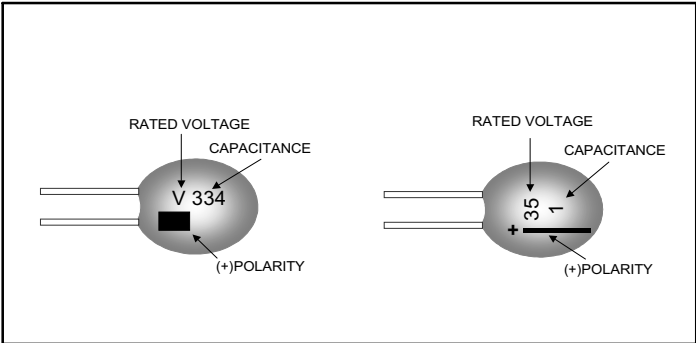
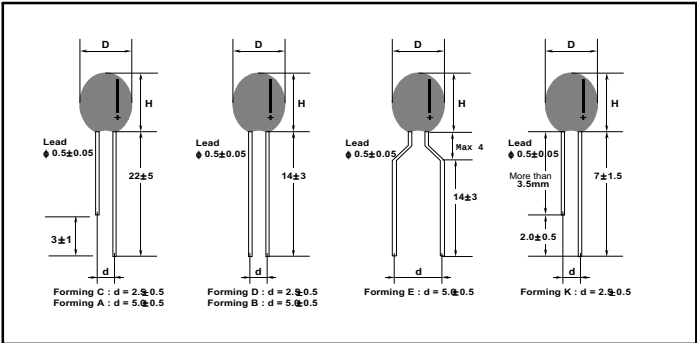




FEATURES

- Capacitance : 0.1 $\mu$ F to 330 $\mu$ F
- 100% Surge current test on each sizes (A,B2,C,D)
- Capacitance tolerance :  $\pm 10\%$ (K),  $\pm 20\%$ (M)
- Voltage : 3.15V DC to 50V DC

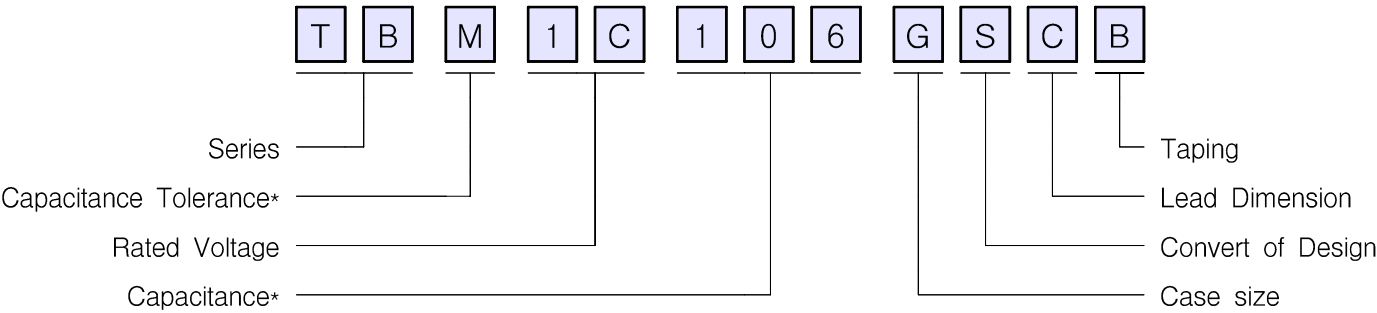
CASE DIMENSIONS AND MARKINGS



(unit : millimeters)

