

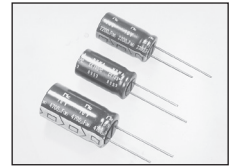
HIGH CV, RADIAL LEADS, POLARIZED

### FEATURES

- LOW AND HIGH VOLTAGE, WIDE TEMPERATURE
- NEW REDUCED SIZES

**RoHS**  
**Compliant**  
includes all homogeneous materials

\*See Part Number System for Details



### CHARACTERISTICS

|                                                      |               |                                                   |      |      |      |                                                                    |      |      |
|------------------------------------------------------|---------------|---------------------------------------------------|------|------|------|--------------------------------------------------------------------|------|------|
| Rated Voltage Range                                  |               | 6.3 ~ 35 & 400Vdc                                 |      |      |      |                                                                    |      |      |
| Capacitance Range                                    |               | 4.7 ~ 1,200μF                                     |      |      |      |                                                                    |      |      |
| Operating Temperature Range                          |               | -40 ~ +105°C                                      |      |      |      |                                                                    |      |      |
| Capacitance Tolerance                                |               | ±20%(M)                                           |      |      |      |                                                                    |      |      |
| Max. Leakage Current @ 20°C                          |               | 6.3 ~ 35Vdc                                       |      |      |      | 400Vdc                                                             |      |      |
|                                                      |               | 0.01CV or 3μA whichever is less (after 2 minutes) |      |      |      | 0.04CV + 100μA (after 1 minute)<br>0.02CV + 25μA (after 5 minutes) |      |      |
| Max. Tan δ @ 120Hz/20°C                              | W.V. (Vdc)    | 6.3                                               | 8    | 10   | 16   | 25                                                                 | 35   | 400  |
|                                                      | S.V. (Vdc)    | 8                                                 | 10   | 13   | 20   | 32                                                                 | 44   | 450  |
|                                                      | Tan δ         | 0.22                                              | 0.20 | 0.19 | 0.16 | 0.14                                                               | 0.12 | 0.25 |
| Low Temperature Stability<br>Impedance Ratio @ 120Hz | W.V. (Vdc)    | 6.3                                               | 8    | 10   | 20   | 32                                                                 | 44   | 400  |
|                                                      | Z-25°C/Z+20°C | 2                                                 | 2    | 2    | 2    | 2                                                                  | 2    | 6    |
|                                                      | Z-40°C/Z+20°C | 12                                                | 12   | 12   | 10   | 8                                                                  | 6    | 10   |
| Load Life Test at<br>Rated W.V. @ +105°C             |               | Hours                                             |      |      |      | L ≤ 7.5 = 1,000, L ≥ 9 = 2,000                                     |      |      |
|                                                      |               | Capacitance Change                                |      |      |      | Within ±25% of initial measured value                              |      |      |
|                                                      |               | Tan δ                                             |      |      |      | Less than 200% of specified value                                  |      |      |
|                                                      |               | Leakage Current                                   |      |      |      | Less than specified value                                          |      |      |

