

# Miniature Aluminum Electrolytic Capacitors

NRB-XL Series

ULTRA LOW IMPEDANCE, RADIAL LEADS, POLARIZED, ALUMINUM ELECTROLYTIC

## FEATURES

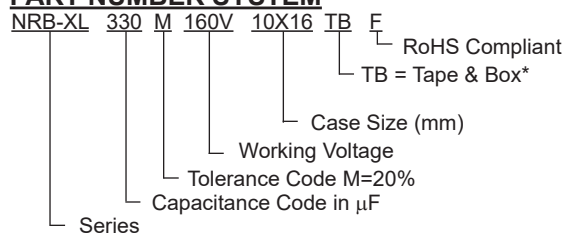
- ULTRA LONG LIFE AT 105°C (12,000 ~ 20,000 hrs.)
- HIGH VOLTAGE, REDUCED SIZE



## CHARACTERISTICS

Rated Voltage Range		160 ~ 450Vdc				
Capacitance Range		1.0 ~ 68μF				
Operating Temperature Range		160V ~ 400V		450V		
		-40°C ~ +105°C		-25°C ~ +105°C		
Capacitance Tolerance		±20% (M)				
Maximum Leakage Current	Duration	CV ≤ 1000		CV > 1000		
	After 1 minute	LC=0.1CV + 40μA		LC=0.04CV + 100μA		
	After 5 minutes	LC=0.03CV + 15μA		LC=0.02CV + 25μA		
Max. Tan δ at 120Hz/20°C	W.V. (Vdc)	160	200	250	400	450
	S.V. (Vdc)	200	250	300	450	500
	Tan δ	0.24	0.24	0.24	0.24	0.24
Low Temperature Stability Impedance Ratio @ 120Hz	W.V. (Vdc)	160	200	250	400	450
	Z-25°C/Z+20°C	3	3	3	6	6
	Z-40°C/Z+20°C	8	8	8	10	-
Load Life Hours Load Life Test at Rated W.V. & 105°C	Capacitance Change	Within ±30% of initial measured value				
	Tan δ	Less than 300% of specified value				
	Leakage Current	Less than specified value				
	Case Size	Load Life Hours				
	6.3X11, 8X9, 10X9	12,000 Hrs				
	8X11.5, 10X12.5	15,000 Hrs				
10X16, 10X20, φD ≥ 12.5	20,000 Hrs					

## PART NUMBER SYSTEM



\*see tape specification for details

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



NIC COMPONENTS CORP.

[www.niccomp.com](http://www.niccomp.com)

