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	-	-	-	-	-	-
	C = 33,000µF	0.92	-	-	-	-	-	-	-
Low Temperature Stability Impedance Ratio @ 120Hz	Z-40°C/Z+20°C	5	4	3	2	2	2	2	2
	Z-55°C/Z+20°C	10	8	6	4	3	3	3	3
Load Life Test @ 105°C	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**

Miniature Aluminum Electrolytic Capacitors

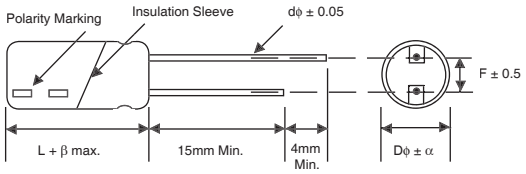
NRWP Series

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

Capacitance (µF)	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. (Dϕ)	5	6.3	8	10	12.5	16	18
Lead Dia. (Dϕ)	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



β = D < 16mm = 1.5mm, L ≥ 16mm = 2.0mm

PART NUMBER SYSTEM

NRWP 221 M 25V 6.3X11 F

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