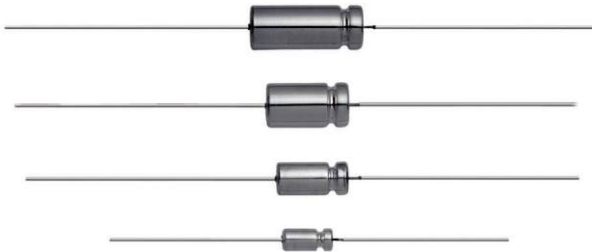


## Wet Tantalum Capacitors Sintered Anode TANTALEX® Capacitors For Operation to + 125 °C, Elastomer-Sealed



### FEATURES

Terminations: standard Tin/lead (SnPb), 100 % Tin (RoHS compliant) available

Vishay Sprague Model 109D tubular elastomer-sealed, sintered anode TANTALEX® capacitors fill the basic requirements for applications where a superior quality, reliable design for industrial, automotive and telecommunications application is desired.

Model 109D capacitors are the commercial equivalents of Tansitor Style WC, UWC, Mallory-NACC Style TLS, TLH and the Military Style CL64 and CL65, designed to meet the performance requirements of Military Specification MIL-DTL-3965.



**RoHS\***  
COMPLIANT

### PERFORMANCE CHARACTERISTICS

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

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

**DC Leakage Current (DCL Max.):**

At + 25 °C, + 85 °C, + 125 °C: Leakage current shall not exceed the values listed in the Standard Ratings Tables.

**Life Test:** Capacitors are capable of withstanding a 2000 hour life test at a temperature of + 85 °C or + 125 °C at the applicable DC working voltage.

Following the life test:

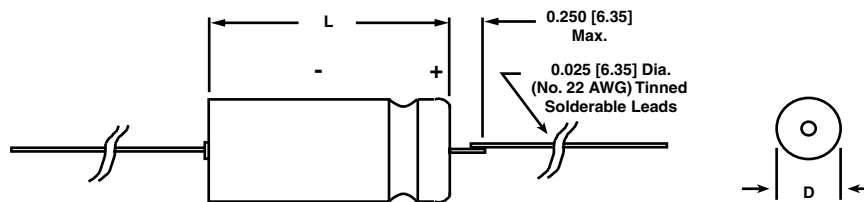
1. DCL shall not exceed the initial requirements or 1 µA, whichever is greater.
2. The ESR shall meet the initial requirement.
3. Change in capacitance shall not exceed 10 % from the initial measurement. For capacitors with voltage ratings of 15 WVDC and below, change in capacitance shall not exceed + 10 %, - 25 % from the initial measurement

### ORDERING INFORMATION

109D MODEL	207 CAPACITANCE	X0 CAPACITANCE TOLERANCE	006 DC VOLTAGE RATING AT + 85 °C	C CASE CODE	0 STYLE NUMBER	E3 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. A decimal point is indicated by an "R" (6R3 = 6.3 volts).	See Ratings and Case Codes Table.	0 = No outer sleeve. Standard. 2 = Outer plastic film insulation.	E3 = 100 % tin termination (RoHS compliant) Blank = SnPb termination (standard design)

**Packaging:** The use of formed plastic trays for packaging these axial lead components is standard. Tape and reel is not recommended due to the unit weight.

### DIMENSIONS in inches [millimeters]



CASE CODE	BARE TUBE		WITH PLASTIC-FILM INSULATING SLEEVE		LEAD LENGTH
	D	L	D (Max.)	L (Max.)	
C	0.188 ± 0.016 [4.78 ± 0.41]	0.453 + 0.031 - 0.016 [11.51 + 0.79 - 0.41]	0.219 [5.56]	0.608 [15.45]	1.500 ± 0.250 [38.10 ± 6.35]
F	0.281 ± 0.016 [7.14 ± 0.41]	0.641 + 0.031 - 0.016 [16.28 + 0.79 - 0.41]	0.312 [7.92]	0.796 [20.22]	2.250 ± 0.250 [57.15 ± 6.35]
T	0.375 ± 0.016 [9.53 ± 0.41]	0.766 + 0.031 - 0.016 [19.46 + 0.79 - 0.41]	0.406 [10.31]	0.921 [23.40]	2.250 ± 0.250 [57.15 ± 6.35]
K <sup>1)</sup>	0.375 ± 0.016 [9.53 ± 0.41]	1.062 + 0.031 - 0.016 [26.97 + 0.79 - 0.41]	0.406 [10.31]	1.217 [30.91]	2.250 ± 0.250 [57.15 ± 6.35]

<sup>1)</sup> Replaces previous W case.