| S I Z E C O D E |       |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |
|-----------------|-------|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|
| Series          | D / H | A   | B   | C   | D   | E   | F    | G    | H    | I    | J    | K    | L    | M    | N    | P    |
| TB Series       | D max | 4.5 | 4.5 | 5.0 | 5.0 | 5.0 | 5.5  | 5.5  | 6.0  | 6.0  | 6.5  | 7.0  | 7.5  | 8.5  | 9.0  | 9.5  |
|                 | H max | 7.5 | 8.0 | 8.0 | 9.0 | 9.5 | 10.0 | 10.5 | 10.5 | 11.0 | 11.0 | 12.5 | 13.5 | 14.5 | 15.5 | 16.0 |
| TD Series       | D max | 3.4 | 3.7 | 3.9 | 4.0 | 4.0 | 4.5  | 5.0  | 5.2  | 5.5  | 6.0  | -    | -    | -    | -    | -    |
|                 | H max | 5.4 | 6.0 | 6.5 | 7.0 | 7.5 | 8.0  | 8.0  | 8.0  | 10.0 | 10.0 | -    | -    | -    | -    | -    |

ORDERING INFORMATION



Capacitance\* : First two digits represent significant figures.  
Third digit specifies number of zeros to follow.

Capacitance Tolerance\* : M -  $\pm 20\%$   
K -  $\pm 10\%$

**SPECIFICATIONS**

|                                        |                                   |                                                     |     |      |      |      |      |      |      |
|----------------------------------------|-----------------------------------|-----------------------------------------------------|-----|------|------|------|------|------|------|
| Capacitance                            | Range                             | 0.01 $\mu$ F to 330 $\mu$ F                         |     |      |      |      |      |      |      |
|                                        | Tolerance                         | $\pm 20\%$ (M), $\pm 10\%$ (K)                      |     |      |      |      |      |      |      |
| Dissipation Factor<br>(tan $\delta$ )  | $C \leq 1.0\mu F$                 | D.F $\leq 4.0\%$                                    |     |      |      |      |      |      |      |
|                                        | $1.5\mu F \leq C \leq 6.8\mu F$   | D.F $\leq 6.0\%$                                    |     |      |      |      |      |      |      |
|                                        | $10\mu F \leq C \leq 68\mu F$     | D.F $\leq 8.0\%$                                    |     |      |      |      |      |      |      |
|                                        | $100\mu F \leq C \leq 150\mu F$   | D.F $\leq 10.0\%$                                   |     |      |      |      |      |      |      |
|                                        | $C \geq 220\mu F$                 | D.F $\leq 12.0\%$                                   |     |      |      |      |      |      |      |
| Leakage Current                        |                                   | between 0.01CV and 0.5 $\mu$ A, whichever is higher |     |      |      |      |      |      |      |
| Rated Voltage (V <sub>R</sub> )        |                                   | 4.0                                                 | 6.3 | 10.0 | 16.0 | 20.0 | 25.0 | 35.0 | 50.0 |
| Operating Voltage<br>(V <sub>O</sub> ) | T $\leq 85^{\circ}\text{C}$       | 4.0                                                 | 6.3 | 10.0 | 16.0 | 20.0 | 25.0 | 35.0 | 50.0 |
|                                        | $85 < T \leq 125^{\circ}\text{C}$ | 2.5                                                 | 4.0 | 6.3  | 10.0 | 13.0 | 16.0 | 22.0 | 32.0 |
| Surge Voltage<br>(V <sub>S</sub> )     | T $\leq 85^{\circ}\text{C}$       | 5.2                                                 | 8.0 | 13.0 | 20.0 | 25.0 | 32.0 | 44.0 | 63.0 |
|                                        | $85 < T \leq 125^{\circ}\text{C}$ | 3.2                                                 | 5.0 | 8.0  | 13.0 | 16.0 | 20.0 | 28.0 | 40.0 |
| Operating Temperature                  |                                   | $-55^{\circ}\text{C}$ to $125^{\circ}\text{C}$      |     |      |      |      |      |      |      |

