

HIGH TEMPERATURE, EXTENDED LOAD LIFE, RADIAL LEADS, POLARIZED

### FEATURES

- HIGH RIPPLE CURRENT AT HIGH TEMPERATURE (105°C)
- IDEAL FOR HIGH VOLTAGE LIGHTING BALLAST
- REDUCED SIZE (FROM NRBX)

**RoHS Compliant**  
includes all homogeneous materials

\*See Part Number System for Details



### CHARACTERISTICS

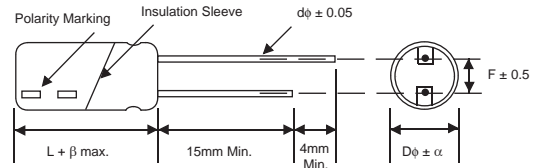
Rated Voltage Range		160 ~ 450VDC					
Capacitance Range		1.0 ~ 220μF					
Operating Temperature Range		-25°C ~ +105°C					
Capacitance Tolerance		±20% (M)					
Maximum Leakage Current @ +20°C		CV ≤ 1,000μF			CV > 1,000μF		
		0.1CV +40μA (1 minute) 0.03CV +15μA (5 minutes)			0.04CV +100μA (1 minute) 0.02CV +25μA (5 minutes)		
Max. Tan δ at 120Hz/20°C	W.V. (Vdc)	160	200	250	350	400	450
	S.V. (Vdc)	200	250	300	400	450	500
	Tan δ	0.15	0.15	0.15	0.20	0.20	0.20
Low Temperature Stability Impedance Ratio @ 120Hz	Z-25°C/Z+20°C	3	3	3	6	6	6
Load Life at W.V. & 105°C 8x11.5mm, 10x12.5mm: 5,000 Hours 10x16mm, 10x20mm: 8,000 Hours φD ≥ 12.5mm: 10,000 Hours	Δ Capacitance	Within ±20% of initial measured value					
	Δ Tan δ	Less than 200% of specified value					
	Δ LC	Less than specified value					

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

Cap. (μF)	Code	Working Voltage (Vdc)					
		160	200	250	350	400	450
1.0	1R0	-	-	-	-	8X11.5	-
		-	-	-	-	10X12.5	-
1.5	1R5	-	-	-	-	8X11.5	-
		-	-	-	-	10X12.5	-
1.8	1R8	-	-	-	-	8X11.5	-
		-	-	-	-	10X12.5	-
2.2	2R2	-	-	-	-	8X11.5	-
		-	-	-	-	10X12.5	-
3.3	3R3	-	-	-	-	10X12.5	-
		-	-	-	-	10X16	-
4.7	4R7	-	-	8X11.5	10X12.5	10X16	10X20
5.6	5R6	-	-	-	10X12.5	10X16	10X20
6.8	6R8	-	-	10X12.5	10X16	10X16	10X20
10	100	10X16	10X16	10X16	10X20	10X20	12.5X20
15	150	-	-	-	-	12.5X20	12.5X25
22	220	10X20	10X20	10X20	12.5X20	12.5X25	16X20
		-	-	-	-	16X20	
33	330	10X20	10X20	12.5X20	16X20	16X20	16X25
47	470	10X20	12.5X20	12.5X20	16X20	16X25	18X25
		-	-	-	-	18X20	
68	680	12.5x20	12.5x25 16x20	16x20	18x25	18x25	-
82	820	-	16x20	16x20	18x25	-	-
100	101	12.5x25 16x20	16x20	16x25	-	-	-
		-	-	-	-	-	-
150	151	16x25	16x25	18x25	-	-	-
220	221	18x25	-	-	-	-	-

### LEAD SPACING AND DIAMETER (mm)

Case Dia. (Dφ)	8	10	12.5	16	18
Lead Dia. (Dφ)	0.6	0.6	0.6	0.8	0.8
Lead Spacing (F)	3.5	5.0	5.0	7.5	7.5
Dim. α	0.5	0.5	0.5	0.5	0.5
Dim. β	2.0	2.0	2.0	2.0	2.0



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 VALUES, SPECIFICATIONS AND CASE SIZES (mm)

