

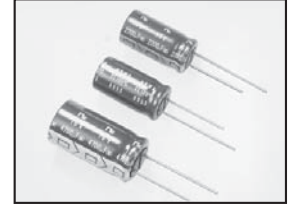
+130°C WIDE TEMPERATURE RANGE, RADIAL LEADS, POLARIZED

### FEATURES

- -40°C\* ~ +130°C EXTENDED OPERATING TEMPERATURE RANGE
- LONG LIFE (1,000 ~ 4,000 Hours @ 130°C)

\*200V and up -25°C ~ +130°C

**RoHS  
Compliant**  
includes all homogeneous materials

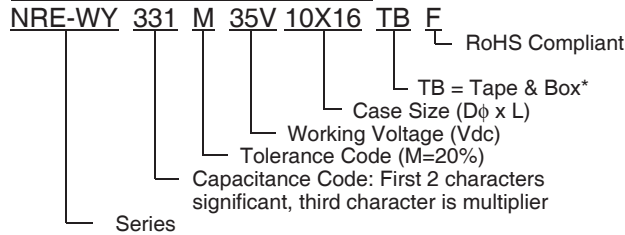


\*See Part Number System for Details

### CHARACTERISTICS

Rated Voltage Range	10 ~ 400Vdc										
Capacitance Range	1.0 ~ 4,700μF										
Operating Temperature Range	-40 ~ +130°C (10 to 100Vdc), -25°C ~ +130°C (200 to 400Vdc)										
Capacitance Tolerance	±20% (M)										
Max. Leakage Current	After 2 minutes	10 ~ 100Vdc: 0.01CV or 3μA whichever is greater									
	After 1 minute	200Vdc, 400Vdc: 0.1CV+40μA									
	After 5 minutes	200Vdc, 400Vdc: 0.03CV+15μA									
Max. Tan δ @ 120Hz/20°C	W.V. (Vdc)	10	16	25	35	50	63	100	200	400	
	S.V. (Vdc)	13	20	32	44	63	79	125	250	450	
	C ≤ 1000μF	0.20	0.16	0.14	0.12	0.10	0.09	0.08	0.15	0.20	
	C = 1,500μF	-	-	-	-	-	0.09	-	-	-	
	C = 2,200μF	0.22	0.18	0.16	0.14	0.12	-	-	-	-	
	C = 3,300μF	0.24	0.20	0.18	0.16	-	-	-	-	-	
Low Temperature Stability Impedance Ratio @ 120Hz	Z-25°C/Z+20°C	3	2	2	2	2	2	2	3	6	
	Z-40°C/Z+20°C	6	4	3	3	3	3	3	-	-	
Load Life Test at Rated W.V. 1000 ~ 4000Hrs @ 130°C (See part number table)	Capacitance Change	Within ±30% of initial measured value					Within ±20% of initial measured value				
	Tan δ	Less than 300% of specified max. value					Less than 200% of specified max. value				
	Leakage Current	Less than specified maximum value									
Shelf Life Test +130°C 1000Hrs	Capacitance Change	Within ±30% of initial measured value									
	Tan δ	Less than 300% of specified max. value									
	Leakage Current	Not more than 500% of specified max. value									

### 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)



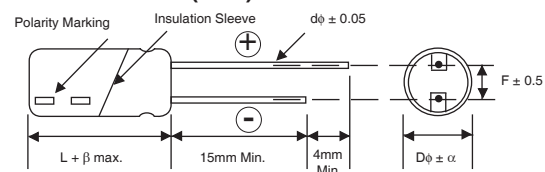
### STANDARD PRODUCT AND CASE SIZE D $\phi$ x L (mm)