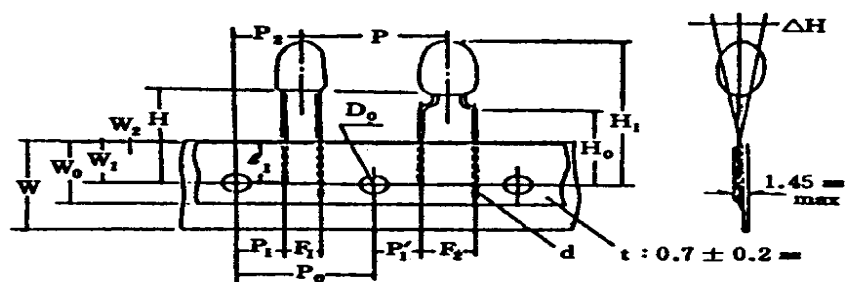
**CAPACITANCE AND VOLTAGE RANGE of TB series**

| W.V<br>Cap( $\mu$ F) | 3.15 | 6.3 | 10 | 16 | 20 | 25 | 35 | 50 |
|----------------------|------|-----|----|----|----|----|----|----|
| 0.1                  |      |     |    |    |    |    | A  | B  |
| 0.15                 |      |     |    |    |    |    | A  | B  |
| 0.22                 |      |     |    |    |    |    | B  | B  |
| 0.33                 |      |     |    |    |    |    | B  | C  |
| 0.47                 |      |     |    |    |    | B  | B  | D  |
| 0.68                 |      |     |    |    | B  | B  | B  | E  |
| 1.0                  |      |     |    | A  | B  | B  | C  | F  |
| 1.5                  |      |     |    | B  | B  | B  | D  | H  |
| 2.2                  |      |     | B  | B  | C  | C  | E  | J  |
| 3.3                  |      | B   | B  | C  | D  | D  | G  | L  |
| 4.7                  | B    | B   | C  | D  | E  | E  | H  | L  |
| 6.8                  | B    | C   | D  | E  | F  | G  | I  | M  |
| 10                   | B    | D   | E  | G  | H  | I  | J  | N  |
| 15                   | C    | E   | F  | I  | J  | J  | L  |    |
| 22                   | D    | F   | H  | J  | K  | L  | M  |    |
| 33                   | E    | H   | I  | K  | L  | M  | N  |    |
| 47                   | F    | I   | K  | L  | M  | N  | N  |    |
| 68                   | H    | K   | L  | M  | N  | N  |    |    |
| 100                  | I    | L   | M  | N  | P  |    |    |    |
| 150                  | K    | M   | N  | P  |    |    |    |    |
| 220                  | L    | N   | P  |    |    |    |    |    |
| 330                  | M    | P   |    |    |    |    |    |    |

## CAPACITANCE AND VOLTAGE RANGE of TD series

| W.V<br>Cap( $\mu F$ ) | 3.15 | 6.3 | 10 | 16 | 20 | 25 | 35 | 50 |
|-----------------------|------|-----|----|----|----|----|----|----|
| 0.1                   |      |     |    |    |    |    | A  |    |
| 0.15                  |      |     |    |    |    |    | A  |    |
| 0.22                  |      |     |    |    |    |    | A  |    |
| 0.33                  |      |     |    |    | A  | A  | B  |    |
| 0.47                  |      |     |    | A  | B  | B  | B  |    |
| 0.68                  |      |     |    | A  | B  | B  | C  |    |
| 1.0                   |      |     | A  | A  | C  | C  | D  |    |
| 1.5                   |      | A   | A  | B  | D  | D  | E  |    |
| 2.2                   | A    | A   | B  | C  | E  | E  | F  |    |
| 3.3                   | A    | B   | C  | D  | E  | E  | G  |    |
| 4.7                   | B    | C   | D  | E  | G  | G  | H  |    |
| 6.8                   | C    | D   | E  | F  | H  | H  | I  |    |
| 10                    | D    | E   | F  | G  | I  | I  |    |    |
| 15                    | F    | G   | H  | H  |    |    |    |    |
| 22                    | F    | G   | H  | I  |    |    |    |    |
| 33                    | G    | H   | I  | J  |    |    |    |    |
| 47                    | H    | I   | J  |    |    |    |    |    |
| 68                    | I    | J   |    |    |    |    |    |    |
| 100                   | J    |     |    |    |    |    |    |    |

