

# Miniature Aluminum Electrolytic Capacitors

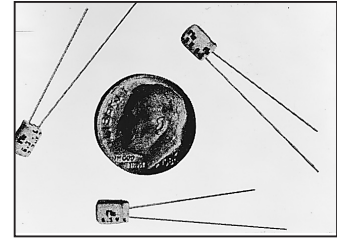
NSR Series

## FEATURES

- LOW PROFILE 5mm HEIGHT
- SPACE SAVING AT COMPETITIVE PRICING

**RoHS Compliant**  
includes all homogeneous materials

\*See Part Number System for Details



## CHARACTERISTICS

Rated Voltage Range	4 ~ 50Vdc							
Capacitance Range	10 ~ 470 $\mu$ F							
Operating Temperature Range	-40 ~ +85°C							
Capacitance Tolerance	$\pm$ 20%(M)							
Max. Leakage Current @ 20°C   After 1 min.	0.01CV or 3 $\mu$ A, whichever is greater							
Max. Tan $\delta$ @ 120Hz/+20°C	W.V. (Vdc)	4	6.3	10	16	25	35	50
	S.V. (Vdc)	5	8	13	20	32	44	63
	Tan $\delta$	0.35	0.24	0.20	0.16	0.14 (8 $\phi$ =0.15)	0.12	0.10
Low Temperature Stability Impedance Ratio @ 120Hz	Z-25°C/Z+20°C	7	4	3	2	2	2	2
	Z-40°C/Z+20°C	15	10	8	6	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)

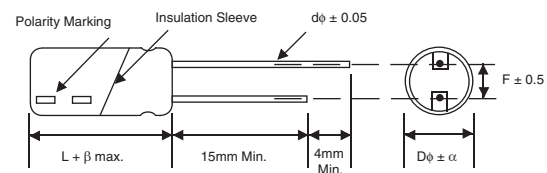
Cap. ( $\mu$ F)	Code	Working Voltage (Vdc)						
		4	6.3	10	16	25	35	50
10	100	-	-	-	-	-	-	6.3x5
22	220	-	-	-	-	6.3x5	6.3x5	6.3x5
33	330	-	-	-	6.3x5	6.3x5	6.3x5	-
47	470	-	-	6.3x5	6.3x5	6.3x5	6.3x5	-
100	101	-	6.3x5	6.3x5	6.3x5	8x5	-	-
220	221	6.3x5	6.3x5	6.3x5	-	-	-	-
330	331	6.3x5	6.3x5	-	-	-	-	-
470	471	8x5	-	-	-	-	-	-

## LEAD SPACING AND DIAMETER (mm)

Case Dia. (D $\phi$ )	6.3	8*
Lead Dia. (d $\phi$ )	0.5	0.6
Lead Spacing (F)	2.5	3.5
Dim. $\alpha$	0.5	0.5
dim. $\beta$	1.5	1.5

\*LEAD SPACING OF 8x5mm SIZE IS 2.5mm.

## DIMENSIONS (mm)



Drawing is representative of parts as supplied in bulk or straight lead format, please see taping specifications 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)



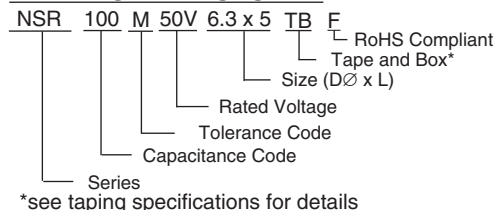
### STANDARD PRODUCT, SPECIFICATIONS AND CASE SIZES D $\phi$ x L (mm)

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
NSR221M4V6.3x5F	220	4	0.35	82	2.60	1,000
NSR331M4V6.3x5F	330		0.35	85	1.80	1,000
NSR471M4V8x5F	470		0.35	145	1.23	1,000
NSR101M6.3V6.3x5F	100	6.3	0.24	71	4.00	1,000
NSR221M6.3V6.3x5F	220		0.24	90	1.80	1,000
NSR331M6.3V6.3x5F	330		0.24	92	1.20	1,000
NSR470M10V6.3x5F	47	10	0.20	59	7.10	1,000
NSR101M10V6.3x5F	100		0.20	76	3.30	1,000
NSR221M10V6.3x5F	220		0.20	90	1.50	1,000
NSR330M16V6.3x5F	33	16	0.16	57	8.00	1,000
NSR470M16V6.3x5F	47		0.16	68	5.60	1,000
NSR101M16V6.3x5F	100		0.16	86	2.70	1,000
NSR220M25V6.3x5F	22	25	0.14	52	10.6	1,000
NSR330M25V6.3x5F	33		0.14	63	7.00	1,000
NSR470M25V6.3x5F	47		0.14	73	4.90	1,000
NSR101M25V8x5F	100	35	0.15	110	2.49	1,000
NSR220M35V6.3x5F	22		0.12	54	9.00	1,000
NSR330M35V6.3x5F	33		0.12	68	6.00	1,000
NSR470M35V6.3x5F	47	50	0.12	73	4.20	1,000
NSR100M50V6.3x5F	10		0.10	34	16.6	1,000
NSR220M50V6.3x5F	22		0.10	54	7.50	1,000

