Solid-Electrolyte TANTALEX® Capacitors, Extended Capacitance Values, Hermetically-Sealed

FEATURES

- Axial through-hole terminatons: Tin/lead (SnPb), 100 % tin (RoHS compliant)
- High capacitance and small size
- Exceptional operating stability
- Hermetically-sealed, cylindrical, metal-case
- Low leakage current and low dissipation factor
- The military equivalent to the 152D is the CSR23 which is qualified to MIL-C-39003/03
- Provide proven reliability in a wide variety of high performance military, industrial and commercial markets
- Material categorization: For definitions please see www.vishay.com/doc?99912

Pb Available

RoHS* COMPLIANT

Note

* Lead (Pb)-containing terminations are not RoHS-compliant. Exemptions may apply.

PERFORMANCE CHARACTERISTICS

Operating Temperature: - 55 °C to + 85 °C
(to + 125 °C with voltage derating)

Capacitance Tolerance: At 120 Hz, + 25 °C
± 20 % and ± 10 % standard. ± 5 % available as special

Dissipation Factor: At 120 Hz, + 25 °C
Dissipation factor, as determined from the expression 2πfRC, shall not exceed the values listed in the Standard Ratings table

DC Leakage Current (DCL Max.):

At + 25 °C: Leakage current shall not exceed the values listed in the Standard Ratings table

At + 85 °C: Leakage current shall not exceed 10 times the values listed in the Standard Ratings table

At + 125 °C: Leakage shall not exceed 12 times the values listed in the Standard Ratings table

Life Test: Capacitors shall withstand rated DC voltage applied at + 85 °C for 2000 h or derated DC voltage applied at + 125 °C for 1000 h

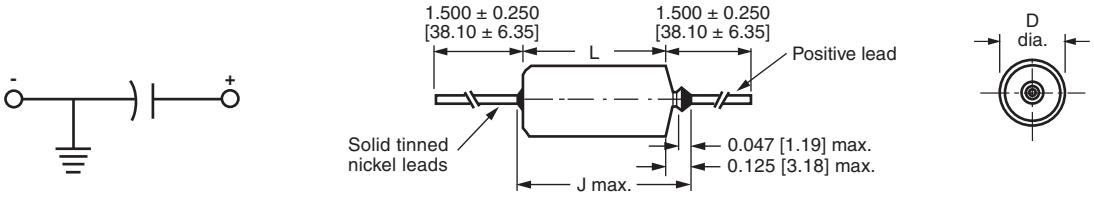
Following the life test:

1. DCL shall not exceed 125 % of the initial requirement. In no case need the leakage current be less than 2 µA
2. Dissipation factor shall meet the initial requirement
3. Change in capacitance shall not exceed ± 5 %

ORDERING INFORMATION

152D	106	X0	006	A	2	T	E3
MODEL	CAPACITANCE	CAPACITANCE TOLERANCE	DC VOLTAGE RATING AT 85 °C	CASE CODE	STYLE NUMBER	PACKAGING	RoHS COMPLIANT
	This is expressed in picofarads. The first two digits are the significant figures. The third is the number of zeros to follow.	X0 = ± 20 % X9 = ± 10 % X5 = ± 5 % * * Special order	This is expressed in volts. To complete the three-digit block, zeros precede the voltage rating.	See Ratings and Case Codes table	2 = Insulated sleeve	T = Tape and reel	E3 = 100 % tin termination (RoHS compliant) Blank = SnPb termination

DIMENSIONS in inches [millimeters]



CASE CODE	D	L	J (MAXIMUM)	LEAD SIZE	
	WITH INSULATING SLEEVE (1)			AWG NO.	NOMINAL DIAMETER
A	0.135 ± 0.016 [3.43 ± 0.41]	0.286 ± 0.031 [7.26 ± 0.79]	0.422 [10.72]	24	0.020 [0.51]
B	0.185 ± 0.016 [4.70 ± 0.41]	0.474 ± 0.031 [12.04 ± 0.79]	0.610 [15.49]	24	0.020 [0.51]
R	0.289 ± 0.016 [7.34 ± 0.41]	0.686 ± 0.031 [17.42 ± 0.79]	0.822 [20.88]	22	0.025 [0.64]
S	0.351 ± 0.016 [8.92 ± 0.41]	0.786 ± 0.031 [19.96 ± 0.79]	0.922 [23.42]	22	0.025 [0.64]

