

# Large Can Aluminum Electrolytic Capacitors

NRLMW Series

## FEATURES

- LONG LIFE (105°C, 2000 HOURS)
- LOW PROFILE AND HIGH DENSITY DESIGN OPTIONS
- EXPANDED CV VALUE RANGE
- HIGH RIPPLE CURRENT
- CAN-TOP SAFETY VENT
- DESIGNED AS INPUT FILTER OF SMPS
- STANDARD 10mm (.400") SNAP-IN SPACING

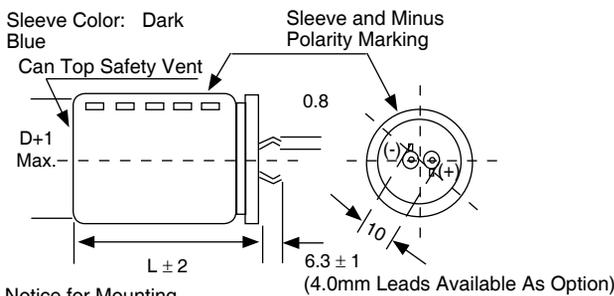
**RoHS Compliant**  
includes all homogeneous materials

\*See Part Number System for Details



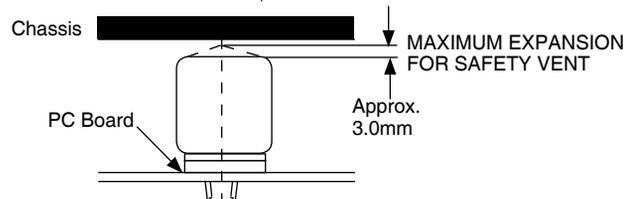
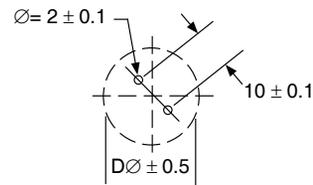
## SPECIFICATIONS

Operating Temperature Range	-40 ~ +105°C	-25 ~ +105°C									
Rated Voltage Range	10 ~ 250Vdc	400 ~ 450Vdc									
Rated Capacitance Range	180 ~ 68,000µF	56 ~ 470µF									
Capacitance Tolerance	±20% (M) at 120Hz, +20°C										
Max. Leakage Current (µA) After 5 minutes (20°C)	3 × √C(µF)V										
Max. Tan δ at 120Hz/20°C	W.V. (Vdc)	10	16	25	35	50	63	80	100 ~ 400	450	
	Tan δ max.	0.55	0.45	0.35	0.30	0.25	0.20	0.17	0.15	0.20	
Surge Voltage	W.V. (Vdc)	10	16	25	35	50	63	80	100	160	
	S.V. (Vdc)	13	20	32	44	63	79	100	125	200	
	W.V. (Vdc)	180	200	250	400	450	-	-	-	-	
	S.V. (Vdc)	220	250	300	450	500	-	-	-	-	
Ripple Current Correction Factors	Frequency (Hz)	50	60	100	120	500	1K	10K ~ 50K	-	-	
	Multiplier at 105°C	16 ~ 100Vdc	0.93	0.95	0.99	1.0	1.05	1.08	1.15	-	-
		160 ~ 450Vdc	0.75	0.80	0.95	1.0	1.20	1.25	1.40	-	-
Low Temperature Stability (10 to 250Vdc)	Temperature (°C)	0	-25	-40	-	-	-	-	-	-	
	Capacitance Change	-5%	-10	-30%	-	-	-	-	-	-	
	Impedance Ratio	1.5	3	9	-	-	-	-	-	-	
Load Life Test 2,000 hours at +105°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 +105°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									