Cap. ( $\mu$ F)	Code	Working Voltage (VDC)								
		10	16	25	35	50	63	100	200	400
1.0	1R0	-	-	-	-	8X11.5	-	-	-	6.3X11
		-	-	-	-	-	-	-	-	8X11.5
1.5	1R5	-	-	-	-	-	-	-	-	6.3X11
		-	-	-	-	-	-	-	-	8X16
1.8	1R8	-	-	-	-	-	-	-	-	6.3X11
		-	-	-	-	-	-	-	-	8X16
2.2	2R2	-	-	-	-	8X11.5	-	-	-	8X11.5
		-	-	-	-	-	-	-	-	8X16
		-	-	-	-	-	-	-	-	8X20
2.7	2R7	-	-	-	-	-	-	-	-	8X16
		-	-	-	-	-	-	-	-	8X20
3.3	3R3	-	-	-	-	8X11.5	-	-	-	8X16
		-	-	-	-	-	-	-	-	8X20
4.7	4R7	-	-	-	-	8X11.5	-	8X11.5	6.3X11	8X20
		-	-	-	-	-	-	-	8X11.5	10X16
5.6	5R6	-	-	-	-	-	-	-	8X11.5	10X16
		-	-	-	-	-	-	-	8X16	10X20
6.8	6R8	-	-	-	-	-	-	-	8X11.5	10X20
		-	-	-	-	-	-	-	8X16	
10	10	-	-	-	-	8X11.5	-	8X11.5	8X16	-
		-	-	-	-	-	-	-	8X20	-
15	150	-	-	-	-	-	-	-	8X16	-
		-	-	-	-	-	-	-	8X20	-
22	220	-	-	-	-	8X11.5	-	8X11.5	8X20	-
		-	-	-	-	-	-	-	10X16	-
33	330	-	-	-	-	8X11.5	8X11.5	10X12.5	10X20	-
47	470	-	-	-	-	8X11.5	10X12.5	10X16	-	-
100	101	-	-	-	8X11.5	10X12.5	10X16	12.5X20	-	-
220	221	-	-	8X11.5	10X12.5	10X20	12.5X20	16X25	-	-
330	331	8X11.5	8X11.5	10X12.5	10X16	12.5X20	12.5X25	16X31.5	-	-
470	471	10X12.5	10X12.5	10X16	10X20	12.5X25	16X25	18X31.5	-	-
1000	102	10X20	10X20	12.5X20	12.5X25	16X31.5	16X31.5	-	-	-
1500	152	-	-	-	-	-	18X40	-	-	-
2200	222	12.5X25	12.5X25	16X31.5	16X35.5	18X40	-	-	-	-
3300	332	16X25	16X31.5	16X35.5	18X35.5	-	-	-	-	-
4700	472	16X31.5	16X35.5	-	-	-	-	-	-	-

### DIAMETER AND LEADSPACE (mm)

Case Dia. (D $\phi$ )	6.3	8	10	12.5	16	18
Lead Dia. (d $\phi$ )	0.5	0.6		0.8		
Lead Spacing (F)	2.5	3.5	5.0	7.5		
Dim. $\alpha$	0.5		1.0			
Dim. $\beta$	2.0					