Note

(1) When a shrink-fitted insulation is used, it shall lap over the ends of the capacitor body

STANDARD RATINGS

CAPACITANCE (µF)	CASE CODE	PART NUMBER	MAX. DCL AT + 25 °C (µA)	MAX. DF AT + 25 °C 120 Hz (%)
6 V_{DC} AT + 85 °C, SURGE = 8 V; 4 V_{DC} AT + 125 °C, SURGE = 5 V				
10	A	152D106(1)006A2	1.0	6
12	A	152D126(1)006A2	1.0	6
15	A	152D156(1)006A2	1.0	6
68	B	152D686(1)006B2	3.0	6
82	B	152D826(1)006B2	3.0	6
100	B	152D107(1)006B2	6.0	6
330	R	152D337(1)006R2	10.0	8
390	R	152D397(1)006R2	10.0	8
470	R	152D477(1)006R2	10.0	8
560	S	152D567(1)006S2	20.0	10
680	S	152D687(1)006S2	20.0	10
820	S	152D827(1)006S2	20.0	10
1000	S	152D108(1)006S2	20.0	10
10 V_{DC} AT + 85 °C, SURGE = 13 V; 7 V_{DC} AT + 125 °C, SURGE = 9 V				
5.6	A	152D565(1)010A2	1.0	4
6.8	A	152D685(1)010A2	1.0	6
8.2	A	152D825(1)010A2	1.2	6
10	A	152D106(1)010A2	1.2	6
47	B	152D476(1)010B2	4.0	6
56	B	152D566(1)010B2	5.0	6
68	B	152D686(1)010B2	6.0	6
82	B	152D826(1)010B2	7.0	6
150	R	152D157(1)010R2	8.0	8
180	R	152D187(1)010R2	8.0	8
220	R	152D227(1)010R2	12.0	8
270	R	152D277(1)010R2	13.0	8
330	S	152D337(1)010S2	16.0	8
390	S	152D397(1)010S2	16.0	10
470	S	152D477(1)010S2	16.0	10
560	S	152D567(1)010S2	20.0	10
15 V_{DC} AT + 85 °C, SURGE = 20 V; 10 V_{DC} AT + 125 °C, SURGE = 12 V				
3.9	A	152D395(1)015A2	1.0	4
4.7	A	152D475(1)015A2	1.0	4
5.6	A	152D565(1)015A2	1.3	4
6.8	A	152D685(1)015A2	1.3	6
27	B	152D276(1)015B2	3.0	6
33	B	152D336(1)015B2	5.0	6
39	B	152D396(1)015B2	5.0	6
82	R	152D826(1)015R2	8.0	6
100	R	152D107(1)015R2	10.0	8
120	R	152D127(1)015R2	10.0	8
150	R	152D157(1)015R2	15.0	8
180	R	152D187(1)015R2	15.0	8
220	S	152D227(1)015S2	20.0	8
270	S	152D277(1)015S2	20.0	8
330	S	152D337(1)015S2	20.0	8

Note

- Part number definitions:
  (1) For 10 % tolerance specify X9; for 20 % specify “X0”; for 5 % “X5” (special order)