Part Number	Cap. (µF)	W.V. (Vdc)	Dissipation Factor +20°C/120Hz	Ripple Current Rating (mA) +105°C/100KHz	Max. ESR (Ω) +20°C/120Hz	Load Life Hours @+105°C
NRB-XS100M160V10X16F	10	160	0.15	320	24.9	8,000
NRB-XS220M160V10X20F	22		0.15	500	11.3	8,000
NRB-XS330M160V10X20F	33		0.15	650	7.54	8,000
NRB-XS470M160V10X20F	47		0.15	750	5.29	8,000
NRB-XS680M160V12.5x20F	68		0.15	1180	3.66	10,000
NRB-XS101M160V12.5x25F	100		0.15	1420	2.49	10,000
NRB-XS101M160V16x20F			0.15			10,000
NRB-XS151M160V16x25F	150		0.15	1890	1.66	10,000
NRB-XS221M160V18x25F	220		0.15	2370	1.13	10,000
NRB-XS100M200V10X16F	10		200	0.15	320	24.9
NRB-XS220M200V10X20F	22	0.15		500	11.3	8,000
NRB-XS330M200V10X20F	33	0.15		650	7.54	8,000
NRB-XS470M200V12.5X20F	47	0.15		980	5.29	10,000
NRB-XS680M200V12.5x25F	68	0.15		1300	3.66	10,000
NRB-XS680M200V16x20F		0.15				10,000
NRB-XS820M200V16x20F	82	0.15		1380	3.03	10,000
NRB-XS101M200V16x20F	100	0.15		1420	2.49	10,000
NRB-XS151M200V16x25F	150	0.15		1890	1.66	10,000
NRB-XS4R7M250V8X11.5F	4.7	250		0.15	160	52.9
NRB-XS6R8M250V10X12.5F	6.8		0.15	250	36.6	5,000
NRB-XS100M250V10X16F	10		0.15	320	24.9	5,000
NRB-XS220M250V10X20F	22		0.15	500	11.3	8,000
NRB-XS330M250V12.5X20F	33		0.15	800	7.54	10,000
NRB-XS470M250V12.5X20F	47		0.15	980	5.29	10,000
NRB-XS680M250V16x20F	68		0.15	1300	3.66	10,000
NRB-XS820M250V16x20F	82		0.15	1380	3.03	10,000
NRB-XS101M250V16x25F	100		0.15	1530	2.49	10,000
NRB-XS151M250V18x25F	150		0.15	1940	1.66	10,000
NRB-XS4R7M350V10X12.5F	4.7	350	0.20	150	70.6	5,000
NRB-XS5R6M350V10X12.5	5.6		0.20	180	59.2	5,000
NRB-XS6R8M350V10X16F	6.8		0.20	280	48.8	8,000
NRB-XS100M350V10X20F	10		0.20	350	33.2	8,000
NRB-XS220M350V12.5X20F	22		0.20	650	15.1	10,000
NRB-XS330M350V16X20F	33		0.20	900	10.1	10,000
NRB-XS470M350V16X20F	47		0.20	1080	7.06	10,000
NRB-XS680M350V18x25F	68		0.20	1470	4.88	10,000
NRB-XS820M350V18x25F	82		0.20	1530	4.05	10,000
NRB-XS1R0M400V8X11.5F	1.0		0.20	60	332	5,000
NRB-XS1R0M400V10X12.5F		0.20	70	5,000		
NRB-XS1R5M400V8X11.5F	1.5	0.20	90	221	5,000	
NRB-XS1R5M400V10X12.5F		0.20	100		5,000	
NRB-XS1R8M400V8X11.5F	1.8	0.20	95	184	5,000	
NRB-XS1R8M400V10X12.5F		0.20	120		5,000	
NRB-XS2R2M400V8X11.5F	2.2	0.20	95	151	5,000	
NRB-XS2R2M400V10X12.5F		0.20	140		5,000	
NRB-XS3R3M400V10X12.5F	3.3	0.20	150	101	5,000	
NRB-XS3R3M400V10X16F		0.20	180		8,000	
NRB-XS4R7M400V10X16F	4.7	400	0.20	220	70.6	8,000
NRB-XS5R6M400V10X16F	5.6		0.20	250	59.2	8,000
NRB-XS6R8M400V10X16F	6.8		0.20	280	48.8	8,000
NRB-XS100M400V10X20F	10		0.20	350	33.2	8,000
NRB-XS150M400V12.5X20F	15		0.20	550	22.1	10,000
NRB-XS220M400V12.5X25F	22		0.20	760	15.1	10,000
NRB-XS220M400V16X20F			0.20			10,000
NRB-XS330M400V16X20F	33		0.20	900	10.1	10,000
NRB-XS470M400V16X25F	47		0.20	1180	7.06	10,000
NRB-XS470M400V18X20F			0.20			10,000
NRB-XS680M400V18x25F	68	0.20	1470	4.88	10,000	



