

# Miniature Aluminum Electrolytic Capacitors

NRSZ Series

LOW IMPEDANCE AT HIGH FREQUENCY RADIAL LEADS, POLARIZED ALUMINUM ELECTROLYTIC CAPACITORS

**RoHS  
Compliant**  
includes all homogeneous materials  
\*See Part Number System for Details



## FEATURES

- VERY LOW IMPEDANCE
- LONG LIFE AT 105°C (2000 ~ 5000 hrs.)
- HIGH STABILITY AT LOW TEMPERATURE
- IDEALLY FOR USE IN SWITCHING POWER SUPPLIES AND CONVERTORS

## CHARACTERISTICS

Rated Voltage Range	6.3 ~ 100VDC									
Capacitance Range	0.47 ~ 12,000μF									
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. Tanδ ~ 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 < 1,200μF	0.22	0.19	0.16	0.14	0.12	0.10	0.08	0.07	
	C = 1,500μF	0.23	0.20	0.17	0.15	0.13	0.11	-	-	
	C = 1,800μF	0.23	0.20	0.17	0.15	0.13	0.11	-	-	
	C = 2,200μF	0.24	0.21	0.18	0.16	0.14	-	-	-	
	C = 2,700μF	0.25	0.22	0.19	0.17	0.15	-	-	-	
	C = 3,300μF	0.26	0.23	0.20	0.18	0.16	-	-	-	
	C = 3,900μF	0.28	0.25	0.22	0.20	-	-	-	-	
	C = 4,700μF	0.29	0.26	0.23	0.21	-	-	-	-	
	C = 5,600μF	0.31	0.28	0.25	-	-	-	-	-	
	C = 6,800μF	0.33	0.30	0.27	-	-	-	-	-	
	C = 8,200μF	0.36	0.33	-	-	-	-	-	-	
C = 10,000μF	0.40	-	-	-	-	-	-	-		
C = 12,000μF	0.44	-	-	-	-	-	-	-		
Low Temperature Stability Impedance Ratio @ 120Hz	Z-25°C/Z+20°C	3	2	2	2	2	2	2	2	
	Z-40°C/Z+20°C	4	3	3	3	3	3	3	3	
Load Life Test at Rated W.V. & 105°C 5,000 hours: 12.5φ 3,000 hours: 8 ~ 10φ 2,000 hours: 5 ~ 6.3φ	Capacitance Change	Within ±20% of initial measured value								
	Tanδ	Less than 200% of specified maximum value								
	Leakage Current	Less than specified maximum value								
Shelf Life Test 105°C for 1,000 hours No Load	Capacitance Change	Within ±20% of initial measured value								
	Tanδ	Less than 200% of specified maximum value								
	Leakage Current	Less than specified maximum value								

LOW IMPEDANCE  
NRSZ ➔ NRSY  
(today's standard) (reduced sizes)

\*NRSZ102M6.3V8X20 is 4,500 Hours @ 105°C

Unless otherwise specified here, capacitor shall meet JIS C-5141 Characteristics W.

## RIPPLE CURRENT CORRECTION FACTORS

Frequency (Hz)	Cap. (μF)	120	1K	10K	100K
Multiplier	0.47 ~ 4.7	0.40	0.68	0.78	1.00
	5.6 ~ 47	0.50	0.76	0.87	1.00
	56 ~ 270	0.70	0.85	0.90	1.00
	330 ~ 1000	0.80	0.93	0.98	1.00
	1200 ~ 12000	0.90	0.95	1.0	1.0

## 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](http://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](mailto:tpmg@niccomp.com)

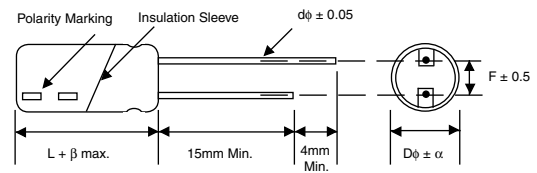


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## LEAD SPACING AND DIAMETER (mm)

