

# Miniature Aluminum Electrolytic Capacitors

NRSK Series

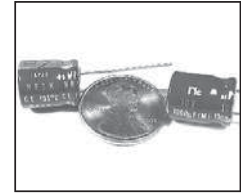
ULTRA LOW IMPEDANCE AT HIGH FREQUENCY, RADIAL LEADS,  
POLARIZED ALUMINUM ELECTROLYTIC CAPACITORS

**FEATURES**

- VERY LOW IMPEDANCE
- LONG LIFE AT 105°C (Up to 4000 hrs)
- HIGH STABILITY AT LOW TEMPERATURE
- IDEALLY SUITED FOR USE IN SWITCHING POWER SUPPLIES & CONVERTERS

**RoHS Compliant**  
includes all homogeneous materials

\*See Part Number System for Details



**CHARACTERISTICS**

Rated Voltage Range	6.3 ~ 25				
Rated Capacitance Range	470 ~ 3,300µF				
Operating Temp. Range	-40°C ~ +105°C				
Capacitance Tolerance	± 20% (M)				
Max. Leakage Current After 2 Minutes @ 20°C	0.03CV				
Surge Voltage Ratings	W.V.	6.3	10	16	25
	S.V.	8	13	20	32
Maximum Tan δ (see specifications table for values above 1,800µF)	Tan δ @ 20°C/120Hz	0.22	0.19	0.16	0.14
Low Temperature Stability (Impedance Ratio @ 120Hz)	Z -25°C/Z +20°C	2	2	2	2
	Z -40°C/Z +20°C	3	3	3	3
Load Life Test @ Rated W.V. & 105°C 2,000 hours for 8x11.5, 8x16, 10x12.5 and 10x16 3,000 hours for 8x20 4,000 hours for 10x20, 10x23	Capacitance Change	Within ± 25% of initial measured value			
	Tan δ	Less than 200% of the specified maximum value			
	Leakage Current	Less than specified maximum value			

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

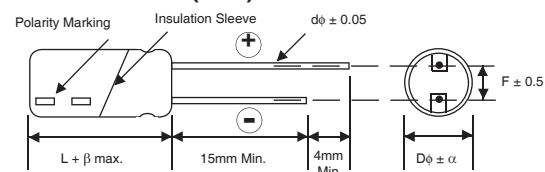
Cap (µF)	Code	Working Voltage (Vdc)			
		6.3	10	16	25
220	221	-	-	-	8x11.5
330	331	-	-	-	8x11.5
		-	-	-	10x12.5
470	471	-	-	-	8x20
		-	-	-	10x12.5
		-	-	8x11.5	10x16
680	681	-	8x11.5	8x16	10x16
		-		10x12.5	10x20
820	821	8x11.5	-	-	-
1000	102	8x11.5	8x16	8x20	10x23
			10x12.5	10x16	
1200	122	8x16	-	-	-
1500	152	8x20	8x20	10x20	-
		10x12.5	10x16		
1800	182	10x16	10x20	10x23	-
2200	222	10x20	10x23	-	-
3300	332	10x23	-	-	-

**DIAMETER AND LEADSPACE (mm)**

Case Dia. (Dφ)	8	10
Lead Dia. (dφ)	0.6	0.6
Lead Spacing (F)	3.5	5.0
Dim. α	0.5	0.5

β = L ≤ 16mm = 1.5mm, L ≥ 20mm = 2.0mm

**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.



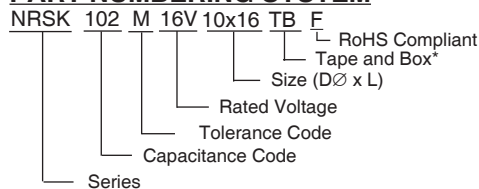
# Miniature Aluminum Electrolytic Capacitors

