

## TD SERIES

### INTRODUCTION

The TD Series, due to its good electrical characteristics, is recommended for professional and industrial applications. The extremely stable oxide layer of the TD solid tantalum capacitor allows only a very low leakage current even after long storage. The solid electrolyte provides stable electrical performance over wide ranges and long time periods.

### FEATURES:

- HIGH TEMPERATURE RANGE OF -55 TO +125°C
- LOW LEAKAGE CURRENT AND DISSIPATION FACTOR
- COMPACT SIZE FOR SPACE SAVING DESIGN
- NO DEGRADATION EVEN AFTER PROLONGED STORAGE
- HUMIDITY, SHOCK AND VIBRATION RESISTANT SELF INSULATING ENCAPSULATION
- DECREASING FAILURE RATE INDICATING ABSENCE OF "WEAR-OUT" MECHANISM

### GENERAL SPECIFICATIONS

**CAPACITANCE:** 0.1  $\mu$ F to 330  $\mu$ F.

**VOLTAGE RANGE:** 6.3VDC to 50VDC.

**CAPACITANCE TOLERANCE:**  $\pm 20\%$ ,  $\pm 10\%$ , (5% upon request).

**TEMPERATURE RANGE:** -55°C to +125°C with Derating above 85°C as per Table 4.

**DISSIPATION FACTOR:** 0.1 to 1.5  $\mu$ F  $\leq 4\%$ , 2.2 to 6.8  $\mu$ F  $\leq 6\%$ , 10 to 68  $\mu$ F  $\leq 8\%$ ,  $> 68 \mu$ F  $\leq 10\%$  at 120Hz.

**LEAKAGE CURRENT:** Not More Than 0.01CV  $\mu$  Amps or 0.5  $\mu$ A which ever is greater.

**FAILURE RATE:** 1% per 1000 Hrs.

### LIFE TEST DETAILS

Capacitors shall withstand rated DC Voltage applied at 85°C for 2,000 Hours. After the test:

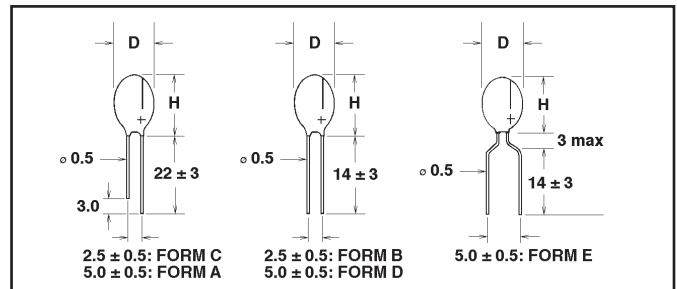
1. Capacitance change shall not exceed  $\pm 10\%$  of the initial value.
2. Dissipation factor shall be within the normal specified limits.
3. Leakage current shall be within the normal specified limit.
4. No remarkable change in the appearance. Marking shall remain legible.

**TABLE 4**

**VOLTAGE DERATING (85°C - 125°C)**

| VR | 6.3 | 10  | 16 | 20 | 25 | 35 | 50 |
|----|-----|-----|----|----|----|----|----|
| VO | 4   | 6.3 | 10 | 13 | 16 | 22 | 32 |
| VS | 5   | 8   | 13 | 16 | 20 | 28 | 40 |

VR - Rated Voltage, VO - Operating Voltage, VS - Surge Voltage



**Case Dimensions TD Series**

| Case Code | Dimensions in mm |        | Dimensions in Inches |        |
|-----------|------------------|--------|----------------------|--------|
|           | D max.           | H max. | D max.               | H max. |
| A         | 4.5              | 8.5    | 0.177                | 0.335  |
| B         | 4.5              | 9.0    | 0.177                | 0.354  |
| C         | 5.0              | 10.0   | 0.197                | 0.394  |
| D         | 5.0              | 10.5   | 0.197                | 0.413  |
| E         | 5.5              | 10.5   | 0.217                | 0.413  |
| F         | 6.0              | 11.5   | 0.236                | 0.453  |
| G         | 6.5              | 11.5   | 0.256                | 0.453  |
| H         | 7.0              | 12.0   | 0.276                | 0.472  |
| J         | 8.0              | 13.0   | 0.315                | 0.512  |
| K         | 8.5              | 14.0   | 0.335                | 0.551  |
| L         | 9.0              | 14.0   | 0.354                | 0.551  |
| M         | 9.0              | 14.5   | 0.354                | 0.571  |
| N         | 9.0              | 16.0   | 0.354                | 0.630  |
| P         | 10.0             | 17.0   | 0.394                | 0.669  |
| R         | 10.0             | 18.5   | 0.394                | 0.728  |

