

## Hybrid Wet Tantalum

# TDD

Series

DLA 15010



- 1.4" x 1.4" square base
- Heights range from 0.312" – 0.905"
- Voltages range from 10V-125V
- Cap values range from 1,500μF – 300,000μF
- Temperature range of -55°C to 125°C
- Standard tolerance ±20% (±10% available)
- Stud mount options available

## Product Overview

The TDD series capacitors utilize sintered tantalum anodes and ruthenium oxide coated cathodes operating in aqueous electrolyte. The components are hermetically sealed in a welded tantalum case with a glass-to-metal seal.

The TDD series capacitors come in a 1.4" x 1.4" square case and has the highest power density of any tantalum capacitor technology in the 10-50V, 125V range (see Evans TDE Series for other voltages).

| Electrical                                                                                                                                                       | Physical                                                                                                                                                                                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Rated Voltage Range</b><br>10VDC to 125VDC<br><br><b>Capacitance Range</b><br>1,500μF to 300,000μF<br><br><b>Life (@ 85°C)</b><br>>2000 hours @ Rated Voltage | <b>Solderability</b><br>To ANSI J-STD-002<br><br><b>Operating Temperature Range</b><br>-55°C to +85°C or 125°C with voltage derating (see page 3)<br><br><b>Storage Temperature Range</b><br>- 62°C to +130°C |

| Mechanical          |                        |              |                            |
|---------------------|------------------------|--------------|----------------------------|
| Test                | Method                 | Condition    | Remarks                    |
| Shock               | MIL-STD-202 METHOD 213 | G            | 11 ms, 50G                 |
| Vibration           | MIL-STD-202 METHOD 204 | D            | 12 sweeps/axis, 20G peak   |
|                     | MIL-STD-202 METHOD 214 | II, Letter E | 1.5 hours/axis, 19.64G rms |
| Moisture Resistance | MIL-STD-202 METHOD 106 |              | 6V bias                    |

## Thermal Dissipation

In free air, TDD series capacitors exhibit a case temperature rise of approximately 20°C per watt dissipated.

## Capacitor Life

TDD series capacitors are rated for >2,000 hours at 85°C and rated voltage or 125°C at derated voltage. The effective life of a capacitor in a given application is based on the specific operating voltage and average temperature.

**TDD Series Capacitors have an unlimited Shelf life.**

## Environmental Compliance

All TDD series capacitor ratings are not RoHS compliant. TDD Series are REACH complaint.

- Negative terminal is 60/40 SnPb plated copper wire
- Positive Terminal is 60/40 SnPb plated Nickel Tube
- Lead free RoHS compliant versions available upon request.

## Export Classification

TDD series capacitors are **ECCN EAR99**

## Handling Guidelines

Attachment / Mounting by leads only is discouraged in applications exposed to mechanical shock or vibration. Always ensure capacitor is firmly secured to PWB, by either mounting studs, epoxy staking or both (preferred for vibration environments). In severe shock and vibration environments full potting is preferred.

### Provide adequate care to protect the glass to metal seal (GTMS)

- Avoid forces on the positive terminal, lateral, axial or torque.
- Avoid mechanical shock to the positive terminal.
- Secure the part to PWB before soldering

### Mounting with studs

- #2-56 CDA 752 studs are available as a standard option.
- Use spacers (provided) to fill the gap between PWB and leaded surface of capacitor.
- Tighten Studs to 30-40 in oz.
- Secure nuts (provided) with red Loctite. Do not use lock washers.

### Potting / Epoxy Staking

- We advise epoxy staking capacitor to PWB even when using studs, for maximum vibration tolerance.
- In some applications it may be advisable to pot the cavity between the PWB and leaded surface.
- Highest shock/vibration applications may require the capacitor to be fully potted.

### Soldering

- Rim of capacitor is intended to mate directly to PWB. Advise using "no-clean" flux.
- Use through-hole soldering methods in accordance with ANSI/IPC J-STD-001.