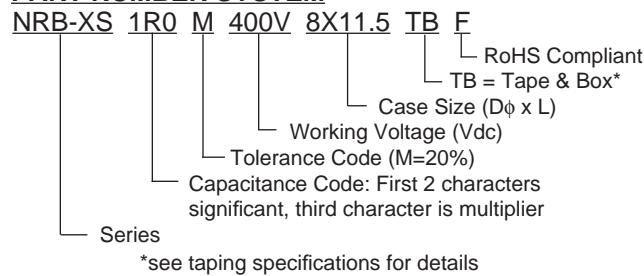
### STANDARD VALUES, SPECIFICATIONS AND CASE SIZES (mm)

Part Number	Cap. (μF)	W.V. (Vdc)	Dissipation Factor +20°C/120Hz	Ripple Current Rating (mA) +105°C/100KHz	Max. ESR (Ω) +20°C/120Hz	Load Life Hours @+105°C
NRB-XS4R7M450V10X20F	4.7	450	0.20	220	70.6	8,000
NRB-XS5R6M450V10X20F	5.6		0.20	250	59.2	8,000
NRB-XS6R8M450V10X20F	6.8		0.20	280	48.8	8,000
NRB-XS100M450V12.5X20F	10		0.20	450	33.2	10,000
NRB-XS150M450V12.5X25F	15		0.20	600	22.1	10,000
NRB-XS220M450V16X20F	22		0.20	730	15.1	10,000
NRB-XS330M450V16X25F	33		0.20	980	10.1	10,000
NRB-XS470M450V18X25F	47		0.20	1200	7.06	10,000

### RIPPLE CURRENT FREQUENCY CORRECTION FACTOR

Cap. (μF)	120Hz	1KHz	10KHz	100KHz ~ up
1 ~ 4.7	0.2	0.4	0.8	1.0
6.8 ~ 15	0.3	0.6	0.9	1.0
22 ~ 82	0.4	0.7	0.9	1.0
100 ~ 220	0.45	0.75	0.9	1.0

### PART NUMBER SYSTEM

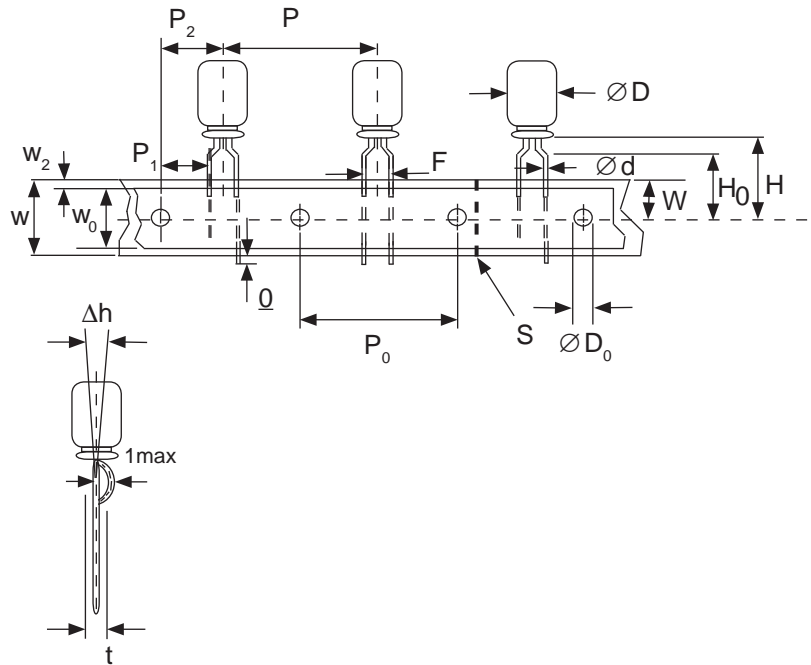


# Miniature Aluminum Electrolytic Capacitors Taping Specifications

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

Taping Dimensions (mm)