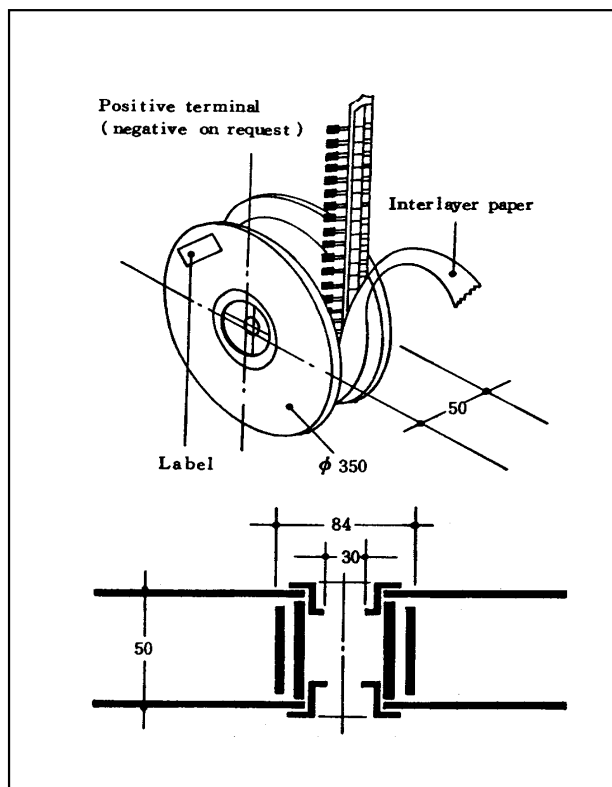
## TB/TD SERIES TAPING AND PACKING



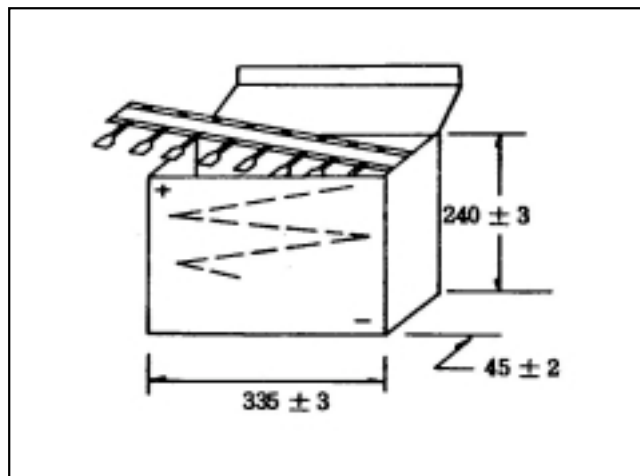
| Item                   | Symbol                          | Length(mm) | Tolerance(mm) |
|------------------------|---------------------------------|------------|---------------|
| lead diameter          | d                               | 0.5        | $\pm 0.05$    |
| pitch per parts        | p                               | 12.7       | $\pm 1.0$     |
| pitch per hole         | p <sub>0</sub>                  | 12.7       | $\pm 0.2$     |
| interval(hole to lead) | p <sub>1</sub> '/P <sub>1</sub> | 3.85/5.1   | $\pm 0.7$     |
| interval(hole to part) | P <sub>2</sub>                  | 6.35       | $\pm 0.5$     |
| interval(lead to lead) | F <sub>1</sub> /F <sub>2</sub>  | 2.2/5.0    | $\pm 0.5$     |
| parts alignment(F-R)   | ▲H                              | 0          | $\pm 2.0$     |
| tape width             | W                               | 18.0       | $\pm 0.5$     |

| Item                       | Symbol         | Length(mm) | Tolerance(mm) |
|----------------------------|----------------|------------|---------------|
| hole to down tape width    | W <sub>0</sub> | 6.0        | $\pm 0.5$     |
| hole position              | W <sub>1</sub> | 9.0        | +0.75,-0.5    |
| hole to down tape position | W <sub>2</sub> | 2.0        | max.          |
| part to tape center        | H              | 19.0       | $\pm 0.5$     |
| lead forming H             | H <sub>0</sub> | 16.0       | $\pm 0.5$     |
| part H                     | H <sub>1</sub> | 32.25      | max.          |
| feed hole diameter         | D <sub>0</sub> | 4.0        | $\pm 0.3$     |
| lead exposure              | L <sub>1</sub> | 7.0        | +2.0,-2.5     |