### 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.

Part Number	Cap. (µF)	W.V. (Vdc)	Dissipation Factor +20°C/120Hz	Ripple Current Rating (mA) +130°C/100KHz	Max. Impedance (Ω) +20°C/100KHz	Load Life Hours @+130°C	
NRE-WY331M10V8X11.5F	330	10	0.20	360	0.22	2,000	
NRE-WY471M10V10X12.5F	470		0.20	620	0.15	2,000	
NRE-WY102M10V10X20F	1000		0.20	960	0.073	2,000	
NRE-WY222M10V12.5X25F	2200		0.22	1430	0.040	4,000	
NRE-WY332M10V16X25F	3300		0.24	1900	0.038	4,000	
NRE-WY472M10V16X31.5F	4700		0.26	2300	0.034	4,000	
NRE-WY331M16V8X11.5F	330	16	0.16	360	0.22	2,000	
NRE-WY471M16V10X12.5F	470		0.16	620	0.15	2,000	
NRE-WY102M16V10X20F	1000		0.16	960	0.073	2,000	
NRE-WY222M16V12.5X25F	2200		0.18	1430	0.040	4,000	
NRE-WY332M16V16X31.5F	3300		0.20	2300	0.034	4,000	
NRE-WY472M16V16X35.5F	4700		0.22	2550	0.031	4,000	
NRE-WY221M25V8X11.5F	220	25	0.14	360	0.22	2,000	
NRE-WY331M25V10X12.5F	330		0.14	620	0.15	2,000	
NRE-WY471M25V10X16F	470		0.14	800	0.10	2,000	
NRE-WY102M25V12.5X20F	1000		0.14	1100	0.055	4,000	
NRE-WY222M25V16X31.5F	2200		0.16	2300	0.034	4,000	
NRE-WY332M25V16X35.5F	3300		0.18	2550	0.031	4,000	
NRE-WY101M35V8X11.5F	100	35	0.12	360	0.22	2,000	
NRE-WY221M35V10X12.5F	220		0.12	620	0.15	2,000	
NRE-WY331M35V10X16F	330		0.12	800	0.10	2,000	
NRE-WY471M35V10X20F	470		0.12	960	0.073	2,000	
NRE-WY102M35V12.5X25F	1000		0.12	1430	0.040	4,000	
NRE-WY222M35V16X35.5F	2200		0.14	2550	0.031	4,000	
NRE-WY332M35V18X35.5F	3300	0.16	2800	0.028	4,000		
NRE-WY1R0M50V8X11.5F	1.0	50	0.10	35	2.5	2,000	
NRE-WY2R2M50V8X11.5F	2.2		0.10	50	1.8	2,000	
NRE-WY3R3M50V8X11.5F	3.3		0.10	70	1.3	2,000	
NRE-WY4R7M50V8X11.5F	4.7		0.10	100	0.85	2,000	
NRE-WY100M50V8X11.5F	10		0.10	200	0.60	2,000	
NRE-WY220M50V8X11.5F	22		0.10	260	0.35	2,000	
NRE-WY330M50V8X11.5F	33		0.10	300	0.28	2,000	
NRE-WY470M50V8X11.5F	47		0.10	300	0.28	2,000	
NRE-WY101M50V10X12.5F	100		0.10	520	0.18	2,000	
NRE-WY221M50V10X20F	220		0.10	890	0.082	2,000	
NRE-WY331M50V12.5X20F	330		0.10	1000	0.065	4,000	
NRE-WY471M50V12.5X25F	470		0.10	1200	0.051	4,000	
NRE-WY102M50V16X31.5F	1000		0.10	2180	0.037	4,000	
NRE-WY222M50V18X40F	2200		0.12	2800	0.029	4,000	
NRE-WY330M63V8X11.5F	33		63	0.09	250	0.40	2,000
NRE-WY470M63V10X12.5F	47			0.09	400	0.27	2,000
NRE-WY101M63V10X16F	100	0.09		450	0.20	2,000	
NRE-WY221M63V12.5X20	220	0.09		820	0.10	4,000	
NRE-WY331M63V12.5X25F	330	0.09		1000	0.072	4,000	
NRE-WY471M63V16X25F	470	0.09		1500	0.069	4,000	
NRE-WY102M63V16X31.5F	1000	0.09		1850	0.056	4,000	
NRE-WY152M63V18X40F	1500	0.09		2350	0.043	4,000	
NRE-WY4R7M100V8X11.5F	4.7	100	0.08	100	1.3	2,000	
NRE-WY100M100V8X11.5F	10		0.08	200	1.0	2,000	
NRE-WY220M100V8X11.5F	22		0.08	220	0.67	2,000	
NRE-WY330M100V10X12.5F	33		0.08	260	0.45	2,000	
NRE-WY470M100V10X16F	47		0.08	330	0.33	2,000	
NRE-WY101M100V12.5X20F	100		0.08	670	0.17	4,000	
NRE-WY221M100V16X25F	220		0.08	1100	0.13	4,000	
NRE-WY331M100V16X31.5F	330		0.08	1300	0.10	4,000	
NRE-WY471M100V18X31.5F	470		0.08	1600	0.092	4,000	

### RIPPLE CURRENT CORRECTION FACTOR (10V ~ 100V)

Frequency (Hz)	60 (50)	120Hz	1KHz	10K	100K
1.0µF ~ 4.7µF	0.35	0.42	0.60	0.80	1.0
10µF ~ 33µF	0.45	0.55	0.75	0.90	1.0
47µF ~ 330µF	0.60	0.70	0.85	0.95	1.0
470µF ~ 1500µF	0.65	0.75	0.90	0.98	1.0
2200µF ~ 4700µF	0.75	0.80	0.95	1.0	1.0



