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

NRB-XL 330 M 160V 10X16 TB F

- F — RoHS Compliant
- TB = Tape & Box*
- 10X16 — Case Size (mm)
- 160V — Working Voltage
- M — Tolerance Code M=20%
- 330 — Capacitance Code in µF
- NRB-XL — Series

*see tape specification for details

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 PRODUCT, SPECIFICATIONS AND CASE SIZES D ϕ x L (mm)

Part Number	Cap. (µF)	W.V. (Vdc)	Dissipation Factor +20°C/120Hz	Ripple Current Rating (mA) +105°C		Max. ESR (Ω) 120Hz @ +20°C	LC (µA) 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	450	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

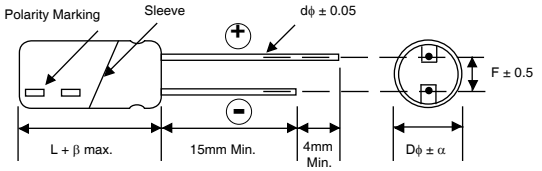
450V

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)

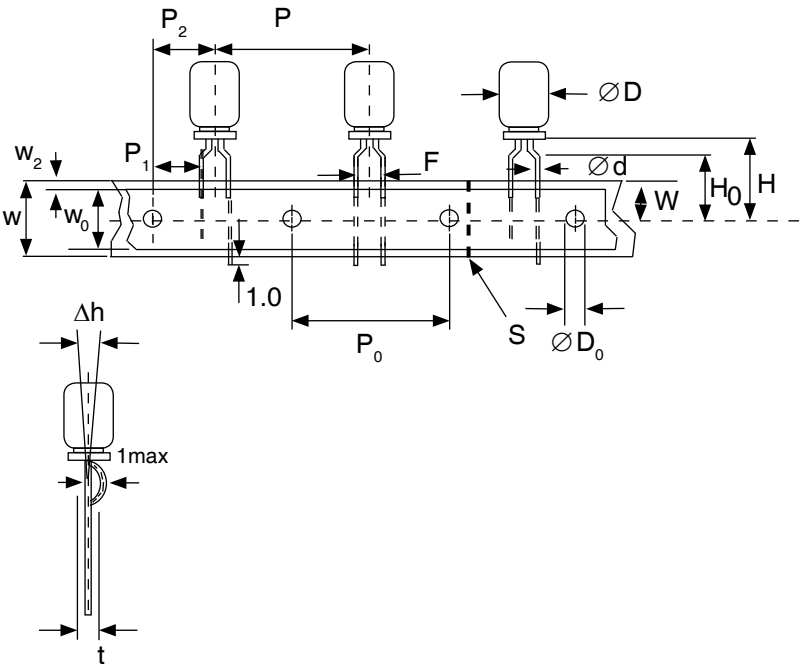


Drawing is representative of parts as supplied in bulk or straight lead format, please see taping specification for details on taped format packaging.

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

Taping Dimensions (mm)

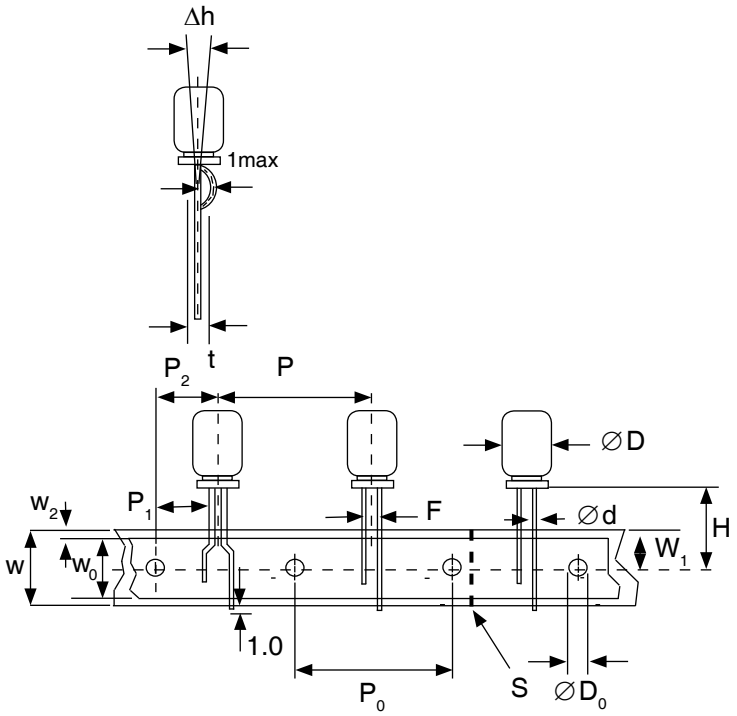
Case Dia. (Dϕ)	6.3	8
Case Size Dim.	6.3x11	8x11.5
dϕ ±0.05	0.5	0.6
H ±0.75	18.5	20.0
F +0.8 ~ -0.2	5.0 -02 ~ +0.8	
P	12.7 ±1.0	
P_0	12.7 ±0.2	
P_1	3.85 ±0.5 (at end of tape)	
P_2	6.35 ±1.0	
W	18.0 ±0.5	
W_0	11.5 min.	
W_1	9.0 ±0.5	
W_2	0 ~ 2.5	
H_0	16.0 ±0.5	
I	1.0 max.	
$D_0\phi$	4.0 ±0.2	
Δh	0 ±1.0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



