

# Non-Polar Aluminum Electrolytic Capacitors

NNR Series

## RADIAL LEADS NON-POLARIZED ALUMINUM ELECTROLYTIC CAPACITORS

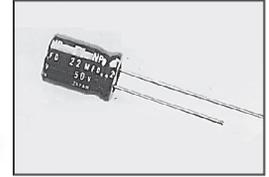
### FEATURES

- DESIGNED FOR APPLICATIONS WITH REVERSIBLE POLARITY
- LOW AC VOLTAGE CAN BE SUPERIMPOSED WITHIN THE LIMITED RIPPLE CURRENT

**RoHS  
Compliant**

includes all homogeneous materials

\*See Part Number System for Details



### CHARACTERISTICS

Rated Voltage Range	10 ~ 100Vdc						
Capacitance Range	0.47 ~ 1,000 $\mu$ F						
Operating Temperature Range	-40 ~ +85°C						
Capacitance Tolerance	$\pm$ 10% (K), $\pm$ 20%(M)						
Max. Leakage Current After 5 minutes At +20°C	0.03CV +8 $\mu$ A						
Surge Voltage & Max. Tan $\delta$ @ 120Hz/+20°C	W.V. (Vdc)	10	16	25	35	50	100
	S.V. (Vdc)	13	20	32	44	63	125
	Tan $\delta$	0.20	0.18	0.14	0.13	0.09	0.10
Low Temperature Stability (Impedance Ratio @ 120Hz)	Z-25°C/Z+20°C	3	2	2	2	2	2
	Z-40°C/Z+20°C	8	6	4	3	3	3
Load Life Test at Rated W.V. & +85°C 2,000 Hours (Polarity Shall Be Reversed Every 250 Hours)	Capacitance Change	Within $\pm$ 25% of initial measured value					
	Tan $\delta$	Less than 200% of specified maximum value					
	Leakage Current	Less than specified maximum value					

### MAXIMUM PERMISSIBLE RIPPLE CURRENT (mA rms AT 120HZ AND 85°C)

Cap. ( $\mu$ F)	Working Voltage (Vdc)					
	10	16	25	35	50	100
0.47	-	-	-	-	5.0	8.0
1.0	-	-	-	-	10	15
2.2	-	-	-	-	20	25
3.3	-	-	-	-	28	30
4.7	-	-	25	30	38	46
10	-	28	40	45	50	70
22	38	50	60	75	90	120
33	58	60	80	90	110	170
47	70	85	90	125	135	200
100	125	165	180	200	250	-
220	225	260	320	350	410	-
330	295	360	425	440	-	-
470	390	420	540	585	-	-
1000	620	740	-	-	-	-

### MAXIMUM ESR ( $\Omega$ AT 120HZ AND 20°C)

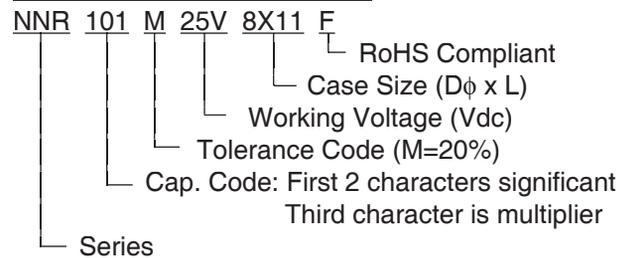
Cap. ( $\mu$ F)	Working Voltage (Vdc)					
	10	16	25	35	50	100
0.47	-	-	-	-	458.79	317.62
1.0	-	-	-	-	215.63	149.28
2.2	-	-	-	-	98.01	67.86
3.3	-	-	-	-	65.34	45.24
4.7	-	-	56.47	49.41	45.88	31.76
10	-	29.86	26.54	23.22	21.56	14.93
22	15.08	13.57	12.06	10.56	9.80	6.79
33	10.05	9.05	8.04	7.04	6.53	4.52
47	7.06	6.35	5.65	4.94	4.59	3.18
100	3.32	2.99	2.65	2.32	2.16	-
220	1.51	1.36	1.21	1.06	0.98	-
330	1.01	0.90	0.80	0.70	-	-
470	0.71	0.64	0.56	0.49	-	-
1000	0.33	0.30	-	-	-	-

### STANDARD PRODUCTS AND

#### CASE SIZE TABLE D $\phi$ x L (mm)

Cap. ( $\mu$ F)	Working Voltage (Vdc)					
	10	16	25	35	50	100
0.47	-	-	-	-	5x11	5x11
1.0	-	-	-	-	5x11	5x11
2.2	-	-	-	-	5x11	5x11
3.3	-	-	-	-	5x11	6.3x11
4.7	-	-	5x11	5x11	5x11	6.3x11
10	-	5x11	5x11	5x11	6.3x11	8x12.5
22	5x11	5x11	5x11	6.3x11	8x11.5	10x16
33	5x11	5x11	6.3x11	6.3x11	8x11.5	10x20
47	5x11	6.3x11	6.3x11	8x11.5	10x12.5	12.5x25
100	6.3x11	8x11.5	8x12.5	10x12.5	10x20	-
220	8x12.5	10x12.5	10x16	10x20	12.5x25	-
330	10x12.5	10x16	10x20	12.5x25	-	-
470	10x16	10x20	12.5x20	12.5x25	-	-
1000	12.5x20	12.5x25	-	-	-	-

### PART NUMBERING SYSTEM



### LEAD SPACING AND DIAMETER (mm)

Case Dia. (D $\phi$ )	5	6.3	8	10	12.5
Lead Dia. (d $\phi$ )	0.5	0.5	0.6	0.6	0.6
Lead Space (F)	2.0	2.5	3.5	5.0	5.0
Dim. $\alpha$	0.5	0.5	0.5	0.5	0.5
Dim. $\beta$	1.5	1.5	1.5	1.5	1.5

### PRECAUTIONS

Please review the notes on correct use, safety and precautions found on pages T10 & T11 of NIC's Electrolytic Capacitor catalog.  
Also found at [www.niccomp.com/precautions](http://www.niccomp.com/precautions)  
If in doubt or uncertainty, please review your specific application - process details with NIC's technical support personnel: [tpmg@niccomp.com](mailto:tpmg@niccomp.com)

