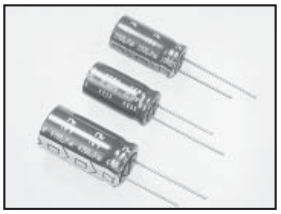
Miniature Aluminum Electrolytic Capacitors

NRZX Series

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



FEATURES

- -40˚C ~ +125˚C EXTENDED OPERATING TEMPERATURE RANGE
- LOW IMPEDANCE AND HIGH RIPPLE CURRENT AT HIGH FREQUENCY
- MEETS THE REQUIREMENTS OF AEC-Q200*

*Contact NIC for supporting test data

CHARACTERISTICS

Rated Voltage Range	10 ~ 35Vdc				
Capacitance Range	22 ~ 2,200µF				
Operating Temperature Range	-40 ~ +125°C				
Capacitance Tolerance	±20% (M)				
Max. Leakage Current @ 20°C	0.01CV or 3µA, whichever is greater after 2 minutes				
Max. Tan δ @ 120Hz/20°C	W.V. (Vdc)	10	16	25	35
	S.V. (Vdc)	13	20	32	44
	C ≤ 1,000µF	0.20	0.16	0.14	0.12
	C = 1,200µF	0.20	-	-	-
	C = 1,500µF	0.20	0.16	-	-
	C = 2,200µF	0.22	-	-	-
Low Temperature Stability Impedance Ratio @ 120Hz	Z-25°C/Z+20°C	3	2	2	2
	Z-40°C/Z+20°C	6	4	3	3
Load Life Test at Rated W.V. +125°C	Case Diameter	ϕD ≤ 6.3	ϕD = 8	ϕD = 10	ϕD = 12.5
	Life Hours	1,000hrs	2,000hrs	3,000hrs	4,000hrs
	Capacitance Change	Within ±30% of intial measured value			
	Tan δ	Less than 300% of specified value			
	Leakage Current	Less than specified vlaue			

STANDARD PRODUCT AND CASE SIZE D ϕxL (mm)

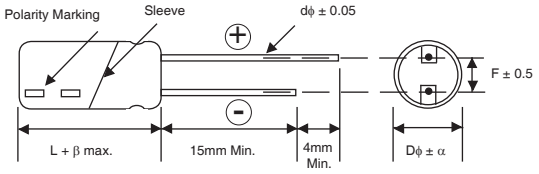
Cap. (µF)	Code	Working Voltage (VDC)			
		10	16	25	35
22	220	-	-	-	5x11
33	330	-	-	5x11	-
47	470	-	5x11	-	8x12.5
56	560	5x11	-	6.3x11	6.3x11
100	101	-	6.3x11	-	8x11.5
120	121	6.3x11	-	-	8x16
150	151	-	-	8x11.5	10x12.5
180	181	-	-	-	8x20
220	221	-	8x11.5	8x16	10x16
				10x12.5	
270	271	-	-	8x20	10x20
330	331	8x11.5	8x16	10x16	10x23
			10x12.5		
470	471	8x16	8x20	10x20	12.5x20
		10x12.5	10x16		
560	561	-	-	10x23	12.5x25
680	681	8x20	10x20	12.5x20	-
		10x16			
820	821	-	10x23	-	-
1000	102	10x20	12.5x20	12.5x25	-
1200	122	10x23	-	-	-
1500	152	12.5x20	12.5x25	-	-
2200	222	12.5x25	-	-	-

DIAMETER AND LEADSPACE (mm)

Case Dia. (Dϕ)	5.0	6.3	8.0	10	12.5
Lead Dia. (dϕ)	0.5	0.5	0.6	0.6	0.8
Lead Spacing (F)	2.0	2.5	3.5	5.0	5.0
Dim. α	0.5				1.0