### RIPPLE CURRENT FREQUENCY CORRECTION FACTOR

Frequency (Hz)	120	1K	10K	100K
Correction Factor	1.00	1.15	1.20	1.25
	8x5	1.00	1.13	1.20

### PART NUMBER SYSTEM

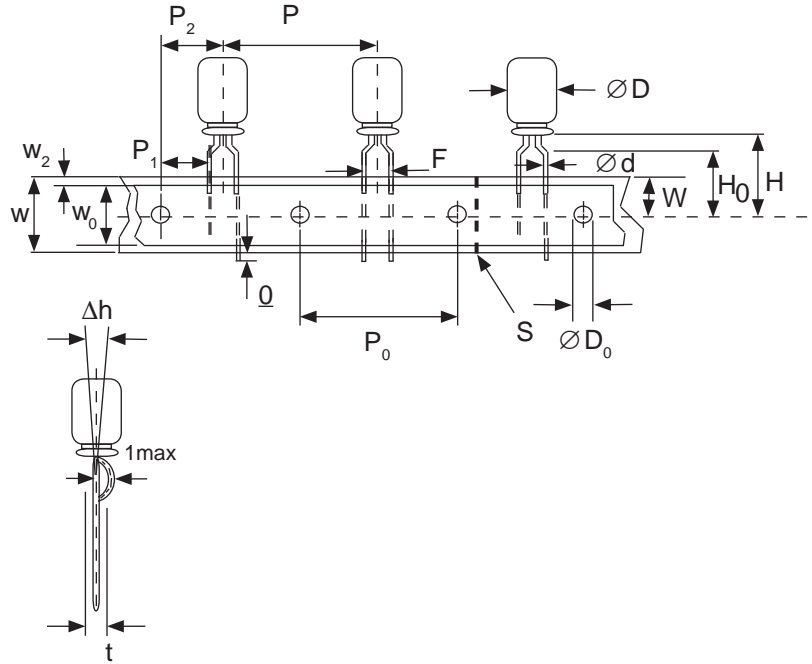


# Miniature Aluminum Electrolytic Capacitors Taping Specifications

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

Taping Dimensions (mm)

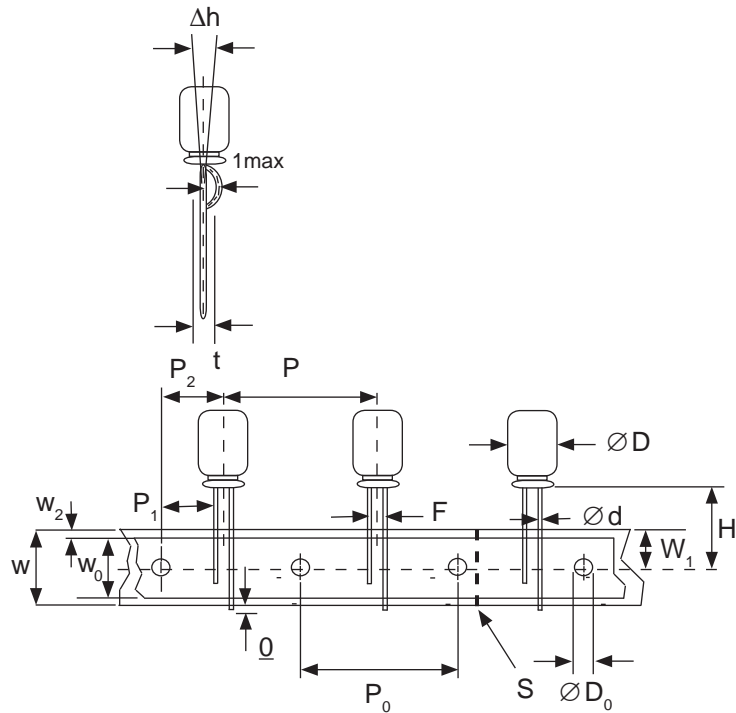
Case Dia. (D $\phi$ )	4	5	6.3	8
Case Size	4x5 4x7	5x5 5x7	5x11	6.3x5 6.3x7 6.3x11 8x11.5
d $\phi$ $\pm$ 0.05	0.45	0.45	0.5	0.45
H $\pm$ 0.75	17.5	17.5	18.5	17.5
F +0.8 ~ -0.2	5.0 -0.2 ~ +0.8			
P	12.7 $\pm$ 1.0			
P <sub>0</sub>	12.7 $\pm$ 0.2			
P <sub>1</sub>	3.85 $\pm$ 0.5 (at end of tape)			
P <sub>2</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)			



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

Taping Dimensions (mm)

Case Dia. (D $\phi$ )	10	12.5
Case Size	All	All
d $\phi$ $\pm$ 0.05	0.6	0.6
H $\pm$ 0.75	19.0	19.0
F +0.8 ~ -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".