Case Dia. (D $\phi$ )	5	6.3	8	10	12.5	16	18
Lead Dia. (d $\phi$ )	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. $\alpha$	0.5						
Dim. $\beta$	1.0			2.0			



## STANDARD PRODUCTS, CASE SIZES AND SPECIFICATIONS

W.V. (Vdc)	Cap. (μF)	Code	Case Size D $\phi$ x L(mm)	Lead Space (mm)	Max. Tan $\delta$	Max. LC (μA)	Max. Impedance		Max. Ripple Current at 100KHz/105°C (mA rms)
							100KHz/20°C	100KHz/-10°C	
6.3	100	101	5x11	2.0	0.22	6.3	0.90	1.8	100
	220	221	6.3x11	2.5	0.22	13.9	0.30	0.60	280
	330	331	6.3x11	2.5	0.22	20.8	0.22	0.44	300
			8x11.5	3.5	0.22	20.8	0.19	0.38	410
	470	471	8x11.5	3.5	0.22	296	0.11	0.22	560
	680	681	8x15	3.5	0.22	42.8	0.985	0.17	730
	820	821	10x12.5	5.0	0.22	51.7	0.085	0.17	800
	1000	102	8x20	3.5	0.22	63.0	0.069	0.14	800
	1200	122	10x16	5.0	0.22	75.6	0.062	0.13	1050
	1500	152	10x20	5.0	0.23	94.5	0.044	0.088	1250
	2200	222	12.5x20	5.0	0.24	138	0.048	0.096	1400
	2700	272	12.5x20	5.0	0.25	170	0.038	0.076	1600
	3900	392	12.5x25	5.0	0.28	245	0.029	0.058	1800
	4700	472	12.5x25	5.0	0.29	296	0.029	0.058	1800
5600	562	16x25	7.5	0.31	353	0.022	0.044	2100	
12000	123	18x35.5	7.5	0.44	756	0.018	0.036	2800	
10	68	680	5x11	2.0	0.19	6.8	0.90	1.8	160
	82	820	5x11	2.0	0.19	8.2	0.65	1.3	175
	100	101	5x11	2.0	0.19	10.0	0.42	0.84	190
	150	151	6.3x11	2.5	0.19	150.0	0.31	0.62	280
	180	181	6.3x11	2.5	0.19	18.0	0.31	0.62	280
	220	221	6.3x11	2.5	0.19	22.0	0.22	0.44	300
	330	331	8x11.5	3.5	0.19	33.0	0.11	0.28	560
			8x15	3.5	0.19	47.0	0.085	0.17	610
	470	471	10x12.5	5.0	0.19	47.0	0.12	0.24	730
	560	561	10x16	5.0	0.19	56.0	0.095	0.19	735
	680	681	8x20	3.5	0.19	68.0	0.069	0.14	800
			10x12.5	5.0	0.19	68.0	0.085	0.17	800
	1000	102	10x20	5.0	0.19	100	0.050	0.10	1200
	1200	122	10x20	5.0	0.19	120	0.044	0.088	1250
	1500	152	10x22	5.0	0.20	150	0.039	0.078	1450
	2200	222	12.5x20	5.0	0.22	220	0.038	0.076	1400
			12.5x25	5.0	0.22	220	0.037	0.074	1700
	2700	272	12.5x25	5.0	0.22	270	0.029	0.058	1800
	3300	332	12.5x25	5.0	0.23	330	0.035	0.070	1700
	3900	392	16x25	7.5	0.25	390	0.028	0.056	2070
4700	472	16x31.5	7.5	0.26	470	0.024	0.048	2350	
5600	562	16x31.5	7.5	0.18	560	0.024	0.048	2350	
6800	682	16x35.5	7.5	0.30	680	0.022	0.044	2550	
8200	822	18x35.5	7.5	0.33	820	0.020	0.040	2800	