### STANDARD PRODUCT, SPECIFICATIONS AND CASE SIZES D φ x L (mm)

| Part Number            | Cap.<br>(μF) | W.V.<br>(Vdc) | Dissipation Factor<br>+20°C/120Hz | Ripple Current Rating (mA)<br>+105°C/120Hz | Impedance (Ω)<br>+20°C/100KHz | Load Life Hours<br>@ +105°C |
|------------------------|--------------|---------------|-----------------------------------|--------------------------------------------|-------------------------------|-----------------------------|
| NRE-AX820M6.3V5X7F     | 82           | 6.3           | 0.22                              | 510                                        | 0.25                          | 1,000                       |
| NRE-AX221M6.3V6.3X7F   | 220          |               | 0.22                              | 720                                        | 0.13                          | 1,000                       |
| NRE-AX221M6.3V5X11F    | 220          |               | 0.22                              | 800                                        | 0.14                          | 2,000                       |
| NRE-AX471M6.3V8X7.5F   | 470          |               | 0.22                              | 1080                                       | 0.065                         | 1,000                       |
| NRE-AX471M6.3V6.3X11F  | 470          |               | 0.22                              | 1140                                       | 0.067                         | 2,000                       |
| NRE-AX681M6.3V8X9F     | 680          |               | 0.22                              | 1360                                       | 0.049                         | 2,000                       |
| NRE-AX821M6.3V8X10.8F  | 820          |               | 0.22                              | 1600                                       | 0.042                         | 2,000                       |
| NRE-AX102M6.3V8X16F    | 1000         |               | 0.22                              | 2010                                       | 0.027                         | 2,000                       |
| NRE-AX102M6.3V10X9F    | 1000         |               | 0.22                              | 1540                                       | 0.036                         | 2,000                       |
| NRE-AX122M6.3V10X12.5F | 1200         |               | 0.22                              | 1970                                       | 0.025                         | 2,000                       |
| NRE-AX750M8V5X7F       | 75           | 8             | 0.20                              | 510                                        | 0.25                          | 1,000                       |
| NRE-AX201M8V6.3X7F     | 200          |               | 0.20                              | 720                                        | 0.13                          | 1,000                       |
| NRE-AX201M8V5X11F      | 200          |               | 0.20                              | 800                                        | 0.14                          | 2,000                       |
| NRE-AX391M8V8X7.5F     | 390          |               | 0.20                              | 1080                                       | 0.065                         | 1,000                       |
| NRE-AX431M8V6.3X11F    | 430          |               | 0.20                              | 1140                                       | 0.067                         | 2,000                       |
| NRE-AX621M8V8X9F       | 620          |               | 0.20                              | 1360                                       | 0.049                         | 2,000                       |
| NRE-AX751M8V8X10.8F    | 750          |               | 0.20                              | 1600                                       | 0.042                         | 2,000                       |
| NRE-AX911M8V8X16F      | 910          |               | 0.20                              | 2010                                       | 0.027                         | 2,000                       |
| NRE-AX911M8V10X9F      | 910          |               | 0.20                              | 1540                                       | 0.036                         | 2,000                       |
| NRE-AX112M8V10X12.5F   | 1100         |               | 0.20                              | 1970                                       | 0.025                         | 2,000                       |
| NRE-AX680M10V5x7F      | 68           | 10            | 0.19                              | 510                                        | 0.25                          | 1,000                       |
| NRE-AX181M10V6.3x7F    | 180          |               | 0.19                              | 720                                        | 0.13                          | 1,000                       |
| NRE-AX181M10V5x11F     | 180          |               | 0.19                              | 800                                        | 0.14                          | 2,000                       |
| NRE-AX331M10V8x7.5F    | 330          |               | 0.19                              | 1080                                       | 0.065                         | 1,000                       |
| NRE-AX391M10V6.3x11F   | 390          |               | 0.19                              | 1140                                       | 0.067                         | 2,000                       |
| NRE-AX561M10V8x9F      | 560          |               | 0.19                              | 1360                                       | 0.049                         | 2,000                       |
| NRE-AX681M10V8x10.8F   | 680          |               | 0.19                              | 1600                                       | 0.042                         | 2,000                       |
| NRE-AX821M10V8x16F     | 820          |               | 0.19                              | 2010                                       | 0.027                         | 2,000                       |
| NRE-AX821M10V10x9F     | 820          |               | 0.19                              | 1540                                       | 0.036                         | 2,000                       |
| NRE-AX102M10V10x12.5F  | 1000         |               | 0.19                              | 1970                                       | 0.025                         | 2,000                       |

