NRWP Series
Radial Leaded Aluminum Electrolytic Capacitors

ROHS/REACH COMPLIANT HALOGEN FREE

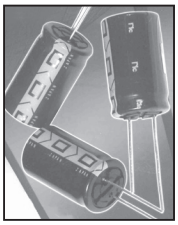
NIC COMPONENTS Performance Passives By Design

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

EXTENDED TEMPERATURE

NRWS ➡ NRWP

(today's standard) (reduced sizes)



CHARACTERISTICS

Rated Voltage Range		6.3 ~ 450VDC							
Capacitance Range		0.47 ~ 33,000µF							
Operating Temperature Range	6.3 ~ 100Vdc	-55°C ~ +105°C							
	160 ~ 400Vdc	-40°C ~ +105°C							
	450Vdc	-25°C ~ +105°C							
Capacitance Tolerance		±20% (M)							
Maximum Leakage Current	6.3 ~ 100Vdc	0.01CV or 3µA whichever is greater (after 2 minutes)							
	160 ~ 450Vdc	For CV's ≤ 1000 LC = 0.1CV + 40µA (after 1 minute), 0.03CV + 15µA (after 5 minutes)							
		For CV's > 1000 LC = 0.04CV + 100µA (after 1 minute), 0.02CV + 25µA (after 5 minutes)							
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
	All Part Numbers	See specifications tables							
Low Temperature Stability Impedance Ratio @ 120Hz	W.V. (Vdc)	6.3	10	16	25	35	50	63	100
	Z-25°C/Z+20°C	5	4	3	2	2	2	2	2
	Z-40°C/Z+20°C	10	8	6	4	3	3	3	3
	W.V. (Vdc)	160	200	250	350	400	450	N/A	
	Z-25°C/Z+20°C	3	3	4	6	6	7		
	Z-40°C/Z+20°C	4	4	8	8	10	-		
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							

PART NUMBERING SYSTEM

NRWP 221 M 50V 10x12.5 TB F

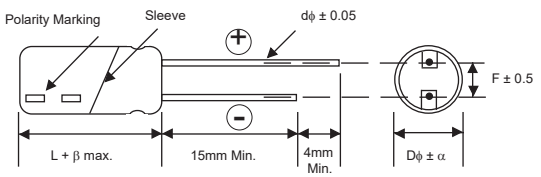
- F — RoHS Compliant
- TB — Tape and Box*
- 10x12.5 — Size (DØxL)
- 50V — Rated Voltage
- M — Tolerance Code
- 221 — Capacitance Code
- NRWP — Series

*see tape specification for details

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

DIMENSIONS (mm)



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

β for all 160V ~ 450V parts = 2.0mm

Drawing is representative of parts as supplied in bulk or straight lead format, please see taping specification for details on taped format packaging.

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COMPONENTS
Performance Passives By Design

STANDARD VALUES, SPECIFICATIONS AND CASE SIZES (mm)

