

# Large Can Aluminum Electrolytic Capacitors

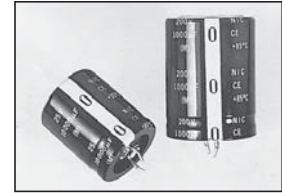
NRLC Series

## FEATURES

- LONG LIFE AT +85°C (3,000 HOURS)
- HIGH RIPPLE CURRENT
- HIGH DENSITY DESIGN
- SUITABLE FOR SWITCHING POWER SUPPLIES

**RoHS Compliant**  
includes all homogeneous materials

\*See Part Number System for Details



## SPECIFICATIONS

Operating Temperature Range		-25 ~ +85°C						
Rated Voltage Range		200 ~ 450Vdc						
Rated Capacitance Range		68 ~ 2,200µF						
Capacitance Tolerance		±20% (M)						
Max. Leakage Current (µA) After 5 minutes (20°C)		0.02CV or 3,000µA						
Max. Tan δ at 120Hz/20°C	W.V. (Vdc)	200	220	250	400	420	450	
	Tan δ max.	0.20	0.20	0.20	0.20	0.20	0.20	
Surge Voltage	W.V. (Vdc)	200	220	250	400	420	450	
	S.V. (Vdc)	250	270	300	450	470	500	
Ripple Current Frequency Correction Factors	Frequency (Hz)	50 (60)	+120	+300	+1K	10K <sub>≤</sub>	-	
	Multiplier at 85°C	200 ~ 250Vdc	0.80	1.0	1.15	1.17	1.20	-
		400 ~ 450Vdc	0.77	1.00	1.10	1.12	1.15	-
Ripple Current Temperature Correction Factors	Temperature (°C)	+65	+85	-				
	Multiplier	1.15	1.0	-				
Low Temperature Stability (Impedance Ratio)	Temperature (°C)	200	220	250	400	420	450	
	Z-25°C/+20°C	7						
Load Life Test 3,000 hours at +85°C	Capacitance Change	Within ±20% of initial measured value						
	Tan δ	Less than 200% of specified maximum value						
	Leakage Current	Less than specified maximum value						
Shelf Life Test 1,000 hours at +85°C (no load)	Capacitance Change	Within ±20% of initial measured value						
	Tan δ	Less than 200% of specified maximum value						
	Leakage Current	Less than specified maximum value						
Surge Voltage Test 1,000 Cycles 30 seconds "On" and 5.5 minutes "Off" @ +15°C ~ +35°C	Capacitance Change	Within ±15% of initial measured value						
	Tan δ	Less than specified maximum value						
	Leakage Current	Less than specified maximum value						
Soldering Effect Solder Bath Temp.: +260 ± 5°C Pre-heat: 120 ± 2 sec. to +120 ± 2°C	Capacitance Change	Within ±10% of initial measured value						
	Tan δ	Less than specified maximum value						
	Leakage Current	Less than specified maximum value						

Note: Please note NRLC product series is specifically designed for use in commercial & consumer applications. For mission critical or industrial applications, NIC recommends our NRLF / NRLM / NRLP / NRLR series products. Please consult NIC product specifications available on [www.niccomp.com](http://www.niccomp.com). If in doubt, please contact NIC to review your requirements ([apreview@niccomp.com](mailto:apreview@niccomp.com))

## MECHANICAL CHARACTERISTICS:

### 1. Safety Vent:

The capacitors are provided with a pressure sensitive safety vent on the top of can. The vent is designed to rupture in the event that high internal gas pressure is developed by circuit malfunction or mis-use like reverse voltage.

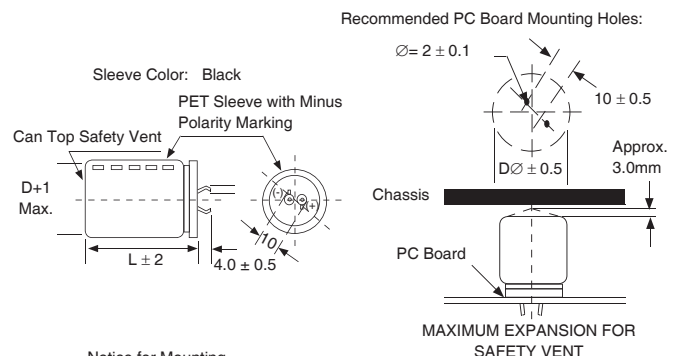
### 2. Terminal Strength:

Each terminal of the capacitor shall withstand an axial pull force of 4.5Kg for a period 10 seconds or a radial bent force of 2.5Kg for a period of 30 seconds.

