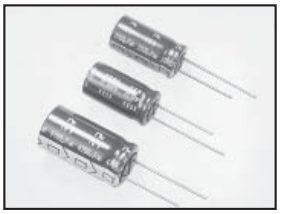
Miniature Aluminum Electrolytic Capacitors

NRWX Series

+125°C WIDE TEMPERATURE RANGE, RADIAL LEADS, POLARIZED



FEATURES

- -55°C ~ +125°C EXTENDED OPERATING TEMPERATURE RANGE
- LOW IMPEDANCE AND HIGH RIPPLE CURRENT AT HIGH FREQUENCY

CHARACTERISTICS

Rated Voltage Range	10 ~ 100Vdc		160 ~ 250Vdc		350 ~ 400Vdc							
Capacitance Range	1.0 ~ 4,700µF		10 ~ 150µF		4.7 ~ 47µF							
Operating Temperature Range	-55 ~ +125°C		-40 ~ +125°C		-25 ~ +125°C							
Capacitance Tolerance	±20% (M)											
Max. Leakage Current @ 20°C	0.01CV or 3µA, whichever is greater after 2 minutes					0.02CV+25µA after 2 minutes						
Max. Tan δ @ 120Hz/20°C	W.V. (Vdc)	10	16	25	35	50	100	160	200	250	350	400
	S.V. (Vdc)	13	20	32	44	63	125	200	250	300	400	450
	C <= 1,000µF	0.20	0.16	0.14	0.12	0.10	0.08	0.20	0.20	0.20	0.24	0.24
	C = 2,200µF	0.22	0.18	0.16	-	-	-	-	-	-	-	-
	C = 3,300µF	0.24	0.20	-	-	-	-	-	-	-	-	-
	C = 4,700µF	0.26	-	-	-	-	-	-	-	-	-	-
Low Temperature Stability Impedance Ratio @ 120Hz	Z-25°C/Z+20°C	-	-	-	-	-	-	3	3	3	6	6
	Z-40°C/Z+20°C	2	2	2	2	2	2	6	6	6	-	-
	Z-55°C/Z+20°C	4	3	3	3	2	2	-	-	-	-	-
Load Life Test at Rated W.V. +125°C	Life Hours	φ8=2,000hrs, φ10=3,000hrs, φ12.5~18=4,000hrs						2,000hrs				
	Capacitance Change	Within ±30% of intial measured value						Within ±20% of inital measured value				
	Tan δ	Less than 300% of specified value						Less than 200% of specified value				
	Leakage Current	Less than specified vlaue						Less than specified value				

STANDARD PRODUCT AND CASE SIZE D φxL (mm)

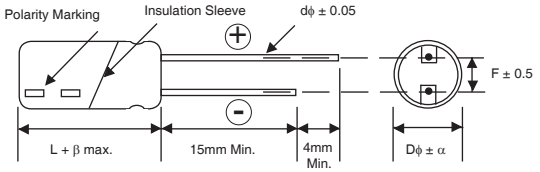
Cap. (µF)	Code	Working Voltage (VDC)										
		10	16	25	35	50	100	160	200	250	350	400
1.0	1R0	-	-	-	-	8x11.5	-	-	-	-	-	-
2.2	2R2	-	-	-	-	8x11.5	-	-	-	-	-	-
3.3	3R3	-	-	-	-	8x11.5	-	-	-	-	-	-
4.7	4R7	-	-	-	-	8x11.5	8x11.5	-	-	-	10x20	10x20
10	10	-	-	-	-	8x11.5	8x11.5	-	10x20	10x20	10x20	12.5x20
22	220	-	-	-	-	8x11.5	8x12.5	10x20	10x20	12.5x20	12.5x25	12.5x25
33	330	-	-	-	-	8x12.5	10x12.5	10x20	12.5x20	12.5x25	16x25	16x25
47	470	-	-	-	8x12.5	8x12.5	10x16	12.5x20	12.5x25	16x25	16x31.5	16x31.5
68	680	-	-	-	-	-	-	12.5x20	16x21	16x31.5	-	-
100	101	-	8x11.5	8x12.5	10x12.5	10x12.5	12.5x20	16x25	-	-	-	-
220	221	8x12.5	10x12.5	10x12.5	10x16	10x20	16x25	-	-	-	-	-
330	331	10x12.5	10x12.5	10x16	10x20	12.5x20	16x31.5	-	-	-	-	-
470	471	10x12.5	10x16	10x20	12.5x20	12.5x25	18x31.5	-	-	-	-	-
1000	102	10x20	12.5x20	12.5x25	16x25	16x31.5	-	-	-	-	-	-
2200	222	12.5x25	16x25	16x31.5	-	-	-	-	-	-	-	-
3300	332	16x25	16x31.5	-	-	-	-	-	-	-	-	-
4700	472	16x31.5	-	-	-	-	-	-	-	-	-	-

