

# Miniature Aluminum Electrolytic Capacitors

NRSZC Series

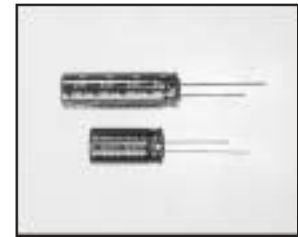
VERY LOW IMPEDANCE (LOWER THAN NRSZ) AT HIGH FREQUENCY  
 RADIAL LEADS, POLARIZED ALUMINUM ELECTROLYTIC CAPACITORS

## FEATURES

- VERY LOW IMPEDANCE
- LONG LIFE AT 105°C (2000 ~ 7000 hrs.)
- HIGH STABILITY AT LOW TEMPERATURE
- IDEALLY FOR SWITCHING POWER SUPPLIES

**RoHS Compliant**  
 includes all homogeneous materials

\*See Part Number System for Details

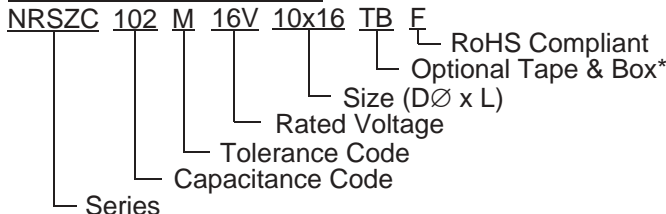


## CHARACTERISTICS

Rated Voltage Range	6.3 ~ 35VDC						
Capacitance Range	47 ~ 18,000µF						
Operating Temperature Range	-55 ~ +105°C						
Capacitance Tolerance	±20% (M)						
Max. Leakage Current @ 20°C after 2 min.	0.01CV						
Max. Tanδ ~ 120Hz/20°C	W.V. (VDC)	6.3	10	16	25	35	
	S.V. (VDC)	8	13	20	32	44	
	C < 1,000µF	0.22	0.19	0.16	0.14	0.12	
	C = 1,800µF	0.22	0.19	0.16	0.14	0.12	
	C = 2,200µF	0.24	-	0.18	0.16	0.14	
	C = 2,700µF	0.24	0.21	0.18	0.16	0.14	
	C = 3,300µF	-	-	0.20	0.18	0.16	
	C = 3,900µF	0.26	0.23	0.20	0.18	0.16	
	C = 4,700µF	0.28	0.26	0.22	-	0.18	
	C = 5,600µF	0.30	0.27	0.24	0.22	-	
	C = 6,800µF	0.32	0.29	0.26	0.24	-	
	C = 8,200µF	0.36	0.33	0.30	-	-	
	C = 10,000µF	0.40	0.37	0.34	-	-	
	C = 12,000µF	0.44	0.41	-	-	-	
C = 15,000µF	0.50	0.47	-	-	-		
C = 18,000µF	0.56	-	-	-	-		
Low Temperature Stability Impedance Ratio @ 120Hz	Z-25°C/Z+20°C	3	2	2	2	2	
	Z-40°C/Z+20°C	4	4	3	3	3	
Load Life Test at Rated W.V. & 105°C 7,000 Hours: 16 ~ 18φ 5,000 hours: 12.5φ 4,000 hours: 10φ 3,000 hours: 8φ 2,000 hours: 5 ~ 6.3φ	Capacitance Change	Within ±25% 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					