NRSK Series

## 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/100KHz	Max. ESR ( $\Omega$ ) +20°C/100KHz	Load Life Hours @ +105°C	
NRSK821M6.3V8X11.5F	820	6.3	0.22	1140	0.036	2,000	
NRSK102M6.3V8X11.5F	1000		0.22	1140	0.030	2,000	
NRSK122M6.3V8X16F	1200		0.22	1490	0.028	2,000	
NRSK152M6.3V8X20F	1500		0.22	1870	0.019	3,000	
NRSK152M6.3V10X12.5F	1500		0.22	1540	0.026	2,000	
NRSK152M6.3V10X16F	1500		0.22	2000	0.018	2,000	
NRSK182M6.3V8X20F	1800		0.22	1950	0.016	3,000	
NRSK182M6.3V10X16F	1800		0.22	2000	0.019	2,000	
NRSK222M6.3V10X20F	2200		0.24	2550	0.013	4,000	
NRSK332M6.3V10X23F	3300		0.26	2800	0.012	4,000	
NRSK471M10V8X11.5F	470		10	0.19	1140	0.030	2,000
NRSK681M10V8X11.5F	680	0.19		1140	0.036	2,000	
NRSK102M10V8X16F	1000	0.19		1490	0.028	2,000	
NRSK102M10V10X12.5F	1000	0.19		1540	0.026	2,000	
NRSK122M10V8X20F	1200	0.19		1870	0.019	3,000	
NRSK152M10V8X20F	1500	0.19		1870	0.019	3,000	
NRSK152M10V10X16F	1500	0.19		2000	0.019	2,000	
NRSK182M10V10X20V	1800	0.19		2550	0.013	4,000	
NRSK222M10V10X23	2200	0.21		2800	0.012	4,000	
NRSK331M16V8X11.5F	330	16		0.16	1140	0.030	2,000
NRSK471M16V8X11.5F	470			0.16	1140	0.036	2,000
NRSK681M16V8X16F	680		0.16	1490	0.028	2,000	
NRSK681M16V10X12.5F	680		0.16	1540	0.026	2,000	
NRSK102M16V8X20F	1000		0.16	1870	0.019	3,000	
NRSK102M16V10X16F	1000		0.16	2000	0.019	2,000	
NRSK152M16V10X20F	1500		0.16	2550	0.013	4,000	
NRSK182M16V10X23F	1800		0.16	2800	0.012	4,000	
NRSK221M25V8X11.5F	220		25	0.14	1110	0.030	2,000
NRSK331M25V8X11.5F	330			0.14	1080	0.032	2,000
NRSK331M25V10X12.5F	330			0.14	1440	0.025	2,000
NRSK471M25V8X20F	470	0.14		1820	0.018	3,000	
NRSK471M25V10X12.5F	470	0.14		1390	0.027	2,000	
NRSK471M25V10X16F	470	0.14		1920	0.020	2,000	
NRSK681M25V10X16F	680	0.14		1830	0.022	2,000	
NRSK681M25V10X20F	680	0.14		2180	0.016	4,000	
NRSK102M25V10X23F	1000	0.14		2180	0.016	4,000	

### PART NUMBERING SYSTEM



\*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](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)

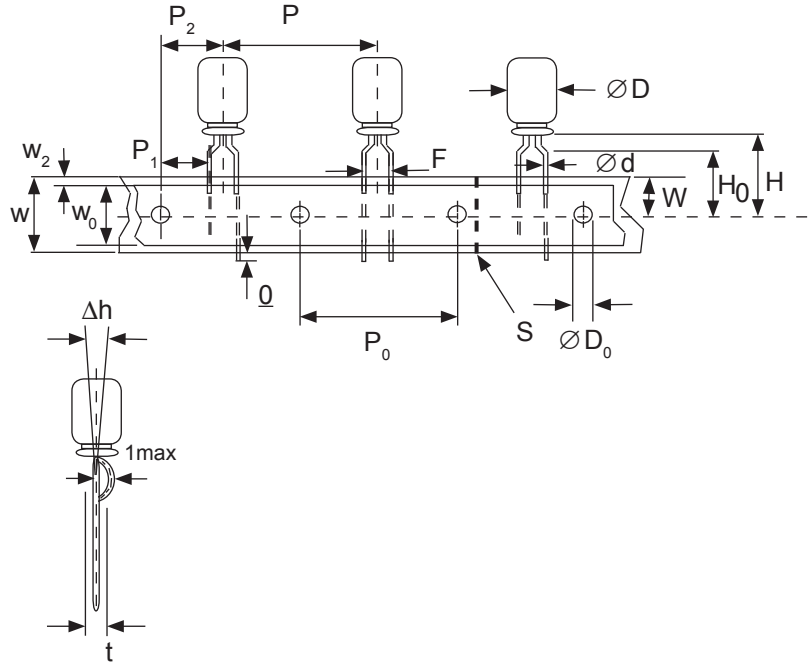


# Miniature Aluminum Electrolytic Capacitors Taping Specifications

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

Taping Dimensions (mm)

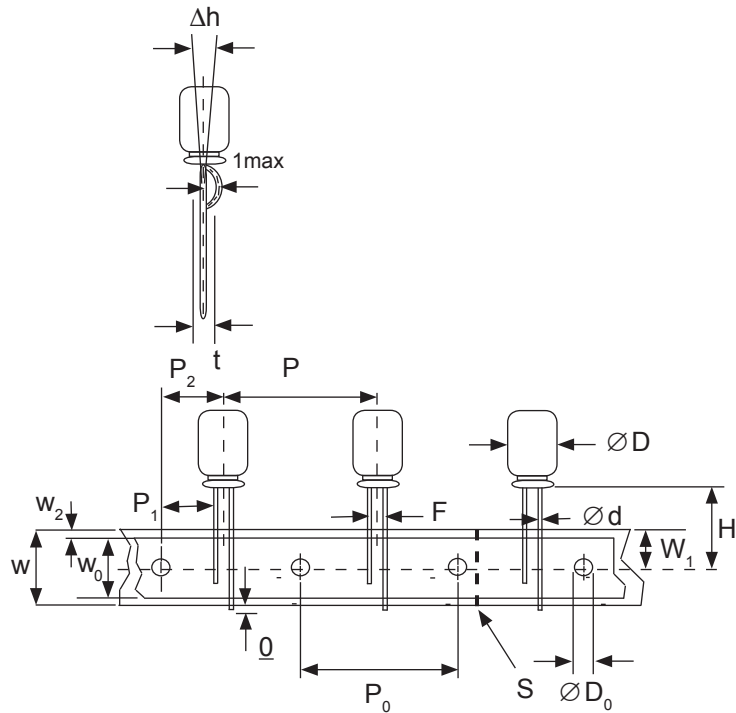
Case Dia. (D $\phi$ )	4	5	6.3	8
Case Size	4x5	5x5	6.3x5	8x11.5
Dim.	4x7	5x7	6.3x7	6.3x11
d $\phi$ $\pm$ 0.05	0.45	0.45	0.5	0.5
H $\pm$ 0.75	17.5	17.5	18.5	20.0
F +0.8 ~ -0.2	5.0 -0.2 ~ +0.8			
P	12.7 $\pm$ 1.0			
P <sub>0</sub>	12.7 $\pm$ 0.2			
P <sub>1</sub>	3.85 $\pm$ 0.5 (at end of tape)			
P <sub>2</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)			