### 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/120Hz | Impedance ( $\Omega$ ) +20°C/100KHz | Load Life Hours @ +105°C |
|-----------------------|-----------------|------------|--------------------------------|-----------------------------------------|-------------------------------------|--------------------------|
| NRE-AX391M16V8X9F     | 390             | 16         | 0.16                           | 1360                                    | 0.049                               | 2,000                    |
| NRE-AX471M16V8X10.8F  | 470             |            | 0.16                           | 1600                                    | 0.042                               | 2,000                    |
| NRE-AX561M16V8X16F    | 560             |            | 0.16                           | 2010                                    | 0.027                               | 2,000                    |
| NRE-AX561M16V10X9F    | 560             |            | 0.16                           | 1540                                    | 0.036                               | 2,000                    |
| NRE-AX681M16V10X12.5F | 680             |            | 0.16                           | 1970                                    | 0.025                               | 2,000                    |
| NRE-AX102M16V10X16F   | 1000            |            | 0.16                           | 2480                                    | 0.019                               | 2,000                    |
| NRE-AX221M25V8X9F     | 220             | 25         | 0.14                           | 1360                                    | 0.049                               | 2,000                    |
| NRE-AX271M25V8X10.8F  | 270             |            | 0.14                           | 1600                                    | 0.042                               | 2,000                    |
| NRE-AX391M25V8X16F    | 390             |            | 0.14                           | 2010                                    | 0.027                               | 2,000                    |
| NRE-AX391M25V10X9F    | 390             |            | 0.14                           | 1540                                    | 0.036                               | 2,000                    |
| NRE-AX471M25V10X12.5F | 470             |            | 0.14                           | 1970                                    | 0.025                               | 2,000                    |
| NRE-AX681M25V10X16F   | 680             |            | 0.14                           | 2480                                    | 0.019                               | 2,000                    |
| NRE-AX151M35V8X9F     | 150             | 35         | 0.12                           | 1360                                    | 0.049                               | 2,000                    |
| NRE-AX181M35V8X10.8F  | 180             |            | 0.12                           | 1600                                    | 0.042                               | 2,000                    |
| NRE-AX221M35V8X16F    | 220             |            | 0.12                           | 2010                                    | 0.027                               | 2,000                    |
| NRE-AX221M35V10X9F    | 220             |            | 0.12                           | 1540                                    | 0.036                               | 2,000                    |
| NRE-AX271M35V10X12.5F | 270             |            | 0.12                           | 1970                                    | 0.025                               | 2,000                    |
| NRE-AX391M35V10X16F   | 390             |            | 0.12                           | 2480                                    | 0.019                               | 2,000                    |

### 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/120Hz | Load Life Hours @ +105°C |
|------------------------|-----------------|------------|--------------------------------|-----------------------------------------|--------------------------|
| NRE-AX4R7M400V6.3X14F  | 4.7             | 400        | 0.25                           | 50                                      | 2,000                    |
| NRE-AX4R7M400V8X9F     | 4.7             |            | 0.25                           | 50                                      | 2,000                    |
| NRE-AX6R8M400V8X10.8F  | 6.8             |            | 0.25                           | 70                                      | 2,000                    |
| NRE-AX7R5M400V8X10.8F  | 7.5             |            | 0.25                           | 75                                      | 2,000                    |
| NRE-AX8R2M400V8X16F    | 8.2             |            | 0.25                           | 85                                      | 2,000                    |
| NRE-AX8R2M400V10X9F    | 8.2             |            | 0.25                           | 85                                      | 2,000                    |
| NRE-AX100M400V8X16F    | 10              |            | 0.25                           | 90                                      | 2,000                    |
| NRE-AX100M400V10X12.5F | 10              |            | 0.25                           | 100                                     | 2,000                    |
| NRE-AX120M400V10X12.5F | 12              |            | 0.25                           | 110                                     | 2,000                    |
| NRE-AX120M400V8X20F    | 12              |            | 0.25                           | 120                                     | 2,000                    |
| NRE-AX150M400V8X20F    | 15              |            | 0.25                           | 130                                     | 2,000                    |
| NRE-AX150M400V10X16F   | 15              |            | 0.25                           | 150                                     | 2,000                    |
| NRE-AX180M400V10X16F   | 18              |            | 0.25                           | 150                                     | 2,000                    |
| NRE-AX220M400V12.5X16F | 22              |            | 0.25                           | 180                                     | 2,000                    |
| NRE-AX240M400V12.5X16F | 24              |            | 0.25                           | 190                                     | 2,000                    |