**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 @ 105°C)	
				120Hz	20KHz	120Hz	10K ~ 50KHz
NRLMW682M10V20X25F	6,800	10	20x25	0.110	0.093	1.30	1.50
NRLMW822M10V20X30F	8,200		20x30	0.091	0.077	1.60	1.84
NRLMW103M10V22X25F	10,000		22x25	0.075	0.063	1.80	2.07
NRLMW153M10V25X25F	15,000		25x25	0.053	0.045	2.30	2.65
NRLMW223M10V25X35F	22,000		25x35	0.038	0.032	2.60	2.99
NRLMW223M10V30X25F			30x25				
NRLMW333M10V25X45F	33,000		25x45	0.027	0.023	3.40	3.91
NRLMW333M10V30X35F			30x35				
NRLMW333M10V35X30F			35x30				
NRLMW473M10V30X45F	47,000		30x45	0.023	0.020	4.20	4.83
NRLMW473M10V35X35F			35x35				
NRLMW683M10V35X50F	68,000		35x50	0.021	0.020	5.50	6.33
NRLMW682M16V22X25F	6,800	16	22x25	0.085	0.068	2.20	2.53
NRLMW822M16V22X30F	8,200		22x30	0.071	0.057	2.40	2.76
NRLMW103M16V25X25F	10,000		25x25	0.066	0.053	2.60	2.99
NRLMW153M16V25X35F	15,000		25x35	0.046	0.037	3.20	3.68
NRLMW153M16V30X30F			30x30				
NRLMW223M16V25X45F	22,000		25x45	0.033	0.028	3.80	4.37
NRLMW223M16V30X35F			30x35				
NRLMW223M16V35X30F			35x30				
NRLMW333M16V30X45F	33,000		30x45	0.023	0.020	4.70	5.41
NRLMW333M16V35X35F			35x35				
NRLMW473M16V35X45F	47,000		35x45	0.020	0.018	5.50	6.33
NRLMW683M16V35X50F	56,000		35x50	0.019	0.017	6.00	6.90
NRLMW472M25V22X25F	4,700	25	22x25	0.106	0.079	2.00	2.30
NRLMW682M25V25X25F	6,800		25x25	0.073	0.055	2.40	2.76
NRLMW822M25V25X30F	8,200		25x30	0.061	0.045	2.70	3.11
NRLMW822M25V30X25F			30x25				
NRLMW103M25V25X35F	10,000		25x35	0.051	0.039	3.00	3.45
NRLMW103M25V30X30F			30x30				
NRLMW153M25V25X45F	15,000		25x45	0.036	0.031	3.60	4.14
NRLMW153M25V30X35F			30x35				
NRLMW153M25V35X30F			35x30				
NRLMW223M25V30X45F	22,000		30x45	0.025	0.022	4.30	4.95
NRLMW223M25V35X35F			35x35				
NRLMW333M25V35X50F	33,000		35x50	0.018	0.016	5.50	6.33
NRLMW332M35V22X25F	3,300	35	22x25	0.121	0.090	1.90	2.19
NRLMW472M35V25X25F	4,700		25x25	0.088	0.066	2.20	2.53
NRLMW682M35V25X35F	6,800		25x35	0.061	0.046	2.60	2.99
NRLMW682M35V30X30F			30x30				
NRLMW822M35V25X40F	8,200		25x40	0.051	0.038	2.90	3.34
NRLMW822M35V30X30F			30x30				
NRLMW822M35V35X25F			35x25				
NRLMW103M35V25X45F	10,000		25x45	0.041	0.031	3.20	3.68
NRLMW103M35V30X35F			30x35				
NRLMW103M35V35X30F			35x30				
NRLMW153M35V30X45F	15,000		30x45	0.030	0.022	3.90	4.49
NRLMW153M35V35X35F			35x35				
NRLMW223M35V35X50F	22,000	35x50	0.023	0.017	5.00	5.75	