DIAMETER AND LEADSPACE (mm)

Case Dia. (Dφ)	8	10	12.5	16
Lead Dia. (dφ)	0.6	0.6	0.8	0.8
Lead Spacing (F)	3.5	5.0	5.0	7.5
Dim. α	0.5		1.0	

β = L< 20mm=1.5mm, L > 20mm=2.0mm

DIMENSIONS (mm)



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

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 VALUES, SPECIFICATIONS AND CASE SIZES (mm)

Part Number	Cap. (µF)	W.V. (Vdc)	Dissipation Factor +20°C/120Hz	Ripple Current Rating (mA) +125°C/100KHz	Max. ESR (Ω) +20°C/100KHz	Load Life Hours @+125°C
NRWX221M10V8x12.5F	220	10	0.20	280	0.26	1,000
NRWX331M10V10x12.5F	330		0.20	350	0.20	2,000
NRWX471M10V10x12.5F	470		0.20	380	0.17	2,000
NRWX102M10V10x20F	1000		0.20	580	0.12	2,000
NRWX222M10V12.5x25F	2200		0.20	1050	0.05	2,000
NRWX332M10V16x25F	3300		0.20	1150	0.04	2,000
NRWX472M10V16x31.5F	4700		0.20	1500	0.03	2,000
NRWX101M16V8x11.5F	100	16	0.16	250	0.39	1,000
NRWX221M16V10x12.5F	220		0.16	350	0.20	2,000
NRWX331M16V10x12.5F	330		0.16	380	0.17	2,000
NRWX471M16V10x16F	470		0.16	490	0.15	2,000
NRWX102M16V12.5x20F	1000		0.16	770	0.07	2,000
NRWX222M16V16x25F	2200		0.16	1150	0.04	2,000
NRWX332M16V16x31.5F	3300		0.16	1500	0.03	2,000
NRWX101M25V8x12.5F	100	25	0.14	280	0.26	1,000
NRWX221M25V10x12.5F	220		0.14	380	0.17	2,000
NRWX331M25V10x16F	330		0.14	480	0.15	2,000
NRWX471M25V10x20F	470		0.14	580	0.12	2,000
NRWX102M25V12.5x25F	1000		0.14	1050	0.05	2,000
NRWX222M25V16x31.5F	2200		0.14	1500	0.03	2,000
NRWX470M35V8x12.5F	47	35	0.12	230	0.45	1,000
NRWX101M35V10x12.5F	100		0.12	315	0.35	2,000
NRWX221M35V10x16F	220		0.12	420	0.29	2,000
NRWX331M35V10x20F	330		0.12	580	0.20	2,000
NRWX471M35V12.5x20F	470		0.12	630	0.12	2,000
NRWX102M35V16x25F	1000		0.12	980	0.06	2,000
NRWX1R0M50V8x11.5F	1.0	50	0.10	28	2.0	1,000
NRWX2R2M50V8x11.5F	2.2		0.10	42	1.8	1,000
NRWX3R3M50V8x11.5F	3.3		0.10	49	1.5	1,000
NRWX4R7M50V8x11.5F	4.7		0.10	70	1.15	1,000
NRWX100M50V8x11.5F	10		0.10	150	0.95	1,000
NRWX220M50V8x11.5F	22		0.10	210	0.65	1,000
NRWX330M50V8x12.5F	33		0.10	230	0.45	1,000
NRWX470M50V8x12.5F	47		0.10	230	0.45	1,000
NRWX101M50V10x12.5F	100		0.10	315	0.35	2,000
NRWX221M50V10x20F	220		0.10	560	0.20	2,000
NRWX331M50V12.5x20F	330		0.10	630	0.12	2,000
NRWX471M50V12.5x25F	470		0.10	770	0.10	2,000
NRWX102M50V16x31.5F	1000		0.10	1200	0.045	2,000
NRWX4R7M100V8x11.5F	4.7	100	0.08	100	2.0	2,000
NRWX100M100V8x11.5F	10		0.08	150	1.5	2,000
NRWX220M100V8x12.5F	22		0.08	190	1.5	2,000
NRWX330M100V10x12.5F	33		0.08	330	0.75	3,000
NRWX470M100V10x16F	47		0.08	400	0.57	3,000
NRWX101M100V12.5x20F	100		0.08	580	0.29	4,000
NRWX221M100V16x25F	220		0.08	670	0.22	4,000
NRWX331M100V16x31.5F	330		0.08	810	0.15	4,000
NRWX471M100V18x31.5F	470		0.08	950	0.11	4,000
NRWX220M160V10x20F	22	160	0.20	115	N/A	3,000
NRWX330M160V10x20F	33		0.20	125		3,000
NRWX470M160V12.5x20F	47		0.20	187		4,000
NRWX680M160V12.5x20F	68		0.20	200		4,000
NRWX101M160V16x25F	100		0.20	329		4,000
NRWX151M160V16x31.5F	150		0.20	434		4,000
NRWX100M200V10x20F	10	200	0.20	78		3,000
NRWX220M200V10x20F	22		0.20	95		3,000
NRWX330M200V12.5x20F	33		0.20	157		4,000
NRWX470M200V12.5x25F	47		0.20	204		4,000
NRWX680M200V16x21F	68		0.20	250		4,000

