

LOW PROFILE, WIDE TEMPERATURE, RADIAL LEAD, POLARIZED

FEATURES

- LOW PROFILE APPLICATIONS
- WIDE TEMPERATURE 105°C
- HIGH STABILITY AND PERFORMANCE

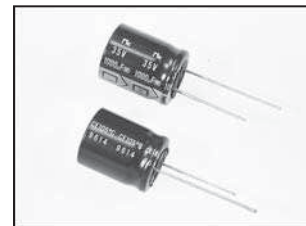
**RoHS
Compliant**

includes all homogeneous materials

*See Part Number System for Details

CHARACTERISTICS

Rated Voltage Range		10 ~ 100Vdc						
Capacitance Range		47 ~ 4,700μF						
Operating Temperature Range		-40 ~ +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. Tan δ @ 120Hz/20°C	W.V. (Vdc)	10	16	25	35	50	63	100
	S.V. (Vdc)	13	20	32	44	63	79	125
	C ≤ 1,000μF	0.20	0.16	0.14	0.12	0.10	0.09	0.08
	C ≤ 2,200μF	0.22	0.18	0.16	-	-	-	-
	C ≤ 3,300μF	0.24	-	-	-	-	-	-
	C < 4,700μF	0.26	-	-	-	-	-	-
Low Temperature Stability Impedance Ratio @ 120Hz	W.V. (Vdc)	10	16	25	35	50	63	100
	Z-25°C/Z+20°C	3	3	2	2	2	2	2
	Z-40°C/Z+20°C	8	6	4	3	3	3	3
Load Life Test at Rated W.V. 105°C 1,000 Hours	Capacitance Change	Within 20% of initial measured value						
	Tan δ	Less than 200% of specified maximum value						
	Leakage Current	Less than specified maximum value						



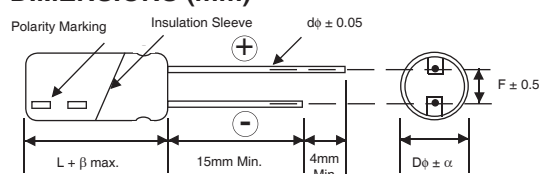
STANDARD PRODUCT AND CASE SIZE TABLE Dφ x L (mm)

Cap (μF)	Code	Working Voltage (Vdc)						
		10	16	25	35	50	63	100
47	470	-	-	-	-	-	-	10x12.5
100	101	-	-	-	-	-	10x12.5	16x16
220	221	-	-	-	10x12.5	10x12.5	16x16	16x21
330	331	-	-	10x12.5	12.5x16	16x16	16x21	-
470	471	-	10x12.5	12.5x16	16x16	16x21	-	-
1,000	102	12.5x15	16x16	16x21	16x21	-	-	-
2,200	222	16x16	16x21	16x21	-	-	-	-
3,300	332	16x21	-	-	-	-	-	-
4,700	472	18x21	-	-	-	-	-	-

LEAD SPACING AND DIAMETER (mm)

Case Dia. (Dφ)	5	6.3	8	10	12.5	16	18	22
Lead Dia. (Dφ)	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	7.5	7.5	10
Dim. α	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1.0

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 VALUES, SPECIFICATIONS AND CASE SIZES (mm)