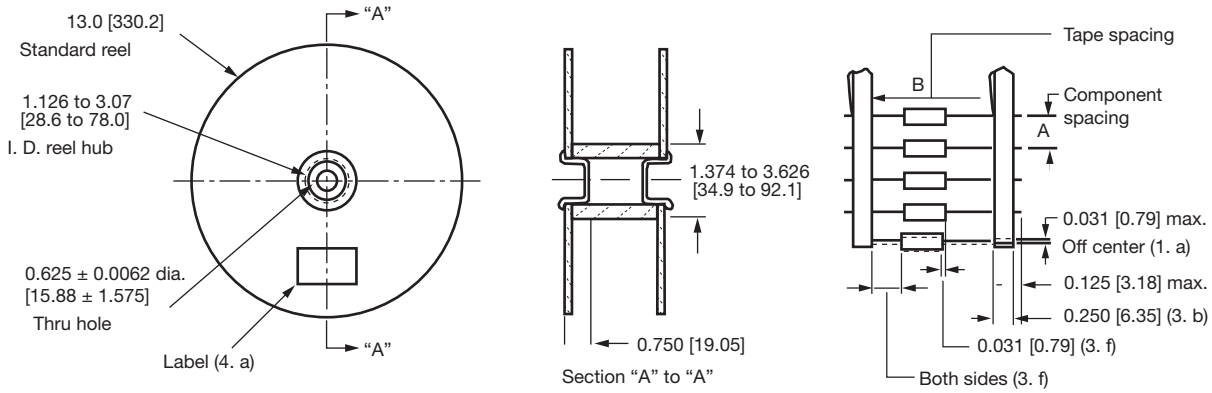
STANDARD RATINGS

CAPACITANCE (µF)	CASE CODE	PART NUMBER	MAX. DCL AT + 25 °C (µA)	MAX. DF AT + 25 °C 120 Hz (%)
20 V_{DC} AT + 85 °C, SURGE = 26 V; 13 V_{DC} AT + 125 °C, SURGE = 16 V				
2.7	A	152D275(1)020A2	0.8	4
3.3	A	152D335(1)020A2	1.0	4
3.9	A	152D395(1)020A2	1.2	4
4.7	A	152D475(1)020A2	1.2	4
18	B	152D186(1)020B2	3.0	4
22	B	152D226(1)020B2	3.0	4
27	B	152D276(1)020B2	4.0	4
56	R	152D566(1)020R2	7.0	6
68	R	152D686(1)020R2	8.0	6
82	R	152D826(1)020R2	10.0	6
100	R	152D107(1)020R2	12.0	6
120	R	152D127(1)020R2	12.0	6
150	S	152D157(1)020S2	15.0	8
180	S	152D187(1)020S2	15.0	8
220	S	152D227(1)020S2	15.0	8
30 V_{DC} AT + 85 °C, SURGE = 39 V; 20 V_{DC} AT + 125 °C, SURGE = 26 V				
2.2	A	152D225(1)030A2	1.0	4
2.7	A	152D275(1)030A2	1.0	4
12	B	152D126(1)030B2	3.0	4
15	B	152D156(1)030B2	3.0	4
18	B	152D186(1)030B2	3.0	4
56	R	152D566(1)030R2	7.0	6
68	R	152D686(1)030R2	7.0	6
82	S	152D826(1)030S2	10.0	8
100	S	152D107(1)030S2	10.0	8
35 V_{DC} AT + 85 °C, SURGE = 46 V; 23 V_{DC} AT + 125 °C, SURGE = 28 V				
1.2	A	152D125(1)035A2	0.6	4
1.5	A	152D155(1)035A2	0.8	4
1.8	A	152D185(1)035A2	1.0	4
8.2	B	152D825(1)035B2	3.0	4
10	B	152D106(1)035B2	3.0	4
27	R	152D276(1)035R2	7.0	6
33	R	152D336(1)035R2	8.0	6
39	R	152D396(1)035R2	10.0	6
47	R	152D476(1)035R2	10.0	6
56	S	152D566(1)035S2	12.0	6
68	S	152D686(1)035S2	12.0	6
82	S	152D826(1)035S2	30.0	8
100	S	152D107(1)035S2	30.0	8
50 V_{DC} AT + 85 °C, SURGE = 65 V; 33 V_{DC} AT + 125 °C, SURGE = 40 V				
1.2	A	152D125(1)050A2	0.6	4
1.5	A	152D155(1)050A2	0.8	4
5.6	B	152D565(1)050B2	2.5	4
6.8	B	152D685(1)050B2	2.5	4
22	R	152D226(1)050R2	7.0	6
27	R	152D276(1)050R2	8.0	6
33	S	152D336(1)050S2	10.0	6
39	S	152D396(1)050S2	10.0	6
47	S	152D476(1)050S2	10.0	6
60 V_{DC} AT + 85 °C, SURGE = 78 V; 39 V_{DC} AT + 125 °C, SURGE = 49 V				
22	R	152D226(1)060R2	7	6