### Lead trimming

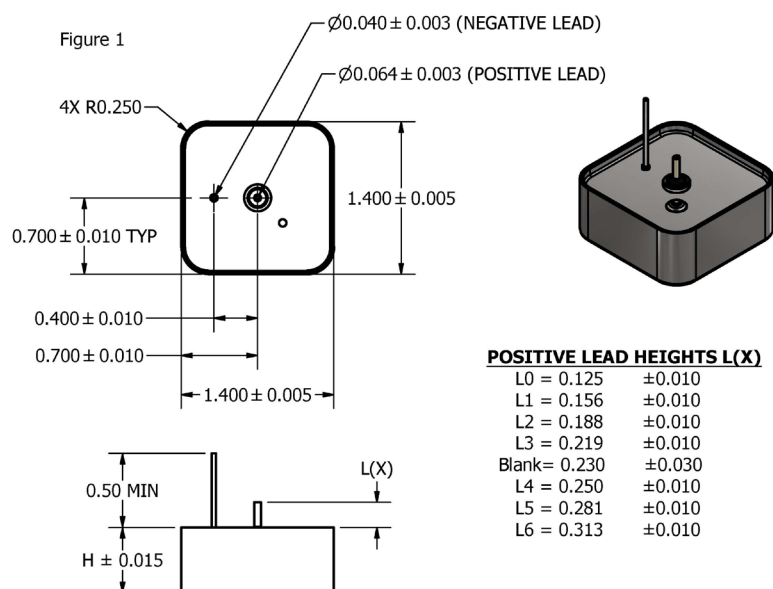
- Provide adequate care if leads must be trimmed.
- Trimming of the positive terminal is risky and highly discouraged.
- Positive lead lengths available in 1/32" increments from 0.125" when measured from the rim of the capacitor.

## 2D Drawings

|                 | TDD1   | TDD2   | TDD3   | TDD4   | TDD5   |
|-----------------|--------|--------|--------|--------|--------|
| Case Height (H) | 0.312" | 0.450" | 0.600" | 0.755" | 0.905" |

\* If unspecified, standard center lead length is 0.230+/-0.030"

L(x) dimensions are +/-0.010"

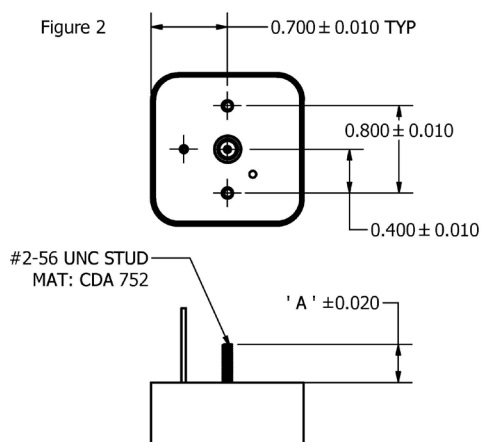


### POSITIVE LEAD HEIGHTS L(X)

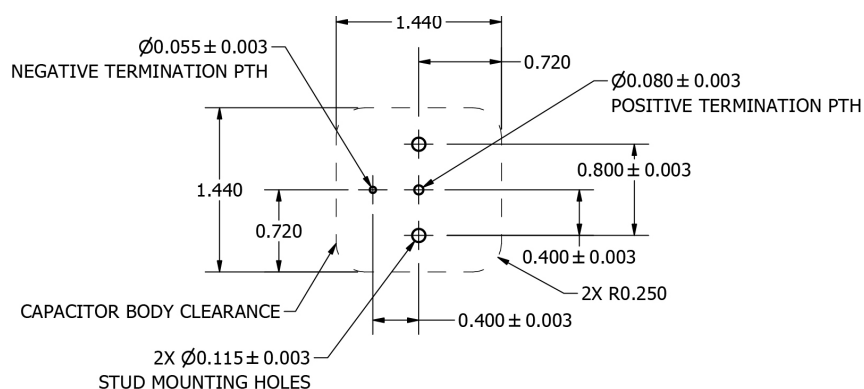
|               |        |
|---------------|--------|
| L0 = 0.125    | ±0.010 |
| L1 = 0.156    | ±0.010 |
| L2 = 0.188    | ±0.010 |
| L3 = 0.219    | ±0.010 |
| Blank = 0.230 | ±0.030 |
| L4 = 0.250    | ±0.010 |
| L5 = 0.281    | ±0.010 |
| L6 = 0.313    | ±0.010 |

Table 3

| OPTIONAL STUD MOUNT |                   |
|---------------------|-------------------|
| PART NUMBERS        | STUD LENGTH ('A') |
| TDD#XXXXXXSM00      | 0.21 INCH         |
| TDD#XXXXXXSM01      | 0.27 INCH         |
| TDD#XXXXXXSM02      | 0.40 INCH         |
| TDD#XXXXXXSM03      | 0.15 INCH         |
| TDD#XXXXXXSM04      | 0.18 INCH         |
| TDD#XXXXXXSM05      | 0.35 INCH         |



