

# 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

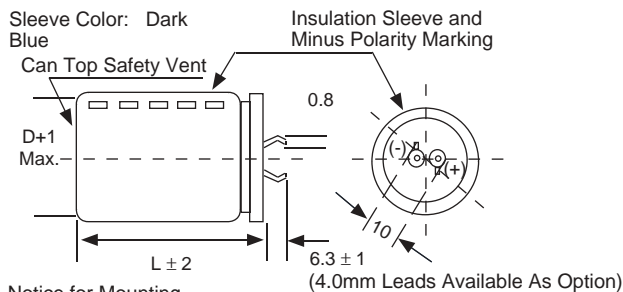
\*See Part Number System for Details



## SPECIFICATIONS

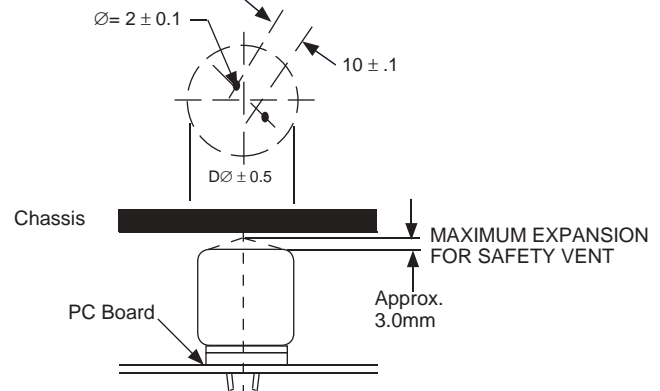
Operating Temperature Range		-40 ~ +85°C					-25 ~ +85°C			
Rated Voltage Range		16 ~ 250Vdc					350 ~ 450Vdc			
Rated Capacitance Range		180 ~ 68,000µF					56 ~ 680µF			
Capacitance Tolerance		±20% (M)								
Max. Leakage Current (µA) After 5 minutes (20°C)		$3 \times \sqrt{C(\mu F)V}$								
Max. 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)

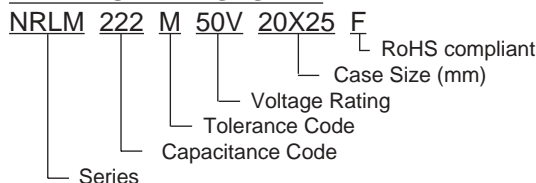


### STANDARD PRODUCT LIST, CASE SIZE AND SPECIFICATIONS

W.V.	Cap (µF)	Case Size	ESR (Ω @ 20°C)		Max. Ripple Current (Arms@85°C)	
			120Hz	20KHz	120Hz	10K ~ 50KHz
16	6,800	20x25	0.098	0.083	3.15	3.62
	8,200	20x30	0.081	0.069	3.47	3.99
	10,000	20x35	0.075	0.063	3.78	4.35
		22x30				
		25x25				
	15,000	20x40	0.053	0.045	5.26	6.05
		22x35				
		25x30				
	22,000	22x45	0.038	0.032	6.10	7.02
		25x35				
		30x30				
	33,000	25x50	0.025	0.021	6.84	7.87
30x40						
35x30						
47,000	30x50	0.021	0.019	7.47	8.59	
35x50						
68,000	35x50	0.018	0.017	9.05	10.41	
25	4,700	20x25	0.113	0.090	3.05	3.51
	6,800	22x30	0.078	0.062	3.47	3.99
		25x25				
	8,200	22x30	0.065	0.052	3.57	4.11
		25x25				
	10,000	22x35	0.058	0.046	3.78	4.35
		25x30				
		30x25				
	15,000	22x50	0.039	0.031	4.63	5.32
		25x40				
		30x30				
	22,000	25x50	0.029	0.023	6.10	7.02
30x40						
33,000	30x50	0.020	0.017	6.84	7.87	
	35x40					
47,000	35x50	0.017	0.015	8.00	9.20	
35	2,200	22x25	0.181	0.136	1.40	1.61
	3,300	20x25	0.111	0.083	2.73	3.14
	4,700	20x35	0.078	0.058	3.26	3.75
		22x30				
	6,800	22x35	0.066	0.049	3.68	4.23
		25x30				
	8,200	25x35	0.057	0.042	4.00	4.60
	10,000	22x45	0.050	0.037	4.42	5.08
		25x40				
		30x30				
		35x25				
	15,000	25x50	0.036	0.027	5.57	6.41
30x40						
35x30						
22,000	30x50	0.026	0.020	6.10	7.02	
	35x40					
33,000	35x50	0.018	0.014	7.15	8.22	