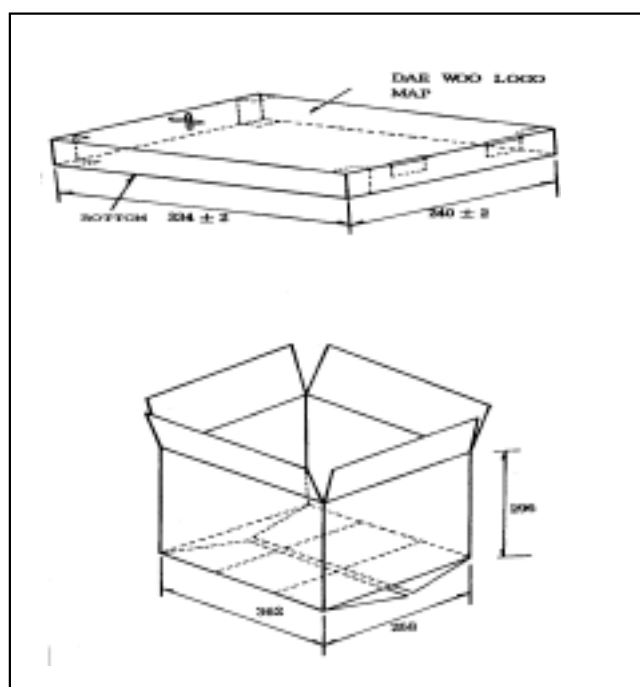
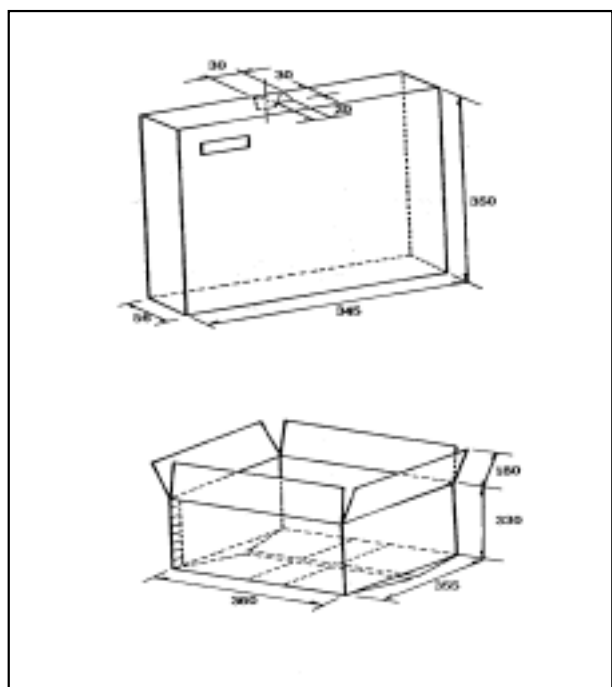
### Reel Taping



### Ammo Taping



### Packing



| SIZE | Quantity | Inner Box | Outer Box |
|------|----------|-----------|-----------|
| A~C  | 2.0KP    | 1 Reel    | 5(10.0KP) |
| D~G  | 1.5KP    | 1 Reel    | 5(7.5KP)  |
| H~J  | 1.0KP    | 1 Reel    | 5(5.0KP)  |

| SIZE | Inner Box | Outer Box  |
|------|-----------|------------|
| A~C  | 4.0 KP    | 6 (24.0KP) |
| D~G  | 3.0 KP    | 6 (18.0KP) |
| H~J  | 2.5 KP    | 6 (15.0KP) |
| K~L  | 2.0 KP    | 6 (12.0KP) |