### RIPPLE CURRENT FREQUENCY CORRECTION FACTORS

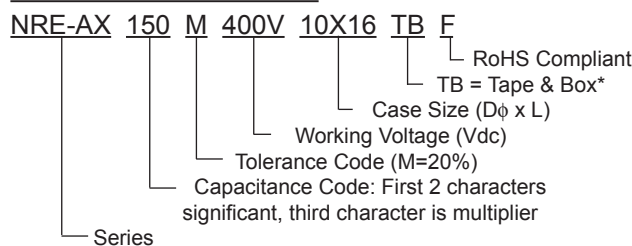
6.3V ~ 35V

| Frequency (Hz)     | 120  | 500  | 1K   | 100K $\leq$ |
|--------------------|------|------|------|-------------|
| 68 ~ 82 $\mu$ F    | 0.21 | 0.73 | 0.92 | 1.00        |
| 150 ~ 270 $\mu$ F  | 0.36 | 0.73 | 0.92 | 1.00        |
| 330 ~ 750 $\mu$ F  | 0.55 | 0.77 | 0.94 | 1.00        |
| 820 ~ 1200 $\mu$ F | 0.60 | 0.80 | 0.96 | 1.00        |

400V

| Frequency (Hz)    | 60   | 120  | 500  | 1K   | 10K $\geq$ |
|-------------------|------|------|------|------|------------|
| 4.7 ~ 8.2 $\mu$ F | 0.65 | 1.00 | 1.20 | 1.30 | 1.50       |
| 10 ~ 24 $\mu$ F   | 0.80 | 1.00 | 1.20 | 1.30 | 1.50       |

### PART NUMBER SYSTEM



\*see taping specifications for details



### LEAD SPACING AND DIAMETER (mm)

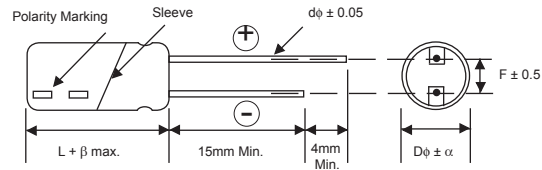
$L \leq 7.5\text{mm}$

| Case Dia. (D $\phi$ ) | 5    | 6.3 | 8   |
|-----------------------|------|-----|-----|
| Lead Dia. (d $\phi$ ) | 0.45 |     |     |
| Lead Spacing (F)      | 2.0  | 2.5 | 3.5 |
| Dim. $\alpha$         | 0.5  |     |     |
| Dim. $\beta$          | 1.0  |     |     |

$L \geq 9.0\text{mm}$

| Case Dia. (D $\phi$ ) | 5                                | 6.3 | 8   | 10  | 12.5 |
|-----------------------|----------------------------------|-----|-----|-----|------|
| Lead Dia. (d $\phi$ ) | 0.5                              |     | 0.6 |     |      |
| Lead Spacing (F)      | 2.0                              | 2.5 | 3.5 | 5.0 | 5.0  |
| Dim. $\alpha$         | 0.5                              |     |     |     |      |
| Dim. $\beta$          | 6.3V ~ 35V $\beta = 1.5$         |     |     |     |      |
|                       | 400V $L \leq 10.8$ $\beta = 1.5$ |     |     |     |      |
|                       | $L \geq 12.5$ $\beta = 2.0$      |     |     |     |      |

### DIMENSIONS (mm)

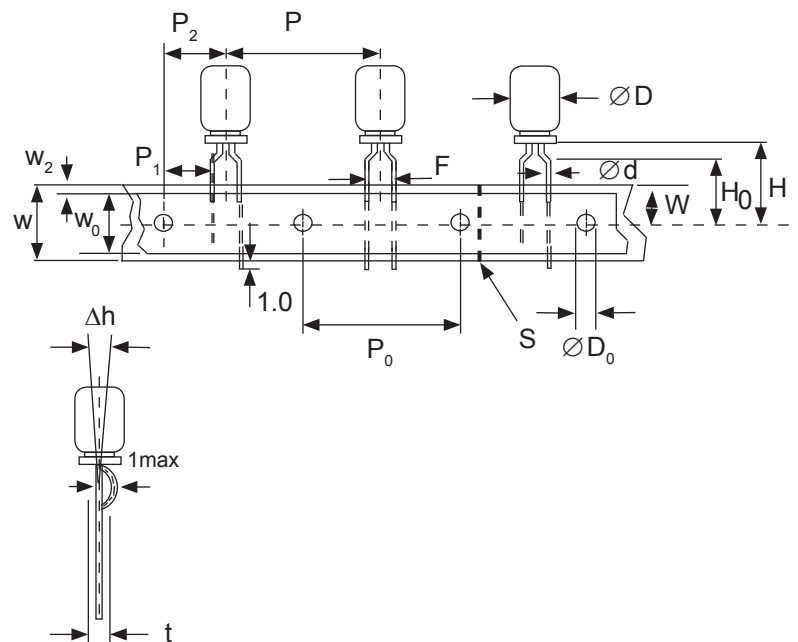


Drawing is representative of parts as supplied in bulk or straight lead format, please see taping specification for details on taped format packaging.