Part Number	Cap. (μF)	W.V. (Vdc)	Dissipation Factor +20°C/120Hz	Ripple Current Rating (mA) +105°C/120Hz	Max. ESR (Ω) +20°C/120Hz	Load Life Hours @ +105°C
NRE-LW102M10V12.5x15F	1,000	10	0.20	470	0.33	1,000
NRE-LW222M10V16x16F	2,200		0.22	780	0.17	1,000
NRE-LW332M10V16x21F	3,300		0.24	1000	0.12	1,000
NRE-LW472M10V18x21F	4,700		0.26	1200	0.09	1,000
NRE-LW471M16V10x12.5F	470	16	0.16	340	0.56	1,000
NRE-LW102M16V16x16F	1,000		0.16	630	0.27	1,000
NRE-LW222M16V16x21F	2,200		0.18	940	0.14	1,000
NRE-LW331M25V10x12.5F	330	25	0.14	310	0.70	1,000
NRE-LW471M25V12.5x16F	470		0.14	390	0.49	1,000
NRE-LW102M25V16x21F	1,000		0.14	720	0.23	1,000
NRE-LW222M25V16x21F	2,200		0.16	1080	0.12	1,000
NRE-LW221M35V10x12.5F	220	35	0.12	270	0.90	1,000
NRE-LW331M35V12.5x16F	330		0.12	350	0.60	1,000
NRE-LW471M35V16x16F	470		0.12	490	0.42	1,000
NRE-LW102M35V16x21F	1,000		0.12	840	0.20	1,000
NRE-LW221M50V10x12.5F	220	50	0.10	310	0.75	1,000
NRE-LW331M50V16x16F	330		0.10	440	0.50	1,000
NRE-LW471M50V16x21F	470		0.10	570	0.35	1,000
NRE-LW101M63V10x12.5F	100	63	0.09	210	1.49	1,000
NRE-LW221M63V16x16F	220		0.09	380	0.25	1,000
NRE-LW331M63V16x21F	330		0.09	525	0.68	1,000
NRE-LW470M100V10x12.5F	47	100	0.08	240	2.82	1,000
NRE-LW101M100V16x16F	100		0.08	275	1.33	1,000
NRE-LW221M100V16x21F	220		0.08	490	0.60	1,000

RIPPLE CURRENT CORRECTION FACTORS

Frequency Factor

W.V. (Vdc)	Cap (μF)	Working Voltage (Vdc)			
		50	120	1K	10K
6.3~16	ALL	0.8	1.0	1.1	1.2
25~35	≤1000	0.8	1.0	1.5	1.7
	1000<	0.8	1.0	1.2	1.3
50~100	<1000	0.8	1.0	1.6	1.9
	1000<	0.8	1.0	1.2	1.3

PART NUMBER SYSTEM

NRELW 102 M 35V 16X20 TB F

- Series
- Capacitance Code: First 2 characters significant, third character is multiplier
- Tolerance Code (M=20%)
- Working Voltage (Vdc)
- Case Size (Dφ x L)
- TB = Tape & Box*
- RoHS Compliant

*see taping specifications 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

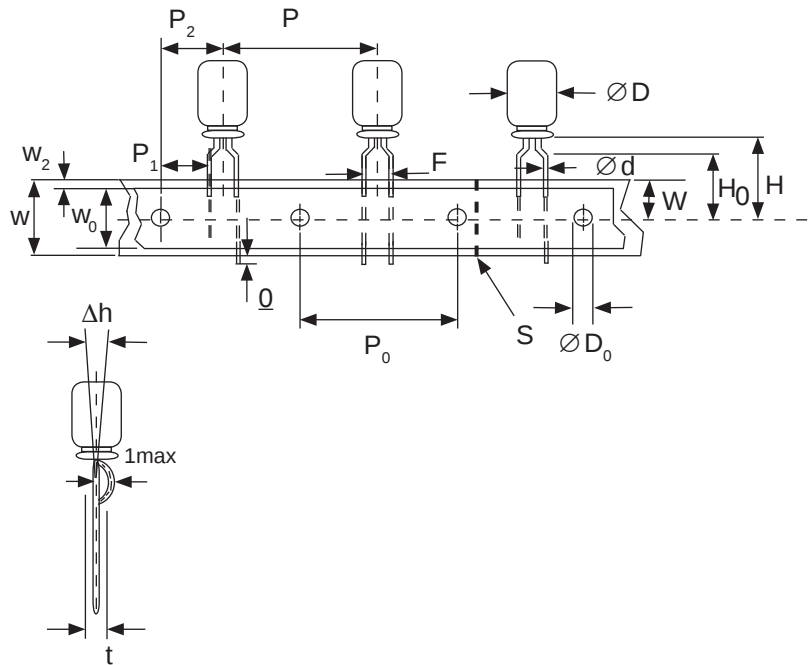


Miniature Aluminum Electrolytic Capacitors Taping Specifications

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

Taping Dimensions (mm)