Part Number	Cap. (μF)	W.V. (Vdc)	Dissipation Factor +20°C/120Hz	Ripple Current Rating (mA) +130°C/100KHz	Max. ESR (Ω) +20°C/120Hz	Load Life Hours @+130°C
NRE-WY4R7M200V6.3X11F	4.7	200	0.15	100	52.94	1,000
NRE-WY4R7M200V8X11.5F			0.15	120	52.94	2,000
NRE-WY5R6M200V8X11.5F	5.6		0.15	130	44.43	2,000
NRE-WY5R6M200V8X16F			0.15	180	44.43	2,000
NRE-WY6R8M200V8X11.5F	6.8		0.15	130	36.59	2,000
NRE-WY6R8M200V8X16F			0.15	180	36.59	2,000
NRE-WY100M200V8X16F	10		0.15	200	24.88	2,000
NRE-WY100M200V8X20F			0.15	240	24.88	2,000
NRE-WY150M200V8X16F	15		0.15	200	16.59	2,000
NRE-WY150M200V8X20F			0.15	240	16.59	2,000
NRE-WY220M200V8X20F	22		0.15	240	11.31	2,000
NRE-WY220M200V10X16F			0.15	240	11.31	2,000
NRE-WY330M200V10X20F	33	0.15	320	7.54	2,000	
NRE-WY1R0M400V6.3X11F	1.0	400	0.20	60	331.74	1,000
NRE-WY1R0M400V8X11.5F			0.20	65	331.74	2,000
NRE-WY1R5M400V8X11.5F	1.5		0.20	75	221.16	2,000
NRE-WY1R5M400V8X16F			0.20	80	221.16	2,000
NRE-WY1R8M400V8X11.5F	1.8		0.20	75	184.30	2,000
NRE-WY1R8M400V8X16F			0.20	85	184.30	2,000
NRE-WY2R2M400V8X11.5F	2.2		0.20	75	150.79	2,000
NRE-WY2R2M400V8X16F			0.20	90	150.79	2,000
NRE-WY2R2M400V8X20F	2.7		0.20	110	150.79	2,000
NRE-WY2R7M400V8X16F			0.20	95	122.87	2,000
NRE-WY2R7M400V8X20F	3.3		0.20	115	122.87	2,000
NRE-WY3R3M400V8X16F			0.20	100	100.53	2,000
NRE-WY3R3M400V8X20F	4.7	0.20	120	100.53	2,000	
NRE-WY4R7M400V8X20F		0.20	120	70.58	2,000	
NRE-WY4R7M400V10X16F	5.6	0.20	125	70.58	2,000	
NRE-WY5R6M400V10X16F		0.20	130	59.24	2,000	
NRE-WY5R6M400V10X20F	6.8	0.20	145	59.24	2,000	
NRE-WY6R8M400V10X20F		0.20	150	48.79	2,000	

### RIPPLE CURRENT CORRECTION FACTOR (200V ~ 400V)

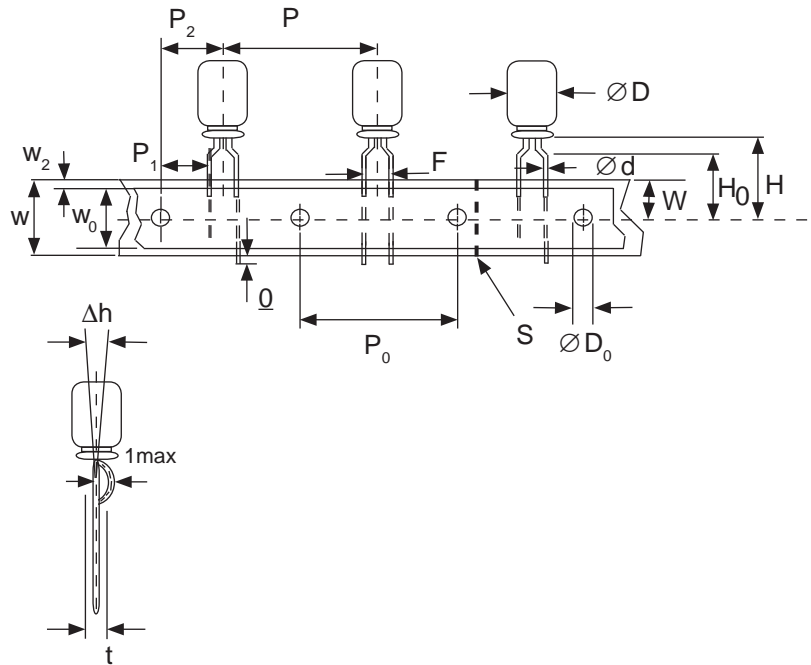
Frequency (Hz)	120Hz	1KHz	10K	100K
1.0μF ~ 5.6μF	0.20	0.40	0.80	1.0
6.8μF ~ 15μF	0.30	0.60	0.90	1.0
22μF	0.50	0.80	0.90	1.0

