225		100×250	41.1						

Rated Ripple (Arms) at 85°C 120Hz

ALUMINUM ELECTROLYTIC CAPACITORS

NR series

■ Dimensions

V(Code)		35V (1V)			50V (1H)			63V (1J)		
Surge		44V			63V			79V		
Cap.(μF)	Code	Case size	φD × L (mm)	Rated ripple	Case size	φD × L (mm)	Rated ripple	Case size	φD × L (mm)	Rated ripple
10000	103							35×80		4.1
15000	153				35×80		5.4	35×100		5.5
22000	223				35×100		6.1	35×120		7.1
33000	333	35×80		6.2	51×70		7.0	51×80		8.8
47000	473	35×120		8.2	51×90		8.6	51×120		11.7
68000	683	51×80		9.3	51×100		11.0	63.5×100		15.0
100000	104	51×120		13.6	63.5×100		14.2	63.5×140		20.8
150000	154	63.5×100		14.5	76.2×120		18.6	76.2×140		26.0
220000	224	76.2×100		16.8	90×140		20.3	90×170		28.3
330000	334	76.2×140		24.8	90×170		25.3	90×220		31.2
470000	474	90×170		32.6	90×220		33.2	100×250		33.6
680000	684	90×220		35.2	100×250		36.0			
1000000	105	100×250		38.5						

V(Code)		80V (1K)			100V (2A)			160V (2C)		
Surge		100V			125V			200V		
Cap.(μF)	Code	Case size	φD × L (mm)	Rated ripple	Case size	φD × L (mm)	Rated ripple	Case size	φD × L (mm)	Rated ripple
2200	222							35×80		3.2
3300	332							35×120		4.7
4700	472				35×80		3.8	51×80		5.0
6800	682				35×100		4.5	51×100		6.4
10000	103	35×80		4.2	35×120		5.3	63.5×100		9.1
15000	153	35×120		6.0	51×80		6.0	76.2×100		12.0
22000	223	51×80		6.5	51×100		6.8	76.2×140		16.9
33000	333	51×120		9.2	51×140		10.0	90×140		19.2
47000	473	63.5×100		12.7	63.5×140		14.4	90×170		20.6
68000	683	63.5×140		15.5	76.2×140		18.2	90×220		22.3
100000	104	76.2×140		21.3	90×170		22.1	100×250		24.4
150000	154	90×170		26.5	90×220		27.0			
220000	224	90×220		28.9	100×250		32.7			
330000	334	100×250		31.8						

V(Code)		200V (2D)			250V (2E)		
Surge		250V			300V		
Cap.(μF)	Code	Case size	φD × L (mm)	Rated ripple	Case size	φD × L (mm)	Rated ripple
1000	102				35×80		2.4
1500	152	35×80		2.9	35×100		3.0
2200	222	35×100		3.5	51×80		4.0
3300	332	51×80		4.8	51×100		5.4
4700	472	51×100		6.3	63.5×100		7.3
6800	682	51×140		7.3	63.5×120		8.9
10000	103	63.5×120		9.8	76.2×120		11.8
15000	153	76.2×120		13.0	90×140		16.4
22000	223	90×140		15.9	90×170		17.9
33000	333	90×170		19.5	90×220		19.7
47000	473	90×220		20.9	100×250		21.2
68000	683	100×250		22.6			

Rated Ripple (Arms) at 85°C 120Hz

● Frequency coefficient of rated ripple current

Frequency (Hz)	60	120	360	1k	10k~
Coeff. 10~100V	0.90	1.00	1.08	1.15	1.15
160~250V	0.88	1.00	1.08	1.15	1.20