

# Large Can Aluminum Electrolytic Capacitors

NRLM Series

## FEATURES

- NEW SIZES FOR LOW PROFILE AND HIGH DENSITY DESIGN OPTIONS
- EXPANDED CV VALUE RANGE
- HIGH RIPPLE CURRENT
- LONG LIFE
- CAN-TOP SAFETY VENT
- DESIGNED AS INPUT FILTER OF SMPS
- STANDARD 10mm (.400") SNAP-IN SPACING

**RoHS Compliant**  
includes all homogeneous materials

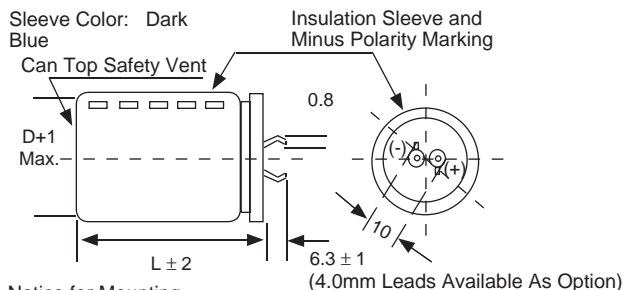
\*See Part Number System for Details



## SPECIFICATIONS

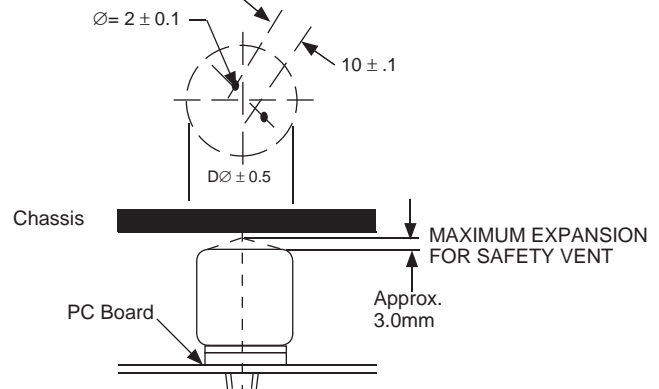
Operating Temperature Range		-40 ~ +85°C					-25 ~ +85°C			
Rated Voltage Range		16 ~ 250Vdc					350 ~ 450Vdc			
Rated Capacitance Range		180 ~ 68,000µF					56 ~ 680µF			
Capacitance Tolerance		±20% (M)								
Max. Leakage Current (µA) After 5 minutes (20°C)		$3 \times \sqrt{C(\mu F)V}$								
Max. Tan δ at 120Hz/20°C	W.V. (Vdc)	16	25	35	50	63	80	100	160-450	
	Tan δ max.	0.50*	0.40*	0.35	0.30	0.25	0.20	0.20	0.15	
Surge Voltage	W.V. (Vdc)	16	25	35	50	63	80	100	160	
	S.V. (Vdc)	20	32	44	63	79	100	125	200	
	W.V. (Vdc)	180	200	250	350	400	450	-	-	
	S.V. (Vdc)	220	250	300	400	450	500	-	-	
Ripple Current Correction Factors	Frequency (Hz)	50	60	100	120	500	1K	10K ~ 50K	-	
	Multiplier at 85°C	0.75	0.80	0.95	1.00	1.05	1.08	1.15	-	
Low Temperature Stability (10 to 250Vdc)	Temperature (°C)	0	-25	-40	-	-	-	-	-	
	Capacitance Change	-5%	-15%	-30%	-	-	-	-	-	
	Impedance Ratio	1.5	3	9	-	-	-	-	-	
Load Life Test 2,000 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 Per JIS-C-5141 (table #6, #4) Surge voltage applied: 30 seconds "On" and 5.5 minutes no voltage "Off"	Capacitance Change	Within ±20% of initial measured value								
	Tan δ	Less than 200% of specified maximum value								
	Leakage Current	Less than specified maximum value								
Soldering Effect Refer to MIL-STD-202F Method 210A	Capacitance Change	Within ±10% of initial measured value								
	Tan δ	Less than specified maximum value								
	Leakage Current	Less than specified maximum value								

(\* 47,000µF add 0.14, 68,000µF add 0.35.)