## PART NUMBER SYSTEM

NRLC 221 M 400V 22X45 S F

Series | Capacitance Code | Voltage Rating | Tolerance Code | Case Size (mm) | Lead Length (S=4mm) | RoHS compliant



### Notice for Mounting

The space from the top of the can shall be more than (3mm) from chassis or other construction materials so that safety vent has room to expand in case of emergency.

## 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)



## STANDARD PRODUCT LIST, CASE SIZE AND SPECIFICATIONS

Part Number	Cap. (µF)	Voltage (Vdc)	Case Size (mm)	ESR (Ω @ 20°C)	Max. Ripple Current (Arms@85°C)		Load Life @ +85°C (Hours)	
				120Hz	120Hz	10K ~ 50KHz		
NRLC271M200V22X25SF	270	200	22X25	1.23	1250	1500	3,000	
NRLC331M200V22X25SF	330		22X25	1.01	1320	1584	3,000	
NRLC391M200V22X31SF	390		22X31	0.85	1510	1812	3,000	
NRLC391M200V25X25SF	390		25X25	0.85	1560	1872	3,000	
NRLC471M200V22X31SF	470		22X31	0.71	1730	2076	3,000	
NRLC471M200V25X31SF	470		25X31	0.71	1780	2136	3,000	
NRLC561M200V22X35SF	560		22X35	0.59	1910	2292	3,000	
NRLC561M200V25X31SF	560		25X31	0.59	1960	2352	3,000	
NRLC561M200V30X25SF	560		30X25	0.59	1960	2352	3,000	
NRLC681M200V22X41SF	680		22X41	0.49	2170	2604	3,000	
NRLC681M200V25X35SF	680		25X35	0.49	2260	2712	3,000	
NRLC681M200V30X31SF	680		30X31	0.49	2270	2724	3,000	
NRLC821M200V22X45SF	820		22X45	0.40	2450	2940	3,000	
NRLC821M200V25X41SF	820		25X41	0.40	2540	3048	3,000	
NRLC821M200V30X31SF	820		30X31	0.40	2530	3036	3,000	
NRLC102M200V22X55SF	1000		22X55	0.33	2880	3456	3,000	
NRLC102M200V25X45SF	1000		25X45	0.33	2990	3588	3,000	
NRLC102M200V30X35SF	1000		30X35	0.33	2870	3444	3,000	
NRLC122M200V25X51SF	1200		25X51	0.28	3290	3948	3,000	
NRLC122M200V30X41SF	1200		30X41	0.28	3280	3936	3,000	
NRLC122M200V35X35SF	1200		35X35	0.28	3250	3900	3,000	
NRLC152M200V30X51SF	1500		30X51	0.22	3760	4512	3,000	
NRLC152M200V35X41SF	1500		35X41	0.22	3710	4452	3,000	
NRLC182M200V30X55SF	1800		30X55	0.18	4200	5040	3,000	
NRLC182M200V35X45SF	1800		35X45	0.18	4190	5028	3,000	
NRLC222M200V35X51SF	2200		35X51	0.15	4780	5736	3,000	
NRLC331M220V22X31SF	330		220	22X31	1.01	1450	1740	3,000
NRLC391M220V22X35SF	390			22X35	0.85	1640	1968	3,000
NRLC391M220V25X31SF	390			25X31	0.85	1590	1908	3,000
NRLC471M220V22X35SF	470			22X35	0.71	1870	2244	3,000
NRLC471M220V25X35SF	470	25X35		0.71	1900	2280	3,000	
NRLC561M220V22X41SF	560	22X41		0.59	2030	2436	3,000	
NRLC561M220V25X35SF	560	25X35		0.59	2170	2604	3,000	
NRLC561M220V30X31SF	560	30X31		0.59	1990	2388	3,000	
NRLC681M220V22X45SF	680	22X45		0.49	2390	2868	3,000	
NRLC681M220V25X41SF	680	25X41		0.49	2330	2796	3,000	
NRLC681M220V30X35SF	680	30X35		0.49	2290	2748	3,000	
NRLC821M220V25X48SF	820	25X48		0.40	2650	3180	3,000	
NRLC821M220V30X41SF	820	30X41		0.40	2590	3108	3,000	
NRLC821M220V35X31SF	820	35X31		0.40	2540	3048	3,000	
NRLC102M220V30X45SF	1000	30X45		0.33	3060	3672	3,000	
NRLC102M220V35X35SF	1000	35X35		0.33	3000	3600	3,000	
NRLC122M220V30X51SF	1200	30X51		0.28	3390	4068	3,000	
NRLC122M220V35X41SF	1200	35X41		0.28	3360	4032	3,000	
NRLC152M220V35X45SF	1500	35X45		0.22	3730	4476	3,000	
NRLC182M220V35X51SF	1800	35X51		0.18	4120	4944	3,000	
NRLC221M250V22X31SF	220	250 (continue next page)		22X31	1.51	1130	1356	3,000
NRLC271M250V22X31SF	270			22X31	1.23	1370	1644	3,000
NRLC331M250V22X35SF	330			22X35	1.01	1520	1824	3,000