Case Dia. (D ϕ)	4	5	6.3	8
Case Size	4x5	5x5	6.3x5	6.3x11
Dim.	4x7	5x7	5x11	6.3x7
d ϕ ± 0.05	0.45	0.45	0.5	0.45
H ± 0.75	17.5	17.5	18.5	18.5
F $+0.8 \sim -0.2$	5.0 $-0.2 \sim +0.8$			
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			
l	1.0 max.			
D ₀ ϕ	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

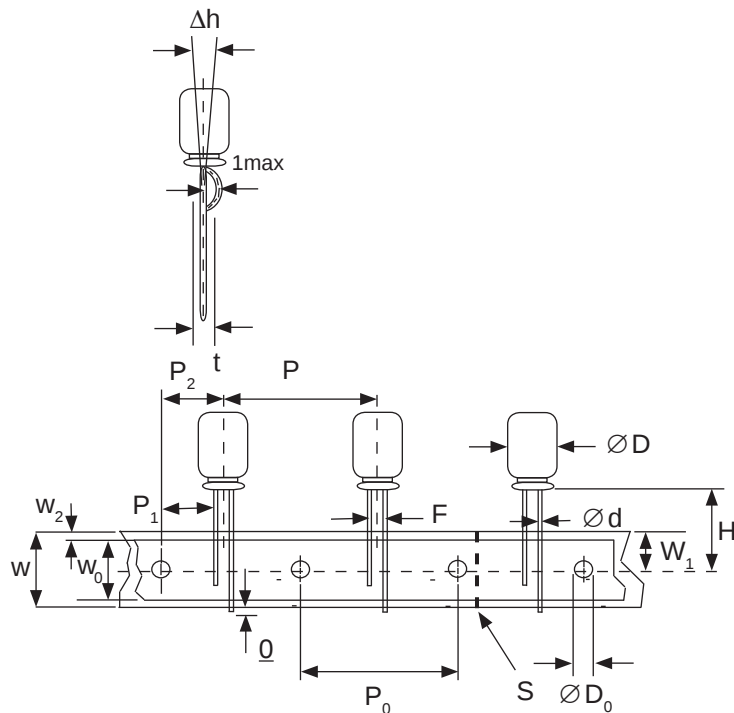
Taping Dimensions (mm)

Case Dia. (D ϕ)	10	12.5
Case Size	All	All
Dim.	All	All
d ϕ ± 0.05	0.6	0.6
H ± 0.75	19.0	19.0
F $+0.8 \sim -0.2$	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	
l	1.0 max.	
D ₀ ϕ	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, P₁ = 5.0mm,
P₀ = 15.0mm & P₂ = 7.5mm (P/N Suffix: TB15MMP)



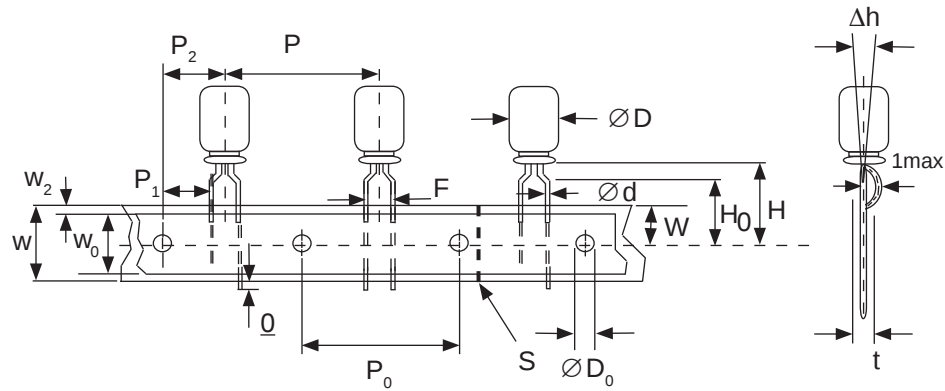
NOTE: ANODE (+) LEAD FEEDS OFF FIRST.
FOR OPTION OF NEGATIVE (-) LEAD FIRST,
SPECIFY "TBN".