**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.

Recommended PC Board Mounting Holes:



## PRECAUTIONS

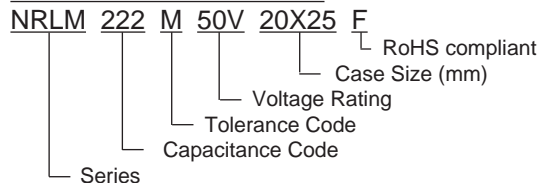
Please review the notes on correct use, safety and precautions found on pages T10 & T11 of NIC's Electrolytic Capacitor catalog.  
Also found at [www.niccomp.com/precautions](http://www.niccomp.com/precautions)  
If in doubt or uncertainty, please review your specific application - process details with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



### STANDARD PRODUCT LIST, CASE SIZE AND SPECIFICATIONS

Part Number	Cap (μF)	W.V.	Case Size	ESR (Ω @ 20°C)		Max. Ripple Current (Arms@85°C)		
				120Hz	20KHz	120Hz	10K ~ 50KHz	
NRLM682M16V20X25F	6,800	16	20x25	0.098	0.083	3.15	3.62	
NRLM822M16V20X30F	8,200		20x30	0.081	0.069	3.47	3.99	
NRLM103M16V20X35F	10,000		20x35	0.075	0.063	3.78	4.35	
NRLM103M16V22X30F			22x30					
NRLM103M16V25X25F			25x25					
NRLM153M16V20X40F	15,000		20x40	0.053	0.045	5.26	6.05	
NRLM153M16V22X35F			22x35					
NRLM153M16V25X30F			25x30					
NRLM223M16V22X45F	22,000		22x45	0.038	0.032	6.10	7.02	
NRLM223M16V25X35F			25x35					
NRLM223M16V30X30F			30x30					
NRLM333M16V25X50F	33,000		25x50	0.025	0.021	6.84	7.87	
NRLM333M16V30X40F			30x40					
NRLM333M16V35X30F			35x30					
NRLM473M16V30X50F	47,000		30x50	0.021	0.019	7.47	8.59	
NRLM473M16V35X50F			35x50					
NRLM683M16V35X50F			35x50					
NRLM472M25V20X25F	4,700		25	20x25	0.113	0.090	3.05	3.51
NRLM682M25V22X30F	6,800	22x30		0.078	0.062	3.47	3.99	
NRLM682M25V25X25F	8,200	25x25		0.065	0.052	3.57	4.11	
NRLM822M25V22X30F		22x30						
NRLM822M25V25X25F	8,200	25x25		0.065	0.052	3.57	4.11	
NRLM103M25V22X35F		22x35						
NRLM103M25V25X30F	10,000	25x30		0.058	0.046	3.78	4.35	
NRLM103M25V30X25F		30x25						
NRLM153M25V22X50F	15,000	22x50		0.039	0.031	4.63	5.32	
NRLM153M25V25X40F		25x40						
NRLM153M25V30X30F		30x30						
NRLM223M25V25X50F	22,000	25x50		0.029	0.023	6.10	7.02	
NRLM223M25V30X40F		30x40						
NRLM333M25V30X50F	33,000	30x50		0.020	0.017	6.84	7.87	
NRLM333M25V35X40F		35x40						
NRLM473M25V35X50F	47,000	35x50		0.017	0.015	8.00	9.20	
NRLM222M35V22X25F	2,200	35		22x25	0.181	0.136	1.40	1.61
NRLM332M35V20X25F	3,300			20x25	0.111	0.083	2.73	3.14
NRLM472M35V20X35F	4,700		20x35	0.078	0.058	3.26	3.75	
NRLM472M35V22X30F			22x30					
NRLM472M35V25X25F			25x25					
NRLM682M35V22X35F	6,800		22x35	0.066	0.049	3.68	4.23	
NRLM682M35V25X30F			25x30					
NRLM822M35V25X35F	8,200		25x35	0.057	0.042	4.00	4.60	
NRLM103M35V22X45F	10,000		22x45	0.050	0.037	4.42	5.08	
NRLM103M35V25X40F			25x40					
NRLM103M35V30X30F			30x30					
NRLM103M35V35X25F	15,000		35x25	0.036	0.027	5.57	6.41	
NRLM153M35V25X50F			25x50					
NRLM153M35V30X40F			30x40					
NRLM153M35V35X30F	15,000		35x30	0.036	0.027	5.57	6.41	
NRLM223M35V30X50F			30x50					
NRLM223M35V35X40F	22,000		35x40	0.026	0.020	6.10	7.02	
NRLM333M35V35X50F	33,000		35x50	0.018	0.014	7.15	8.22	