## STANDARD PRODUCT LIST, CASE SIZE AND SPECIFICATIONS

Part Number	Cap. (µF)	Voltage (Vdc)	Case Size (mm)	ESR (Ω @ 20°C)	Max. Ripple Current (Arms@85°C)		Load Life @ +85°C (Hours)	
				120Hz	120Hz	10K ~ 50KHz		
NRLC331M250V25X31SF	330	250	25X31	1.01	1470	1764	3,000	
NRLC391M250V22X41SF	390		22X41	0.85	1720	2064	3,000	
NRLC391M250V25X35SF	390		25X35	0.85	1720	2064	3,000	
NRLC471M250V22X45SF	470		22X45	0.71	1960	2352	3,000	
NRLC471M250V25X41SF	470		25X41	0.71	1960	2352	3,000	
NRLC471M250V30X31SF	470		30X31	0.71	1860	2232	3,000	
NRLC561M250V22X51SF	560		22X51	0.59	2270	2724	3,000	
NRLC561M250V25X45SF	560		25X45	0.59	2140	2568	3,000	
NRLC561M250V30X35SF	560		30X35	0.59	2140	2568	3,000	
NRLC681M250V25X51SF	680		25X51	0.49	2440	2928	3,000	
NRLC681M250V30X41SF	680		30X41	0.49	2470	2964	3,000	
NRLC821M250V30X45SF	820		30X45	0.40	2720	3264	3,000	
NRLC821M250V35X35SF	820		35X35	0.40	2700	3240	3,000	
NRLC102M250V30X51SF	1000		30X51	0.33	3240	3888	3,000	
NRLC102M250V35X41SF	1000		35X41	0.33	3180	3816	3,000	
NRLC122M250V35X51SF	1200		35X51	0.28	3500	4200	3,000	
NRLC820M400V22X25SF	82		400	22X25	4.05	760	874	3,000
NRLC101M400V22X31SF	100			22X31	3.32	900	1035	3,000
NRLC121M400V22X31SF	120	22X31		2.76	1000	1150	3,000	
NRLC121M400V25X25SF	120	25X25		2.76	1030	1184	3,000	
NRLC151M400V22X35SF	150	22X35		2.21	1130	1299	3,000	
NRLC151M400V25X31SF	150	25X31		2.21	1160	1334	3,000	
NRLC181M400V22X41SF	180	22X41		1.84	1290	1483	3,000	
NRLC181M400V25X35SF	180	25X35		1.84	1320	1518	3,000	
NRLC181M400V30X25SF	180	30X25		1.84	1380	1587	3,000	
NRLC221M400V22X45SF	220	22X45		1.51	1440	1656	3,000	
NRLC221M400V25X41SF	220	25X41		1.51	1500	1725	3,000	
NRLC221M400V30X31SF	220	30X31		1.51	1520	1748	3,000	
NRLC271M400V25X45SF	270	25X45		1.23	1630	1874	3,000	
NRLC271M400V30X35SF	270	30X35		1.23	1660	1909	3,000	
NRLC331M400V25X51SF	330	25X51		1.01	1820	2093	3,000	
NRLC331M400V30X41SF	330	30X41		1.01	1870	2150	3,000	
NRLC331M400V35X31SF	330	35X31		1.01	1870	2150	3,000	
NRLC391M400V30X45SF	390	30X45		0.85	2060	2369	3,000	
NRLC391M400V35X35SF	390	35X35		0.85	2080	2392	3,000	
NRLC471M400V30X51SF	470	30X51		0.71	2280	2622	3,000	
NRLC471M400V35X41SF	470	35X41		0.71	2310	2656	3,000	
NRLC561M400V35X45SF	560	35X45		0.59	2600	2990	3,000	
NRLC681M400V35X51SF	680	35X51		0.49	2830	3254	3,000	
NRLC820M420V22X25SF	82	420 (continue next page)		22X25	4.05	780	897	3,000
NRLC101M420V22X31SF	100			22X31	3.32	880	1012	3,000
NRLC101M420V25X25SF	100			25X25	3.32	890	1023	3,000
NRLC121M420V22X31SF	120			22X31	2.76	980	1127	3,000
NRLC121M420V25X31SF	120		25X31	2.76	990	1138	3,000	
NRLC151M420V22X35SF	150		22X35	2.21	1100	1265	3,000	
NRLC151M420V25X31SF	150		25X31	2.21	1150	1322	3,000	
NRLC151M420V30X25SF	150		30X25	2.21	1190	1368	3,000	
NRLC181M420V22X41SF	180		22X41	1.84	1210	1391	3,000	
NRLC181M420V25X35SF	180		25X35	1.84	1300	1495	3,000	