SPECIAL RADIAL TAPING (2.5mm LEAD SPACING, FORMED LEADS) TBF1

Taping Dimensions (mm)

Case Dia. (D ϕ)	4	5	
Case Size	4x5	5x5	5x11
Dim.	4x7	5x7	
d ϕ ± 0.05	0.45	0.45	0.5
H ± 0.75	17.5	17.5	18.5
H ₀ ± 0.5	16.0	-	-
F	2.5 -0.2 ~ +0.8		
P	12.7 ± 1.0		
P ₀	12.7 ± 0.2		
P ₁	5.1 ± 0.5		
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 ~ 1.5		
l	1.0 max.		
D ₀ ϕ	4.0 ± 0.2		
Δh	0 ± 1.0		
t	0.7 ± 0.2		

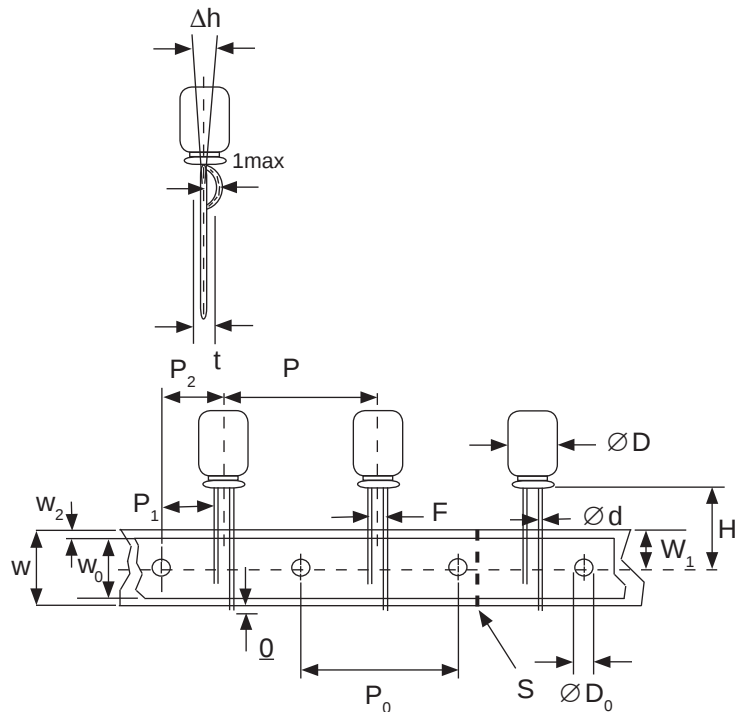


SPECIAL STRAIGHT LEAD TAPING TBST

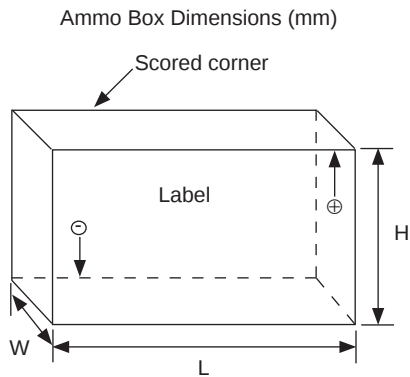
Taping Dimensions (mm)

Case Dia. (D ϕ)	4	5		6.3		8
Case Size	4x5	5x5	5x11	6.3x5	6.3x11	8x11.5
Dim.	4x7	5x7		6.3x7		
d ϕ ± 0.05	0.45	0.45	0.5	0.45	0.5	0.6
H ± 0.75	17.5	17.5	18.5	17.5	18.5	20.0
F +0.8 ~ -0.2	2.0*	2.0	2.0	2.5	2.5	3.5
P ± 1.0	12.7 ± 0.2					
P ₀	12.7 ± 0.2					
P ₁	5.1	5.1	5.1	5.1	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 ϕ	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.



RADIAL TAPED PACKAGING



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

Size of box and component quantity

Case Dia (D ϕ) or Case Size	Q'ty per Box (pcs)	Dim. L	Dim. H	Dim. W
4x5, 4x7	2,000	331	175	43
5x5, 5x7	2,000	331	220	43
5x11	2,000	340	255	55
6.3x5, 6.3x7	2,000	331	280	43
6.3x11	2,000	331	280	48
8x11.5, 8x12.5	1,000	335	235	53
10x12.5*	500	335	190	53
10x16*	500	335	300	53
10x20*	500	335	300	55
12.x20*	500	335	300	55
12.5x25*	500	335	300	61

*Special Taping Consult Factory For Availability