

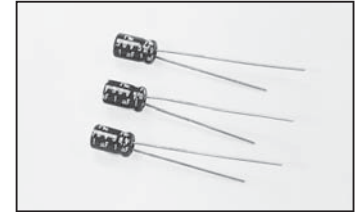
SUBMINIATURE, RADIAL LEADS, POLARIZED

### FEATURES

- LOW PROFILE, 7mm HEIGHT
- STABLE & HIGH PERFORMANCE

**RoHS Compliant**  
includes all homogeneous materials

\*See Part Number System for Details



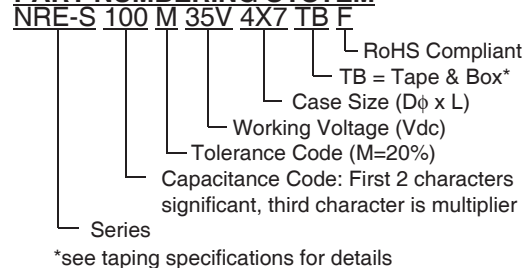
### CHARACTERISTICS

Rated Voltage Range	6.3 ~ 63Vdc								
Capacitance Range	0.1 ~ 220 $\mu$ F								
Operating Temperature Range	-40 ~ +85°C								
Capacitance Tolerance	$\pm$ 20%(M)								
Max. Leakage Current @ 20°C   After 2 min.	0.01CV or 3 $\mu$ A, whichever is greater								
Max. Tan $\delta$ @ 120Hz/+20°C	W.V. (Vdc)	6.3	10	16	25	35	50	63	
	S.V. (Vdc)	8	13	20	32	44	63	79	
	Tan $\delta$	0.24	0.20	0.16	0.14	0.12	0.10	0.08	
Low Temperature Stability Impedance Ratio @ 120Hz	Z-25°C/Z+20°C	4	3	2	2	2	2	2	
	Z-40°C/Z+20°C	10	8	6	4	4	4	4	
Load Life Test at Rated W.V. +85°C 1,000 Hours	Capacitance Change	Within $\pm$ 25% of initial measured value							
	Tan $\delta$	Less than 200% of specified maximum value							
	Leakage Current	Less than specified maximum value							

### STANDARD PRODUCT AND CASE SIZE TABLE D $\phi$ x L (mm)

Cap. ( $\mu$ F)	Code	Working Voltage (Vdc)							
		6.3	10	16	25	35	50	63	
0.1	R10	-	-	-	-	-	4x7	4x7	
0.22	R22	-	-	-	-	-	4x7	4x7	
0.33	R33	-	-	-	-	-	4x7	4x7	
0.47	R47	-	-	-	-	-	4x7	4x7	
1.0	1R0	-	-	-	-	-	4x7	4x7	
2.2	2R2	-	-	-	-	-	4x7	4x7	
3.3	3R3	-	-	-	-	-	4x7	4x7	
4.7	4R7	-	-	-	-	4x7	4x7	5x7	
10	100	-	-	4x7	4x7	4x7	5x7	6.3x7	
22	220	4x7	4x7	4x7	5x7	5x7	6.3x7	6.3x7	
33	330	4x7	4x7	5x7	5x7	6.3x7	6.3x7	-	
47	470	4x7	5x7	5x7	6.3x7	6.3x7	6.3x7	-	
100	101	5x7	6.3x7	6.3x7	6.3x7	6.3x7	-	-	
220	221	6.3x7	6.3x7	6.3x7	-	-	-	-	
330	331	6.3x7	-	-	-	-	-	-	

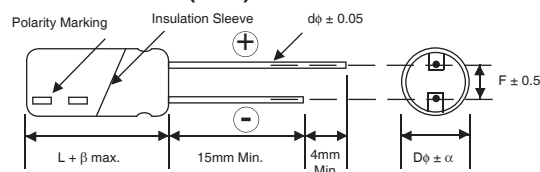
### PART NUMBERING SYSTEM



### LEAD SPACING AND DIAMETER (mm)

Case Dia. (D $\phi$ )	4	5	6.3
Lead Dia. (d $\phi$ )	0.45	0.5	0.5
Lead Spacing (F)	1.5	2.0	2.5
Dim. $\alpha$	0.5	0.5	0.5
dim. $\beta$	1.0	1.0	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.