Part Number	Cap. (µF)	W.V. (Vdc)	Dissipation Factor +20°C/120Hz	Ripple Current Rating (mA) +105°C/120Hz	Max. ESR (Ω) +20°C/120Hz	Load Life Hours @+105°C
NRWP101M6.3V5X11F	100	6.3	0.28	96	4.64	1,000
NRWP221M6.3V5X11F	220		0.28	160	2.11	1,000
NRWP331M6.3V6.3X11F	330		0.28	210	1.41	1,000
NRWP471M6.3V6.3X11F	470		0.28	275	0.99	1,000
NRWP681M6.3V6.3X11F	680		0.28	285	0.68	1,000
NRWP102M6.3V8X11.5F	1,000		0.28	460	0.46	1,000
NRWP222M6.3V10X16F	2,200		0.30	775	0.23	2,000
NRWP332M6.3V10X20F	3,300		0.32	985	0.16	2,000
NRWP472M6.3V12.5X20F	4,700		0.34	1150	0.12	2,000
NRWP682M6.3V12.5X25F	6,800		0.38	1480	0.09	2,000
NRWP103M6.3V16X25F	10,000		0.46	1700	0.08	2,000
NRWP153M6.3V16X31.5F	15,000		0.56	2090	0.06	2,000
NRWP223M6.3V18X31.5F	22,000		0.70	2280	0.05	2,000
NRWP333M6.3V18X40F	33,000		0.92	2350	0.05	2,000
NRWP101M10V5X11F	100	10	0.24	105	3.98	1,000
NRWP221M10V5X11F	220		0.24	165	1.81	1,000
NRWP331M10V6.3X11F	330		0.24	235	1.21	1,000
NRWP471M10V6.3X11F	470		0.24	295	0.85	1,000
NRWP681M10V8X11.5F	680		0.24	430	0.59	1,000
NRWP102M10V8X11.5F	1,000		0.24	500	0.40	1,000
NRWP222M10V10X16F	2,200		0.26	860	0.20	2,000
NRWP332M10V10X20F	3,300		0.28	1100	0.14	2,000
NRWP472M10V12.5X20F	4,700		0.30	1350	0.11	2,000
NRWP682M10V16X25F	6,800		0.34	1700	0.08	2,000
NRWP103M10V16X25F	10,000		0.42	1950	0.07	2,000
NRWP153M10V16X35.5F	15,000		0.52	2090	0.06	2,000
NRWP223M10V18X35.5F	22,000		0.66	2180	0.05	2,000
NRWP470M16V5X11F	47	16	0.20	80	7.06	1,000
NRWP101M16V5X11F	100		0.20	130	3.32	1,000
NRWP221M16V6.3X11F	220		0.20	220	1.51	1,000
NRWP331M16V6.3X11F	330		0.20	270	1.01	1,000
NRWP471M16V8X11.5F	470		0.20	375	0.71	1,000
NRWP681M16V8X11.5F	680		0.20	480	0.49	1,000
NRWP102M16V10X12.5F	1,000		0.20	640	0.33	2,000
NRWP222M16V10X20F	2,200		0.22	1050	0.17	2,000
NRWP332M16V12.5X20F	3,300		0.24	1300	0.12	2,000
NRWP472M16V12.5X25F	4,700		0.26	1650	0.09	2,000
NRWP682M16V16X25F	6,800		0.30	1900	0.07	2,000
NRWP103M16V16X31.5F	10,000		0.38	1950	0.06	2,000
NRWP153M16V18X35.5F	15,000		0.48	2070	0.05	2,000
NRWP330M25V5X11F	33	25	0.16	69	8.04	1,000
NRWP470M25V5X11F	47		0.16	84	5.65	1,000
NRWP101M25V5X11F	100		0.16	135	2.65	1,000
NRWP221M25V6.3X11F	220		0.16	240	1.21	1,000
NRWP331M25V8X11.5F	330		0.16	335	0.80	1,000
NRWP471M25V8X11.5F	470		0.16	440	0.56	1,000
NRWP681M25V10X12.5F	680		0.16	630	0.39	2,000
NRWP102M25V10X16F	1,000		0.16	740	0.27	2,000
NRWP222M25V12.5X20F	2,200		0.18	1090	0.14	2,000
NRWP332M25V16X25F	3,300		0.20	1500	0.10	2,000
NRWP472M25V16X25F	4,700		0.22	1800	0.08	2,000
NRWP682M25V16X35.5F	6,800		0.26	1910	0.06	2,000
NRWP103M25V18X35.5F	10,000		0.34	2050	0.06	2,000
NRWP220M35V5X11F	22	35	0.14	64	10.56	1,000
NRWP330M35V5X11F	33		0.14	77	7.04	1,000
NRWP470M35V5X11F	47		0.14	100	4.94	1,000
NRWP101M35V6.3X11F	100		0.14	170	2.32	1,000

