CB Series
Tantalum Capacitors

Features:

- Lead-Free
- Specially designed of general purpose
- Highly reliable resin dipped type
- Excellent frequency and temperature characteristics
- Non-flammable epoxy resin

Specifications:

<table>
<tr><th>Item</th><th>Performance Characteristics</th></tr>
<tr><td>Operating temperature range</td><td>-55°C to +125°C (>85°C with rated voltage derating)</td></tr>
<tr><td>Rated working voltage range</td><td>6.3 to 50 V dc</td></tr>
<tr><td>Nominal capacitance range</td><td>0.1 to 300 µF</td></tr>
<tr><td>Capacitance tolerance</td><td>± 20% (± 10% is available) (120 Hz, +20°C)</td></tr>
<tr><td>Leakage current</td><td>Not more than 0.008 CV (µA) or 0.5 µA whichever is greater</td></tr>
<tr><td>Tan δ (120 Hz, +20°C)</td><td>
<table>
<tr><td>Working voltage</td><td colspan="4">6.3 to 50 V</td></tr>
<tr><td>Capacitance</td><td>≤1 µF</td><td>1.5 to 6.8 µF</td><td>10 to 68 µF</td><td>≥100 µF</td></tr>
<tr><td>Maximum tan δ</td><td>0.04</td><td>0.06</td><td>0.08</td><td>0.1</td></tr>
</table>
</td></tr>
<tr><td>Characteristics at high and low temperature</td><td>
<table>
<tr><td>-55°C</td><td>Capacitance change</td><td>±12% of initial measured value at +20°C</td></tr>
<tr><td rowspan="2">+105°C</td><td>Leakage current</td><td>≤10% of initial measured value</td></tr>
<tr><td>Capacitance change</td><td>±12% of initial measured value at +20°C</td></tr>
</table>
</td></tr>
<tr><td>Moisture resistance</td><td>
Test conditions

Relative humidity : 90 to 95% without load
Ambient temperature : +40°C
Duration : 500 hours
Post test requirements at +20°C
Leakage current : ≤0.012 CV or 0.75 (µF), whichever is greater
Capacitance change : ±10% of initial measured value
Tan δ : ≤150% of initial specified value
</td></tr>
</table>

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Specifications:

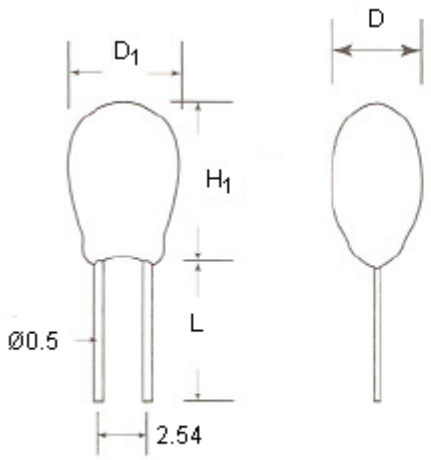
<table>
<tr><th>Item</th><th>Performance Characteristics</th></tr>
<tr><td>Endurance</td><td>
Test conditions
<table>
<tr><th>Conditions / Item</th><th>Derating (for 10 to 50 V only)</th><th>Rating</th></tr>
<tr><td>Duration</td><td>1,000 hours</td><td>1,000 hours</td></tr>
<tr><td>Ambient temperature</td><td>+105°C</td><td>+85°C</td></tr>
<tr><td>Applied voltage</td><td>Derated working voltage</td><td>Rated working voltage</td></tr>
<tr><td>Source impedance</td><td>1 Ω/V</td><td>1 Ω/V</td></tr>
</table>
Derating voltage +105°C for 10 to 50 V working
<table>
<tr><td>Working Voltage (V dc)</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td></tr>
<tr><td>Derating Voltage (V dc)</td><td>6.3</td><td>10</td><td>16</td><td>23</td><td>33</td></tr>
</table>
Post test requirements at +20°C

Leakage current : ≤0.01% CV or 00625 (μA), whichever is greater
Capacitance change : ±10% of initial measured value
Tan δ : ≤Initial specified value
</td></tr>
<tr><td>Shelf life</td><td>
Test Conditions

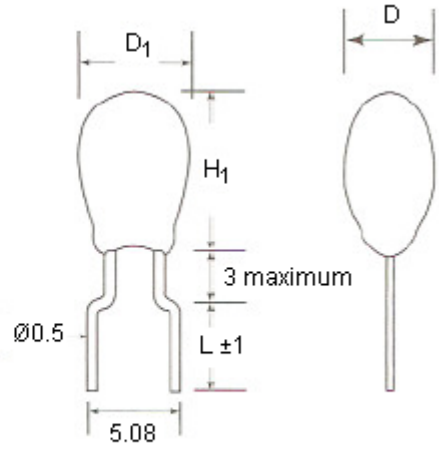
Duration : 1,000 hours
Ambient temperature : +85°C
Applied voltage : (none)
Post test requirements at +20°C
Same limits for “Endurance”
</td></tr>
</table>