#### PART NUMBER SYSTEM



### STANDARD PRODUCT LIST, CASE SIZE AND SPECIFICATIONS

Part Number	Cap (μF)	W.V.	Case Size	ESR (Ω @ 20°C)		Max. Ripple Current (Arms@85°C)		
				120Hz	20KHz	120Hz	10K ~ 50KHz	
NRLM222M50V20X25F	2,200	50	20x25	0.151	0.113	2.26	2.60	
NRLM332M50V22X30F	3,300		22x30	0.100	0.075	2.73	3.14	
NRLM332M50V25X25F			25x25					
NRLM472M50V25X30F	4,700		25x30	0.071	0.053	3.03	3.48	
NRLM472M50V30X25F			30x25					
NRLM682M50V25X40F	6,800		25x40	0.049	0.037	3.85	4.43	
NRLM682M50V30X30F			30x30					
NRLM822M50V25X45F	8,200		25x45	0.040	0.030	4.41	5.07	
NRLM822M50V30X35F			30x35					
NRLM103M50V25X50F	10,000		25x50	0.036	0.027	4.97	5.72	
NRLM103M50V30X40F			30x40					
NRLM103M50V35X30F	15,000		35x30	0.028	0.021	6.44	7.41	
NRLM153M50V30X50F			30x50					
NRLM153M50V35X40F	35x40							
NRLM223M50V35X50F	22,000		35x50	0.021	0.017	7.57	8.71	
NRLM102M63V22X25F	1,000		63	22x25	0.381	0.286	1.20	1.38
NRLM222M63V20X35F	2,200			20x35	0.151	0.113	2.52	2.90
NRLM222M63V22X30F				22x30				
NRLM222M63V25X25F	3,300	25x25		0.105	0.079	4.10	4.72	
NRLM332M63V22X40F		22x40						
NRLM332M63V25X30F	4,700	25x30		0.081	0.061	4.86	5.59	
NRLM332M63V30X25F		30x25						
NRLM472M63V22X50F	6,800	22x50		0.061	0.046	5.84	6.72	
NRLM472M63V25X40F		25x40						
NRLM472M63V30X30F	8,200	30x30		0.051	0.046	6.00	6.90	
NRLM472M63V35X25F		35x25						
NRLM682M63V25X50F	10,000	25x50		0.041	0.033	6.52	7.50	
NRLM682M63V30X40F		30x40						
NRLM682M63V35X50F	12,000	35x30		0.035	0.028	7.15	8.22	
NRLM822M63V30X45F		30x45						
NRLM822M63V35X35F	35x35							
NRLM103M63V35X40F	80	35x40		0.177	0.133	2.26	2.60	
NRLM123M63V35X50F		35x50						
NRLM152M80V20X35F		20x35	0.121	0.090	2.73	3.14		
NRLM152M80V22X30F		22x30						
NRLM152M80V25X25F		25x25	0.085	0.064	3.21	3.69		
NRLM222M80V22X40F		22x40						
NRLM222M80V25X30F		25x30	0.063	0.048	4.09	4.70		
NRLM222M80V30X25F		30x25						
NRLM332M80V22X50F		3,300	22x50	0.046	0.035	5.16	5.93	
NRLM332M80V25X40F			25x40					
NRLM332M80V30X30F		4,700	30x30	0.038	0.029	5.83	6.70	
NRLM472M80V25X50F			25x50					
NRLM472M80V30X40F		30x40						
NRLM682M80V30X50F		6,800	30x50	0.216	0.140	1.96	2.25	
NRLM682M80V35X40F			35x40					
NRLM822M80V35X50F		8,200	35x50					
NRLM102M100V20X35F		1,000	20x35	0.155	0.101	2.57	2.96	
NRLM102M100V22X30F			22x30					
NRLM102M100V25X25F	25x25							
NRLM152M100V22X40F	1,500	22x40	0.121	0.078	3.14	3.61		
NRLM152M100V25X30F		25x30						
NRLM152M100V30X25F	2,200	30x25	0.090	0.059	4.06	4.67		
NRLM222M100V25X40F		25x40						
NRLM222M100V30X30F	3,300	30x30	0.071	0.049	5.13	5.90		
NRLM332M100V25X50F		25x50						
NRLM332M100V30X40F	4,700	30x40	0.049	0.037	6.60	7.59		
NRLM472M100V30X50F		30x50						
NRLM472M100V35X40F	6,800	35x40	0.049	0.037	6.60	7.59		
NRLM682M100V35X50F		35x50						