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Part Number	Cap. (µF)	W.V. (Vdc)	Dissipation Factor +20°C/120Hz	Ripple Current Rating (mA) +105°C/120Hz	Max. ESR (Ω) +20°C/120Hz	Load Life Hours @+105°C
NRWP221M35V8X11.5F	220	35	0.14	300	1.06	1,000
NRWP331M35V10X12.5F	330		0.14	400	0.70	2,000
NRWP471M35V10X12.5F	470		0.14	525	0.49	2,000
NRWP681M35V10X16F	680		0.14	760	0.34	2,000
NRWP102M35V10X20F	1,000		0.14	865	0.23	2,000
NRWP222M35V16X25F	2,200		0.16	1370	0.12	2,000
NRWP332M35V16X25F	3,300		0.18	1680	0.09	2,000
NRWP472M35V16X35.5F	4,700		0.20	1870	0.07	2,000
NRWP682M35V18X35.5F	6,800		0.24	1920	0.06	2,000
NRWP3R3M50V5X11F	3.3	50	0.12	25	60.32	1,000
NRWP4R7M50V5X11F	4.7		0.12	32	42.35	1,000
NRWP100M50V5X11F	10		0.12	47	19.90	1,000
NRWP220M50V5X11F	22		0.12	70	9.05	1,000
NRWP330M50V5X11F	33		0.12	94	6.03	1,000
NRWP470M50V6.3X11F	47		0.12	115	4.23	1,000
NRWP101M50V8X11.5F	100		0.12	200	1.99	1,000
NRWP221M50V10X12.5F	220		0.12	360	0.90	2,000
NRWP331M50V10X16F	330		0.12	470	0.60	2,000
NRWP471M50V10X20F	470		0.12	600	0.42	2,000
NRWP681M50V12.5X20F	680		0.12	980	0.29	2,000
NRWP102M50V12.5X25F	1,000		0.12	1060	0.20	2,000
NRWP222M50V16X31.5F	2,200		0.14	1600	0.11	2,000
NRWP332M50V18X35.5F	3,300		0.16	1780	0.08	2,000
NRWP100M63V5X11F	10	63	0.10	48	16.59	1,000
NRWP220M63V5X11F	22		0.10	80	7.54	1,000
NRWP330M63V6.3X11F	33		0.10	100	5.03	1,000
NRWP470M63V6.3X11F	47		0.10	140	3.53	1,000
NRWP101M63V8x11.5F	100		0.10	230	1.66	1,000
NRWP221M63V10x16F	220		0.10	390	0.75	2,000
NRWP331M63V10x20F	330		0.10	540	0.50	2,000
NRWP471M63V12.5x20F	470		0.10	700	0.35	2,000
NRWP681M63V12.5x25F	680		0.10	800	0.24	2,000
NRWP102M63V16x25F	1,000		0.10	1200	0.17	2,000
NRWP222M63V18x31.5F	2,200		0.12	1400	0.09	2,000
NRWP3R3M100V5X11F	3.3	100	0.08	30	40.21	1,000
NRWP4R7M100V5X11F	4.7		0.08	35	28.23	1,000
NRWP100M100V5X11F	10		0.08	60	13.27	1,000
NRWP220M100V6.3X11F	22		0.08	98	6.03	1,000
NRWP330M100V8x11.5F	33		0.08	140	4.02	1,000
NRWP470M100V8x11.5F	47		0.08	185	2.82	1,000
NRWP101M100V10x16F	100		0.08	290	1.33	2,000
NRWP221M100V12.5x20F	220		0.08	560	0.60	2,000
NRWP331M100V12.5x25F	330		0.08	690	0.40	2,000
NRWP471M100V16x25F	470		0.08	880	0.28	2,000
NRWP681M100V16x31.5F	680		0.08	900	0.20	2,000
NRWP102M100V18x35.5F	1,000		0.08	985	0.13	2,000
NRWP4R7M160V6.3X11F	4.7	160	0.20	43	70.58	1,000
NRWP100M160V8X11.5F	10		0.20	77	33.17	1,000
NRWP220M160V10X12.5F	22		0.20	92	15.08	2,000
NRWP330M160V10X16F	33		0.20	125	10.05	2,000
NRWP470M160V10X20F	47		0.20	150	7.06	2,000
NRWP101M160V12.5X25F	100		0.20	320	3.32	2,000
NRWP221M160V16X31.5F	220		0.20	410	1.51	2,000
NRWP331M160V18X31.5F	330		0.20	570	1.01	2,000
NRWP471M160V18X40F	470		0.20	855	0.71	2,000

