

TD series

Tantalum Solid Electrolytic Capacitors Dipped Type (Epoxy-Coated)

◆ Features

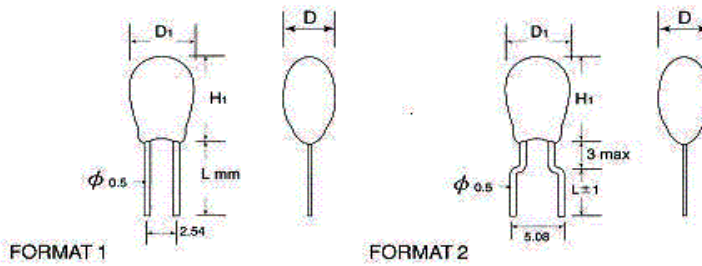
- » Lead Free, RoHS Compliant
- » Specially designed of general purpose
- » Highly reliable resin dipped type
- » Excellent frequency and temperature characteristics
- » Non-Flammable epoxy resin



◆ Specification

Item	Performance Characteristics																																																			
Operating Temperature Range	-55 to +125°C (-55 to +85°C for 4 & 6.3V)																																																			
Rated Working Voltage Range	6.3 to 50 VDC																																																			
Nominal Capacitance Range	0.1 to 330 uF																																																			
Capacitance Tolerance	±20% (±10% is available) (120Hz, +20°C)																																																			
Leakage Current	Not more than 0.008CV (uA) or 0.5uA whichever is greater																																																			
Characteristics at High and Low Temperature	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Capacitance (uF)</th> <th colspan="3">Capacitance change (%)</th> <th colspan="4">DF Max. (%)</th> <th colspan="3">DCL Max.(uF)</th> </tr> <tr> <th>-55°C</th> <th>+85°C</th> <th>+125°C</th> <th>-50°C</th> <th>+20°C</th> <th>+85°C</th> <th>+125°C</th> <th>+20°C</th> <th>+85°C</th> <th>+125°C</th> </tr> </thead> <tbody> <tr> <td>≤ 1.0</td> <td rowspan="3" style="text-align: center;">±10</td> <td rowspan="3" style="text-align: center;">±15</td> <td rowspan="3" style="text-align: center;">±25</td> <td>6</td> <td>4</td> <td>6</td> <td>6</td> <td rowspan="3" style="text-align: center;">I₀ ≤ 0.02 C_UR_U (or) 1uF (whichever is grater)</td> <td rowspan="3" style="text-align: center;">10I₀</td> <td rowspan="3" style="text-align: center;">12.5I₀</td> </tr> <tr> <td>1.5~68</td> <td>8</td> <td>6</td> <td>8</td> <td>8</td> </tr> <tr> <td>100~330</td> <td>10</td> <td>8</td> <td>10</td> <td>10</td> </tr> </tbody> </table>										Capacitance (uF)	Capacitance change (%)			DF Max. (%)				DCL Max.(uF)			-55°C	+85°C	+125°C	-50°C	+20°C	+85°C	+125°C	+20°C	+85°C	+125°C	≤ 1.0	±10	±15	±25	6	4	6	6	I ₀ ≤ 0.02 C _U R _U (or) 1uF (whichever is grater)	10I ₀	12.5I ₀	1.5~68	8	6	8	8	100~330	10	8	10	10
Capacitance (uF)	Capacitance change (%)			DF Max. (%)				DCL Max.(uF)																																												
	-55°C	+85°C	+125°C	-50°C	+20°C	+85°C	+125°C	+20°C	+85°C	+125°C																																										
≤ 1.0	±10	±15	±25	6	4	6	6	I ₀ ≤ 0.02 C _U R _U (or) 1uF (whichever is grater)	10I ₀	12.5I ₀																																										
1.5~68				8	6	8	8																																													
100~330				10	8	10	10																																													
Moisture Resistance	<p>Test conditions:</p> <p>Relative humidity : 90 to 95% without load</p> <p>Ambient temperature : +40°C</p> <p>Duration : 500 hours</p> <p>Post test requirements at + 20°C</p> <p>Leakage current : ≤ 0.012CV or 0.75 [μF], whichever is greater</p> <p>Capacitance change : ± 10% of initial measured value</p> <p>Tan δ : ≤ 150% of Initial specified value</p>																																																			
Endurance	<p>Test conditions:</p> <p>Derating Voltage + 125°C for 10~50V working</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Rated Voltage</th> <th>4.0</th> <th>6.3</th> <th>10.0</th> <th>16.0</th> <th>20.0</th> <th>25.0</th> <th>35.0</th> <th>50.0</th> </tr> </thead> <tbody> <tr> <td>Voltage Derating</td> <td>2.5</td> <td>4.0</td> <td>6.3</td> <td>16.0</td> <td>13.0</td> <td>16.0</td> <td>23.0</td> <td>33.0</td> </tr> <tr> <td>Surge Voltage + 85°C</td> <td>5.0</td> <td>8.0</td> <td>13.0</td> <td>16.0</td> <td>26.0</td> <td>32.0</td> <td>46.0</td> <td>65.0</td> </tr> <tr> <td>Surge Voltage + 125°C</td> <td>3.4</td> <td>5.0</td> <td>9.0</td> <td>16.0</td> <td>16.0</td> <td>20.0</td> <td>28.0</td> <td>38.0</td> </tr> </tbody> </table> <p>Post test requirements at +20°C</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td>Leakage current</td> <td>≤ 0.01% CV or 00625 [μA], whichever is greater</td> </tr> <tr> <td>Capacitance change</td> <td>± 10% of initial measured value</td> </tr> <tr> <td>tan δ</td> <td>≤ initial specified value</td> </tr> </tbody> </table>										Rated Voltage	4.0	6.3	10.0	16.0	20.0	25.0	35.0	50.0	Voltage Derating	2.5	4.0	6.3	16.0	13.0	16.0	23.0	33.0	Surge Voltage + 85°C	5.0	8.0	13.0	16.0	26.0	32.0	46.0	65.0	Surge Voltage + 125°C	3.4	5.0	9.0	16.0	16.0	20.0	28.0	38.0	Leakage current	≤ 0.01% CV or 00625 [μA], whichever is greater	Capacitance change	± 10% of initial measured value	tan δ	≤ initial specified value
Rated Voltage	4.0	6.3	10.0	16.0	20.0	25.0	35.0	50.0																																												
Voltage Derating	2.5	4.0	6.3	16.0	13.0	16.0	23.0	33.0																																												
Surge Voltage + 85°C	5.0	8.0	13.0	16.0	26.0	32.0	46.0	65.0																																												
Surge Voltage + 125°C	3.4	5.0	9.0	16.0	16.0	20.0	28.0	38.0																																												
Leakage current	≤ 0.01% CV or 00625 [μA], whichever is greater																																																			
Capacitance change	± 10% of initial measured value																																																			
tan δ	≤ initial specified value																																																			
Shelf Life	<p>Test conditions</p> <p>Duration : 2000 hours</p> <p>Ambient temperature : + 85°C</p> <p>Applied voltage : (none)</p> <p style="text-align: right;">Post test requirements at +20°C Same limits for "Endurance"</p>																																																			

