

# Miniature Aluminum Electrolytic Capacitors

NREL Series

LOW PROFILE, RADIAL LEAD, POLARIZED

## FEATURES

- LOW PROFILE APPLICATIONS
- HIGH STABILITY AND PERFORMANCE

**RoHS  
Compliant**

includes all homogeneous materials

\*See Part Number System for Details



## CHARACTERISTICS

Rated Voltage Range		6.3 ~ 100 VDC							
Capacitance Range		22 ~ 4,700µF							
Operating Temperature Range		-40 ~ +85°C							
Capacitance Tolerance		± 20%							
Max. Leakage Current @ (20°C)	After 1 min.	0.03CV or 4µA , whichever is greater							
	After 2 min.	0.01CV or 3µA , whichever is greater							
Max. Tan δ @ 120Hz/20°C	W.V. (Vdc)	6.3	10	16	25	35	50	63	100
	S.V. (Vdc)	8	13	20	32	44	63	79	125
	C ≤ 1,000µF	0.24	0.20	0.16	0.14	0.12	0.10	0.10	0.10
	C = 2,200µF	0.26	0.22	0.18	0.16				
	C = 3,300µF	0.28	0.24						
Low Temperature Stability Impedance Ratio @ 120Hz	Z-25°C/Z+20°C	4	3	3	2	2	2	2	2
	Z-40°C/Z+20°C	10	8	6	4	3	3	3	3
Load Life Test at Rated W.V. 85°C 2,000 Hours: ≤ 8φ 3,000 Hours: ≥ 10φ	Capacitance Change	Within ±20% of initial measured value							
	Tan δ	Less than 200% of specified maximum value							
	Leakage Current	Less than specified maximum value							

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

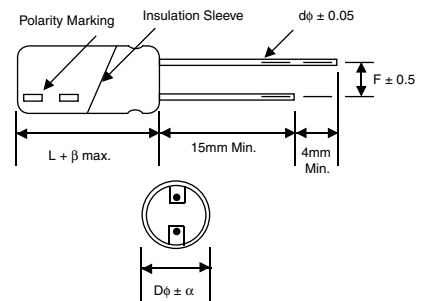
Cap (µF)	Working Voltage (Vdc)							
	6.3	10	16	25	35	50	63	100
22	-	-	-	-	-	-	-	110
100	-	-	-	-	200	220	-	410
220	-	-	260	280	-	-	560	720
330	-	290	320	390	510	650	770	-
470	-	340	-	560	710	725	-	-
1,000	-	680	695	730	1190	-	-	-
2,200	1030	1120	1140	1250	-	-	-	-
3,300	1330	1510	-	-	-	-	-	-
4,700	1630	1650	-	-	-	-	-	-

## MAXIMUM ESR (Ω AT 120Hz AND 20°C)

Cap (µF)	Working Voltage (Vdc)							
	6.3	10	16	25	35	50	63	100
22	-	-	-	-	-	-	-	6.04
100	-	-	-	-	1.99	1.66	-	1.33
220	-	-	1.21	1.06	-	-	0.68	0.60
330	-	1.01	0.80	0.70	0.60	0.50	0.45	-
470	-	0.71	-	0.49	0.42	0.35	-	-
1,000	-	0.33	0.27	0.23	0.20	-	-	-
2,200	0.20	0.17	0.14	0.12	-	-	-	-
3,300	0.14	0.12	-	-	-	-	-	-
4,700	0.11	0.09	-	-	-	-	-	-

## STANDARD PRODUCT AND CASE SIZE TABLE D φ x L (mm)

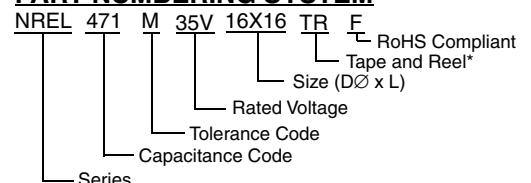
Cap (µF)	Code	Working Voltage (Vdc)							
		6.3	10	16	25	35	50	63	100
22	220	-	-	-	-	-	-	-	10x9.5
100	101	-	-	-	-	10x9.5	10x9.5	-	16x16
220	221	-	-	10x9.5	10x9.5	-	-	-	18x21
330	331	-	10x9.5	10x9.5	10x12.5	12.5x16	16x16	16x16	-
470	471	-	10x9.5	-	12.5x16	16x16	16x16	16x21	-
1,000	102	-	12.5x16	12.5x16	16x16	18x21	-	-	-
2,200	222	16x16	16x16	16x16	16x21	-	-	-	-
3,300	332	18x21	18x21	-	-	-	-	-	-
4,700	472	18x21	18x21	-	-	-	-	-	-



## LEAD SPACING AND DIAMETER (mm)

Case Dia. (Dφ)	10	12.5	16	18
Leads Dia. (dφ)	0.6	0.6	0.8	0.8
Lead Spacing (F)	5.0	5.0	7.5	7.5
Dim. α	0.5	0.5	0.5	0.5
Dim. β	1.5	1.5	2.0	2.0

## PART NUMBERING SYSTEM



\*see tape specification for details

## 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)