W.V.	Cap (µF)	Case Size	ESR (Ω @ 20°C)		Max. Ripple Current (Arms@85°C)	
			120Hz	20KHz	120Hz	10K ~ 50KHz
50	2,200	20x25	0.151	0.113	2.26	2.60
		22x30	0.100	0.075	2.73	3.14
	4,700	25x25	0.071	0.053	3.03	3.48
		25x30				
		30x25				
	6,800	25x40	0.049	0.037	3.85	4.43
		30x30				
	8,200	25x45	0.040	0.030	4.41	5.07
		30x35				
	10,000	25x50	0.036	0.027	4.97	5.72
		30x40				
	15,000	35x30				
30x50		0.028	0.021	6.44	7.41	
22,000	35x40					
	35x50	0.021	0.017	7.57	8.71	
1,000	22x25	0.381	0.286	1.20	1.38	
2,200	20x35	0.151	0.113	2.52	2.90	
80	3,300	22x30	0.105	0.079	4.10	4.72
		25x25				
		22x40				
	4,700	25x30	0.081	0.061	4.86	5.59
		30x25				
		22x50				
	6,800	25x40	0.061	0.046	5.84	6.72
		30x40				
		35x30				
	8,200	30x45	0.051	0.046	6.00	6.90
		35x35				
	10,000	35x40	0.041	0.033	6.52	7.50
35x50		0.035	0.028	7.15	8.22	
100	1,500	20x35	0.177	0.133	2.26	2.60
		22x30				
		25x25				
	2,200	22x40	0.121	0.090	2.73	3.14
		25x30				
		30x25				
	3,300	22x50	0.085	0.064	3.21	3.69
		25x40				
	4,700	30x30	0.063	0.048	4.09	4.70
		25x50				
	6,800	30x40	0.046	0.035	5.16	5.93
		35x40				
8,200	35x50	0.038	0.029	5.83	6.70	
100	1,000	20x35	0.216	0.140	1.96	2.25
		22x30				
		25x25				
	1,500	22x40	0.155	0.101	2.57	2.96
		25x30				
		30x25				
	2,200	25x40	0.121	0.078	3.14	3.61
		30x30				
	3,300	25x50	0.090	0.059	4.06	4.67
		30x40				
	4,700	30x50	0.071	0.049	5.13	5.90
		35x40				
6,800	35x50	0.049	0.037	6.60	7.59	

#### PART NUMBER SYSTEM



## STANDARD PRODUCT LIST, CASE SIZE AND SPECIFICATIONS

W.V.	Cap (μF)	Case Size	ESR (Ω @ 20°C)		Max. Ripple Current (Arms@85°C)	
			120Hz	20KHz	120Hz	10K ~ 50KHz
160	330	22x25	0.553	0.276	1.45	2.03
	470	22x30	0.423	0.212	2.50	2.95
		25x25				
	680	25x35	0.293	0.146	2.50	3.50
		30x25				
	820	25x35	0.263	0.131	2.75	3.85
		30x30				
	1,000	25x45	0.232	0.128	3.00	4.20
30x35						
35x30						
1,500	30x45	0.166	0.910	3.73	5.22	
	35x45					
2,200	35x45	0.113	0.073	4.78	6.69	
200	220	22x25	0.904	0.407	0.87	1.22
		25x25				
	330	20x35	0.553	0.249	1.56	2.18
		22x30				
		25x25				
	470	22x35	0.388	0.175	1.85	2.59
		25x30				
		30x25				
	680	22x45	0.268	0.121	2.68	3.75
		25x35				
		30x30				
	820	25x45	0.243	0.109	2.93	4.10
		30x35				
		35x25				
	1,000	25x50	0.199	0.090	3.25	4.55
		30x40				
35x30						
1,500	30x50	0.144	0.072	3.87	5.42	
	35x40					
2,200	35x50	0.098	0.054	4.92	6.89	
250	220	22x30	0.904	0.360	1.17	1.64
		25x25				
	330	22x35	0.653	0.261	1.75	2.45
		25x30				
		30x25				
	470	22x45	0.388	0.155	2.11	2.95
		25x40				
		30x30				
	680	25x50	0.268	0.107	2.50	3.50
		30x40				
		35x30				
	820	30x45	0.222	0.089	2.77	3.88
		35x45				
		35x45				
	1,000	30x50	0.199	0.090	3.32	4.65
		35x40				
1,500	30x50	0.168	0.083	3.87	4.94	
	35x40					
1,500	35x50	0.133	0.066	4.04	5.66	

W.V.	Cap (μF)	Case Size	ESR (Ω @ 20°C)		Max. Ripple Current (Arms@85°C)	
			120Hz	20KHz	120Hz	10K ~ 50KHz
350	100	20x35	1.658	0.580	0.91	1.27
		22x30				
	150	22x35	1.105	0.387	1.12	1.57
		25x30				
		30x25				
	220	22x45	0.754	0.264	1.44	2.02
		25x40				
		30x30				
		35x25				
	330	25x50	0.502	0.176	1.88	2.63
30x40						
35x30						
470	30x50	0.388	0.136	2.40	3.36	
	35x40					
560	35x45	0.355	0.142	2.60	3.64	
680	35x50	0.293	0.117	2.96	4.14	
400	68	20x30	2.438	0.853	0.76	1.06
		22x25				
	82	20x30	2.022	0.708	0.83	1.16
		22x25				
	100	20x35	1.658	0.580	0.92	1.29
		22x30				
		25x25				
	150	25x30	1.105	0.387	1.16	1.62
		30x25				
	220	25x40	0.754	0.264	1.49	2.09
30x30						
330	30x40	0.553	0.193	1.90	2.66	
	35x45					
470	35x45	0.388	0.136	2.39	3.35	
450	56	20x30	2.960	1.184	0.70	0.98
		22x25				
	68	22x25*	2.438	0.975	0.76	1.06
		22x30				
	82	20x35	2.022	0.809	0.83	1.16
		22x30				
		25x25				
	100	22x35	1.658	0.663	0.93	1.30
		25x30				
		30x25				
220	25x50	0.754	0.301	1.55	2.17	
	30x40					
	35x30					
330	30x50	0.533	0.249	2.01	2.81	
	35x40					
470	35x50	0.423	0.233	2.53	3.54	

\* Special Size.