β = L ≤ 16mm=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	Maximum Leakage Current after 2 minutes (µA)	Ripple Current Rating +125°C/100KHz (mA)	Max. ESR (Ω)		Load Life @+125°C (Hours)
						100KHz +20°C	100KHz -10°C	
NRZX560M10V5X11F	56	10	0.2	16.8	250	0.400	1.30	1,000
NRZX121M10V6.3x11F	120	10	0.2	36	405	0.170	0.53	1,000
NRZX331M10V8X11.5F	330	10	0.2	99	760	0.094	0.29	2,000
NRZX471M10V8X16F	470	10	0.2	141	995	0.073	0.23	2,000
NRZX471M10V10X12.5F	470	10	0.2	141	1030	0.069	0.21	3,000
NRZX681M10V8X20F	680	10	0.2	204	1250	0.054	0.17	3,000
NRZX681M10V10X16F	680	10	0.2	204	1430	0.050	0.16	3,000
NRZX102M10V10X20F	1000	10	0.2	300	1500	0.030	0.09	3,000
NRZX122M10V10X23F	1200	10	0.2	360	1620	0.029	0.086	3,000
NRZX152M10V12.5X20F	1500	10	0.2	450	1720	0.028	0.069	4,000
NRZX222M10V12.5X25F	2200	10	0.22	660	1900	0.024	0.059	4,000
NRZX470M16V5X11F	47	16	0.16	22.6	250	0.400	1.30	1,000
NRZX101M16V6.3X11F	100	16	0.16	48	405	0.170	0.53	1,000
NRZX221M16V8X11.5F	220	16	0.16	105.6	760	0.094	0.29	2,000
NRZX331M16V8X16F	330	16	0.16	158.4	995	0.073	0.23	2,000
NRZX331M16V10X12.5F	330	16	0.16	158.4	1030	0.069	0.21	3,000
NRZX471M16V8X20F	470	16	0.16	225.6	1250	0.054	0.17	3,000
NRZX471M16V10X16F	470	16	0.16	225.6	1430	0.050	0.16	3,000
NRZX681M16V10X20F	680	16	0.16	326.4	1500	0.030	0.09	3,000
NRZX821M16V10X23F	820	16	0.16	393.6	1620	0.029	0.086	3,000
NRZX102M16V12.5X20F	1000	16	0.16	480	1720	0.028	0.069	4,000
NRZX152M16V12.5X25F	1500	16	0.16	720	1900	0.024	0.059	4,000
NRZX330M25V5X11F	33	25	0.14	24.8	250	0.400	1.30	1,000
NRZX560M25V6.3X11F	56	25	0.14	42	405	0.170	0.53	1,000
NRZX151M25V8X11.5F	150	25	0.14	112.5	760	0.094	0.29	2,000
NRZX221M25V8X16F	220	25	0.14	165	995	0.073	0.23	2,000
NRZX221M25V10X12.5F	220	25	0.14	165	1030	0.069	0.21	3,000
NRZX271M25V8X20F	270	25	0.14	202.5	1250	0.054	0.17	3,000
NRZX331M25V10X16F	330	25	0.14	247.5	1430	0.050	0.16	3,000
NRZX471M25V10X20F	470	25	0.14	352.5	1500	0.030	0.09	3,000
NRZX561M25V10X23F	560	25	0.14	420	1620	0.029	0.086	3,000
NRZX681M25V12.5X20F	680	25	0.14	510	1720	0.028	0.069	4,000
NRZX102M25V12.5X25F	1000	25	0.14	750	1900	0.024	0.059	4,000
NRZX220M35V5X11F	22	35	0.12	23.1	250	0.400	1.30	1,000
NRZX560M35V6.3X11F	56	35	0.12	58.8	405	0.170	0.53	1,000
NRZX101M35V8X11.5F	100	35	0.12	105	760	0.094	0.29	2,000
NRZX121M35V8X16F	120	35	0.12	126	995	0.073	0.23	2,000
NRZX151M35V10X12.5F	150	35	0.12	157.5	1030	0.069	0.21	3,000
NRZX181M35V8X20F	180	35	0.12	189	1250	0.054	0.17	3,000
NRZX221M35V10X16F	220	35	0.12	231	1430	0.050	0.16	3,000
NRZX271M35V10X20F	270	35	0.12	283.5	1500	0.030	0.09	3,000
NRZX331M35V10X23F	330	35	0.12	346.5	1620	0.029	0.086	3,000
NRZX471M35V12.5X20F	470	35	0.12	493.5	1720	0.028	0.069	4,000
NRZX561M35V12.5X25F	560	35	0.12	588	1900	0.024	0.059	4,000

For Automotive Applications see part number system

RIPPLE CURRENT CORRECTION FACTOR

Frequency (Hz)	120	1K	10K	100K
22 ~ 33µF	0.20	0.50	0.80	1.00
39 ~ 100µF	0.25	0.60	0.90	1.00
120 ~ 270µF	0.35	0.70	0.92	1.00
330 ~ 680µF	0.45	0.75	0.95	1.00
820 ~ 1800µF	0.50	0.80	0.96	1.00
2200µF	0.55	0.85	0.98	1.00