Note

- Part number definitions:
  (1) For 10 % tolerance specify X9; for 20 % specify “X0”; for 5 % “X5” (special order)

STANDARD REEL PACKAGING SPECIFICATIONS - MEETS EIA STANDARD RS-296 in inches [millimeters]



CASE CODE	TYPE 150D UNITS WITH INSULATING SLEEVE		LEAD SIZE		COMPONENT SPACING	TAPE SPACING	UNITS PER REEL
	D	L	AWG NO.	NOM. DIA.	A	B	
A	0.135 ± 0.016 [3.43 ± 0.41]	0.286 ± 0.031 [7.26 ± 0.79]	24	0.020 [0.51]	0.200 ± 0.015 [5.08 ± 0.38]	2.500 ± 0.062 [63.5 ± 1.57]	1000
B	0.185 ± 0.016 [4.70 ± 0.41]	0.474 ± 0.031 [12.04 ± 0.79]	24	0.020 [0.51]	0.200 ± 0.015 [5.08 ± 0.38]	2.500 ± 0.062 [63.5 ± 1.57]	1000
R	0.289 ± 0.016 [7.34 ± 0.41]	0.686 ± 0.031 [17.42 ± 0.79]	22	0.025 [0.64]	0.400 ± 0.015 [10.16 ± 0.38]	2.875 ± 0.062 [73.03 ± 1.57]	500
S	0.351 ± 0.016 [8.92 ± 0.41]	0.786 ± 0.031 [19.96 ± 0.79]	22	0.025 [0.64]	0.400 ± 0.015 [10.16 ± 0.38]	2.875 ± 0.062 [73.03 ± 1.57]	500

STANDARD REEL PACKAGING INFORMATION

1. Component Leads

a. Component leads shall not be bent beyond 0.047" [1.19 mm] maximum from their nominal position when measured from the leading edge of the component lead at the lead egress from the component.

b. The "C" dimension shall be governed by the overall length of the reel packaged component. The distance between flanges shall be 0.125" to 0.250" [3.18 mm to 6.35 mm] greater than the overall component length.

2. Orientation

All polarized components must be oriented to one direction. The cathode lead tape shall be a color and the anode lead tape shall be white.

3. Reeling

a. Components on any reel shall not represent more than two date codes when date code identification is required.

b. Component leads shall be positioned between pairs of 0.250" [6.35 mm] tape.

c. The disposable reels have hubs and corrugated fibreboard flanges and core or equivalent.

d. A minimum of 12.0" [304.8 mm] leader of tape shall be provided before the first and after the last component on the reel.

e. 50 lb or 60 lb. Kraft paper must be wound between layer of components as far as necessary for component protection. Width of paper to be 0.062" to 0.250" [1.57 mm to 6.35 mm] less than the "C" dimension of the reel.

f. A row of components must be centered between tapes ± 0.047" [1.19 mm]. In addition, individual components may deviate from center of component row ± 0.031" [0.79 mm].

g. Staples shall not be used for splicing. Not more than 4 layers of tape shall be used in any splice area and no tape shall be offset from another by more than 0.031" [0.79 mm] non-cumulative. Tape splices shall overlap at least 6.0" [152.4 mm] for butt joints and at least 3.0" [76.2 mm] for lap joints and shall not be weaker than unspliced tape. Universal splicing clips may also be used.

h. Quantity per reel shall be controlled so that tape components and cover shall not extend beyond the smallest dimension of the flange (either across flats or diameter). Once the quantity per reel for each part number has been established, future orders for that part number shall be packaged in that quantity. When order or release quantity is less than the established quantity, a standard commercial pack is to be used.

i. A maximum of 0.25 % of the components per reel quantity may be missing without consecutive missing components.

j. Adequate protection must be provided to prevent physical damage to both reel and components during shipment and storage.

4. Marking

Minimum reel and carton marking shall consist of the following: Customer part number, purchase order no., quantity, package date, manufacturer's name, electrical value, date code, Vishay Sprague part number and country of origin.

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