# Miniature Aluminum Electrolytic Capacitors Taping Specifications

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

Taping Dimensions (mm)

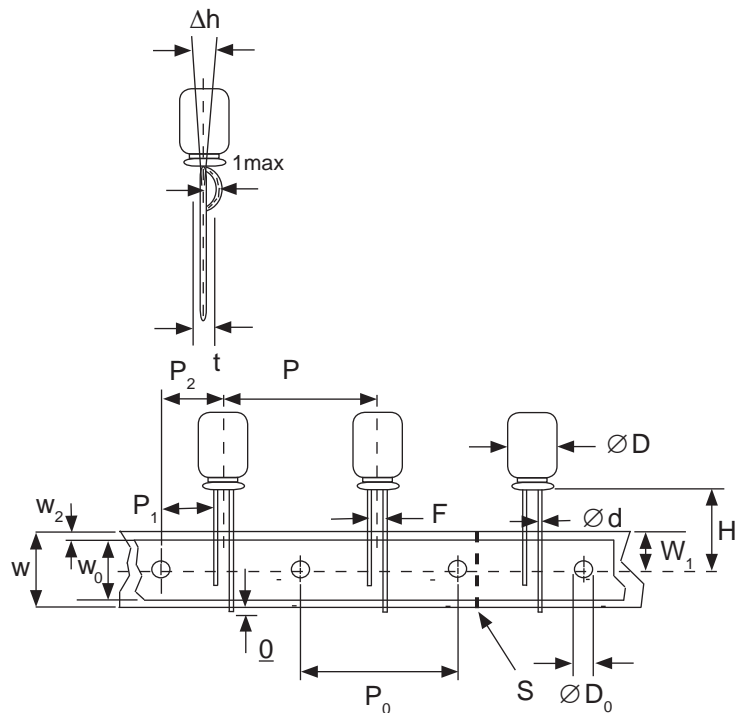
Case Dia. (D $\phi$ )	4	5	6.3	8
Case Size	4x5	5x5	6.3x5	8x11.5
Dim.	4x7	5x7	6.3x7	6.3x11
d $\phi$ $\pm$ 0.05	0.45	0.45	0.5	0.5
H $\pm$ 0.75	17.5	17.5	18.5	17.5
F +0.8 ~ -0.2	5.0 -0.2 ~ +0.8			
P	12.7 $\pm$ 1.0			
P <sub>0</sub>	12.7 $\pm$ 0.2			
P <sub>1</sub>	3.85 $\pm$ 0.5 (at end of tape)			
P <sub>2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

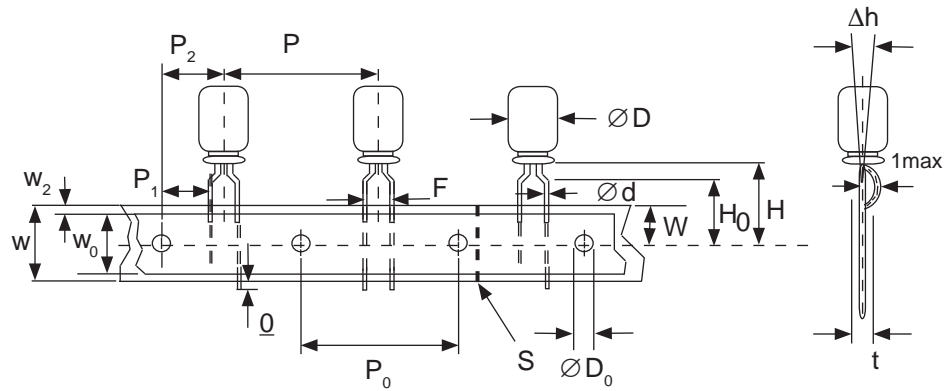


# Miniature Aluminum Electrolytic Capacitors Taping Specifications

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

Taping Dimensions (mm)