## 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 ~ -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 Suf x: 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 Suf x: TB15MMP)

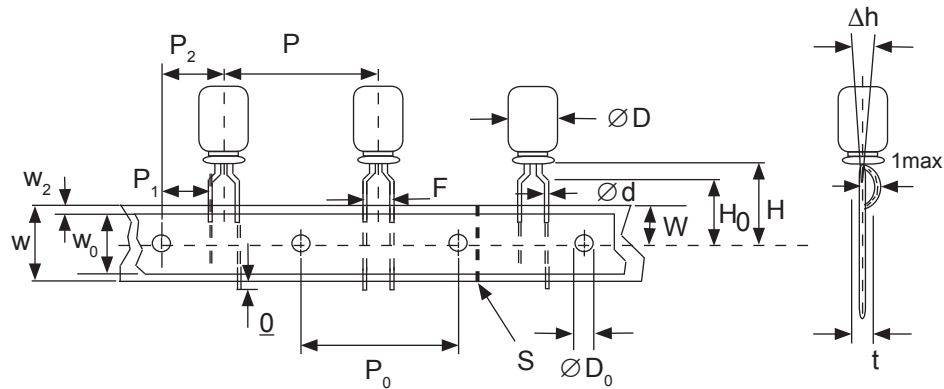
**NOTE:** ANODE (+) LEAD FEEDS OFF FIRST.  
FOR OPTION OF NEGATIVE (-) LEAD FIRST,  
SPECIFY "TBN".



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

Taping Dimensions (mm)

Case Dia. (D $\phi$ )	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 $\pm 0.2$			

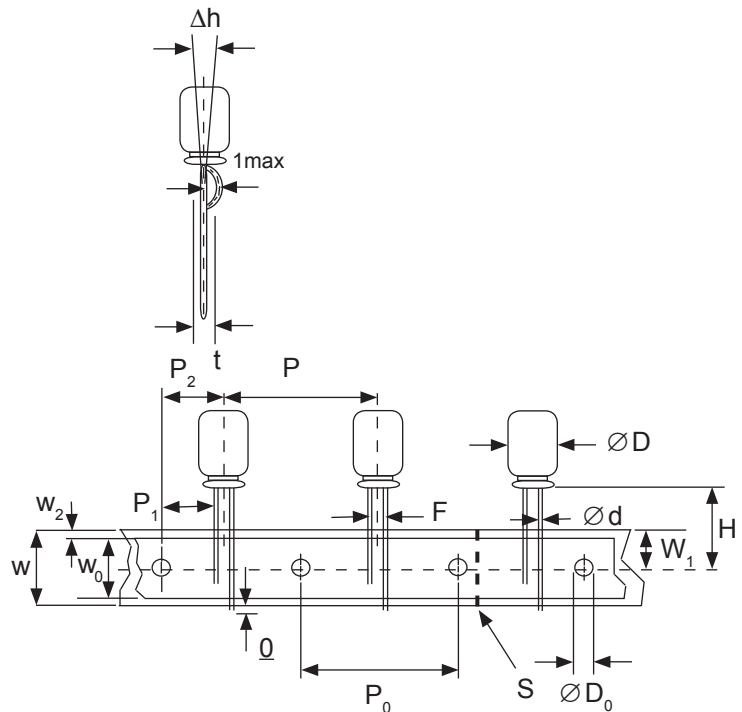


## SPECIAL STRAIGHT LEAD TAPING TBST

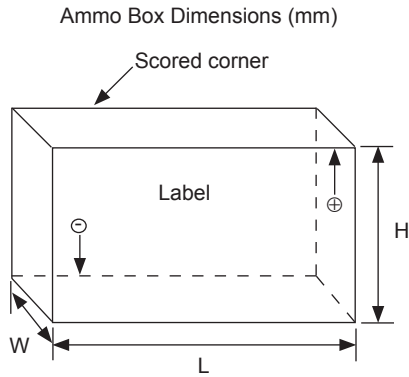
Taping Dimensions (mm)

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 $+0.8 \sim -0.2$	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 curve 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