## Mounting Recommendation



## Part Number Description

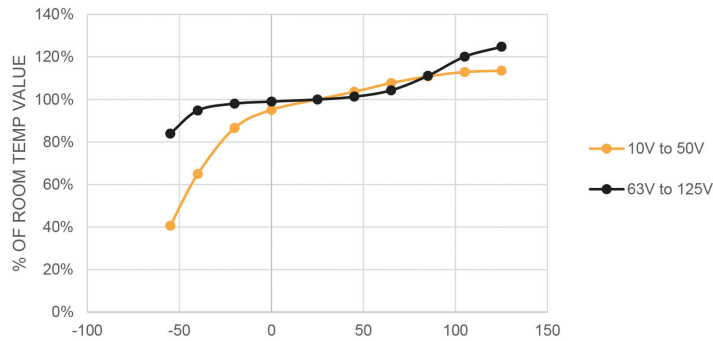
| Product Series | Voltage Rating | Cap Rating | Option:<br>Custom Center<br>Lead | Option:<br>±10% Rating | Option:<br>Lead Free | Option:<br>Stud Mount |
|----------------|----------------|------------|----------------------------------|------------------------|----------------------|-----------------------|
| TDD#           | XXX            | XXX        | LX                               | K                      | LF                   | SMXX                  |