**NRSZ → NRSZC**  
 (today's standard) (for new designs)

## PART NUMBER SYSTEM



## 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)



### 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) 2 minutes	Max. Impedance	Max. Ripple Current at 100KHz/105°C (mA rms)
							100KHz/20°C	
6.3	180	181	5x11	2.0	0.22	11.3	0.340	205
	330	331	6.3x11	2.5	0.22	20.8	0.170	330
	390	391	6.3x11	2.5	0.22	24.6	0.170	330
	680	681	8x11.5	3.5	0.22	42.8	0.110	580
	1000	102	8x15	3.5	0.22	63.0	0.080	750
	1200	122	8x20	3.5	0.22	75.6	0.060	1000
			10x12.5	5.0	0.22	75.6	0.063	900
	1500	152	8x20	3.5	0.22	94.5	0.060	1000
			10x16	5.0	0.22	94.5	0.049	1200
	2200	222	10x20	5.0	0.24	138.6	0.036	1450
			12.5x16	5.0	0.24	138.6	0.049	1400
	2700	272	10x22	5.0	0.24	170.1	0.036	1500
	3900	392	12.5x20	5.0	0.26	245.7	0.035	1660
	4700	472	12.5x25	5.0	0.28	296.1	0.027	2000
	5600	562	12.5x25	5.0	0.30	352.8	0.027	2000
			16x21	7.5	0.30	352.8	0.032	2000
	6800	682	12.5x30	5.0	0.32	428.4	0.24	2450
			16x25	7.5	0.32	428.4	0.022	2560
	8200	822	16x25	7.5	0.36	516.6	0.022	2560
	10000	103	16x25	7.5	0.40	630.0	0.17	3010
18x25			7.5	0.40	630.0	0.022	2740	
12000	123	16x35.5	7.5	0.44	756.0	0.016	3150	
		18x30.5	7.5	0.44	756.0	0.17	3330	
15000	153	18x35.5	7.5	0.50	945.0	0.016	3680	
18000	183	18x41	7.5	0.56	1134	0.015	3800	
10	150	151	5x11	2.0	0.19	15.0	0.340	205
	270	271	6.3x11	2.5	0.19	27.0	0.170	330
	470	471	8x11.5	3.5	0.19	47.0	0.110	580
	560	561	8x11.5	3.5	0.19	56.0	0.110	580
	680	681	8x15	3.5	0.19	68.0	0.080	750
	820	821	10x12.5	5.0	0.19	82.0	0.063	900
	1000	102	8x20	3.5	0.19	100.0	0.060	1000
			10x16	5.0	0.19	100.0	0.049	1200
	1200	122	10x16	5.0	0.19	120.0	0.049	1200
	1500	12	10x20	5.0	0.19	150.0	0.036	1450
	1800	182	10x22	5.0	0.19	180.0	0.036	1500
			12.5x16	5.0	0.19	180.0	0.049	1400
	2700	272	12.5x20	5.0	0.21	270.0	0.035	1660
	3900	392	12.5x25	5.0	0.23	390.0	0.027	2000
			16x21	7.5	0.23	390.0	0.032	2000
	4700	472	12.5x30	5.0	0.25	470.0	0.024	2450
			16x25	7.5	0.25	470.0	0.022	2560
	5600	562	16x25	7.5	0.27	560.0	0.022	2560
			18x21	7.5	0.27	560.0	0.030	2490
	6800	682	16x31.5	7.5	0.29	680.0	0.017	3010
18x25			7.5	0.29	680.0	0.022	2740	
8200	822	16x31.5	7.5	0.33	820.0	0.017	3010	
10000	103	16x35.5	7.5	0.37	1000	0.016	3150	
		18x30.5	7.5	0.37	1000	0.017	3330	
12000	123	18x35.5	7.5	0.41	1200	0.016	3680	
15000	153	18x41	7.5	0.47	1500	0.015	3800	

### 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) 2 minutes	Max. Impedance	Max. Ripple Current at 100KHz/105°C (mA rms)
							100KHz/20°C	
16	100	101	5x11	2.0	0.16	16.0	0.340	205
	180	181	6.3x11	2.5	0.16	28.8	0.170	330
	330	331	8x11.5	3.5	0.16	52.8	0.110	580
	470	471	8x15	3.5	0.16	75.2	0.080	750
	560	561	10x12.5	5.0	0.16	89.6	0.063	900
	680	681	8X20	3.5	0.16	108.8	0.060	1000
	820	821	10X16	5.0	0.16	131.2	0.049	1200
	1000	102	10X20	5.0	0.16	160.0	0.036	1450
	1200	122	10X22	5.0	0.16	192.0	0.036	1500
			12.5X16	5.0	0.16	192.0	0.049	1400
	1500	152	12.5X20	5.0	0.16	240.0	0.035	1660
	1800	182	12.5X20	5.0	0.16	288.0	0.035	1660
	2200	222	12.5X25	5.0	0.18	352.0	0.027	2000
	2700	272	12.5X25	5.0	0.18	432.0	0.027	2000
			16X21	7.5	0.18	432.0	0.032	2000
	3300	332	12.5x30	5.0	0.20	528.0	0.024	2450
			16x25	7.5	0.20	528.0	0.022	2560
			18x21	7.5	0.20	528.0	0.030	2490
	3900	392	16x25	7.5	0.20	624.0	0.022	2560
	4700	472	16x31.5	7.5	0.22	752.0	0.017	3010
18x25			7.5	0.22	752.0	0.022	2740	
5600	562	16x31.5	7.5	0.24	896.0	0.017	3010	
6800	682	16x35.5	7.5	0.26	1088	0.016	3150	
8200	822	18x35.5	7.5	0.30	1312	0.016	3680	
10000	103	18x41	7.5	0.34	1600	0.015	3800	
25	68	680	5x11	2.0	0.14	17.0	0.340	205
	120	121	6.3x11	2.5	0.14	30.0	0.170	330
	220	221	8x11.5	3.5	0.14	55.0	0.110	580
	330	331	8x15	3.5	0.14	82.5	0.080	750
	390	391	10x12.5	5.0	0.14	97.5	0.063	900
	470	471	8x20	3.5	0.14	117.5	0.060	1000
	560	561	10x16	5.0	0.14	140.0	0.049	1200
	680	681	10x20	5.0	0.14	170.0	0.036	1450
	820	821	10x20	5.0	0.14	205.0	0.036	1450
			12.5x16	5.0	0.14	205.0	0.049	1400
	1000	102	10x22	5.0	0.14	250.0	0.036	1500
	1200	122	12.5x20	5.0	0.14	300.0	0.035	1660
	1800	182	12.5x25	5.0	0.14	450.0	0.027	2000
			16x25	7.5	0.14	450.0	0.032	2000
	2200	222	12.5x30	5.0	0.16	550.0	0.024	2450
			18x21	7.5	0.16	550.0	0.030	2490
	2700	272	16x25	7.5	0.16	675.0	0.022	2560
	3300	332	16x31.5	7.5	0.18	825.0	0.017	3010
			18x25	7.5	0.18	825.0	0.022	2740
	3900	392	16x35.5	7.5	0.18	975.0	0.016	3150
18x30.5			7.5	0.18	975.0	0.017	3330	
5600	562	18x35.5	7.5	0.22	1400	0.016	3680	
6800	682	18x41	7.5	0.24	1700	0.015	3800	