◆ Tantalum Capacitor Dipped Typed outline Drawings



◆ Dimensions

Case Size	A	B	C	D	E	F	Wire Length (L)	(mm)	
Formats 1/2 H1 max	7.0	8.0	9.5	11.0	13.0	16.5	5.7±1	12,14±1	
D1 max	4.5	5.0	5.5	6.5	8.5	9.5	Code	A	B
D max	4.2	4.7	5.5	6.5	8.5	9.5			

◆ Rated Voltage, Capacitance

VDC	6.3	10	16	25	35	50
Code	0J	1A	1C	1E	1V	1H
Capacitance (uF)	Case Size					
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	A
1.0 (105)				A	A	B
1.5 (155)			A	A	A	C
2.2 (225)		A	A	A	B	C
3.3 (335)	A	A	A	B	B	D
4.7 (475)	A	A	B	B	C	D
6.8 (685)	A	B	B	C	D	E
10 (106)	B	B	B	C	D	E
15 (156)	B	C	C	D	E	F
22 (226)	C	C	C	D	E	F
33 (336)	C	D	D	E	F	
47 (476)	D	D	D	E	F	
68 (686)	D	D	E	F		
100 (107)	E	E	E	F		
150 (157)	E	E	F			
220 (227)	E	F				
330 (337)	F					

Tinned radial leads, Ø: 0.5mm

Leads & Solderability	temperature: 260°C
-Time of immersion:3s	-Time of immersion:3s
Standard lead spacing:2.54±0.5, 5.08± 0.5mm	The tin should cover 95% of wire surface.
Solderability:	Permissible pull test:10 N.
-Recommended soldering bath	

◆ Part Number

TD	A	475	M	016	B	1 or 2	B or T
Type	Size Code	Capacitance	Tolerance	Voltage	Wire Length	Format & Lead space	Bulk or Ammo pack