## Ratings Table

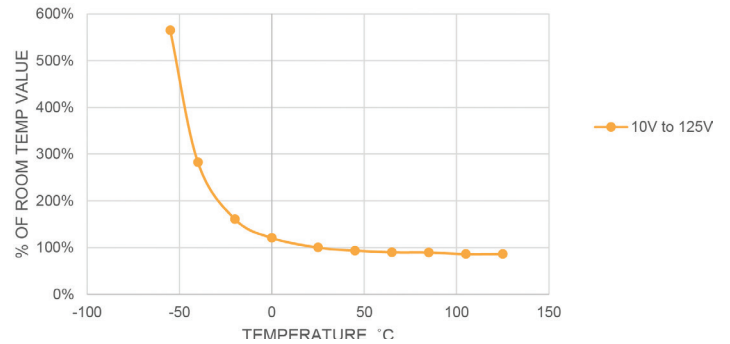
| Part Number | DLA PN   | Voltage_85°C | Voltage_125°C | Cap (µF) | ESR (mΩ) | Height (in) | Mass (g) |
|-------------|----------|--------------|---------------|----------|----------|-------------|----------|
| TDD1010603  | 15010-01 | 10           | 6             | 60.000   | 30       | 0.31        | 55       |
| TDD2010124  | 15010-02 | 10           | 6             | 120.000  | 20       | 0.45        | 80       |
| TDD3010184  | 15010-03 | 10           | 6             | 180.000  | 15       | 0.60        | 108      |
| TDD4010244  | 15010-04 | 10           | 6             | 240.000  | 12       | 0.75        | 134      |
| TDD5010304  | 15010-41 | 10           | 6             | 300.000  | 10       | 0.90        | 160      |
| TDD1016403  | 15010-05 | 16           | 9.6           | 40.000   | 30       | 0.31        | 55       |
| TDD2016803  | 15010-06 | 16           | 9.6           | 80.000   | 20       | 0.45        | 80       |
| TDD3016124  | 15010-07 | 16           | 9.6           | 120.000  | 15       | 0.60        | 108      |
| TDD4016164  | 15010-08 | 16           | 9.6           | 160.000  | 12       | 0.75        | 134      |
| TDD5016204  | 15010-42 | 16           | 9.6           | 200.000  | 10       | 0.90        | 160      |
| TDD1025243  | 15010-09 | 25           | 15            | 24.000   | 30       | 0.31        | 55       |
| TDD2025483  | 15010-10 | 25           | 15            | 48.000   | 20       | 0.45        | 80       |
| TDD3025723  | 15010-11 | 25           | 15            | 72.000   | 15       | 0.60        | 108      |
| TDD4025963  | 15010-12 | 25           | 15            | 96.000   | 12       | 0.75        | 134      |
| TDD5025124  | 15010-43 | 25           | 15            | 120.000  | 10       | 0.90        | 160      |
| TDD1035163  | 15010-13 | 35           | 21            | 16.000   | 40       | 0.31        | 55       |
| TDD2035323  | 15010-14 | 35           | 21            | 32.000   | 20       | 0.45        | 80       |
| TDD3035483  | 15010-15 | 35           | 21            | 48.000   | 15       | 0.60        | 108      |
| TDD4035643  | 15010-16 | 35           | 21            | 64.000   | 12       | 0.75        | 134      |
| TDD5035803  | 15010-44 | 35           | 21            | 80.000   | 10       | 0.90        | 160      |
| TDD1050113  | 15010-17 | 50           | 30            | 11.000   | 50       | 0.31        | 55       |
| TDD2050223  | 15010-18 | 50           | 30            | 22.000   | 25       | 0.45        | 80       |
| TDD3050333  | 15010-19 | 50           | 30            | 33.000   | 17       | 0.60        | 108      |
| TDD4050443  | 15010-20 | 50           | 30            | 44.000   | 15       | 0.75        | 134      |
| TDD5050553  | 15010-45 | 50           | 30            | 55.000   | 12       | 0.90        | 160      |
| TDD1063472  | 15010-21 | 63           | 38            | 4.700    | 50       | 0.31        | 60       |
| TDD2063942  | 15010-22 | 63           | 38            | 9.400    | 25       | 0.45        | 86       |
| TDD3063143  | 15010-23 | 63           | 38            | 14.000   | 17       | 0.60        | 115      |
| TDD4063183  | 15010-24 | 63           | 38            | 18.000   | 15       | 0.75        | 145      |
| TDD5063223  | 15010-46 | 63           | 38            | 22.700   | 12       | 0.90        | 170      |
| TDD1080302  | 15010-25 | 80           | 48            | 3.000    | 55       | 0.31        | 60       |
| TDD2080602  | 15010-26 | 80           | 48            | 6.000    | 27       | 0.45        | 86       |
| TDD3080902  | 15010-27 | 80           | 48            | 9.000    | 18       | 0.60        | 115      |
| TDD4080123  | 15010-28 | 80           | 48            | 12.000   | 15       | 0.75        | 145      |
| TDD5080153  | 15010-47 | 80           | 48            | 15.000   | 12       | 0.90        | 170      |
| TDD1100222  | 15010-29 | 100          | 60            | 2.200    | 65       | 0.31        | 60       |
| TDD2100442  | 15010-30 | 100          | 60            | 4.400    | 30       | 0.45        | 86       |
| TDD3100662  | 15010-31 | 100          | 60            | 6.600    | 20       | 0.60        | 115      |
| TDD4100882  | 15010-32 | 100          | 60            | 8.800    | 15       | 0.75        | 145      |
| TDD5100113  | 15010-48 | 100          | 60            | 11.000   | 12       | 0.90        | 170      |
| TDD1110202  | 15010-37 | 110          | 66            | 2.000    | 85       | 0.31        | 60       |
| TDD2110402  | 15010-38 | 110          | 66            | 4.000    | 40       | 0.45        | 86       |
| TDD3110602  | 15010-39 | 110          | 66            | 6.000    | 27       | 0.60        | 115      |
| TDD4110802  | 15010-40 | 110          | 66            | 8.000    | 20       | 0.75        | 150      |
| TDD5110103  | 15010-49 | 110          | 66            | 10.000   | 15       | 0.90        | 175      |
| TDD1125152  | 15010-33 | 125          | 75            | 1.500    | 60       | 0.31        | 60       |
| TDD2125302  | 15010-34 | 125          | 75            | 3.000    | 45       | 0.45        | 90       |
| TDD3125452  | 15010-35 | 125          | 75            | 4.500    | 25       | 0.60        | 120      |
| TDD4125602  | 15010-36 | 125          | 75            | 6.000    | 20       | 0.75        | 150      |
| TDD5125752  | 15010-50 | 125          | 75            | 7.500    | 15       | 0.90        | 180      |

## Average Electrical Performance

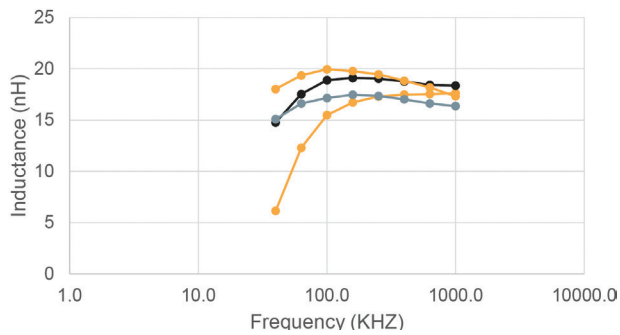
Typical Capacitance vs Temperature  
120 Hz



Typical ESR vs Temperature  
1 KHz



Inductance vs Freq



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