## 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) 2 minutes	Max. Impedance	Max. Ripple Current at 100KHz/105°C (mA rms)
							100KHz/20°C	
35	47	470	5x11	2.0	0.12	16.5	0.340	205
	100	101	6.3x11	2.5	0.12	35.0	0.170	330
	150	151	8x11.5	3.5	0.12	52.5	0.110	580
	220	221	8x15	3.5	0.12	77.0	0.080	750
	270	271	10x12.5	5.0	0.12	94.5	0.063	900
	330	331	8x20	3.5	0.12	115.5	0.060	1000
			10x16	5.0	0.12	115.5	0.049	1200
	390	391	10x16	5.0	0.12	136.5	0.049	1200
	470	471	10x20	5.0	0.12	164.5	0.036	1450
	560	561	10x20	5.0	0.12	196.0	0.036	1450
			12.5x16	5.0	0.12	196.0	0.049	1400
	680	681	10x22	5.0	0.12	238.0	0.036	1500
	820	821	12.5x20	5.0	0.12	287.0	0.035	1660
	1200	122	12.5x25	5.0	0.12	420.0	0.027	2000
			16x21	7.5	0.12	420.0	0.032	2000
	1500	152	12.5x30	5.0	0.12	525.0	0.024	2450
			18x21	7.5	0.12	525.0	0.030	2490
	1800	182	16x25	7.5	0.12	630.0	0.022	2560
	2200	222	18x25	7.5	0.14	770.0	0.022	2740
	2700	272	16x31.5	7.5	0.14	945.0	0.017	3010
3300	332	16x35.5	7.5	0.16	1155	0.016	3150	
3900	392	18x35.5	7.5	0.16	1365	0.016	3680	
4700	472	18x41	7.5	0.18	1645	0.015	3800	

## RIPPLE CURRENT CORRECTION FACTORS

Frequency (Hz)	Cap. (μF)	120	1K	10K	100K
Multiplier	47 ~ 68	0.50	0.80	1.00	1.00
	100 ~ 220	0.55	0.85	1.00	1.00
	270 ~ 1000	0.65	0.90	1.00	1.00
	1200 ~ 18000	0.75	0.90	1.00	1.00

## LEAD SPACING AND DIAMETER (mm)

Case Dia. (D $\phi$ )	5	6.3	8	10	12.5	12.5x30	16	18
Lead Dia. (d $\phi$ )	0.5	0.5	0.6	0.6	0.6	0.8	0.8	0.8
Lead Spacing (F)	2.0	2.5	3.5	5.0	5.0	5.0	7.5	7.5
Dim. $\alpha$	0.5							

$$\beta = L < 20\text{mm} = 1.5\text{mm}, L \geq 20\text{mm} = 2.0\text{mm}$$

