

Miniature Aluminum Electrolytic Capacitors

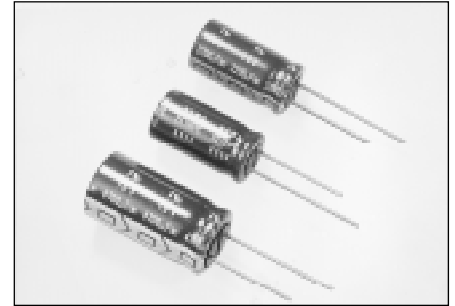
NRWA Series

RADIAL LEADS, STANDARD SIZE,
EXTENDED TEMPERATURE

FEATURES

- REDUCED CASE SIZING
- -55°C ~ +105°C EXTENDED OPERATING TEMPERATURE
- HIGH STABILITY OVER LONG LIFE

EXTENDED TEMPERATURE
NRWA ➔ **NRWS**
(today's standard) (reduced sizes)



LEADED

CHARACTERISTICS

Rated Voltage Range		6.3 ~ 100 VDC								
Capacitance Range		0.47 ~ 10,000μF								
Operating Temperature Range		-55 ~ +105°C								
Capacitance Tolerance		± 20% (M)								
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	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08
		C = 2,200μF	0.24	0.21	0.18	0.16	0.14	0.12		
		C = 3,300μF	0.26	0.23	0.20	0.18	0.16			
		C = 4,700μF	0.28	0.25	0.22	0.20				
		C = 6,800μF	0.32	0.29	0.26					
Low Temperature Stability Impedance Ratio @ 120Hz		C = 10,000μF	0.40	0.37						
		Z-25°C/Z+20°C	4	3	2	2	2	2	2	2
		Z-40°C/Z+20°C	8	6	4	3	3	3	3	3
Load Life Test at Rated W.V.		Capacitance Change	Within ±20% of initial measured value							
105°C 1,000 Hours: 5 ~ 12.5Ø		Tan δ	Less than 200% of specified maximum value							
2,000 Hours: 16 Ø		Leakage Current	Less than specified maximum value							
Shelf Life Test		Capacitance Change	Within ±20% of initial measured value							
105°C 1,000 Hours		Tan δ	Less than 200% of specified maximum value							
No Load		Leakage Current	Less than specified maximum value							

MAXIMUM E.S.R. (Ω) AT 120 Hz AND 20°C

Cap (μF)	Working Voltage (Vdc)							
	6.3V	10V	16V	25V	35V	50V	63V	100V
0.47						353		282
1.0						168		133
2.2						75		60
3.3						50	40	40
4.7				49	42	35	32	28
10			26.5	23	19.9	16.6	15.0	13.3
22		14.3	12.1	10.8	9.0	7.5	6.8	6.0
33	11.1	9.6	8.0	7.0	6.0	5.0	4.5	4.0
47	7.8	6.7	5.8	4.9	4.2	3.5	3.2	2.8
100	3.7	3.2	2.7	2.3	2.0	1.66	1.49	1.33
220		1.43	1.21	1.1	0.90	0.75	0.68	0.60
330	1.11		0.80	0.70	0.60	0.50	0.45	0.40
470	0.78	0.67	0.66	0.49	0.42	0.35	0.32	0.28
1000	0.36	0.32	0.27	0.23	0.20	0.166	0.149	
2200	0.181	0.158	0.136	0.121	0.106	0.091		
3300	0.131	0.116	0.101	0.090	0.081			
4700	0.099	0.088	0.078	0.071				
6800	0.078	0.071	0.063					
10000	0.063	0.058						

MAXIMUM RIPPLE CURRENT (mA rms) AT 105°C, 120Hz

Cap (μF)	Working Voltage (Vdc)							
	6.3V	10V	16V	25V	35V	50V	63V	100V
0.47						8.3		8.8
1.0						12		13
2.2						18		19
3.3						22	23	23
4.7				22	24	26	28	30
10			31	33	35	38	41	49
22		42	45	49	52	57	69	84
33	47	51	55	59	64	80	85	120
47	57	61	68	71	87	96	120	160
100	82	89	110	120	150	160	200	280
220		150	190	200	260	310	350	500
330	170		230	290	350	410	480	610
470	230	250	320	380	450	540	620	780
1000	400	470	560	670	780	950	1080	
2200	760	790	950	1110	1280	1480		
3300	890	1000	1220	1380	1570			
4700	1230	1270	1490	1670				
6800	1340	1540	1770					
10000	1610	1770						