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

Taping Dimensions (mm)

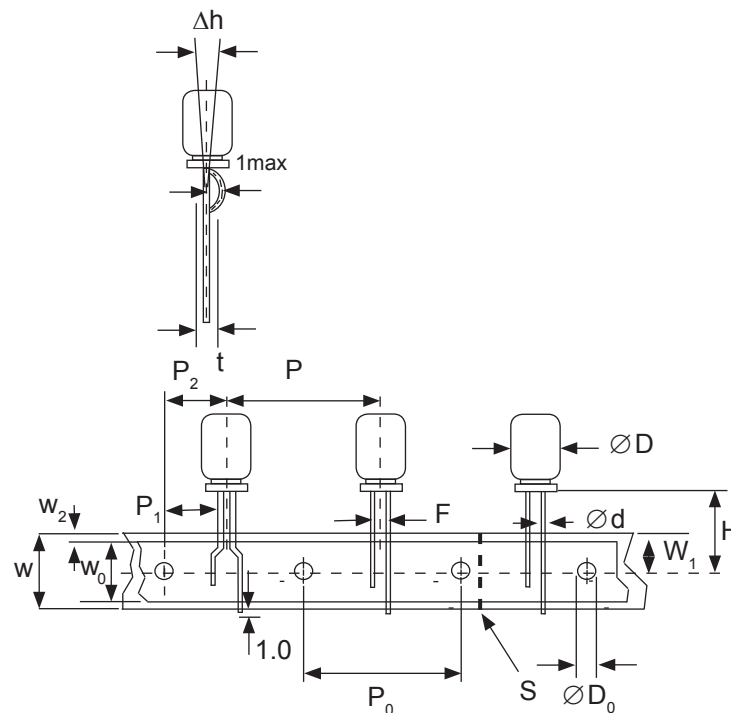
| Case Dia. (D $\phi$ ) | 5                                  |      | 6.3   |        | 8     |      |        |      |      |
|-----------------------|------------------------------------|------|-------|--------|-------|------|--------|------|------|
| Case Size Dim.        | 5x7                                | 5x11 | 6.3x7 | 6.3x11 | 8x7.5 | 8x9  | 8x10.8 | 8x16 | 8x20 |
| d $\phi$ $\pm$ 0.05   | 0.45                               | 0.5  | 0.45  | 0.5    | 0.6   | 0.6  | 0.6    | 0.6  | 0.6  |
| H $\pm$ 0.75          | 17.5                               | 18.5 | 17.5  | 18.5   | 20.0  | 20.0 | 20.0   | 20.0 | 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                     |      |       |        |       |      |        |      |      |
| I                     | 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) |      |       |        |       |      |        |      |      |



### SPECIAL STRAIGHT LEAD TAPING TBST\*

Taping Dimensions (mm)

| Case Dia.<br>(D $\phi$ ) | 6.3                                |        | 8     |      |        |      |      |
|--------------------------|------------------------------------|--------|-------|------|--------|------|------|
| Case Size<br>Dim.        | 6.3x7                              | 6.3x11 | 8x7.5 | 8x9  | 8x10.8 | 8x16 | 8x20 |
| d $\phi$ $\pm 0.05$      | 0.45                               | 0.5    | 0.6   | 0.6  | 0.6    | 0.6  | 0.6  |
| H $\pm 0.75$             | 17.5                               | 18.5   | 20.0  | 20.0 | 20.0   | 20.0 | 20.0 |
| F $+0.8 \sim -0.2$       | 2.5                                | 2.5    | 3.5   | 3.5  | 3.5    | 3.5  | 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    | 4.6   | 4.6  | 4.6    | 4.6  | 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 $\sim$ 2.5                       |        |       |      |        |      |      |
| 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) |        |       |      |        |      |      |