Tantalum electrolytic capacitors resin dipped type

Tantalum capacitor dipped type outline drawings



Format 1



Format 2

Dimensions : Millimetres

CB Series
Tantalum Capacitors

Dimensions

Case Size (Maximum)	A	B	C	D	E	F
Formats 1/2 H_1	7	8	9.5	11	13	16.5
D_1	4.5	5	5.5	6.5	8.5	9.5
D	4.2	4.7				

Dimensions : Millimetres

Wire Length (L)	5,7 ±1	12, 14 ±1	18, 20 ±1
Code	A	B	C

Dimensions : Millimetres

Rated Voltage, Capacitance of Capacitors

VR (V)	6.3	10	16	25	35	50
Code	0J	1A	1C	1E	1V	1H
Capacitance (µF)	Case Size					
0.1 (104)	-	-	-	-	A	A
0.15 (154)	-	-	-	-	-	-
0.22 (224)	-	-	-	-	-	-
0.33 (334)	-	-	-	-	-	-
0.47 (474)	-	-	-	-	-	-
0.68 (684)	-	-	-	-	-	-
1 (105)	-	-	-	A	-	B
1.5 (155)	-	-	A		-	C
2.2 (225)	-	A			B	
3.3 (335)	A			B		D
4.7 (475)			B		C	
6.8 (685)		B		C	D	E
10 (106)	B					
15 (156)		C	C	D	E	F
22 (226)	C					

Rated voltage, capacitance of capacitors

VR (V)	6.3	10	16	25	35	50
Code	0J	1A	1C	1E	1V	1H
Capacitance (µF)	Case Size					
33 (336)	C	D	D	E	F	-
47 (476)	D					-
68 (686)			E	F	-	-
100 (107)	E	E			-	-
150 (157)			F	-	-	-
220 (227)		F	-	-	-	-

Ratings

Case Size	Capacitance µF	DCL (µA) Maximum	DF % Maximum	ESR Maximum (Ω) at 100 kHz
6.3 V, at 85°C (4 V, at 125°C)				
A	4.7	0.5	6	10
	6.8			8
B	10		8	6
	15	0.8		5
C	22	1.1		3.7
	33	1.7		3
D	47	2.4		2
	68	3.4		1.8
E	100	5	10	1.6
	150	7.6		0.9
	220	11		0.9
10 V at 85°C (6.3 V, at 125°C)				
A	4.7	0.5	6	8
B	6.8			6
	10	0.8	8	5
C	15	1.2		3.7
	22	1.7		2.7

Ratings

Case Size	Capacitance µF	DCL (µA) Maximum	DF % Maximum	ESR Maximum (Ω) at 100 kHz
10 V at 85°C (6.3 V, at 125°C)				
D	33	2.6	8	2.1
	47	3.7		1.7
	68	5.4		1.3
E	100	8	10	1
E	150	12		0.8
F	220	17.6		
16 V at 85°C (10 V, at 125°C)				
A	2.2	0.5	6	8
	3.3			6
B	4.7	0.6		5
	6.8	0.8	8	4
	10	1.2		3.2
C	15	1.9		2.5
	22	2.8		2
D	33	4.2		1.6
	47	6		1.3
E	68	8.7		1
	100	12.8	10	0.8
F	150	19.2		0.6
25 V at 85°C (16 V, at 125°C)				
A	1.0	0.5	4	10
	1.5			8
	2.2		6	6
B	3.3	0.6		5
	4.7	0.9		4
C	6.8	1.3		3.1
	10	2	8	2.5
D	15	3		2
	22	4.4		1.5
E	33	6.6		1.2
	47	9.4		1
F	68	13.6		0.8
	100	20	10	0.8

Ratings

Case Size	Capacitance µF	DCL (µA) Maximum	DF % Maximum	ESR Maximum (Ω) at 100 kHz
35 Volt at 85°C (23 Volt, at 125°C)				
A	0.1	0.5	4	26
	0.15			21
	0.22			17
	0.33			15
	0.47			13
	0.68			10
	1			8
	1.5			6
B	2.2	0.6	6	5
	3.3	0.9		4
C	4.7	1.3		3
D	6.8	1.9		2.5
	10	2.8	8	2
E	15	4.2		1.6
	22	6.1		1.3
F	33	9.2		1
	47	10		0.8
50 Volt at 85°C (33 Volt, at 125°C)				
A	0.1	0.5	4	26
	0.22			17
	0.33			15
	0.47			13
	0.68			10
B	1			8
C	1.5	0.6		6
	2.2	0.8	6	3.5
D	3.3	1.3		3
	4.7	1.8		2.5
E	6.8	2.7		2
	10	4	8	1.6