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Part Number	Cap. (µF)	W.V. (Vdc)	Dissipation Factor +20°C/120Hz	Ripple Current Rating (mA) +105°C/120Hz	Max. ESR (Ω) +20°C/120Hz	Load Life Hours @+105°C
NRWP3R3M200V6.3X11F	3.3	200	0.20	36	100.53	1,000
NRWP4R7M200V6.3X11F	4.7		0.20	40	70.58	1,000
NRWP100M200V8X11.5F	10		0.20	57	33.17	1,000
NRWP220M200V10X16F	22		0.20	105	15.08	2,000
NRWP330M200V10X20F	33		0.20	140	10.05	2,000
NRWP470M200V10X20F	47		0.20	195	7.06	2,000
NRWP101M200V16X25F	100		0.20	340	3.32	2,000
NRWP221M200V16X35.5F	220		0.20	580	1.51	2,000
NRWP331M200V18X40F	330		0.20	675	1.01	2,000
NRWPR47M250V6.3X11F	0.47	250	0.20	8	705.83	1,000
NRWP1R0M250V6.3X11F	1.0		0.20	16	331.74	1,000
NRWP2R2M250V6.3X11F	2.2		0.20	30	150.79	1,000
NRWP3R3M250V6.3X11F	3.3		0.20	30	100.53	1,000
NRWP4R7M250V8X11.5F	4.7		0.20	45	70.58	2,000
NRWP100M250V10X12.5F	10		0.20	90	33.17	2,000
NRWP220M250V10X16F	22		0.20	105	15.08	2,000
NRWP330M250V10X20F	33		0.20	140	10.05	2,000
NRWP470M250V12.5X20F	47		0.20	190	7.06	2,000
NRWP101M250V16X25F	100		0.20	310	3.32	2,000
NRWP221M250V18X35.5F	220		0.20	485	1.51	2,000
NRWPR47M350V6.3X11F	0.47	350	0.20	8	705.83	1,000
NRWP1R0M350V6.3X11F	1.0		0.20	16	331.74	1,000
NRWP2R2M350V6.3X11F	2.2		0.20	25	150.79	1,000
NRWP3R3M350V8X11.5F	3.3		0.20	30	100.53	1,000
NRWP4R7M350V8X11.5F	4.7		0.20	45	70.58	1,000
NRWP100M350V10X16F	10		0.20	95	33.17	2,000
NRWP220M350V12.5X20F	22		0.20	175	15.08	2,000
NRWP330M350V12.5X25F	33		0.20	220	10.05	2,000
NRWP470M350V16X25F	47		0.20	260	7.06	2,000
NRWP101M350V18X31.5F	100		0.20	370	3.32	2,000
NRWP1R0M400V6.3X11F	1.0	400	0.25	16	414.68	1,000
NRWP2R2M400V8X11.5F	2.2		0.25	31	188.49	1,000
NRWP3R3M400V8X11.5F	3.3		0.25	34	125.66	1,000
NRWP4R7M400V10X12.5F	4.7		0.25	42	88.23	2,000
NRWP100M400V10X16F	10		0.25	64	41.47	2,000
NRWP220M400V12.5X20F	22		0.25	140	18.85	2,000
NRWP330M400V16X25F	33		0.25	170	12.57	2,000
NRWP470M400V16X25F	47		0.25	200	8.82	2,000
NRWP101M400V18X35.5F	100		0.25	310	4.15	2,000
NRWP1R0M450V6.3X11F	1.0	450	0.25	15	414.68	1,000
NRWP2R2M450V8X11.5F	2.2		0.25	20	188.49	1,000
NRWP3R3M450V10X12.5F	3.3		0.25	33	125.66	2,000
NRWP4R7M450V10X12.5F	4.7		0.25	35	88.23	2,000
NRWP100M450V10X20F	10		0.25	37	41.47	2,000
NRWP220M450V12.5X25F	22		0.25	100	18.85	2,000
NRWP330M450V16X25F	33		0.25	125	12.57	2,000
NRWP470M450V16X31.5F	47		0.25	155	8.82	2,000
NRWP101M450V18X40F	100		0.25	200	4.15	2,000

RIPPLE CURRENT FREQUENCY CORRECTION FACTOR

Cap. (µF)	60Hz	120Hz	500Hz	1KHz	10KHz ~ up
0.47 ~ 1.0	0.50	1.00	1.20	1.30	1.50
2.2 ~ 4.7	0.65	1.00	1.20	1.30	1.50
10 ~ 47	0.80	1.00	1.20	1.30	1.50
100 ~ 1,000	0.80	1.00	1.10	1.15	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 at https://www.niccomp.com/resource/files/aluminum/AlumApplInfoCautions.pdf
If in doubt or uncertainty, please review your specific application - process details with NIC's technical support personnel: **tpmg@niccomp.com**