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

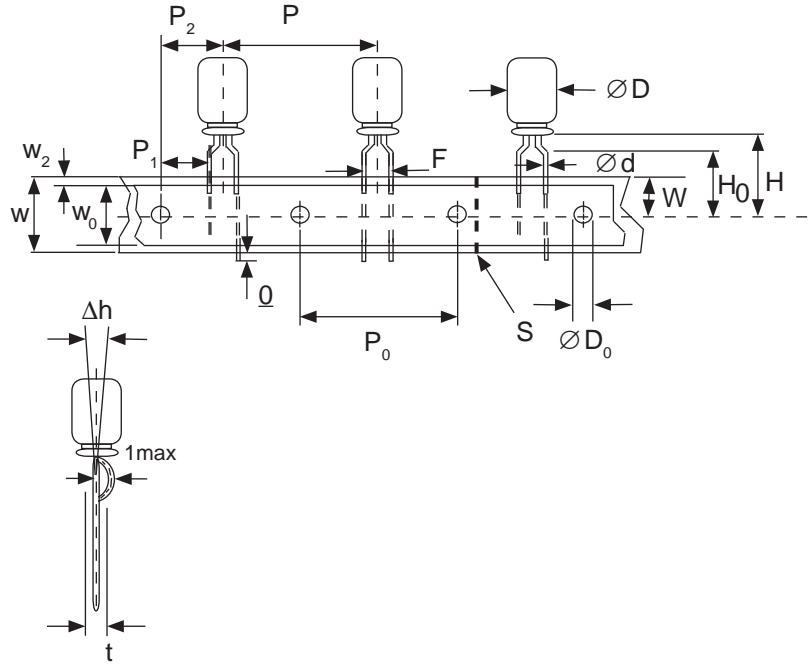
Part Number	Cap. ( $\mu$ F)	W.V. (Vdc)	Dissipation Factor +20°C/120Hz	Ripple Current Rating (mA) +85°C/120Hz	Max. ESR ( $\Omega$ ) +20°C/120Hz	Load Life Hours @ +85°C	
NRE-S220M6.3V4x7F	22	6.3	0.24	29	18.1	1,000	
NRE-S330M6.3V4x7F	33		0.24	38	12.1	1,000	
NRE-S470M6.3V4x7F	47		0.24	46	8.47	1,000	
NRE-S101M6.3V5x7F	100		0.24	70	3.98	1,000	
NRE-S221M6.3V6.3x7F	220		0.24	95	2.49	1,000	
NRE-S331M6.3V6.3x7F	330		0.24	110	2.21	1,000	
NRE-S220M10V4x7F	22	10	0.20	35	15.1	1,000	
NRE-S330M10V4x7F	33		0.20	43	10.1	1,000	
NRE-S470M10V5x7F	47		0.20	53	7.06	1,000	
NRE-S101M10V6.3x7F	100		0.20	80	3.32	1,000	
NRE-S221M10V6.3x7F	220		0.20	110	1.51	1,000	
NRE-S100M16V4x7F	10		16	0.16	25	26.6	1,000
NRE-S220M16V4x7F	22	0.16		39	12.1	1,000	
NRE-S330M16V5x7F	33	0.16		49	8.05	1,000	
NRE-S470M16V5x7F	47	0.16		59	5.65	1,000	
NRE-S101M16V6.3x7F	100	0.16		120	2.88	1,000	
NRE-S221M16V6.3x7F	220	0.16		110	1.21	1,000	
NRE-S100M25V4x7F	10	25	0.14	27	23.3	1,000	
NRE-S220M25V5x7F	22		0.14	43	10.6	1,000	
NRE-S330M25V5x7F	33		0.14	63	7.04	1,000	
NRE-S470M25V6.3x7F	47		0.14	70	4.85	1,000	
NRE-S101M25V6.3x7F	100		0.14	100	2.33	1,000	
NRE-S470M35V4x7F	4.7		35	0.12	20	42.4	1,000
NRE-S100M35V4x7F	10	0.12		29	19.9	1,000	
NRE-S220M35V5x7F	22	0.12		47	9.05	1,000	
NRE-S330M35V6.3x7F	33	0.12		60	6.03	1,000	
NRE-S470M35V6.3x7F	47	0.12		75	4.24	1,000	
NRE-S101M35V6.3x7F	100	0.12		105	1.90	1,000	
NRE-SR10M50V4x7F	0.1	50	0.10	1.0	1680	1,000	
NRE-SR22M50V4x7F	0.22		0.10	2.2	754	1,000	
NRE-SR33M50V4x7F	0.33		0.10	3.2	503	1,000	
NRE-SR47M50V4x7F	0.47		0.10	5.0	353	1,000	
NRE-S1R0M50V4x7F	1.0		0.10	9.0	188	1,000	
NRE-S2R2M50V4x7F	2.2		0.10	15	75.4	1,000	
NRE-S3R3M50V4x7F	3.3		0.10	18	50.3	1,000	
NRE-S4R7M50V4x7F	4.7		0.10	23	35.3	1,000	
NRE-S100M50V5x7F	10		0.10	34	16.6	1,000	
NRE-S220M50V6.3x7F	22		0.10	55	7.54	1,000	
NRE-S330M50V6.3x7F	33		0.10	70	4.80	1,000	
NRE-S470M50V6.3x7F	47		0.10	80	3.53	1,000	
NRE-SR10M63V4x7F	0.1		63	0.08	1.2	1320	1,000
NRE-SR22M63V4x7F	0.22			0.08	2.9	604	1,000
NRE-SR33M63V4x7F	0.33	0.08		4.4	404	1,000	
NRE-SR47M63V4x7F	0.47	0.08		5.0	283	1,000	
NRE-S1R0M63V4x7F	1.0	0.08		10	133	1,000	
NRE-S2R2M63V4x7F	2.2	0.08		17	60.4	1,000	
NRE-S3R3M63V4x7F	3.3	0.08		21	40.4	1,000	
NRE-S4R7M63V5x7F	4.7	0.08		26	26.3	1,000	
NRE-S100M63V6.3x7F	10	0.08		43	6.04	1,000	
NRE-S220M63V6.3x7F	22	0.08		65	4.04	1,000	