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## STANDARD PRODUCTS, CASE SIZES AND SPECIFICATIONS

W.V. (Vdc)	Cap. ( $\mu$ F)	Code	Case Size D $\phi$ x L(mm)	Lead Space (mm)	Max. Tan $\delta$	Max. LC ( $\mu$ A)	Max. Impedance		Max. Ripple Current at 100KHz/105°C (mA rms)
							100KHz/20°C	100KHz/-10°C	
16	47	470	5x11	2.0	0.16	7.5	0.90	1.8	180
	56	560	5x11	2.0	0.16	9.0	0.90	1.8	180
	100	101	6.3x11	2.5	0.16	16.0	0.32	0.64	280
	120	121	6.3x11	2.5	0.16	19.2	0.31	0.62	290
	150	151	6.3x11	2.5	0.16	24.0	0.22	0.44	300
	180	181	6.3x11	2.5	0.16	28.8	0.24	0.48	280
	220	221	8x11.5	3.5	0.16	35.2	0.11	0.32	560
	270	271	8x12.5	3.5	0.16	43.2	0.11	0.28	570
	330	331	8x15	3.5	0.16	52.8	0.085	0.17	730
			10x12.5	5.0	0.16	52.8	0.10	0.20	650
	470	471	8x20	3.5	0.16	75.2	0.069	0.14	800
			10x16	5.0	0.16	75.2	0.90	0.18	950
	680	681	10x20	5.0	0.16	108	0.054	0.11	1250
	820	821	10x20	5.0	0.16	131	0.044	0.90	1250
	1000	102	10x22	5.0	0.16	160	0.039	0.078	1450
	1200	122	12.5x20	5.0	0.16	192	0.038	0.076	1600
	1800	182	12.5x25	5.0	0.17	288	0.029	0.058	1800
	2200	222	12.5x25	5.0	0.18	352	0.037	0.074	1700
16x21			7.5	0.18	352	0.040	0.080	1700	
2700	272	16x25	7.5	0.19	432	0.022	0.044	2100	
3900	392	16x31.5	7.5	0.22	624	0.018	0.036	2350	
4700	472	16x35.5	7.5	0.23	752	0.018	0.036	2550	
5600	562	18x35.5	7.5	0.25	896	0.018	0.036	2800	
25	33	330	5x11	2.0	0.14	8.3	0.90	1.8	160
	47	470	5x11	2.0	0.14	11.7	0.42	0.84	190
	68	680	6.3x11	2.5	0.14	17.0	0.32	0.64	280
	100	101	6.3x11	2.5	0.14	25.0	0.22	0.48	300
	150	151	8x11.5	3.5	0.14	37.5	0.11	0.22	560
	180	181	8x12.5	3.5	0.14	45.0	0.11	0.22	570
	220	221	8x15	3.5	0.14	55.0	0.085	0.18	730
			10x12.5	5.0	0.14	55.0	0.12	0.24	630
	270	271	10x12.5	5.0	0.14	67.5	0.085	0.18	800
	330	331	8x20	3.5	0.14	82.5	0.069	0.16	800
			10x16	5.0	0.14	82.5	0.090	0.18	830
	470	471	10x16	5.0	0.14	117	0.065	0.13	1010
	560	561	10x20	5.0	0.14	140	0.044	0.088	1250
	680	681	10x22	5.0	0.14	170	0.039	0.078	1450
	1000	102	12.5x20	5.0	0.14	250	0.038	0.076	1600
	1200	122	12.5x25	5.0	0.14	300	0.029	0.058	1800
	1800	182	16x25	7.5	0.15	450	0.022	0.044	2100
	2200	222	16x25	7.5	0.16	550	0.029	0.058	2000
2700	272	16x31.5	7.5	0.17	675	0.018	0.038	2350	
3300	332	16x35.5	7.5	0.18	825	0.018	0.038	2550	
3900	392	18x31.5	7.5	0.20	975	0.018	0.046	2800	
4700	472	18x35.5	7.5	0.21	1175	0.021	0.042	2700	