**Case Codes TD Series**

| Capacitance |      | Rated Voltage V DC |    |    |    |    |    |    |
|-------------|------|--------------------|----|----|----|----|----|----|
| $\mu$ F     | Code | 6.3                | 10 | 16 | 20 | 25 | 35 | 50 |
| 0.1         | 104  |                    |    |    |    |    | A  | A  |
| 0.15        | 154  |                    |    |    |    |    | A  | A  |
| 0.22        | 224  |                    |    |    |    |    | A  | A  |
| 0.33        | 334  |                    |    |    |    |    | A  | A  |
| 0.47        | 474  |                    |    |    |    |    | A  | A  |
| 0.68        | 684  |                    |    |    |    |    | A  | B  |
| 1           | 105  |                    |    |    | A  | A  | A  | C  |
| 1.5         | 155  |                    |    | A  | A  | A  | A  | D  |
| 2.2         | 225  |                    | A  | A  | A  | A  | B  | E  |
| 3.3         | 335  | A                  | A  | A  | B  | B  | C  | F  |
| 4.7         | 475  | A                  | A  | B  | C  | C  | E  | G  |
| 6.8         | 685  | A                  | B  | C  | D  | D  | F  | H  |
| 10          | 106  | B                  | C  | D  | E  | E  | F  | J  |
| 15          | 156  | C                  | D  | E  | F  | F  | H  | K  |
| 22          | 226  | D                  | E  | F  | H  | H  | K  | L  |
| 33          | 336  | E                  | F  | F  | J  | J  | M  |    |
| 47          | 476  | F                  | G  | J  | K  | M  | N  |    |
| 68          | 686  | G                  | H  | L  | N  | N  |    |    |
| 100         | 107  | H                  | K  | N  |    |    |    |    |
| 150         | 157  | K                  | N  |    |    |    |    |    |
| 220         | 227  | M                  | P  |    |    |    |    |    |
| 330         | 337  | P                  |    |    |    |    |    |    |

**TD SERIES SPECIFICATIONS****6.3 VDC RATED VOLTAGE**

**SURGE VOLTAGE** 8 VDC at 85°C and  
5 VDC at 125°C

| PartNumber  | Cap<br>Value<br>μ F | Cap<br>Code | Case<br>Size | DF%<br>(max)<br>@25 °C | DCL<br>(max)<br>μ A |
|-------------|---------------------|-------------|--------------|------------------------|---------------------|
| TDA335K06CB | 3.3                 | 335         | A            | 6                      | 0.5                 |
| TDA475K06CB | 4.7                 | 475         | A            | 6                      | 0.5                 |
| TDA685K06CB | 6.8                 | 685         | A            | 6                      | 0.5                 |
| TDB106K06CB | 10                  | 106         | B            | 8                      | 0.5                 |
| TDC156K06CB | 15                  | 156         | C            | 8                      | 0.7                 |
| TDD226K06CB | 22                  | 226         | D            | 8                      | 1.1                 |
| TDE336K06CB | 33                  | 336         | E            | 8                      | 1.6                 |
| TDF476K06CB | 47                  | 476         | F            | 8                      | 2.3                 |
| TDG686K06CB | 68                  | 686         | G            | 8                      | 3.4                 |
| TDH107K06CB | 100                 | 107         | H            | 10                     | 5.0                 |
| TDK157K06CB | 150                 | 157         | K            | 10                     | 7.5                 |
| TDM227K06CB | 220                 | 227         | M            | 10                     | 11.0                |
| TDP337K06CB | 330                 | 337         | P            | 10                     | 16.6                |

**10 VDC RATED VOLTAGE**

**SURGE VOLTAGE** 13 VDC at 85°C and  
8 VDC at 125°C

| PartNumber  | Cap<br>Value<br>μ F | Cap<br>Code | Case<br>Size | DF%<br>(max)<br>@25 °C | DCL<br>(max)<br>μ A |
|-------------|---------------------|-------------|--------------|------------------------|---------------------|
| TDA225K10CB | 2.2                 | 225         | A            | 6                      | 0.5                 |
| TDA335K10CB | 3.3                 | 335         | A            | 6                      | 0.5                 |
| TDA475K10CB | 4.7                 | 475         | A            | 6                      | 0.5                 |
| TDB685K10CB | 6.8                 | 685         | B            | 8                      | 0.5                 |
| TDC106K10CB | 10                  | 106         | C            | 8                      | 0.8                 |
| TDD156K10CB | 15                  | 156         | D            | 8                      | 1.2                 |
| TDE226K10CB | 22                  | 226         | E            | 8                      | 1.7                 |
| TDF336K10CB | 33                  | 336         | F            | 8                      | 2.6                 |
| TDG476K10CB | 47                  | 476         | G            | 8                      | 3.7                 |
| TDH686K10CB | 68                  | 686         | H            | 10                     | 5.4                 |
| TDK107K10CB | 100                 | 107         | K            | 10                     | 8.0                 |
| TDN157K10CB | 150                 | 157         | N            | 10                     | 12.0                |
| TDP227K10CB | 220                 | 227         | P            | 10                     | 17.6                |