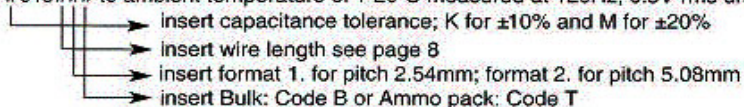
◆ Ratings and Part Number Reference

Part No.	Case size	Capacitance (uF)	DCL (uA) Max.	DF % Max.	ESR Max.(Ω) @100KHz
6.3 volt @ 85°C (4 volt, @125°C)					
TDA335#006###	A	3.3	0.5	6	13.0
TDA475#006###	A	4.7	0.5	6	10.0
TDA 685#006###	A	6.8	0.5	6	8.0
TDB106#006###	B	10	0.5	8	6.0
TDB156#006###	B	15	0.8	8	5.0
TDC226#006###	C	22	1.1	8	3.7
TDC336#006###	C	33	1.7	8	3.0
TDD476#006###	D	47	2.4	8	2.0
TDD686#006###	D	68	3.4	8	1.8
TDE107#006###	E	100	5.0	10	1.6
TDE157#006###	E	150	7.6	10	0.9
TDE227#006###	E	220	11.0	10	0.9
TDF337#006###	F	330	16.6	10	0.7
10 volt @ 85°C (6.3 volt, @E 125°C)					
TDA225#010###	A	2.2	0.5	6	13.0
TDA335#010###	A	3.3	0.5	6	10.0
TDA475#010###	A	4.7	0.5	6	8.0
TDB685#010###	B	6.8	0.5	6	6.0
TDB106#010###	B	10	0.8	8	5.0
TDC156#010###	C	15	1.2	8	3.7
TDC226#010###	C	22	1.7	8	2.7
TDD336#010###	D	33	2.6	8	2.1
TDD476#010###	D	47	3.7	8	1.7
TDD686#010###	D	68	5.4	8	1.8
TDE107#010###	E	100	8.0	10	1.0
TDE157#010###	E	150	12.0	10	0.8
TDF227#010###	F	220	17.6	10	0.8
16 volt @85°C (10 volt, @125°C)					
TDA155#016###	A	1.5	0.5	4	10.0
TDA225#016###	A	2.2	0.5	6	8.0
TDA335#016###	A	3.3	0.5	6	6.0
TDB475#016###	B	4.7	0.6	6	5.0
TDB685#016###	B	6.8	0.8	8	4.0
TDB106#016###	B	10	1.2	8	3.2
TDC156#016###	C	15	1.9	8	2.5
TDC226#016###	C	22	2.8	8	2.0
TDD336#016###	D	33	4.2	8	1.6
TDD476#016###	D	47	6.0	8	1.3
TDE686#016###	E	68	8.7	8	1.0
TDE107#016###	E	100	12.8	10	0.8
TDF157#016###	F	150	19.2	10	0.6
TDF227#016###	F	220	19.2	10	0.6

◆ Ratings and Part Number Reference

Part No.	Case size	Capacitance (uF)	DCL (uA) Max.	DF % Max.	ESR Max.(Ω) @100KHz
25 volt @ 85°C (16 volt, @125°C)					
TDA105#025###	A	1.0	0.5	4	10.0
TDA155#025###	A	1.5	0.5	4	8.0
TDA225#025###	A	2.2	0.5	6	6.0
TDB335#025###	B	3.3	0.6	6	5.0
TDB475#025###	B	4.7	0.9	6	4.0
TDC685#025###	C	6.8	1.3	6	3.1
TDC106#025###	C	10	2.0	8	2.5
TDD156#025###	D	15	3.0	8	2.0
TDD226#025###	D	22	4.4	8	1.5
TDE336#025###	E	33	6.6	8	1.2
TDE476#025###	E	47	9.4	8	1.0
TDF686#025###	F	68	13.6	8	0.8
35 volt @ 85°C (23 volt, @125°C)					
TDA104#035###	A	0.1	0.5	4	26.0
TDA154#035###	A	0.15	0.5	4	21.0
TDA224#035###	A	0.22	0.5	4	17.0
TDA334#035###	A	0.33	0.5	4	15.0
TDA474#035###	A	0.47	0.5	4	13.0
TDA684#035###	A	0.68	0.5	4	10.0
TDA105#035###	A	1.0	0.5	4	8.0
TDA155#035###	A	1.5	0.5	4	6.0
TDB225#035###	B	2.2	0.6	6	5.0
TDB335#035###	B	3.3	0.9	6	4.0
TDC475#035###	C	4.7	1.3	6	3.0
TDD685#035###	D	6.8	1.9	6	2.5
TDD106#035###	D	10	2.8	8	2.0
TDE156#035###	E	15	4.2	8	1.6
TDE226#035###	E	22	6.1	8	1.3
TDF336#035###	F	33	9.2	8	1.0
TDF476#035###	F	47	10.0	8	0.8
50 volt @ 85°C (33 volt, @125°C)					
TDA104#050###	A	0.1	0.5	4	26.0
TDA154#050###	A	0.15	0.5	4	21.0
TDA224#050###	A	0.22	0.5	4	17.0
TDA334#050###	A	0.33	0.5	4	15.0
TDA474#050###	A	0.47	0.5	4	13.0
TDA684#050###	A	0.68	0.5	4	10.0
TDB105#050###	B	1.0	0.5	4	8.0
TDC155#050###	C	1.5	0.6	4	6.0
TDC225#050###	C	2.2	0.8	6	3.5
TDD335#050###	D	3.3	1.3	6	3.0
TDD475#050###	D	4.7	1.8	6	2.5
TDE685#050###	E	6.8	2.7	6	2.0
TDE106#050###	E	10	4.0	8	1.6
TDF156#050###	F	15	6.0	8	1.2
TDF226#050###	F	22	8.8	8	1.0