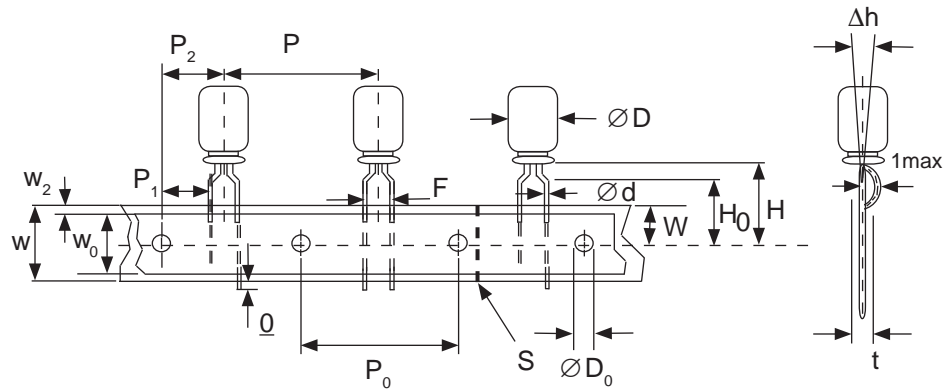


# Miniature Aluminum Electrolytic Capacitors Taping Specifications

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

Taping Dimensions (mm)

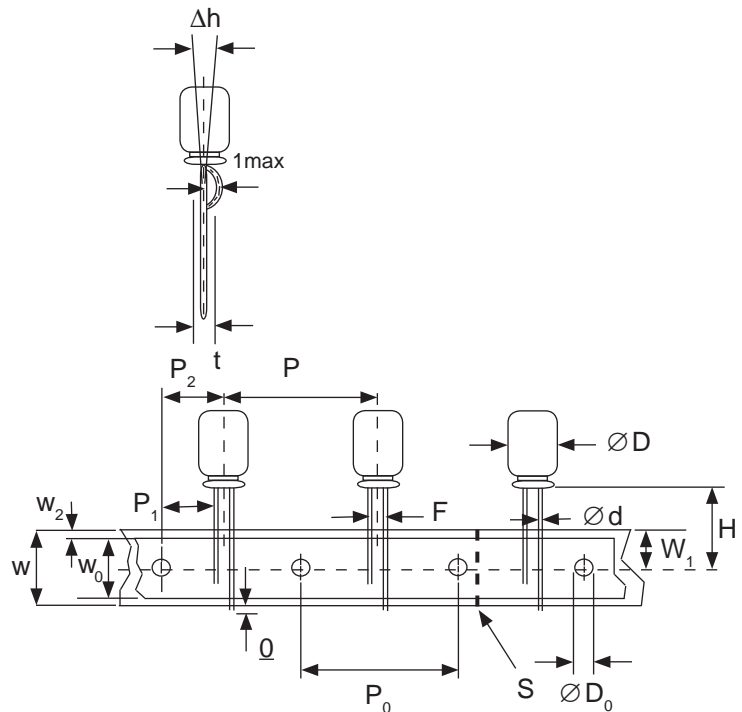
Case Dia. (D $\phi$ )	4		5	
Case Size Dim.	4x5 4x7	5x5 5x7	5x11	
d $\phi$ $\pm$ 0.05	0.45	0.45	0.5	
H $\pm$ 0.75	17.5	17.5	18.5	
H <sub>0</sub> $\pm$ 0.5	16.0	-	-	
F	2.5 -0.2 ~ +0.8			
P	12.7 $\pm$ 1.0			
P <sub>0</sub>	12.7 $\pm$ 0.2			
P <sub>1</sub>	5.1 $\pm$ 0.5			
P <sub>2</sub>	6.35 $\pm$ 1.0			
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)

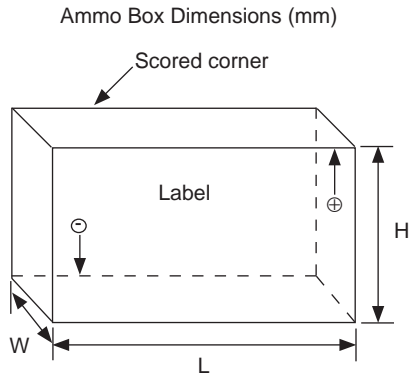
Case Dia. (D $\phi$ )	4			5			6.3		8	
Case Size Dim.	4x5 4x7	5x5 5x7	5x11		6.3x5 6.3x7	6.3x11	8x11.5			
d $\phi$ $\pm$ 0.05	0.45	0.45	0.5		0.45	0.5	0.6			
H $\pm$ 0.75	17.5	17.5	18.5		17.5	18.5	20.0			
F +0.8 ~ -0.2	2.0*	2.0	2.0		2.5	2.5	3.5			
P $\pm$ 1.0	12.7 $\pm$ 0.2									
P <sub>0</sub>	12.7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