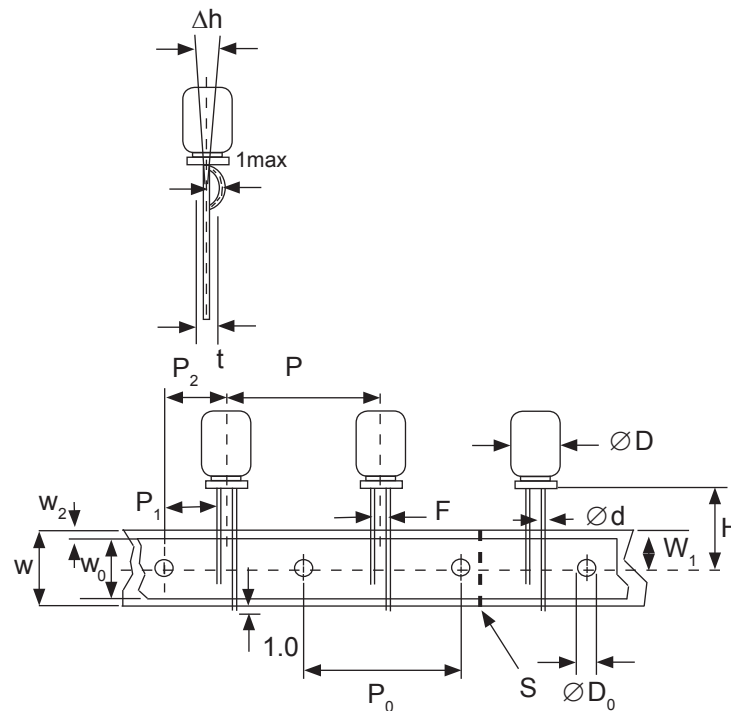
\*Straight leads will extend from the based of the component to the edge of the carrier. The section of lead below the adhesive tape may be straight or formed.



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

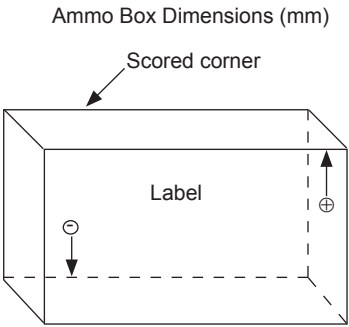
Taping Dimensions (mm)

| Case Dia.<br>(D $\phi$ )                                                                                                              | 10x9                               | 10x12.5 | 10x16 |
|---------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|---------|-------|
| d $\phi$ $\pm$ 0.05                                                                                                                   | 0.6                                | 0.6     | 0.6   |
| H $\pm$ 0.75                                                                                                                          | 20.0                               | 20.0    | 20.0  |
| F +0.8 ~ -0.2                                                                                                                         | 5.0                                |         |       |
| P $\pm$ 1.0                                                                                                                           | 12.7*                              |         |       |
| 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                            |         |       |
| 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) |         |       |
| <div><b>*Optional Taping Specifications</b></div> <div>P<sub>0</sub> = 15.0mm &amp; P<sub>2</sub> = 7.5mm (P/N Suffix: TB15MMP)</div> |                                    |         |       |



**NOTE:** ANODE (+) LEAD FEEDS OFF FIRST.  
FOR OPTION OF NEGATIVE (–) LEAD FIRST,  
SPECIFY “TBN”.

RADIAL TAPED PACKAGING



Ammo Box (Tape & Box) TB, TBST

Size of box and component quantity

| Case Dia (D $\phi$ )<br>or Case Size | Q'ty per Box<br>(pcs) |
|--------------------------------------|-----------------------|
| 5x7                                  | 2,000                 |
| 5x11                                 | 2,000                 |
| 6.3x7                                | 2,000                 |
| 6.3x11                               | 2,000                 |
| 8x7.5                                | 1,000                 |
| 8x9                                  | 1,000                 |
| 8x10.8                               | 1,000                 |
| 8x16                                 | 1,000                 |
| 8x20                                 | 1,000                 |
| 10x9                                 | 500                   |
| 10x12.5                              | 500                   |
| 10x16                                | 500                   |