### STANDARD PRODUCT LIST, CASE SIZE AND SPECIFICATIONS

Part Number	Cap (μF)	W.V.	Case Size	ESR (Ω @ 20°C)		Max. Ripple Current (Arms@85°C)	
				120Hz	20KHz	120Hz	10K ~ 50KHz
NRLM331M160V22X25F	330	160	22x25	0.553	0.276	1.45	2.03
NRLM471M160V22X30F	470		22x30	0.423	0.212	2.50	2.95
NRLM471M160V25X25F	680		25x25				
NRLM681M160V25X35F			25x35	0.293	0.146	2.50	3.50
NRLM681M160V30X25F	820		30x25				
NRLM821M160V25X35F			820	25x35	0.263	0.131	2.75
NRLM821M160V30X30F	1,000			30x30			
NRLM102M160V25X45F			1,000	25x45	0.232	0.128	3.00
NRLM102M160V30X35F	1,500			30x35			
NRLM102M160V35X30F			1,500	35x30	0.166	0.910	3.73
NRLM152M160V30X45F	2,200			30x45			
NRLM152M160V35X45F			35x45	0.113	0.073	4.78	6.69
NRLM222M160V35X45F	220	35x45					
NRLM221M200V22X25F		220	22x25	0.904	0.407	0.87	1.22
NRLM221M200V25X25F	330		25x25				
NRLM331M200V20X35F		330	20x35	0.553	0.249	1.56	2.18
NRLM331M200V22X30F	470		22x30				
NRLM331M200V25X25F		470	25x25	0.388	0.175	1.85	2.59
NRLM471M200V22X35F	680		22x35				
NRLM471M200V25X30F		680	25x30	0.268	0.121	2.68	3.75
NRLM471M200V30X25F	820		30x25				
NRLM681M200V22X45F		820	22x45	0.243	0.109	2.93	4.10
NRLM681M200V25X35F	1,000		25x35				
NRLM681M200V30X30F		1,000	30x30	0.199	0.090	3.25	4.55
NRLM821M200V25X45F	1,500		25x45				
NRLM821M200V30X35F		1,500	30x35	0.144	0.072	3.87	5.42
NRLM821M200V35X25F	2,200		35x25				
NRLM102M200V25X50F		2,200	25x50	0.098	0.054	4.92	6.89
NRLM102M200V30X40F	220		30x40				
NRLM102M200V35X30F		220	35x30	0.904	0.360	1.17	1.64
NRLM152M200V30X50F	330		22x35				
NRLM152M200V35X40F		330	25x30	0.653	0.261	1.75	2.45
NRLM222M200V35X50F	470		30x25				
NRLM221M250V22X30F		470	22x45	0.388	0.155	2.11	2.95
NRLM221M250V25X25F	680		25x40				
NRLM331M250V22X35F		680	30x30	0.268	0.107	2.50	3.50
NRLM331M250V25X30F	820		25x50				
NRLM331M250V30X25F		820	30x40	0.222	0.089	2.77	3.88
NRLM471M250V22X45F	1,000		35x30				
NRLM471M250V25X40F		1,000	30x45	0.199	0.090	3.32	4.65
NRLM471M250V30X30F	1,500		35x40				
NRLM681M250V25X50F		1,500	30x50	0.168	0.083	3.87	4.94
NRLM681M250V30X40F	1,500		35x40				
NRLM681M250V35X30F		1,500	30x50	0.133	0.066	4.04	5.66
NRLM821M250V30X45F	1,500		35x40				
NRLM821M250V35X45F		35x50					