# Miniature Aluminum Electrolytic Capacitors Taping Specifications

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

Taping Dimensions (mm)

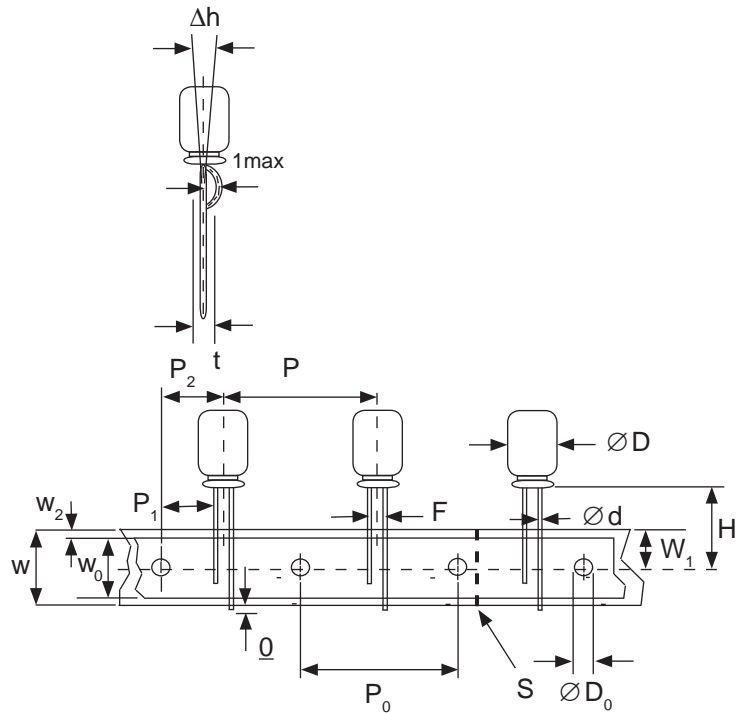
Case Dia. (D $\phi$ )	4	5	6.3	8
Case Size	4x5	5x5	6.3x5	8x11.5
Dim.	4x7	5x7	6.3x7	6.3x11
d $\phi$ $\pm$ 0.05	0.45	0.45	0.5	0.5
H $\pm$ 0.75	17.5	17.5	18.5	17.5
F $+0.8 \sim -0.2$	5.0 $-0.2 \sim +0.8$			
P	12.7 $\pm$ 1.0			
P <sub>0</sub>	12.7 $\pm$ 0.2			
P <sub>1</sub>	3.85 $\pm$ 0.5 (at end of tape)			
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 $\sim$ 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)			



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

Taping Dimensions (mm)

Case Dia. (D $\phi$ )	10	12.5
Case Size	All	All
Dim.	All	All
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 $\sim$ 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".