CB Series
Tantalum Capacitors

Packaging of bead tantalum capacitors explanation of part numbers

CB	OJ	475	M	I	A	B	B&T
Series Code	Rated Voltage	Nominal Capacitance	Capacitance Tolerance	Format & Lead Space	Size Code	Wire Length	Bulk & Ammo Pack

Quantity per bag: Code B
The capacity of the plastic bags depends on

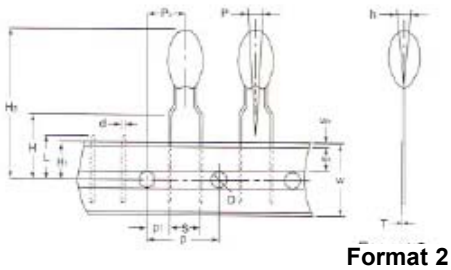
Case Size Format (1)	Qty per bag (cut ≤ 7 mm)
Form A to B	1,000
Form C to D	1,000
Form E to F	500

Case Size Format (1)	Qty per bag (cut ≤ 14 mm)
Form A to B	1,000
Form C to D	1,000
Form E to F	500

Case Size Format (2)	Qty per bag (cut ≤ 7 mm)
Form A to B	1,000
Form C to D	1,000
Form E to F	500

Tape and Ammo Packing (conform to: IEC286-2) Code T.

Tape and ammo packing (conform to: IEC286-2)



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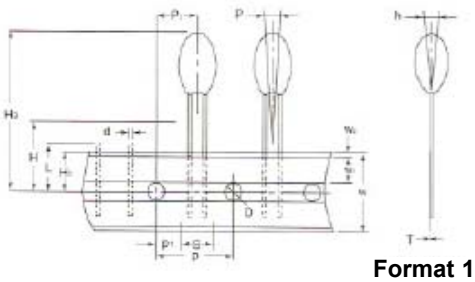

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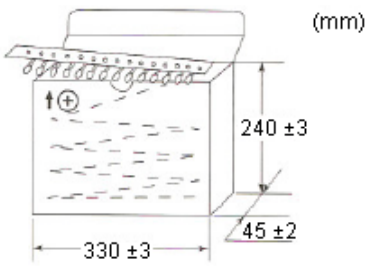

Dimensions : Millimetres

Item	Code	Dimension (mm)
Carrier tape width	W	$18^{+1}_{-0.5}$
Hold down tape width	W_1	6 ±0.5
Hold down tape position	W_2	1 maximum
Feed hole diameter	D	4 ±0.2
Feed hole pitch	P	12.7 ±0.3
Hole centre to lead	P_1	Format 1: 5.05 ±0.7
		Format 2: 3.85 ±0.7
Hole centre to component centre	P	6.35 ±1
Lead wire clench height	H	16 ±0.5
Hole position	H_1	9 ±0.5
Base of component height	H_2	0.8 minimum
Component height	H_3	32.2 maximum
Component alignment	ΔP	0 ±1.3
	Δh	0 ±2
Lead spacing	S	'S' wires : $2.5^{+0.6}_{-0.1}$
		'B' wires : $5^{+0.6}_{-0.5}$
Lead diameter	d	0.5 ±0.05
Length of snipped lead	L	11 maximum
Carrier tape thickness	T	0.5 ±0.1