### STANDARD PRODUCT LIST, CASE SIZE AND SPECIFICATIONS

Part Number	Cap (μF)	W.V.	Case Size	ESR (Ω @ 20°C)		Max. Ripple Current (Arms@85°C)		
				120Hz	20KHz	120Hz	10K ~ 50KHz	
NRLM101M350V20X35F	100	350	20x35	1.658	0.580	0.91	1.27	
NRLM101M350V22X30F			22x30					
NRLM151M350V22X35F	150		22x35	1.105	0.387	1.12	1.57	
NRLM151M350V25X30F			25x30					
NRLM151M350V30X25F			30x25					
NRLM221M350V22X45F	220		22x45	0.754	0.264	1.44	2.02	
NRLM221M350V25X40F			25x40					
NRLM221M350V30X30F			30x30					
NRLM221M350V35X25F			35x25					
NRLM331M350V25X50F	330		25x50	0.502	0.176	1.88	2.63	
NRLM331M350V30X40F			30x40					
NRLM331M350V35X50F			35x30					
NRLM471M350V30X50F	470		30x50	0.388	0.136	2.40	3.36	
NRLM471M350V35X40F			35x40					
NRLM561M350V35X45F	560		35x45	0.355	0.142	2.60	3.64	
NRLM681M350V35X50F	680		35x50	0.293	0.117	2.96	4.14	
NRLM680M400V20X30F	68		400	20x30	2.438	0.853	0.76	1.06
NRLM680M400V22X25F				22x25				
NRLM820M400V20X30F	82	20x30		2.022	0.708	0.83	1.16	
NRLM820M400V22X25F		22x25						
NRLM101M400V20X35F	100	20x35		1.658	0.580	0.92	1.29	
NRLM101M400V22X30F		22x30						
NRLM101M400V25X25F		25x25						
NRLM151M400V25X30F	150	25x30		1.105	0.387	1.16	1.62	
NRLM151M400V30X25F		30x25						
NRLM221M400V25X40F	220	25x40		0.754	0.264	1.49	2.09	
NRLM221M400V30X30F		30x30						
NRLM331M400V30X40F	330	30x40		0.553	0.193	1.90	2.66	
NRLM331M400V35X45F		35x45						
NRLM471M400V35X45F	470	35x45		0.388	0.136	2.39	3.35	
NRLM560M450V20X30F	56	20x30		2.960	1.184	0.70	0.98	
NRLM560M450V22X25F		22x25						
NRLM680M450V22X25F	68	22x25*		2.438	0.975	0.76	1.06	
NRLM820M450V22X30F		22x30						
NRLM820M450V20X35F	82	20x35	2.022	0.809	0.83	1.16		
NRLM820M450V22X30F		22x30						
NRLM820M450V25X25F		25x25						
NRLM101M450V22X35F		22x35						
NRLM101M450V25X30F	100	25x30	1.658	0.663	0.93	1.30		
NRLM101M450V30X25F		30x25						
NRLM221M450V25X50F		25x50						
NRLM221M450V30X40F	220	30x40	0.754	0.301	1.55	2.17		
NRLM221M450V35X30F		35x30						
NRLM331M450V30X50F	330	30x50	0.533	0.249	2.01	2.81		
NRLM331M450V35X40F		35x40						
NRLM471M450V35X50F		470					35x50	0.423

\* Special Size.