SPECIFICATIONS ARE SUBJECT TO CHANGE

## STANDARD PRODUCT, SPECIFICATIONS AND CASE SIZES D $\phi$ x L (mm)

Part Number	Cap. ( $\mu$ F)	W.V. (Vdc)	Dissipation Factor +20°C/120Hz	Ripple Current Rating (mA) +105°C		Max. ESR ( $\Omega$ ) 120Hz @ +20°C	LC ( $\mu$ A) after 5 minutes	Load Life Hours @+105°C	
				120Hz	100KHz				
NRB-XL5R6M160V6.3X11F	5.6	160	0.24	52	104	71.09	41.88	12,000	
NRB-XL100M160V8X9F	10		0.24	70	133	39.81	57.0	12,000	
NRB-XL150M160V8X11.5F	15		0.24	92	174	26.54	73.0	15,000	
NRB-XL150M160V10X9F			0.24	95	180	26.54	73.0	12,000	
NRB-XL220M160V10X12.5F	22		0.24	121	217	18.09	95.4	15,000	
NRB-XL330M160V10X16F	33		0.24	158	284	12.06	130.6	20,000	
NRB-XL2R2M200V6.3X11F	2.2	200	0.24	36	72	180.95	28.2	12,000	
NRB-XL3R3M200V6.3X11F	3.3		0.24	42	84	120.63	34.8	12,000	
NRB-XL4R7M200V6.3X11F	4.7		0.24	49	98	84.70	43.2	12,000	
NRB-XL5R6M200V8X9F	5.6		0.24	56	112	71.09	47.4	12,000	
NRB-XL6R8M200V8X9F	6.8		0.24	62	117	58.54	52.2	12,000	
NRB-XL8R2M200V8X9F	8.2		0.24	66	125	48.55	57.8	12,000	
NRB-XL100M200V8X11.5F	10		0.24	80	152	39.81	65.0	15,000	
NRB-XL120M200V10X9F	12		0.24	88	167	33.17	73.0	12,000	
NRB-XL180M200V10X12.5F	18		0.24	113	214	22.12	97.0	15,000	
NRB-XL270M200V10X16F	27		0.24	149	268	14.74	133	20,000	
NRB-XL1R8M250V6.3X11F	1.8		250	0.24	33	66	221.16	28.5	12,000
NRB-XL2R2M250V6.3X11F	2.2			0.24	36	72	180.95	31.5	12,000
NRB-XL3R3M250V6.3X11F	3.3			0.24	42	84	120.63	39.75	12,000
NRB-XL4R7M250V8X9F	4.7			0.24	53	106	84.70	48.5	12,000
NRB-XL5R6M250V8X11.5F	5.6	0.24		62	124	71.09	53.0	15,000	
NRB-XL6R8M250V8X11.5F	6.8	0.24		68	129	58.54	59.0	15,000	
NRB-XL8R2M250V10X9F	8.2	0.24		76	144	48.55	66.0	12,000	
NRB-XL100M250V10X12.5F	10	0.24		90	171	39.81	75.0	15,000	
NRB-XL120M250V10X12.5F	12	0.24		97	184	33.17	85.0	15,000	
NRB-XL180M250V10X16F	18	0.24		127	241	22.12	115	20,000	
NRB-XL1R0M400V6.3X11F	1.0	400		0.24	24	48	398.09	27.0	12,000
NRB-XL1R2M400V8X9F	1.2			0.24	28	56	331.74	29.4	12,000
NRB-XL1R5M400V8X9F	1.5			0.24	30	60	265.39	33.0	12,000
NRB-XL1R8M400V8X9F	1.8			0.24	33	66	221.16	36.6	12,000
NRB-XL2R2M400V8X9F	2.2		0.24	36	72	180.95	41.4	12,000	
NRB-XL2R2M400V8X11.5F			0.24	40	80	180.95	41.4	15,000	
NRB-XL2R7M400V8X11.5F	2.7		0.24	43	86	147.44	46.6	15,000	
NRB-XL3R3M400V8X11.5F	3.3		0.24	47	94	120.63	51.4	15,000	
NRB-XL3R3M400V10X9F			0.24	48	96	120.63	51.4	12,000	
NRB-XL3R9M400V10X12.5F	3.9		0.24	57	114	102.07	56.2	15,000	
NRB-XL4R7M400V10X12.5F	4.7		0.24	61	122	84.70	62.6	15,000	
NRB-XL6R8M400V10X16F	6.8		0.24	85	161	58.54	79.4	20,000	
NRB-XL4R7M450V10X16F	4.7		0.24	54	180	84.70	67.3	20,000	
NRB-XL4R7M450V10X20F			0.24	66	220	84.70	67.3	20,000	
NRB-XL6R8M450V10X20F	6.8		0.24	84	280	58.54	86.2	20,000	
NRB-XL8R2M450V10X20F	8.2		0.24	84	280	48.55	98.8	20,000	
NRB-XL100M450V12.5X20F	10		0.24	135	450	39.81	115	20,000	
NRB-XL150M450V12.5X25F	15		0.24	180	600	26.54	160	20,000	
NRB-XL220M450V12.5X25F	22		0.24	240	600	18.09	223	20,000	
NRB-XL220M450V16X20F			0.24	292	730	18.09	223	20,000	
NRB-XL330M450V16X25F	33		0.24	392	980	12.06	322	20,000	
NRB-XL330M450V18X20F			0.24	312	780	12.06	322	20,000	
NRB-XL470M450V18X25F	47	0.24	480	1200	8.47	448	20,000		
NRB-XL680M450V18X31.5F	68	0.24	520	1300	5.85	637	20,000		



### RIPPLE CURRENT FREQUENCY CORRECTION FACTOR

#### 160V ~ 400V

Frequency (Hz)	120	1K	10K	100K ≤
1.0 ~ 5.6μF	1.0	1.6	1.8	2.0
6.8 ~ 18μF	1.0	1.5	1.7	1.9
22 ~ 33μF	1.0	1.4	1.6	1.8

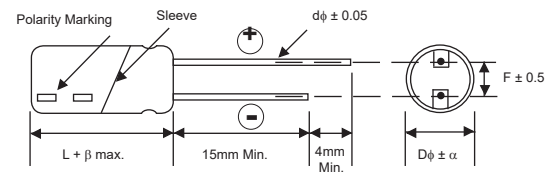
#### 450V

Frequency (Hz)	120	1K	10K	100K ≤
4.7 ~ 15μF	0.3	0.6	0.9	1.0
22 ~ 68μF	0.4	0.7	0.9	1.0

### DIAMETER AND LEADSPACE (mm)

Case Dia. (Dφ)	6.3	8	10	12.5	16	18
Lead Dia. (dφ)	0.5	0.6	0.6	0.6	0.8	0.8
Lead Spacing (F)	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
Dim. β	2.0	2.0	2.0	2.0	2.0	2.0