**16 VDC RATED VOLTAGE**

**SURGE VOLTAGE** 20 VDC at 85°C and  
13 VDC at 125°C

| PartNumber  | Cap<br>Value<br>μ F | Cap<br>Code | Case<br>Size | DF%<br>(max)<br>@25 °C | DCL<br>(max)<br>μ A |
|-------------|---------------------|-------------|--------------|------------------------|---------------------|
| TDA155K16CB | 1.5                 | 155         | A            | 4                      | 0.5                 |
| TDA225K16CB | 2.2                 | 225         | A            | 6                      | 0.5                 |
| TDA335K16CB | 3.3                 | 335         | A            | 6                      | 0.5                 |
| TDB475K16CB | 4.7                 | 475         | B            | 6                      | 0.6                 |
| TDC685K16CB | 6.8                 | 685         | C            | 6                      | 0.8                 |
| TDD106K16CB | 10                  | 106         | D            | 8                      | 1.2                 |
| TDE156K16CB | 15                  | 156         | E            | 8                      | 1.9                 |
| TDF226K16CB | 22                  | 226         | F            | 8                      | 2.8                 |
| TDF336K16CB | 33                  | 336         | F            | 8                      | 4.2                 |
| TDJ476K16CB | 47                  | 476         | J            | 8                      | 6.0                 |
| TDL686K16CB | 68                  | 686         | L            | 10                     | 8.7                 |
| TDN107K16CB | 100                 | 107         | N            | 10                     | 12.8                |
| TDN157K16CB | 150                 | 157         | N            | 10                     | 19.2                |

**20 VDC RATED VOLTAGE**

**SURGE VOLTAGE** 25 VDC at 85°C and  
16 VDC at 125°C

| PartNumber  | Cap<br>Value<br>μ F | Cap<br>Code | Case<br>Size | DF%<br>(max)<br>@25 °C | DCL<br>(max)<br>μ A |
|-------------|---------------------|-------------|--------------|------------------------|---------------------|
| TDA105K20CB | 1                   | 105         | A            | 4                      | 0.5                 |
| TDA155K20CB | 1.5                 | 155         | A            | 4                      | 0.5                 |
| TDA225K20CB | 2.2                 | 225         | A            | 6                      | 0.5                 |
| TDB335K20CB | 3.3                 | 335         | B            | 6                      | 0.5                 |
| TDC475K20CB | 4.7                 | 475         | C            | 6                      | 0.7                 |
| TDD685K20CB | 6.8                 | 685         | D            | 6                      | 1.0                 |
| TDE106K20CB | 10                  | 106         | E            | 8                      | 1.6                 |
| TDF156K20CB | 15                  | 156         | F            | 8                      | 2.4                 |
| TDH226K20CB | 22                  | 226         | H            | 8                      | 3.5                 |
| TDJ336K20CB | 33                  | 336         | J            | 8                      | 5.2                 |
| TDK476K20CB | 47                  | 476         | K            | 8                      | 7.5                 |
| TDN686K20CB | 68                  | 686         | N            | 8                      | 10.8                |
| TDN107K20CB | 100                 | 107         | N            | 10                     | 16.0                |

**25 VDC RATED VOLTAGE**

**SURGE VOLTAGE** 32 VDC at 85°C and  
20 VDC at 125°C

| PartNumber  | Cap<br>Value<br>μ F | Cap<br>Code | Case<br>Size | DF%<br>(max)<br>@25 °C | DCL<br>(max)<br>μ A |
|-------------|---------------------|-------------|--------------|------------------------|---------------------|
| TDA105K25CB | 1                   | 105         | A            | 4                      | 0.5                 |
| TDA155K25CB | 1.5                 | 155         | A            | 4                      | 0.5                 |
| TDA225K25CB | 2.2                 | 225         | A            | 6                      | 0.5                 |
| TDB335K25CB | 3.3                 | 335         | B            | 6                      | 0.6                 |
| TDC475K25CB | 4.7                 | 475         | C            | 6                      | 0.9                 |
| TDD685K25CB | 6.8                 | 685         | D            | 6                      | 1.3                 |
| TDE106K25CB | 10                  | 106         | E            | 8                      | 2.0                 |
| TDF156K25CB | 15                  | 156         | F            | 8                      | 3.0                 |
| TDH226K25CB | 22                  | 226         | H            | 8                      | 4.4                 |
| TDJ336K25CB | 33                  | 336         | J            | 8                      | 6.6                 |
| TDM476K25CB | 47                  | 476         | M            | 8                      | 9.4                 |
| TDN686K25CB | 68                  | 686         | N            | 8                      | 13.6                |