For Automotive Applications see part number system

STANDARD VALUES, SPECIFICATIONS AND CASE SIZES (mm)

Part Number	Cap. (µF)	W.V. (Vdc)	Dissipation Factor +20°C/120Hz	Ripple Current Rating (mA) +125°C/100KHz	Max. ESR (Ω) +20°C/100KHz	Load Life Hours @+125°C
NRWX100M250V10x20F	10	250	0.20	78	N/A	3,000
NRWX220M250V12.5x20F	22		0.20	128		4,000
NRWX330M250V12.5x25F	33		0.20	171		4,000
NRWX470M250V16x25F	47		0.20	225		4,000
NRWX680M250V16x31.5F	68		0.20	292		4,000
NRWX4R7M350V10x20F	4.7	350	0.20	53		3,000
NRWX100M350V10x20F	10		0.20	67		3,000
NRWX220M350V12.5X25F	22		0.20	139		4,000
NRWX330M350V16x25F	33		0.20	189		4,000
NRWX470M350V16x31.5F	47		0.20	243		4,000
NRWX4R7M400V10x20F	4.7	400	0.20	53		3,000
NRWX100M400V12.5x20F	10		0.20	86		4,000
NRWX220M400V12.5X25F	22		0.20	142		4,000
NRWX330M400V16x25F	33		0.20	189		4,000
NRWX470M400V16x31.5F	47		0.20	243		4,000

For Automotive Applications see part number system

RIPPLE CURRENT CORRECTION FACTOR

Frequency (Hz)	100Hz ~ <1KHz	1KHz ~ <10KHz	≥ 10K
C < 4.7µF	0.4	0.7	1.0
4.7µF ≤ C < 100µF	0.50	0.73	0.92
100µF ≤ C < 1000µF	0.55	0.77	0.94
1000µF ≤ C	0.60	0.80	0.96

PART NUMBERING SYSTEM

NRWX 331 M 25V 10X16 TB Y F

- F — RoHS Compliant
- Y — Optional: For automotive equipment, sourced to special production and inspection at TS-16949 certified production site
- TB = Tape & Box*
- 10X16 — Case Size (DϕxL)
- 25V — Working Voltage (Vdc)
- M — Tolerance Code (M=20%)
- 331 — Capacitance Code: First 2 characters significant, third character is multiplier
- NRWX — Series

*see tape specification for details