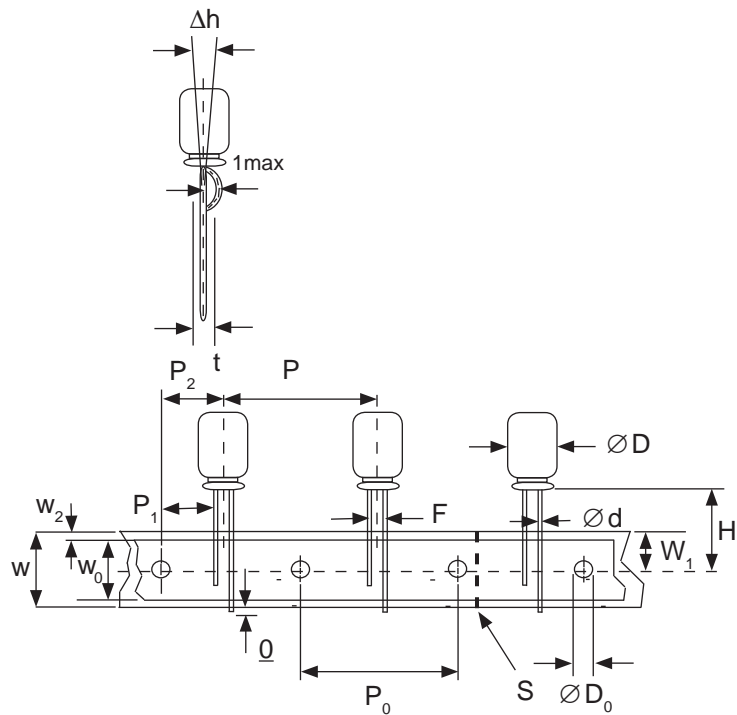
Case Dia. (D $\phi$ )	4	5	6.3	8
Case Size	4x5 4x7	5x5 5x7	5x11	6.3x5 6.3x7 6.3x11 8x11.5
d $\phi$ $\pm$ 0.05	0.45	0.45	0.5	0.45
H $\pm$ 0.75	17.5	17.5	18.5	17.5
F $+0.8 \sim -0.2$	5.0 $-0.2 \sim +0.8$			
P	12.7 $\pm$ 1.0			
P <sub>0</sub>	12.7 $\pm$ 0.2			
P <sub>1</sub>	3.85 $\pm$ 0.5 (at end of tape)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