**35 VDC RATED VOLTAGE**

**SURGE VOLTAGE** 44 VDC at 85°C and  
28 VDC at 125°C

| PartNumber  | Cap<br>Value<br>μ F | Cap<br>Code | Case<br>Size | DF%<br>(max)<br>@25 °C | DCL<br>(max)<br>μ A |
|-------------|---------------------|-------------|--------------|------------------------|---------------------|
| TDA104K35CB | 0.1                 | 104         | A            | 4                      | 0.5                 |
| TDA154K35CB | 0.15                | 154         | A            | 4                      | 0.5                 |
| TDA224K35CB | 0.22                | 224         | A            | 4                      | 0.5                 |
| TDA334K35CB | 0.33                | 334         | A            | 4                      | 0.5                 |
| TDA474K35CB | 0.47                | 474         | A            | 4                      | 0.5                 |
| TDA684K35CB | 0.68                | 684         | A            | 4                      | 0.5                 |
| TDA105K35CB | 1                   | 105         | A            | 4                      | 0.5                 |
| TDA155K35CB | 1.5                 | 155         | A            | 4                      | 0.5                 |
| TDB225K35CB | 2.2                 | 225         | B            | 6                      | 0.6                 |
| TDC335K35CB | 3.3                 | 335         | C            | 6                      | 0.9                 |
| TDE475K35CB | 4.7                 | 475         | E            | 6                      | 1.3                 |
| TDF685K35CB | 6.8                 | 685         | F            | 6                      | 1.9                 |
| TDF106K35CB | 10                  | 106         | F            | 8                      | 2.8                 |

**35 VDC RATED VOLTAGE (Continued)**

**SURGE VOLTAGE** 44 VDC at 85°C and  
28 VDC at 125°C

| PartNumber  | Cap<br>Value<br>μ F | Cap<br>Code | Case<br>Size | DF%<br>(max)<br>@25 °C | DCL<br>(max)<br>μ A |
|-------------|---------------------|-------------|--------------|------------------------|---------------------|
| TDH156K35CB | 15                  | 156         | H            | 8                      | 4.2                 |
| TDK226K35CB | 22                  | 226         | K            | 8                      | 6.1                 |
| TDM336K35CB | 33                  | 336         | M            | 8                      | 9.2                 |
| TDN476K35CB | 47                  | 476         | N            | 8                      | 10.0                |

**50 VDC RATED VOLTAGE**

**SURGE VOLTAGE** 63 VDC at 85°C and  
40 VDC at 125°C

| PartNumber  | Cap<br>Value<br>μ F | Cap<br>Code | Case<br>Size | DF%<br>(max)<br>@25 °C | DCL<br>(max)<br>μ A |
|-------------|---------------------|-------------|--------------|------------------------|---------------------|
| TDA104K50CB | 0.1                 | 104         | A            | 4                      | 0.5                 |
| TDA154K50CB | 0.15                | 154         | A            | 4                      | 0.5                 |
| TDA224K50CB | 0.22                | 224         | A            | 4                      | 0.5                 |
| TDA334K50CB | 0.33                | 334         | A            | 4                      | 0.5                 |
| TDA474K50CB | 0.47                | 474         | A            | 4                      | 0.5                 |
| TDB684K50CB | 0.68                | 684         | B            | 4                      | 0.5                 |
| TDC105K50CB | 1                   | 105         | C            | 4                      | 0.5                 |
| TDD155K50CB | 1.5                 | 155         | D            | 4                      | 0.6                 |
| TDE225K50CB | 2.2                 | 225         | E            | 6                      | 0.8                 |
| TDF335K50CB | 3.3                 | 335         | F            | 6                      | 1.3                 |
| TDG475K50CB | 4.7                 | 475         | G            | 6                      | 1.8                 |
| TDH685K50CB | 6.8                 | 685         | H            | 6                      | 2.7                 |
| TDJ106K50CB | 10                  | 106         | J            | 8                      | 4.0                 |
| TDK156K50CB | 15                  | 156         | K            | 8                      | 6.0                 |
| TDL226K50CB | 22                  | 226         | L            | 8                      | 8.8                 |

Note: Part numbers indicated are for 10% tolerance parts with straight uneven leads and 2.5mm lead spacing. Please refer to ordering information for details of other tolerances and lead styles.