PART NUMBERING SYSTEM

NRZX 471 M 16V 10X16 TB Y F

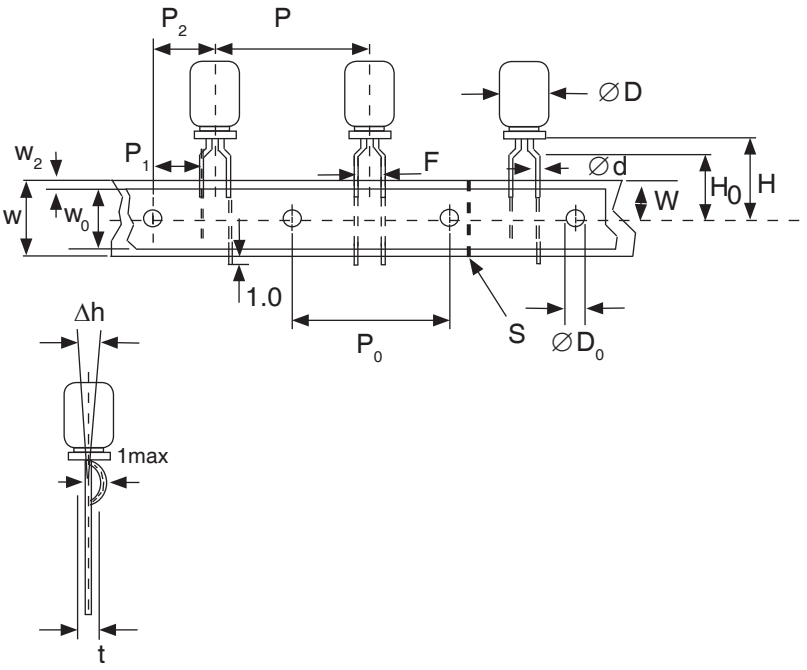
- F — RoHS Compliant
- Y — Optional: For automotive equipment, sourced to special production and inspection at TS-16949 certified production site
- TB = Tape & Box*
- 10X16 — Case Size (DϕxL)
- 16V — Working Voltage (Vdc)
- M — Tolerance Code (M=20%)
- 471 — Capacitance Code: First 2 characters significant, third character is multiplier
- NRZX — Series

*see tape specification for details

STANDARD RADIAL TAPING (5mm LEAD SPACING, FORMED LEADS) TB

Taping Dimensions (mm)

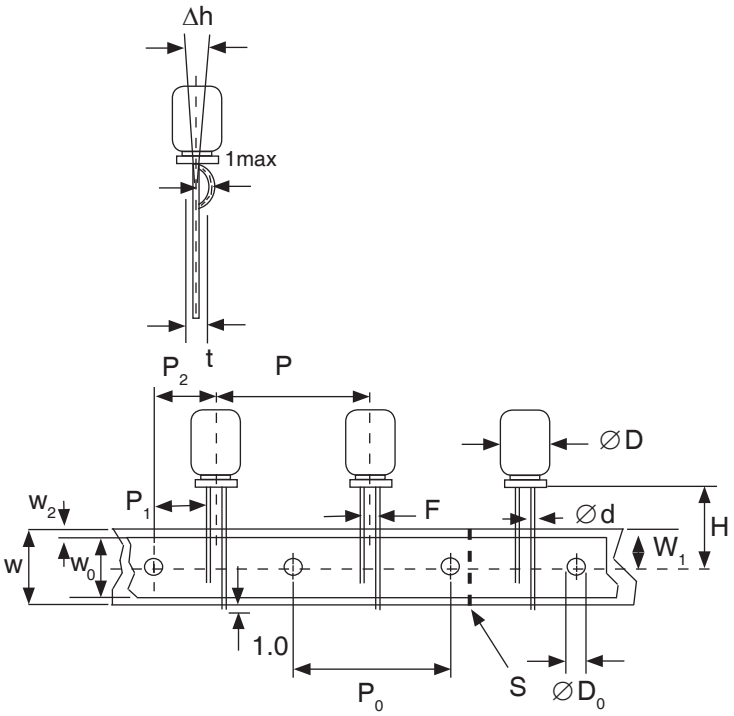
Case Dia. (Dϕ)	5	6.3	8
Case Size	5x11	6.3x11	8x11.5
dϕ ±0.05	0.5	0.5	0.6
H ±0.75	18.5	18.5	20.0
F +0.8 ~ -0.2	5.0 -02 ~ +0.8		
P	12.7 ±1.0		
P_0	12.7 ±0.2		
P_1	3.85 ±0.5 (at end of tape)		
P_2	6.35 ±1.0		
W	18.0 ±0.5		
W_0	11.5 min.		
W_1	9.0 ±0.5		
W_2	0 ~ 2.5		
H_0	16.0 ±0.5		
I	1.0 max.		
$D_0\phi$	4.0 ±0.2		
Δh	0 ±1.0 (at top of can)		
t	0.7 ±0.2 (not including lead)		



STANDARD RADIAL TAPING (5mm LEAD SPACING, STRAIGHT LEADS) TB

Taping Dimensions (mm)