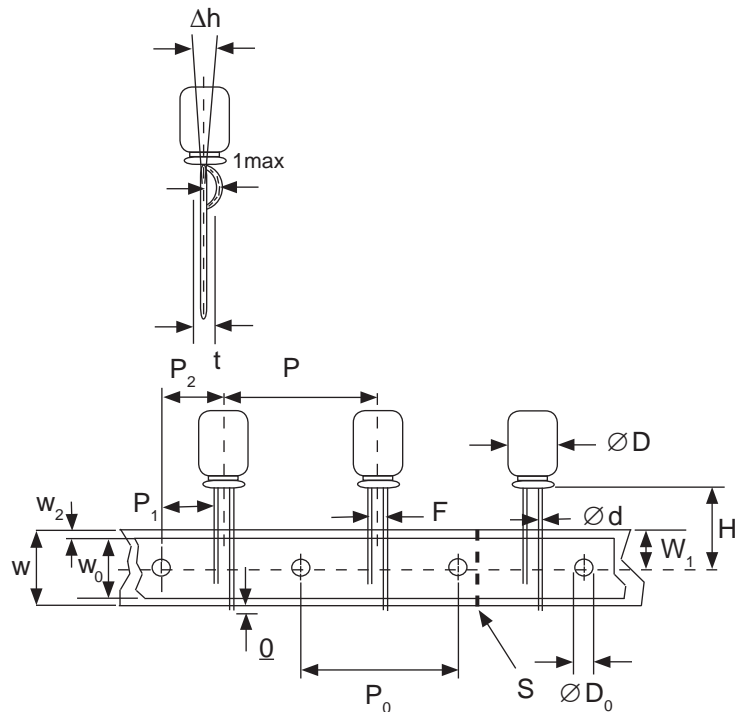
Case Dia. (D $\phi$ )	4	5	
Case Size Dim.	4x5 4x7	5x5 5x7	5x11
d $\phi$ $\pm$ 0.05	0.45	0.45	0.5
H $\pm$ 0.75	17.5	17.5	18.5
H <sub>0</sub> $\pm$ 0.5	16.0	-	-
F	2.5 -0.2 ~ +0.8		
P	12.7 $\pm$ 1.0		
P <sub>0</sub>	12.7 $\pm$ 0.2		
P <sub>1</sub>	5.1 $\pm$ 0.5		
P <sub>2</sub>	6.35 $\pm$ 1.0		
W	18.0 $\pm$ 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)

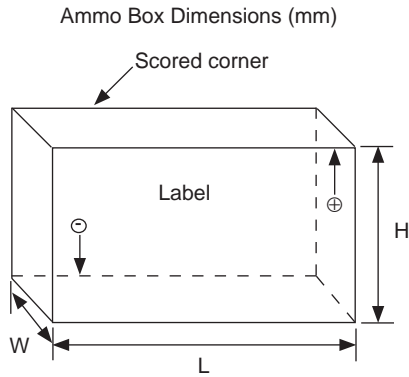
Case Dia. (D $\phi$ )	4	5			6.3		8
Case Size Dim.	4x5 4x7	5x5 5x7	5x11	6.3x5 6.3x7	6.3x11	8x11.5	
d $\phi$ $\pm$ 0.05	0.45	0.45	0.5	0.45	0.5	0.6	
H $\pm$ 0.75	17.5	17.5	18.5	17.5	18.5	20.0	
F +0.8 ~ -0.2	2.0*	2.0	2.0	2.5	2.5	3.5	
P $\pm$ 1.0	12.7 $\pm$ 0.2						
P <sub>0</sub>	12.7 $\pm$ 0.2						
P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