Case Code	A to B	C to D	E to F
Qty. (PCS/box)	2,500	2,000	1,000

CB Series
Tantalum Capacitors

Part Number Table

Description	Part Number
Capacitor, 4.7 µf, 6.3 V	CB0J475M2ACB
Capacitor, 6.8 µf, 6.3 V	CB0J685M2ACB
Capacitor, 15 µf, 6.3 V	CB0J156M2BCB
Capacitor, 33 µf, 6.3 V	CB0J336M2CCB
Capacitor, 150 µf, 6.3 V	CB0J157M2ECB
Capacitor, 220 µf, 6.3 V	CB0J227M2ECB
Capacitor, 6.8 µf, 10 V	CB1A685M2BCB
Capacitor, 15 µf, 10 V	CB1A156M2CCB
Capacitor, 68 µf, 10 V	CB1A686M2DCB
Capacitor, 150 µf, 10 V	CB1A157M2ECB
Capacitor, 220 µf, 10 V	CB1A227M2FCB
Capacitor, 3.3 µf, 16 V	CB1C335M2ACB
Capacitor, 15 µf, 16 V	CB1C156M2CCB
Capacitor, 150 µf, 16 V	CB1C157M2FCB
Capacitor, 1.5 µf, 25 V	CB1E155M2ACB
Capacitor, 3.3 µf, 25 V	CB1E335M2BCB
Capacitor, 47 µf, 25 V	CB1E476M2ECB
Capacitor, 68 µf, 25 V	CB1E686M2FCB
Capacitor, 100 µf, 25 V	CB1E107M2FCB
Capacitor, 0.15 µf, 35 V	CB1V154M2ACB
Capacitor, 0.68 µf, 35 V	CB1V684M2ACB
Capacitor, 1.5 µf, 35 V	CB1V155M2ACB
Capacitor, 33 µf, 35 V	CB1V336M2FCB
Capacitor, 0.1 µf, 50 V	CB1H104M2ACB
Capacitor, 0.22 µf, 50 V	CB1H224N2ACB
Capacitor, 0.33 µf, 50 V	CB1H334M2ACB
Capacitor, 0.47 µf, 50 V	CB1H474M2ACB
Capacitor, 0.68 µf, 50 V	CB1H684M2ACB
Capacitor, 1 µf, 50 V	CB1H105M2BCB
Capacitor, 1.5 µf, 50 V	CB1H155M2CCB
Capacitor, 2.2 µf, 50 V	CB1H225M2CCB
Capacitor, 3.3 µf, 50 V	CB1H335M2DCB
Capacitor, 4.7 µf, 50 V	CB1H475M2DCB
Capacitor, 6.8 µf, 50 V	CB1H685M2ECB
Capacitor, 10 µf, 50 V	CB1H106M2ECB
Capacitor, 10 µf, 6.3 V	CB0J106M2BCB
Capacitor, 22 µf 6.3 V	CB0J226M2CCB
Capacitor, 47 µf, 6.3 V	CB0J476M2DCB
Capacitor, 68 µf, 6.3 V	CB0J686M2DCB
Capacitor, 100 µf, 6.3 V	CB0J107M2ECB

Description	Part Number
Capacitor, 4.7 µf, 10 V	CB1A475M2ACB
Capacitor, 10 µf, 10 V	CB1A106M2BCB
Capacitor, 22 µf, 10 V	CB1A226M2CCB
Capacitor, 33 µf, 10 V	CB1A336M2DCB
Capacitor, 47 µf, 10 V	CB1A476M2DCB
Capacitor, 100 µf, 10 V	CB1A107M2ECB
Capacitor, 2.2 µf, 16 V	CB1C225M2ACB
Capacitor, 4.7 µf, 16 V	CB1C475M2BCB
Capacitor, 6.8 µf, 16 V	CB1C685M2BCB
Capacitor, 10 µf, 16 V	CB1C106M2BCB
Capacitor, 22 µf, 16 V	CB1C226M2CCB
Capacitor, 33 µf, 16 V	CB1C336M2DCB
Capacitor, 47 µf, 16 V	CB1C476M2DCB
Capacitor, 68 µf, 16 V	CB1C686M2ECB
Capacitor, 100 µf, 16 V	CB1C107M2ECB
Capacitor, 1 µf, 25 V	CB1E105M2ACB
Capacitor, 2.2 µf, 25 V	CB1E225M2ACB
Capacitor, 4.7 µf, 25 V	CB1E475M2BCB
Capacitor, 6.8 µf, 25 V	CB1E685M2CCB
Capacitor, 10 µf, 25 V	CB1E106M2CCB
Capacitor, 15 µf, 25 V	CB1E156M2DCB
Capacitor, 22 µf, 25 V	CB1E226M2DCB
Capacitor, 33 µf, 25 V	CB1E336M2ECB
Capacitor, 0.1 µf, 35 V	CB1V104M2ACB
Capacitor, 0.22 µf, 35 V	CB1V224M2ACB
Capacitor, 0.33 µf, 35 V	CB1V334M2ACB
Capacitor, 0.47 µf, 35 V	CB1V474M2ACB
Capacitor, 1 µf, 35 V	CB1V105M2ACB
Capacitor, 2.2 µf, 35 V	CB1V225M2BCB
Capacitor, 3.3 µf, 35 V	CB1V335M2BCB
Capacitor, 4.7 µf, 35 V	CB1V475M2CCB
Capacitor, 6.8 µf, 35 V	CB1V685M2DCB
Capacitor, 10 µf, 35 V	CB1V106M2DCB
Capacitor, 15 µf, 35 V	CB1V156M2ECB
Capacitor, 22 µf, 35 V	CB1V226M2ECB
Capacitor, 47 µf, 35 V	CB1V476M2FCB