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	
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)	
* Parts with 4mm diameter are taped with a slight flare in the lead and a 2.0mm lead-space.		

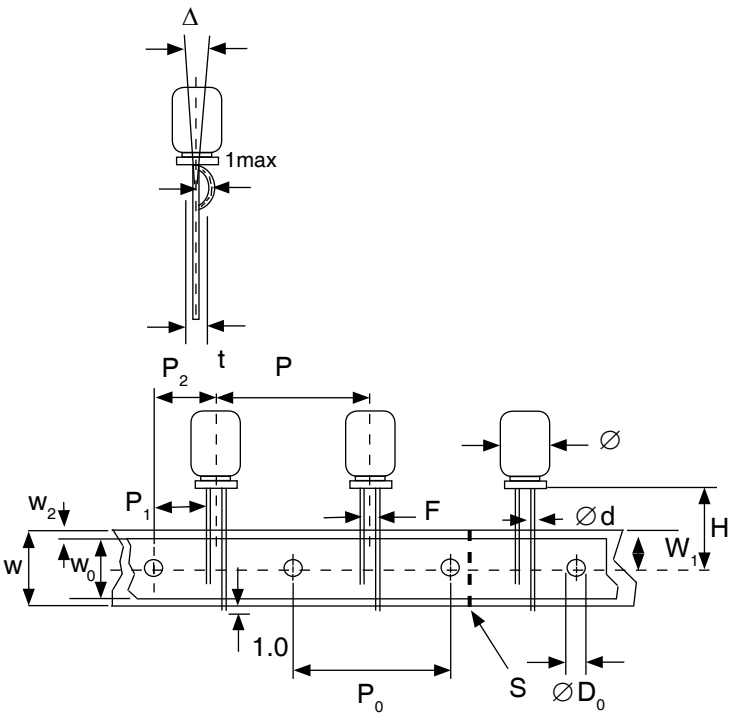


*Straight leads will extend from the based of the component to the edge of the carrier. The section of lead below the adhesive tape may be straight or formed.

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

Taping Dimensions (mm)

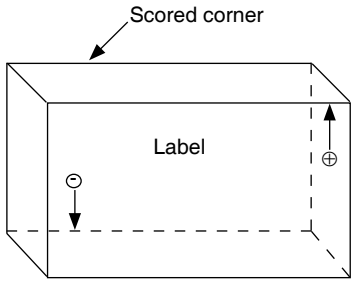
Case Dia. (Dϕ)	10	12.5
Case Size Dim.	All	All
dϕ ±0.05	0.6	0.6
H ±0.75	19.0	19.0
F +0.8 ~ -0.2	5.0	5.0
P ±1.0	25.4*	
P_0	12.7 ±0.2	
P_1	3.85	
P_2	6.35 ±1.0	
W	18.0 ±0.5	
W_0	11.5 min	
W_1	9.0 ±0.5	
W_2	0 ~ 2.5	
H_0	16.0 ±0.5	
I	1.0 max.	
$D_0\phi$	4.0 ±0.2	
Δh	0 ±1.0 (at top of can)	
t	0.7 ±0.2 (not including lead)	
***Optional Taping Specifications** 10mm diameter available with P dim. = 12.7mm (P/N Suffix: TB12.7MMP)		
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".

RADIAL TAPED PACKAGING

Ammo Box Dimensions (mm)



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