

Miniature Aluminum Electrolytic Capacitors

NRWP Series

RADIAL LEADS, POLARIZED, NEW FURTHER REDUCED CASE SIZING,
FROM NRWS WIDE TEMPERATURE RANGE

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

RoHS
Compliant
includes all homogeneous materials

*See Part Number System for Details



CHARACTERISTICS

Rated Voltage Range	6.3 ~ 100VDC								
Capacitance Range	33 ~ 33,000μF								
Operating Temperature Range	-55°C ~ +105°C								
Capacitance Tolerance	±20% (M)								
Maximum Leakage Current After 2 minutes	0.01CV or 3μA whichever is greater								
Max. Tan δ at 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	0.28	0.24	0.20	0.16	0.14	0.12	0.10	0.08
	C = 2,200μF	0.30	0.26	0.22	0.18	0.16	0.14	0.12	-
	C = 3,300μF	0.32	0.28	0.24	0.20	0.18	0.16	-	-
	C = 4,700μF	0.34	0.30	0.26	0.22	0.20	-	-	-
	C = 6,800μF	0.38	0.34	0.30	0.26	0.24	-	-	-
	C = 10,000μF	0.46	0.42	0.38	0.34	-	-	-	-
	C = 15,000μF	0.56	0.52	0.48	-	-	-	-	-
	C = 22,000μF	0.70	0.66	-	-	-	-	-	-
Low Temperature Stability Impedance Ratio @ 120Hz	C = 33,000μF	0.92	-	-	-	-	-	-	-
	Z-40°C/Z+20°C	5	4	3	2	2	2	2	2
Load Life Test @ 105°C	Z-55°C/Z+20°C	10	8	6	4	3	3	3	3
	Duration	φ D ≤ 8: 1,000 hours, φ D ≥ 10: 2,000 hours							
	Δ Capacitance	Within ±25% of initial measured value							
	Δ Tan δ	Less than 200% of specified value							
		Δ LC	Less than specified value						

MAXIMUM PERMISSIBLE RIPPLE CURRENT (mA AT 120Hz AND 105°C)

Cap. (μF)	Working Voltage (Vdc)							
	6.3	10	16	25	35	50	63	100
33	-	-	-	-	-	-	-	140
47	-	-	-	-	-	-	-	185
100	-	-	-	-	-	200	230	290
220	-	-	-	240	300	360	390	560
330	-	-	270	335	400	470	540	690
470	-	295	375	440	525	600	700	880
680	285	430	480	630	760	980	800	900
1,000	460	500	640	740	865	1060	1200	985
2,200	775	860	1050	1090	1370	1600	1400	-
3,300	985	1100	1300	1500	1680	1780	-	-
4,700	1150	1350	1650	1800	1870	-	-	-
6,800	1480	1700	1900	1910	1920	-	-	-
10,000	1700	1950	1950	2050	-	-	-	-
15,000	2090	2090	2070	-	-	-	-	-
22,000	2280	2180	-	-	-	-	-	-
33,000	2350	-	-	-	-	-	-	-

MAXIMUM ESR (Ω AT 120Hz AND 20°C)

Cap. (μF)	Working Voltage (Vdc)							
	6.3	10	16	25	35	50	63	100
33	-	-	-	-	-	-	-	4.02
47	-	-	-	-	-	-	-	2.82
100	-	-	-	-	-	1.99	1.66	1.33
220	-	-	-	1.21	1.06	0.90	0.75	0.60
330	-	-	1.01	0.80	0.70	0.60	0.50	0.40
470	-	0.85	0.71	0.56	0.49	0.42	0.35	0.28
680	0.68	0.59	0.49	0.39	0.34	0.29	0.24	0.20
1,000	0.46	0.40	0.33	0.27	0.23	0.20	0.17	0.13
2,200	0.23	0.20	0.17	0.14	0.12	0.11	0.09	-
3,300	0.16	0.14	0.12	0.10	0.09	0.08	-	-
4,700	0.12	0.11	0.09	0.08	0.07	-	-	-
6,800	0.09	0.08	0.07	0.06	0.06	-	-	-
10,000	0.08	0.07	0.06	0.06	-	-	-	-
15,000	0.06	0.06	0.05	-	-	-	-	-
22,000	0.05	0.05	-	-	-	-	-	-
33,000	0.05	-	-	-	-	-	-	-