NOTE: All #016### to ambient temperature of + 20°C measured at 120Hz, 0.5V rms unless otherwise stated



◆ Packing

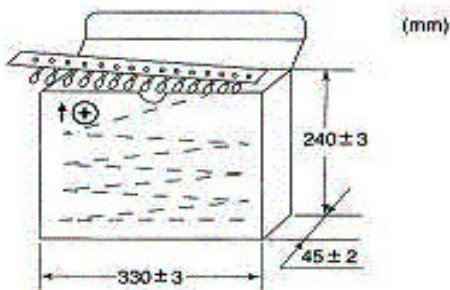
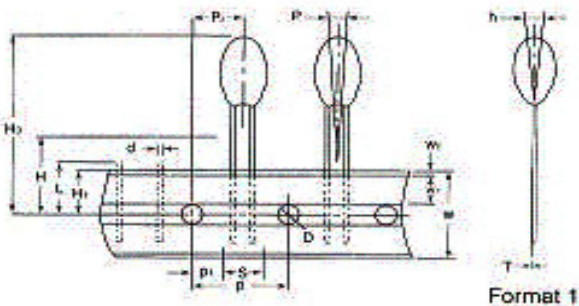
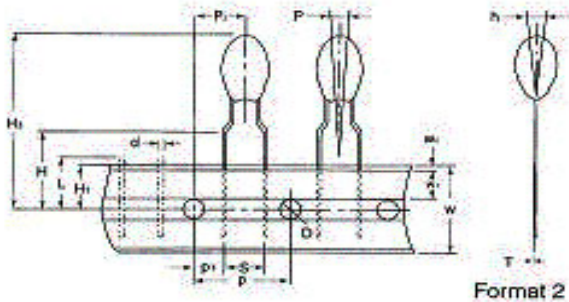
Quantity per bag: Code B

The capacity of the plastic bags depends on

Case size format	Qty per bag (cut \leq 7mm)
From A to B	1000
From C to D	1000
From E to F	500

Case size format	Qty per bag (cut \leq 18mm)
From A to B	1000
From C to D	500
From E to F	500

TAPE & AMMO PACKING (conform to: IEC286-2) Code T.



Item	Code	Dimension(mm)
Carrier tape width	W	18.0 $+1.0/-0.5$
Hold down tape width	W1	6.0 \pm 0.5
Hold down tape position	W2	1.0 max
Feed hole diameter	D	4.0 \pm 0.2
Feed hole pitch	P	12.7 \pm 0.3
Hole center to lead	P1	Format 1: 5.05 \pm 0.7 Format 2: 3.85 \pm 0.7
Hole center to component center	P2	6.35 \pm 1.0
Lead wire clenched height	H	16 \pm 0.5
Hole position	H1	9.0 \pm 0.5
Base of component height	H2	0.8 min
Component height	H3	32.2 max
Component alignment	Δ P	0 \pm 1.3
	Δ h	0 \pm 2.0
Lead spacing	S	'S' wires: 2.5 $+0.5/-0.1$ 'B' wires: 5.0 $+0.5/-0.5$
Lead diameter	d	0.5 \pm 0.05
length of snapped lead	L	11.0 max
Carrier tape thickness	T	0.5 \pm 0.1

Case Code	A~B	C~D	E~F
QTY (PCS/box)	2500	2000	1000