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## STANDARD PRODUCTS, CASE SIZES AND SPECIFICATIONS

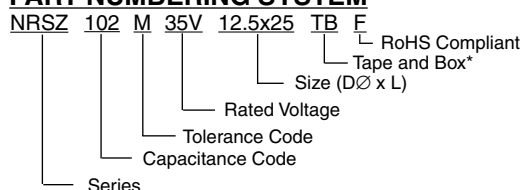
W.V. (Vdc)	Cap. ( $\mu$ F)	Code	Case Size D $\phi$ x L(mm)	Lead Space (mm)	Max. Tan $\delta$	Max. LC ( $\mu$ A)	Max. Impedance		Max. Ripple Current at 100KHz/105°C (mA rms)
							100KHz/20°C	100KHz/-10°C	
35	22	220	5x11	2.0	0.12	7.7	0.42	0.84	190
	33	330	6.3x11	2.5	0.12	11.6	0.42	0.84	190
	47	470	6.3x11	2.5	0.12	16.5	0.32	0.64	280
	68	680	6.3x11	2.5	0.12	19.6	0.22	0.44	300
	82	820	6.3x11	2.5	0.12	28.7	0.24	0.48	280
	100	101	8x11.5	3.5	0.12	35.0	0.11	0.22	560
	120	121	8x12.5	3.5	0.12	42.0	0.11	0.22	570
			10x12.5	5.0	0.14	42.0	0.14	0.28	560
	150	151	8x15	3.5	0.12	52.5	0.085	0.17	730
			10x12.5	5.0	0.12	52.5	0.12	0.24	635
	220	221	8x20	3.5	0.12	77.0	0.069	0.14	800
			10x16	5.0	0.12	77.0	0.085	0.17	950
	330	331	10x20	5.0	0.12	115	0.044	0.088	1250
	390	391	10x20	5.0	0.12	136	0.054	0.11	1190
	470	471	10x20	5.0	0.12	164	0.054	0.11	1250
	560	561	12.5x20	5.0	0.12	196	0.042	0.084	1400
	680	681	12.5x20	5.0	0.12	238	0.038	0.076	1600
	1000	102	12.5x25	5.0	0.12	350	0.029	0.058	1800
			16x21	7.5	0.12	350	0.037	0.074	1700
	1200	122	16x25	7.5	0.12	420	0.029	0.058	2000
1500	152	16x25	7.5	0.13	525	0.022	0.044	2100	
2200	222	16x31	7.5	0.14	770	0.018	0.036	2350	
		16x35.5	7.5	0.14	770	0.018	0.036	2550	
2700	272	18x35.5	7.5	0.15	945	0.018	0.036	2800	
3300	332	18x35.5	7.5	0.16	1155	0.022	0.044	2700	
50	1.0	1R0	5x11	2.0	0.10	3.0	3.3	6.6	30
	2.2	2R2	5x11	2.0	0.10	3.0	3.0	6.0	45
	4.7	4R7	5x11	2.0	0.10	3.0	2.0	4.0	90
	10	100	5x11	2.0	0.10	5.0	1.7	3.4	110
	15	150	5x11	2.0	0.10	7.5	1.2	2.4	130
	18	180	5x11	2.0	0.10	9.0	1.0	2.0	150
	22	220	5x11	2.0	0.10	11.0	0.70	1.4	160
	33	330	6.3x11	2.5	0.10	16.5	0.55	1.1	200
	39	390	6.3x11	2.5	0.10	19.5	0.55	1.1	200
	47	470	6.3x11	2.5	0.10	23.5	0.43	0.86	220
	68	680	8x11.5	3.5	0.10	34.0	0.26	0.52	360
	82	820	8x12.5	3.5	0.10	41.0	0.24	0.48	400
	100	101	8x15	3.5	0.10	50.0	0.18	0.36	500
			10x12.5	5.0	0.10	50.0	0.25	0.50	520
	120	121	8x20	3.5	0.10	60.0	0.16	0.32	650
			10x12.5	5.0	0.10	60.0	0.16	0.32	550
	150	151	8x20	3.5	0.10	75.0	0.16	0.32	650
	180	181	10x16	5.0	0.10	90.0	0.12	0.24	760
	220	221	10x20	5.0	0.10	110	0.10	0.20	850
	330	331	10x22	5.0	0.10	165	0.072	0.16	1000
	390	391	12.5x20	5.0	0.10	195	0.059	0.12	1200
			16x15	7.5	0.10	195	0.08	0.16	1610
	470	471	12.5x20	5.0	0.10	235	0.059	0.12	1200
	560	561	12.5x25	5.0	0.10	280	0.045	0.092	1400
	680	681	16x21	7.5	0.10	340	0.068	0.136	1300
	1000	102	16x25	7.5	0.10	500	0.039	0.078	1750
1200	122	16x31.5	7.5	0.10	600	0.025	0.058	2100	
1500	152	16x35.5	7.5	0.11	750	0.025	0.058	2300	
1800	182	18x35.5	7.5	0.11	900	0.024	0.048	2400	