## STANDARD PRODUCT LIST, CASE SIZE AND SPECIFICATIONS

Part Number	Cap. (μF)	Voltage (Vdc)	Case Size (mm)	ESR (Ω @ 20°C)	Max. Ripple Current (Arms @ 85°C)		Load Life @ +85°C (Hours)	
				120Hz	120Hz	10K ~ 50KHz		
NRLC181M420V30X31SF	180	420	30X31	1.84	1350	1552	3,000	
NRLC221M420V22X48SF	220		22X48	1.51	1410	1621	3,000	
NRLC221M420V25X41SF	220		25X41	1.51	1440	1656	3,000	
NRLC221M420V30X35SF	220		30X35	1.51	1510	1736	3,000	
NRLC271M420V25X48SF	270		25X48	1.23	1580	1817	3,000	
NRLC271M420V30X41SF	270		30X41	1.23	1740	2001	3,000	
NRLC271M420V35X31SF	270		35X31	1.23	1770	2035	3,000	
NRLC331M420V25X55SF	330		25X55	1.01	2010	2311	3,000	
NRLC331M420V30X45SF	330		30X45	1.01	1800	2070	3,000	
NRLC331M420V35X35SF	330		35X35	1.01	1980	2277	3,000	
NRLC391M420V30X51SF	390		30X51	0.85	2030	2334	3,000	
NRLC391M420V35X41SF	390		35X41	0.85	2070	2380	3,000	
NRLC471M420V30X55SF	470		30X55	0.71	2280	2622	3,000	
NRLC471M420V35X45SF	470		35X45	0.71	2380	2737	3,000	
NRLC561M420V35X51SF	560		35X51	0.59	2690	3093	3,000	
NRLC680M450V22X25SF	680		450	22X25	4.88	640	736	3,000
NRLC820M450V22X25SF	820			22X25	4.05	790	908	3,000
NRLC101M450V22X31SF	100			22X31	3.32	860	989	3,000
NRLC101M450V25X25SF	100			25X25	3.32	880	1012	3,000
NRLC121M450V22X35SF	120			22X35	2.76	980	1127	3,000
NRLC121M450V25X31SF	120	25X31		2.76	1000	1150	3,000	
NRLC121M450V30X25SF	120	30X25		2.76	1020	1173	3,000	
NRLC151M450V22X41SF	150	22X41		2.21	1080	1242	3,000	
NRLC151M450V25X35SF	150	25X35		2.21	1130	1299	3,000	
NRLC151M450V30X25SF	150	30X25		2.21	1180	1357	3,000	
NRLC181M450V22X45SF	180	22X45		1.84	1200	1380	3,000	
NRLC181M450V25X41SF	180	25X41		1.84	1280	1472	3,000	
NRLC181M450V30X31SF	180	30X31		1.84	1320	1518	3,000	
NRLC221M450V25X45SF	220	25X45		1.51	1450	1667	3,000	
NRLC221M450V30X35SF	220	30X35		1.51	1500	1725	3,000	
NRLC221M450V35X31SF	220	35X31		1.51	1460	1679	3,000	
NRLC271M450V25X51SF	270	25X51		1.23	1570	1805	3,000	
NRLC271M450V30X41SF	270	30X41		1.23	1730	1989	3,000	
NRLC271M450V35X31SF	270	35X31		1.23	1730	1989	3,000	
NRLC331M450V30X45SF	330	30X45		1.01	1930	2219	3,000	
NRLC331M450V35X35SF	330	35X35		1.01	1960	2254	3,000	
NRLC391M450V30X51SF	390	30X51		0.85	2170	2495	3,000	
NRLC391M450V35X41SF	390	35X41		0.85	2170	2495	3,000	
NRLC471M450V35X45SF	470	35X45		0.71	2450	2817	3,000	
NRLC561M450V35X51SF	560	35X51		0.59	2630	3024	3,000	