NIC COMPONENTS CORPORATION

70 Maxess Rd., Melville, NY 11747 • (631)396-7500 FAX (631)396-7575

RIPPLE CURRENT CORRECTION FACTOR

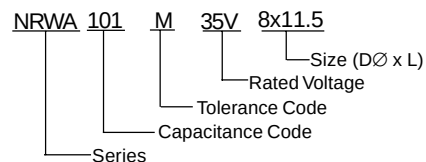
1. Temperature Factor

Ambient Temperature (°C)	≤+60	+65	+70	+85	+105
Correction Rate	2.23	2.17	2.09	1.75	1.00

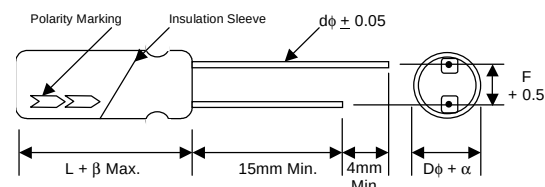
2. Frequency Factor

Frequency (Hz)	50	120	300	1K	10K	100K
0.47 ~ 3.3μF	0.65	1.00	1.35	1.75	2.30	2.50
4.7 ~ 33μF	0.75	1.00	1.25	1.50	1.75	1.80
47 ~ 1000μF	0.80	1.00	1.15	1.30	1.40	1.50
2200 ~ 10000μF	0.85	1.00	1.03	1.05	1.08	1.08

PART NUMBERING SYSTEM



See page 8 for complete part numbering system.



SLEEVE COLOR: DARK BROWN

LEAD SPACING AND DIAMETER (mm)

Case Dia. (DØ)	5	6.3	8	10	12.5	16	18	22
Leads Dia. (dØ)	0.5	0.5	0.6	0.6	0.6	0.8	0.8	0.8
Lead Spacing (F)	2.0	2.5	3.5	5.0	5.0	7.5	7.5	10
Dim. α	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1.0
Dim. β	1.5	1.5	1.5	1.5	1.5	2.0	2.0	2.0

STANDARD PRODUCTS AND CASE SIZE TABLE DØ x L (mm)

Cap (μF)	Code	Working Voltage (Vdc)							
		6.3	10	16	25	35	50	63	100
0.47	R47						5 x 11		5 x 11
1.0	1R0						5 x 11		5 x 11
2.2	2R2						5 x 11		5 x 11
3.3	3R3						5 x 11	5 x 11	5 x 11
4.7	4R7						5 x 11	5 x 11	5 x 11
10	100					5 x 11	5 x 11	5 x 11	6.3 x 11
22	220				5 x 11	5 x 11	5 x 11	6.3 x 11	8 x 11.5
33	330			5 x 11	5 x 11	5 x 11	6.3 x 11	6.3 x 11	10 x 12.5
47	470			5 x 11	5 x 11	6.3 x 11	6.3 x 11	8 x 11.5	10 x 16
100	101		5 x 11	6.3 x 11	6.3 x 11	8 x 11.5	8 x 11.5	10 x 12.5	12.5 x 20
220	221		6.3 x 11	8 x 11.5	8 x 11.5	10 x 12.5	10 x 16	10 x 20	16 x 25
330	331	6.3 x 11		8 x 11.5	10 x 12.5	10 x 16	10 x 20	12.5 x 20	16 x 25
470	471	8 x 11.5	8 x 11.5	10 x 12.5	10 x 16	10 x 20	12.5 x 20	12.5 x 25	16 x 31
1000	102	10 x 12.5	10 x 16	10 x 20	12.5 x 20	12.5 x 25	16 x 25	16 x 31	
2200	222	12.5 x 20	12.5 x 20	12.5 x 25	16 x 25	16 x 31	18 x 36		
3300	332	12.5 x 20	12.5 x 25	16 x 25	16 x 31	18 x 36			
4700	472	16 x 25	16 x 25	16 x 31	18 x 36				
6800	682	16 x 25	16 x 31	18 x 36					
10,000	103	16 x 31	18 x 36						