### STANDARD PRODUCTS, CASE SIZES AND SPECIFICATIONS

W.V. (Vdc)	Cap. ( $\mu$ F)	Code	Case Size D $\phi$ x L(mm)	Lead Space (mm)	Max. Tan $\delta$	Max. LC ( $\mu$ A)	Max. Impedance		Max. Ripple Current at 100KHz/105°C (mA rms)
							100KHz/20°C	100KHz/-10°C	
63	18	180	5x11	2.0	0.08	7.6	1.6	3.2	140
	33	330	6.3x11	2.5	0.08	17.0	0.90	1.8	200
	39	390	6.3x11	2.5	0.08	24.6	0.90	1.8	200
	47	470	8x11.5	3.5	0.08	29.6	0.52	1.04	275
	56	560	8x11.5	3.5	0.08	35.3	0.52	1.04	275
	68	680	8x11.5	3.5	0.08	42.8	0.52	1.04	275
	82	820	8x15	3.5	0.08	51.7	0.34	0.68	360
	120	121	8x20	3.5	0.08	75.6	0.21	0.42	510
			10x12.5	5.0	0.08	75.6	0.26	0.52	420
	150	151	8x20	3.5	0.08	94.5	0.18	0.36	690
			10x16	5.0	0.08	91.5	0.20	0.40	525
	220	221	10x20	5.0	0.08	138	0.15	0.30	765
	270	271	10x22	5.0	0.08	170	0.12	0.24	840
	330	331	12.5x20	5.0	0.08	208	0.10	0.20	960
470	471	12.5x25	5.0	0.08	296	0.064	0.13	1200	
680	681	16x25	7.5	0.08	428	0.052	0.11	1500	
1000	102	16x31.5	7.5	0.08	630	0.042	0.09	1750	
100	1.0	1R0	5x11	2.0	0.07	3.0	4.1	8.2	97
	5.6	5R6	5x11	2.0	0.07	5.6	2.7	5.4	120
	10	100	6.3x11	2.5	0.07	10	1.4	2.8	120
	12	120	6.3x11	2.5	0.07	12	1.4	2.8	170
	15	150	8x11.5	3.5	0.07	15	0.81	1.62	230
	22	220	8x11.5	3.5	0.07	22	0.81	1.62	230
	27	270	8x15	3.5	0.07	27	0.64	1.3	295
	39	390	8x20	3.5	0.07	39	0.36	0.72	400
	47	470	10x16	5.0	0.07	47	0.35	0.70	420
	68	680	10x20	5.0	0.07	68	0.24	0.48	630
	100	101	12.5x20	5.0	0.07	100	0.15	0.30	800
	150	151	12.5x25	5.0	0.07	150	0.11	0.22	920
			18x15	7.5	0.07	150	0.12	0.24	917
	220	221	16x25	7.5	0.07	220	0.071	0.15	1100
330	331	16x31.5	7.5	0.07	330	0.049	0.10	1490	
390	391	16x35.5	7.5	0.07	390	0.043	0.09	1630	
470	471	18x35.5	7.5	0.07	470	0.038	0.08	1700	

### PART NUMBERING SYSTEM



\*see tape specification for details