## STANDARD PRODUCT LIST, CASE SIZE AND SPECIFICATIONS

Part Number	Cap (μF)	W.V.	Case Size	ESR (Ω @ 20°C)		Max. Ripple Current (Arms @ 105°C)		
				120Hz	20KHz	120Hz	10K ~ 50KHz	
NRLMW222M50V22X30F	2,200	50	22x30	0.105	0.079	1.70	1.96	
NRLMW332M50V25X30F	3,300		25x30	0.070	0.053	2.00	2.30	
NRLMW472M50V25X40F	4,700		25x40	0.053	0.040	2.50	2.88	
NRLMW472M50V30X30F			30x30					
NRLMW472M50V35X25F			35x25					
NRLMW562M50V25X50F	6,800		25x50	0.046	0.035	3.30	3.80	
NRLMW562M50V30X40F			30x40					
NRLMW562M50V35X30F			35x30					
NRLMW822M50V30X45F	8,200		30x45	0.038	0.029	3.60	4.14	
NRLMW822M50V35X35F			35x35					
NRLMW103M50V30X50F	10,000		30x50	0.033	0.025	4.00	4.60	
NRLMW103M50V35X40F			35x40					
NRLMW153M50V35X50F	15,000		35x50	0.022	0.018	4.80	5.52	
NRLMW152M63V22X30F	1,500	63	22x30	0.188	0.141	1.50	1.73	
NRLMW222M63V25X30F	2,200		25x30	0.128	0.096	2.00	2.30	
NRLMW332M63V25X40F	3,300		25x40	0.090	0.068	2.50	2.88	
NRLMW332M63V30X30F			30x30					
NRLMW332M63V35X25F			35x25					
NRLMW472M63V25X50F	4,700		25x50	0.063	0.048	3.00	3.45	
NRLMW472M63V30X30F			30x40					
NRLMW472M63V35X30F			35x30					
NRLMW682M63V30X50F	6,800		30x50	0.049	0.037	3.60	4.14	
NRLMW682M63V35X40F			35x40					
NRLMW822M63V35X45F	8,200		35x45	0.040	0.030	3.90	4.49	
NRLMW103M63V35X50F	10,000		35x50	0.033	0.028	4.40	5.06	
NRLMW102M80V25X25F	1,000		80	25x25	0.182	0.119	1.30	1.50
NRLMW152M80V25X30F	1,500	25x30		0.133	0.093	1.70	1.96	
NRLMW222M80V25X35F	2,200	25x35		0.090	0.063	2.10	2.42	
NRLMW222M80V30X30F		30x30						
NRLMW222M80V35X25F		35x25						
NRLMW332M80V25X50F	3,300	25x50		0.065	0.049	2.60	2.99	
NRLMW332M80V30X40F		30x40						
NRLMW332M80V35X30F		35x30						
NRLMW472M80V30X50F	4,700	30x50		0.049	0.037	2.60	2.99	
NRLMW472M80V35X40F		35x40						
NRLMW682M80V35X50F	6,800	35x50		0.041	0.031	3.90	4.49	
NRLMW821M100V25X25F	820	100		25x25	0.202	0.121	1.40	2.10
NRLMW102M100V25X30F	1,000			25x30	0.182	0.109	1.70	2.55
NRLMW152M100V25X40F	1,500		25x40	0.122	0.079	2.10	3.15	
NRLMW152M100V30X30F			30x30					
NRLMW152M100V35X25F			35x25					
NRLMW222M100V25X50F	2,200		25x50	0.090	0.059	2.60	3.90	
NRLMW222M100V30X40F			30x40					
NRLMW222M100V35X30F			35x30					
NRLMW332M100V30X30F	3,300		30x50	0.075	0.053	3.20	4.80	
NRLMW332M100V35X40F			35x40					
NRLMW472M100V35X50F	4,700		35x50	0.053	0.040	3.80	5.70	