### DIMENSIONS (mm)

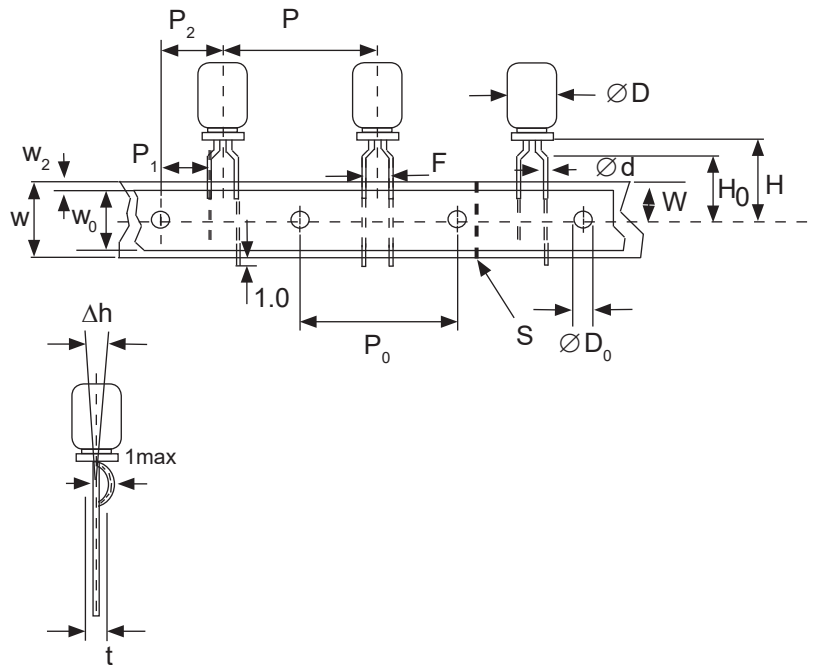


Drawing is representative of parts as supplied in bulk or straight lead format, please see taping specification for details on taped format packaging.

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

Taping Dimensions (mm)

Case Dia. (D $\phi$ )	6.3	8
Case Size Dim.	6.3x11	8x11.5
d $\phi$ $\pm$ 0.05	0.5	0.6
H $\pm$ 0.75	18.5	20.0
F +0.8 ~ -0.2	5.0 -0.2 ~ +0.8	
P	12.7 $\pm$ 1.0	
P <sub>0</sub>	12.7 $\pm$ 0.2	
P <sub>1</sub>	3.85 $\pm$ 0.5 (at end of tape)	
P <sub>2</sub>	6.35 $\pm$ 1.0	
W	18.0 $\pm$ 0.5	
W <sub>0</sub>	11.5 min.	
W <sub>1</sub>	9.0 $\pm$ 0.5	
W <sub>2</sub>	0 ~ 2.5	
H <sub>0</sub>	16.0 $\pm$ 0.5	
l	1.0 max.	
D <sub>0</sub> $\phi$	4.0 $\pm$ 0.2	
$\Delta$ h	0 $\pm$ 1.0 (at top of can)	
t	0.7 $\pm$ 0.2 (not including lead)	

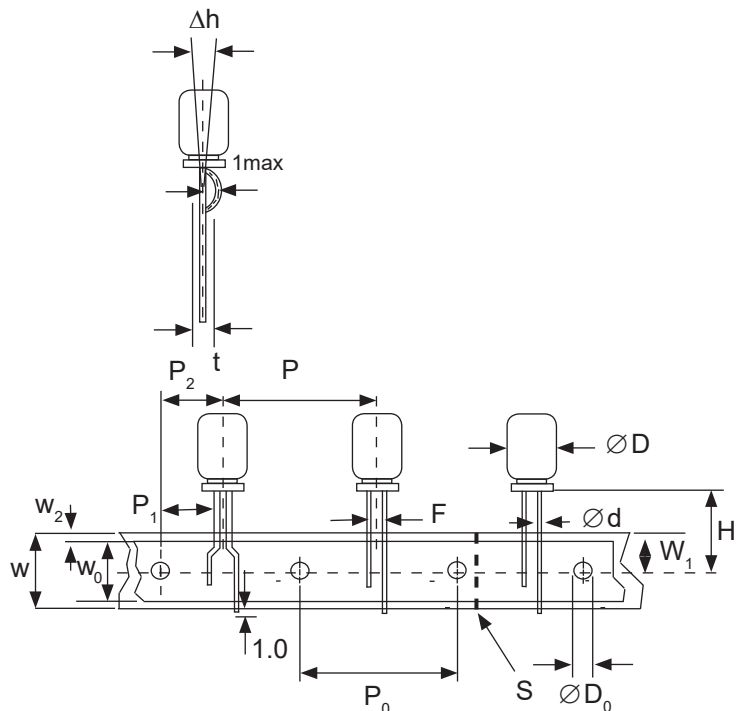


## SPECIAL STRAIGHT LEAD TAPING TBST\*

Taping Dimensions (mm)