RIPPLE CURRENT FREQUENCY CORRECTION FACTOR

Cap. (μF)	60Hz	120Hz	500Hz	1KHz	10KHz ~ up
33 ~ 47	0.80	1.00	1.20	1.30	1.50
100 ~ 1,000	0.80	1.00	1.10	1.10	1.20
2,200 ~ 33,000	0.80	1.00	1.05	1.10	1.15

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
If in doubt or uncertainty, please review your specific application - process details with
NIC's technical support personnel: tpmg@niccomp.com

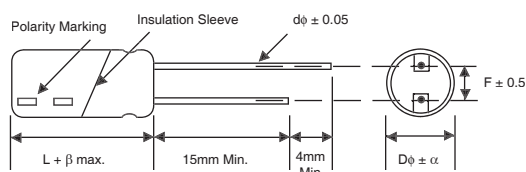


STANDARD PRODUCT AND CASE SIZE TABLE D ϕ x L (mm)

Capacitance (μ F)	Code	Working Voltage (Vdc)							
		6.3	10	16	25	35	50	63	100
33	330	-	-	-	-	-	-	-	8 x 11.5
47	470	-	-	-	-	-	-	-	8 x 11.5
100	101	-	-	-	-	-	8 x 11.5	8 x 11.5	10 x 16
220	221	-	-	-	6.3 x 11	8 x 11.5	10 x 12.5	10 x 16	12.5 x 20
330	331	-	-	6.3 x 11	8 x 11.5	10 x 12.5	10 x 16	10 x 20	12.5 x 25
470	471	-	6.3 x 11	8 x 11.5	8 x 11.5	10 x 12.5	10 x 20	12.5 x 20	16 x 25
680	681	6.3 x 11	8 x 11.5	8 x 11.5	10 x 12.5	10 x 16	12.5 x 20	12.5 x 25	16 x 31.5
1,000	102	8 x 11.5	8 x 11.5	10 x 12.5	10 x 16	10 x 20	12.5 x 25	16 x 25	18 x 35.5
2,200	222	10 x 16	10 x 16	10 x 20	12.5 x 20	16 x 25	16 x 31.5	18 x 31.5	-
3,300	332	10 x 20	10 x 20	12.5 x 20	16 x 25	16 x 25	18 x 35.5	-	-
4,700	472	12.5 x 20	12.5 x 20	12.5 x 25	16 x 25	16 x 35.5	-	-	-
6,800	682	12.5 x 25	16 x 25	16 x 25	16 x 35.5	18 x 35.5	-	-	-
10,000	103	16 x 25	16 x 25	16 x 31.5	18 x 35.5	-	-	-	-
15,000	153	16 x 31.5	16 x 35.5	18 x 35.5	-	-	-	-	-
22,000	223	18 x 31.5	18 x 35.5	-	-	-	-	-	-
33,000	333	18 x 40	-	-	-	-	-	-	-

LEAD SPACING AND DIAMETER (mm)

Case Dia. (D ϕ)	5	6.3	8	10	12.5	16	18
Lead Dia. (D ϕ)	0.5	0.5	0.6	0.6	0.6	0.8	0.8
Lead Spacing (F)	2.0	2.5	3.5	5.0	5.0	7.5	7.5
Dim. α	0.5	0.5	0.5	0.5	0.5	0.5	0.5



$\beta = D < 16\text{mm} = 1.5\text{mm}, L \geq 16\text{mm} = 2.0\text{mm}$

PART NUMBER SYSTEM

NRWP 221 M 25V 6.3X11 F

- NRWP: Series
- 221: Capacitance Code: First 2 characters significant, third character is multiplier
- M: Tolerance Code (M=20%)
- 25V: Working Voltage (Vdc)
- 6.3X11: Case Size (D ϕ x L)
- F: RoHS Compliant