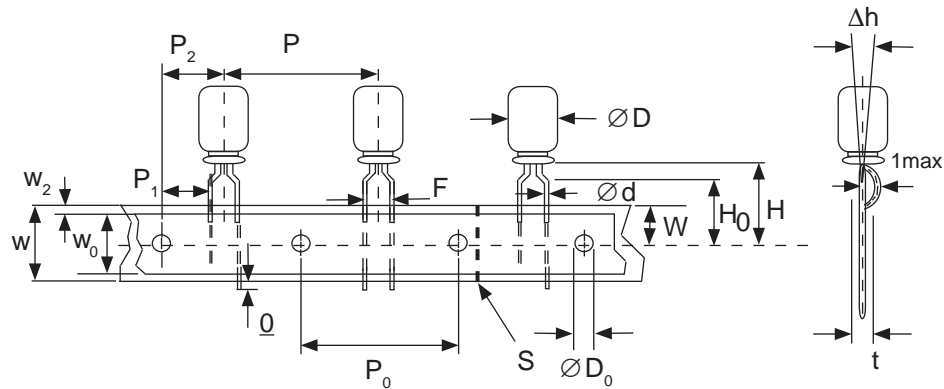


# Miniature Aluminum Electrolytic Capacitors Taping Specifications

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

Taping Dimensions (mm)

Case Dia. (D $\phi$ )	4	5	
Case Size Dim.	4x5 4x7	5x5 5x7	5x11
d $\phi$ $\pm$ 0.05	0.45	0.45	0.5
H $\pm$ 0.75	17.5	17.5	18.5
H <sub>0</sub> $\pm$ 0.5	16.0	-	-
F	2.5 -0.2 ~ +0.8		
P	12.7 $\pm$ 1.0		
P <sub>0</sub>	12.7 $\pm$ 0.2		
P <sub>1</sub>	5.1 $\pm$ 0.5		
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 ~ 1.5		
l	1.0 max.		
D <sub>0</sub> $\phi$	4.0 $\pm$ 0.2		
$\Delta$ h	0 $\pm$ 1.0		
t	0.7 $\pm$ 0.2		

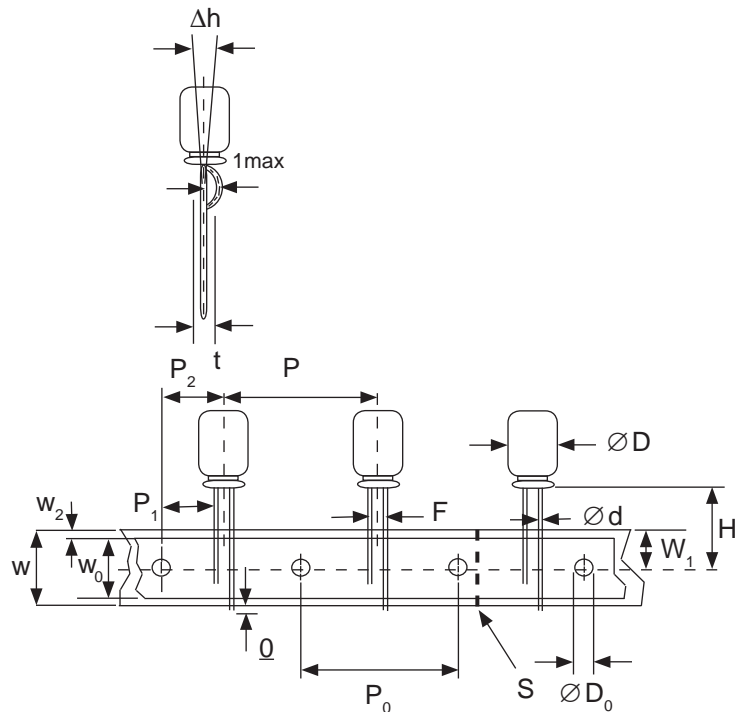


## SPECIAL STRAIGHT LEAD TAPING TBST

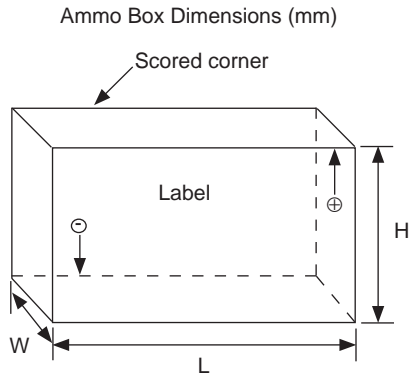
Taping Dimensions (mm)

Case Dia. (D $\phi$ )	4	5			6.3		8
Case Size Dim.	4x5 4x7	5x5 5x7	5x11	6.3x5 6.3x7	6.3x11	8x11.5	
d $\phi$ $\pm$ 0.05	0.45	0.45	0.5	0.45	0.5	0.6	
H $\pm$ 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 $\pm$ 1.0	12.7 $\pm$ 0.2						
P <sub>0</sub>	12.7 $\pm$ 0.2						
P <sub>1</sub>	5.1	5.1	5.1	5.1	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.



## RADIAL TAPED PACKAGING



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

Size of box and component quantity

Case Dia (D $\phi$ ) 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