### STANDARD PRODUCT LIST, CASE SIZE AND SPECIFICATIONS

Part Number	Cap (μF)	W.V.	Case Size	ESR (Ω @ 20°C)		Max. Ripple Current (Arms @ 105°C)		
				120Hz	20KHz	120Hz	10K ~ 50KHz	
NRLMW221M160V20X25F	220	160	20x25	0.829	0.373	1.00	1.40	
NRLMW331M160V22X30F	330		22x30	0.553	0.249	1.20	1.68	
NRLMW471M160V25X30F	470		25x30	0.459	0.208	1.40	1.96	
NRLMW681M160V25X35F	680		25x35	0.317	0.143	1.70	2.38	
NRLMW681M160V30X30F			30x30					
NRLMW821M160V25X40F	820		25x40	0.263	0.118	2.00	2.80	
NRLMW821M160V30X30F			30x30					
NRLMW102M160V25X45F	1,000		25x45	0.216	0.108	2.20	3.08	
NRLMW102M160V30X35F			30x35					
NRLMW152M160V30X45F	1,500		30x45	0.166	0.083	2.50	3.50	
NRLMW152M160V35X35F			35x35					
NRLMW182M160V30X45F	1,800		30x45	0.129	0.064	2.70	3.78	
NRLMW222M160V35X50F	2,200		35x50	0.113	0.057	2.90	4.06	
NRLMW221M200V22X25F	220		200	22x25	0.754	0.339	1.00	1.40
NRLMW331M200V25X25F	330			25x25	0.502	0.226	1.20	1.68
NRLMW471M200V22X40F	470	22x40		0.353	0.159	1.40	1.96	
NRLMW471M200V25X35F		25x35						
NRLMW471M200V30X25F		30x25						
NRLMW681M200V25X40F	680	25x40		0.244	0.110	1.70	2.38	
NRLMW681M200V30X30F		30x30						
NRLMW821M200V25X50F	820	25x50		0.222	0.111	2.00	2.80	
NRLMW821M200V30X35F		30x35						
NRLMW821M200V35X30F		35x30						
NRLMW102M200V30X45F	1,000	30x45		0.199	0.099	2.20	3.08	
NRLMW102M200V35X35F		35x35						
NRLMW152M200V35X50F	1,500	35x50		0.144	0.072	2.50	3.50	
NRLMW221M250V25X25F	220	250		25x25	0.754	0.377	1.00	1.40
NRLMW331M250V25X35F	330			25x35	0.502	0.251	1.20	1.68
NRLMW331M250V30X25F			30x25					
NRLMW471M250V25X45F	470		25x45	0.353	0.176	1.40	1.96	
NRLMW471M250V30X35F			30x35					
NRLMW471M250V35X30F			35x30					
NRLMW681M250V30X45F	680		30x45	0.244	0.122	1.70	2.38	
NRLMW681M250V35X35F			35x35					
NRLMW821M250V30X50F	820		30x50	0.202	0.101	2.00	2.80	
NRLMW821M250V35X40F			35x40					
NRLMW102M250V35X45F	1,000		35x45	0.199	0.099	2.20	3.08	

## STANDARD PRODUCT LIST, CASE SIZE AND SPECIFICATIONS

Part Number	Cap (μF)	W.V.	Case Size	ESR (Ω @ 20°C)		Max. Ripple Current (Arms @ 105°C)		
				120Hz	20KHz	120Hz	10K ~ 50KHz	
NRLMW680M400V25X25F	68	400	25x25	1.950	0.683	0.56	0.78	
NRLMW820M400V25X25F	82		25x25	1.617	0.566	0.64	0.90	
NRLMW101M400V25X30F	100		25x30	1.325	0.464	0.69	0.97	
NRLMW151M400V25X40F	150		25x40	0.884	0.309	0.82	1.15	
NRLMW151M400V30X30F			30x30					
NRLMW221M400V25X50F	220		25x50	0.603	0.211	1.10	1.54	
NRLMW221M400V30X40F			30x40					
NRLMW221M400V35X30F			35x30					
NRLMW331M400V30X50F	330		30x50	0.402	0.161	1.35	1.89	
NRLMW331M400V35X40F			35x40					
NRLMW471M400V35X50F	470		35x50	0.282	0.127	1.75	2.45	
NRLMW560M450V22X25F	56		450	22x25	2.368	0.947	0.40	0.56
NRLMW680M450V25X25F	68			25x25	1.950	0.683	0.50	0.70
NRLMW820M450V22X35F	82			22x35	1.617	0.647	0.56	0.78
NRLMW101M450V25X30F	100			25x30	1.326	0.531	0.64	0.90
NRLMW101M450V30X25F		30x25						
NRLMW151M450V25X40F	150	25x40		0.884	0.354	0.79	1.11	
NRLMW151M450V30X30F		30x30						
NRLMW221M450V30X40F	220	30x40		0.678	0.271	1.00	1.40	
NRLMW221M450V35X30F		35x30						
NRLMW331M450V30X50F	330	30x50		0.502	0.201	1.38	1.93	
NRLMW331M450V35X40F		35x40						
NRLMW471M450V35X50F	470	35x50		0.353	0.123	1.74	2.44	

### PART NUMBER SYSTEM