Case Dia. (D $\phi$ )	6.3	8
Case Size Dim.	6.3x11	8x11.5
d $\phi$ $\pm$ 0.05	0.5	0.6
H $\pm$ 0.75	18.5	20.0
F +0.8 ~ -0.2	2.5	3.5
P $\pm$ 1.0	12.7 $\pm$ 0.2	
P <sub>0</sub>	12.7 $\pm$ 0.2	
P <sub>1</sub>	5.1	4.6
P <sub>2</sub>	6.35 $\pm$ 1.0	
W	18.0 $\pm$ 0.5	
W <sub>0</sub>	11.5 min.	
W <sub>1</sub>	9.0 $\pm$ 0.5	
W <sub>2</sub>	0 ~ 2.5	
H <sub>0</sub>	16.0 $\pm$ 0.5	
l	1.0 max.	
D <sub>0</sub> $\phi$	4.0 $\pm$ 0.2	
$\Delta$ h	0 $\pm$ 1.0 (at top of can)	
t	0.7 $\pm$ 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 base of the component to the edge of the carrier. The section of lead below the adhesive tape may be straight or formed.

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

Taping Dimensions (mm)

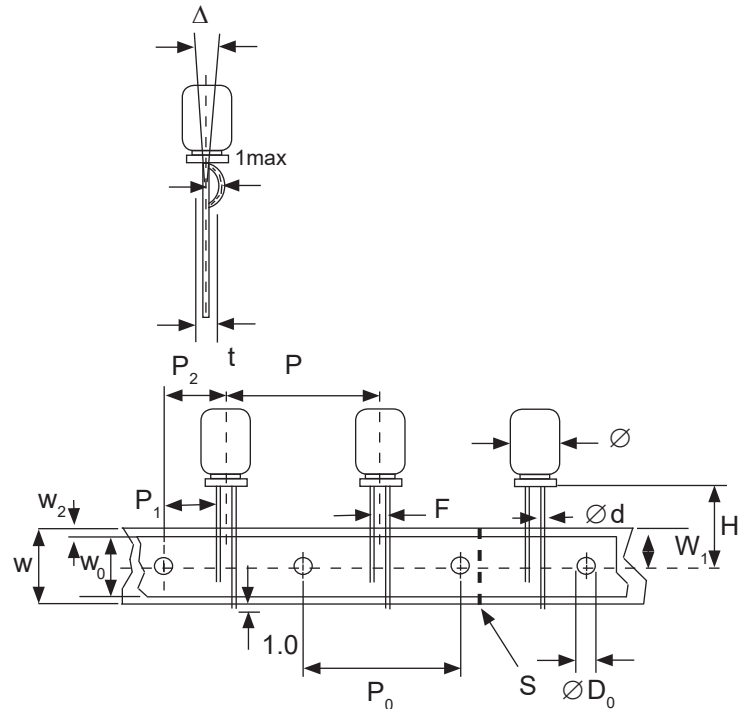
Case Dia. (D $\phi$ )	10	12.5
Case Size	All	All
Dim.		
d $\phi$ $\pm 0.05$	0.6	0.6
H $\pm 0.75$	19.0	19.0
F $+0.8 \sim -0.2$	5.0	5.0
P $\pm 1.0$	25.4*	
P <sub>0</sub>	12.7 $\pm 0.2$	
P <sub>1</sub>	3.85	
P <sub>2</sub>	6.35 $\pm 1.0$	
W	18.0 $\pm 0.5$	
W <sub>0</sub>	11.5 min	
W <sub>1</sub>	9.0 $\pm 0.5$	
W <sub>2</sub>	0 ~ 2.5	
H <sub>0</sub>	16.0 $\pm 0.5$	
l	1.0 max.	
D <sub>0</sub> $\phi$	4.0 $\pm 0.2$	
$\Delta h$	0 $\pm 1.0$ (at top of can)	
t	0.7 $\pm 0.2$ (not including lead)	

### \*Optional Taping Specifications

10mm diameter available with P dim. = 12.7mm  
(P/N Suffix: TB12.7MMP)

12.5mm diameter available with P dim. = 15mm, P<sub>1</sub> = 5.0mm,  
P<sub>0</sub> = 15.0mm & P<sub>2</sub> = 7.5mm (P/N Suffix: TB15MMP)

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



## RADIAL TAPED PACKAGING

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

Box quantity

Case Size	Q'ty per Box (pcs)
6.3x11	2,000
8x9	1,000
8x11.5	1,000
10x9	500
10x12.5	500
10x16	500
10x20	500
12.5.x20	500
12.5x25	500

Ammo Box Dimensions (mm)