Case Dia. (Dϕ)	10	12.5
Case Size Dim.	All	All
dϕ ±0.05	0.6	0.6
H ±0.75	19.0	19.0
F +0.8 ~ -0.2	5.0	5.0
P ±1.0	12.7*	25.4*
P_0	12.7 ±0.2	
P_1	3.85	
P_2	6.35 ±1.0	
W	18.0 ±0.5	
W_0	11.5 min	
W_1	9.0 ±0.5	
W_2	0 ~ 2.5	
H_0	16.0 ±0.5	
I	1.0 max.	
$D_0\phi$	4.0 ±0.2	
Δh	0 ±1.0 (at top of can)	
t	0.7 ±0.2 (not including lead)	
***Optional Taping Specifications** 10mm diameter available with P dim. = 15mm (P/N Suffix: TB15MMP)		
12.5mm diameter available with P dim. = 15mm, P_1= 5.0mm, P_0 = 15.0mm & P_2 = 7.5mm (P/N Suffix: TB15MMP)		

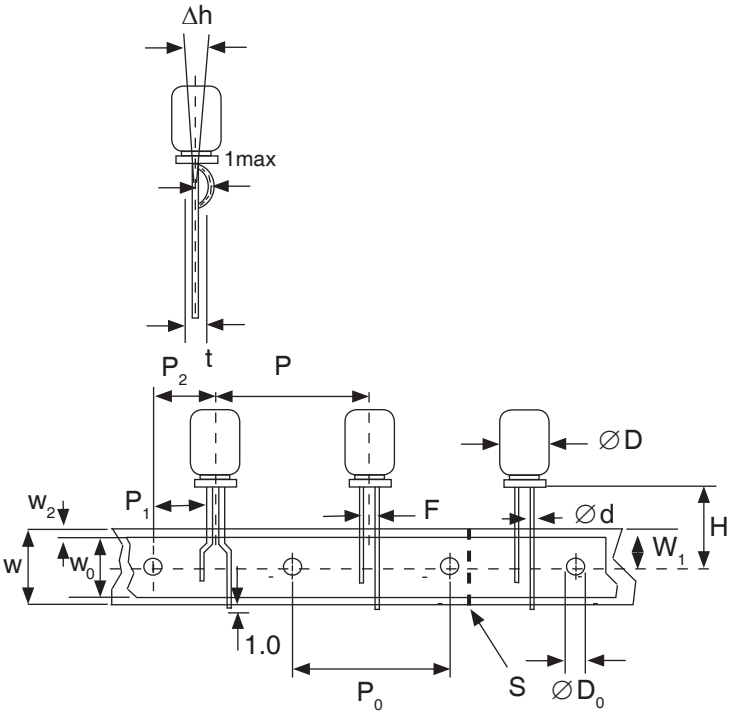


NOTE: ANODE (+) LEAD FEEDS OFF FIRST. FOR OPTION OF NEGATIVE (–) LEAD FIRST, SPECIFY "TBN".

SPECIAL STRAIGHT LEAD TAPING TBST*

Taping Dimensions (mm)

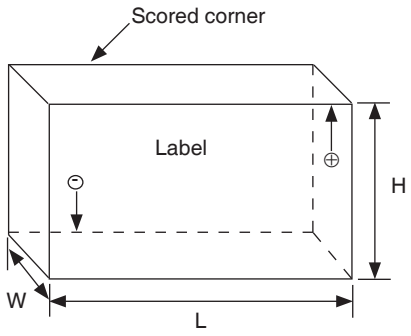
Case Dia. (Dϕ)	6.3	8
Case Size Dim.	6.3x11	8x11.5
dϕ ±0.05	0.5	0.6
H ±0.75	18.5	20.0
F +0.8 ~ -0.2	2.5	3.5
P ±1.0	12.7 ±0.2	
P_0	12.7 ±0.2	
P_1	5.1	4.6
P_2	6.35 ±1.0	
W	18.0 ±0.5	
W_0	11.5 min.	
W_1	9.0 ±0.5	
W_2	0 ~ 2.5	
H_0	16.0 ±0.5	
l	1.0 max.	
$D_0\phi$	4.0 ±0.2	
Δh	0 ±1.0 (at top of can)	
t	0.7 ±0.2 (not including lead)	
* Parts with 4mm diameter are taped with a slight flare in the lead and a 2.0mm lead-space.		



*Straight leads will extend from the based of the component to the edge of the carrier. The section of lead below the adhesive tape may be straight or formed.

RADIAL TAPED PACKAGING

Ammo Box Dimensions (mm)



Ammo Box (Tape & Box) TB, TBF1, TBST

Size of box and component quantity

Case Dia (Dϕ) or Case Size	Q'ty per Box (pcs)	Dim. L	Dim. H	Dim. W
5x11	2,000	340	255	55
6.3x11	2,000	331	280	48
8x11.5	1,000	335	235	53
8x16, 8x20	500	335	300	53
10x12.5	500	335	190	53
10x16	500	335	300	53
10x20	500	335	300	55
10x23	500	335	300	61
12.5x20	500	335	300	55
12.5x25	500	335	300	61