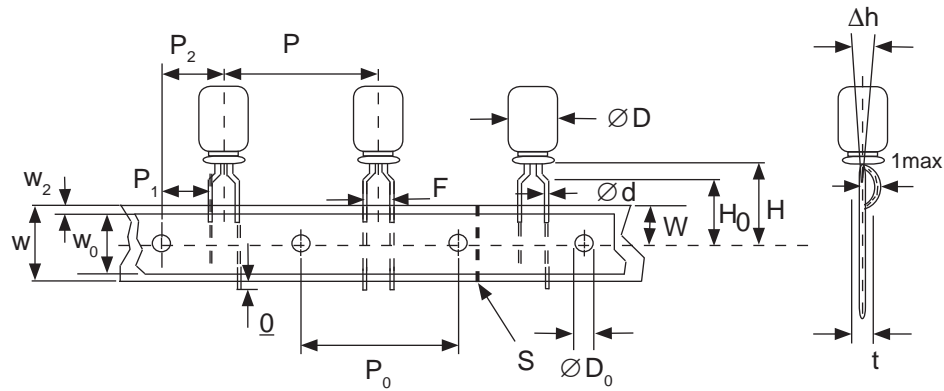


# Miniature Aluminum Electrolytic Capacitors Taping Specifications

## SPECIAL RADIAL TAPING (2.5mm LEAD SPACING, FORMED LEADS) TRF1, 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			

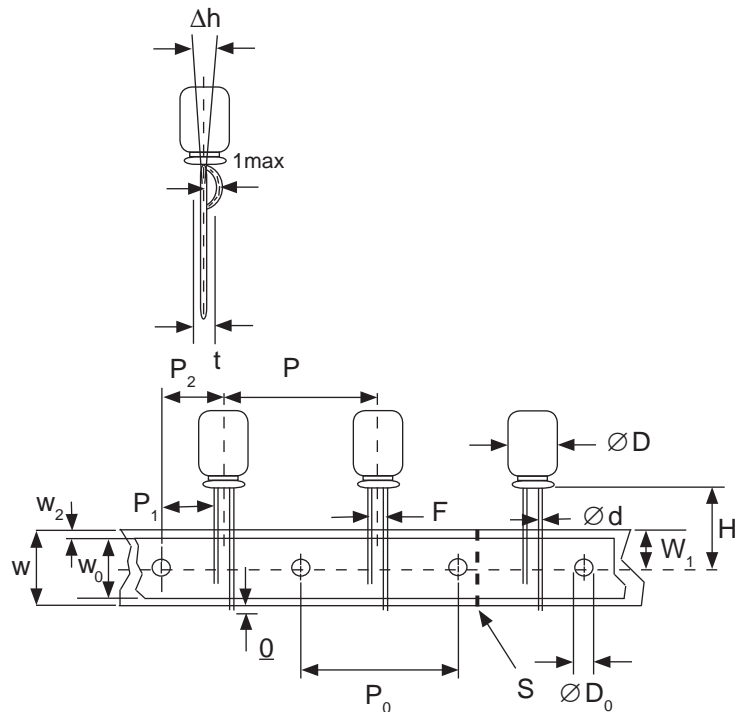


## SPECIAL STRAIGHT LEAD TAPING TRST, TBST

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)									

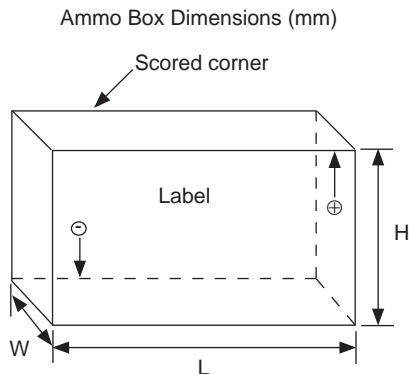
\* Parts with 4mm diameter are taped with a slight flare in the lead and a 2.0mm lead-space.



## RADIAL TAPED PACKAGING

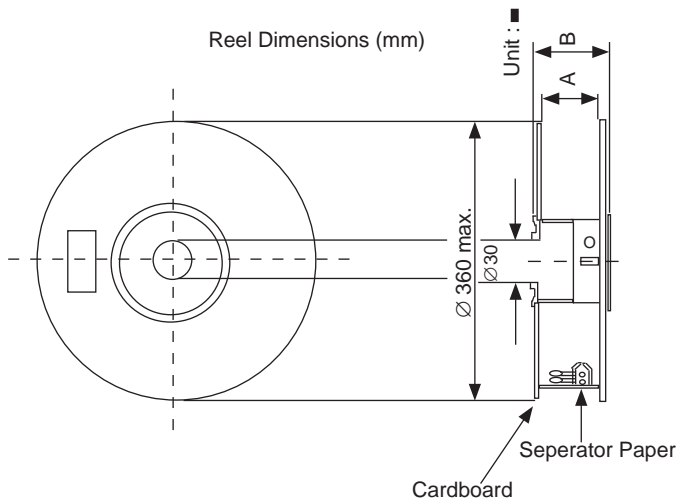
Ammo Box (Tape & Box) TB, TBF, TBST

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



Reel Packages (Tape & Reel) TR, TRF1, TRST

Size of reel and component quantity

Case Dia (D $\phi$ ) or Case Size	Q'ty per Box (pcs)	Dim. A	Dim. B
4 $\phi$	1,800	42	52
5 $\phi$	1,500	42	52
6.3 $\phi$	1,000	42	52
8 $\phi$	800	42	52
10x12.5*	600	42	52
10x16*	600	48	56
10x20*	600	52	60
12.x20*	250	52	60
12.5x25*	250	56	64

\*Special Taping Consult Factory For Availability