\* Pb containing terminations are not RoHS compliant, exemptions may apply



Wet Tantalum Capacitors Sintered Anode  
TANTALEX® Capacitors For Operation to + 125 °C,  
Elastomer-Sealed

<b>STANDARD RATINGS</b>									
CAPACITANCE ( $\mu$ F)	CASE CODE	PART NUMBER*	Max. ESR	Max. IMP.	Max. DCL ( $\mu$ A)		Max. CAPACITANCE CHANGE (%)		
			at + 25 °C 120 Hz (Ohms)	at - 55 °C 120 Hz (Ohms)	at + 25 °C	at + 85 °C + 125 °C	at + 55 °C	at + 85 °C	at + 125 °C
<b>6 WVDC at + 85 °C . . . 4 WVDC at + 125 °C</b>									
68	C	109D686X0006C0	4	60	1	2	- 40	+ 14	+ 16
140	F	109D147X0006F0	2	40	1	3	- 40	+ 14	+ 16
270	F	109D277X0006F0	4	25	1	7	- 44	+ 17.5	+ 20
560	T	109D567X0006T0	3	25	2	13	- 64	+ 17.5	+ 20
1200	K	109D128X0006K0	1.6	20	3	14	- 80	+ 25	+ 25
<b>8 WVDC at + 85 °C . . . 5 WVDC at + 125 °C</b>									
22	C	109D226X0008C0	6	115	1	2	-40	+ 10.5	+ 12
220	F	109D227X0008F0	4	30	1	7	- 44	+ 17.5	+ 20
<b>10 WVDC at + 85 °C . . . 7 WVDC at + 125 °C</b>									
20	C	109D206X0010C0	5	175	1	2	- 32	+ 10.5	+ 12
47	C	109D476X0010C0	5	100	1	2	- 36	+ 14	+ 16
180	F	109D187X0010F0	4	40	1	7	- 36	+ 14	+ 16
390	T	109D397X0010T0	3	25	2	16	- 64	+ 17.5	+ 20
<b>15 WVDC at + 85 °C . . . 10 WVDC at + 125 °C</b>									
15	C	109D156X0015C0	6	155	1	2	- 24	+ 10.5	+ 12
33	C	109D336X0015C0	5	90	1	2	- 28	+ 14	+ 16
120	F	109D127X0015F0	4	50	1	7	- 28	+ 17.5	+ 20
270	T	109D277X0015T0	3	30	2	16	- 56	+ 17.5	+ 20
540	K	109D547X0015K0	1.2	23	6	24	- 80	+ 25	+ 25
<b>25 WVDC at + 85 °C . . . 15 WVDC at + 125 °C</b>									
10	C	109D106X0025C0	6	220	1	2	- 16	+ 8	+ 9
22	C	109D226X0025C0	5	140	1	3	- 20	+ 10.5	+ 12
50	F	109D506X0025F0	4	70	1	5	- 28	+ 13	+ 15
100	F	109D107X0025F0	4	50	1	10	- 28	+ 13	+ 15
100	T	109D107X0025T0	4	45	2	10	- 48	+ 13	+ 15
180	T	109D187X0025T0	4	32	2	18	- 48	+ 13	+ 15
350	K	109D357X0025K0	1.3	24	7	28	- 70	+ 25	+ 25
<b>30 WVDC at + 85 °C . . . 20 WVDC at + 125 °C</b>									
7	C	109D705X0030C0	8	275	1	2	- 16	+ 8	+ 12
8	C	109D805X0030C0	7.5	275	1	2	- 16	+ 8	+ 12
15	C	109D156X0030C0	8	175	1	2	- 20	+ 10.5	+ 12
40	F	109D406X0030F0	4	65	1	5	- 24	+ 10.5	+ 12
68	F	109D686X0030F0	6	60	1	8	- 24	+ 13	+ 15
100	T	109D107X0030T0	6	40	2	12	- 28	+ 10.5	+ 12
150	T	109D157X0030T0	4.1	35	2	18	- 48	+ 13	+ 15
300	K	109D307X0030K0	1.6	25	8	32	- 60	+ 25	+ 25

\* Part Numbers shown are for units with  $\pm$  20 % capacitance tolerance and uninsulated capacitors. For  $\pm$  10 % units, change the digit following the letter "X" from "0" to "9". For units with outer plastic-film insulation, substitute "2" for "0" at the end of the Part Number. For RoHS compliant add "E3."

Wet Tantalum Capacitors Sintered Anode  
TANTALEX® Capacitors For Operation to + 125 °C,  
Elastomer-Sealed



<b>STANDARD RATINGS</b>									
CAPACITANCE ( $\mu$ F)	CASE CODE	PART NUMBER*	Max. ESR	Max. IMP.	Max. DCL ( $\mu$ A)		Max. CAPACITANCE CHANGE (%)		
			at + 25 °C 120 Hz (Ohms)	at - 55 °C 120 Hz (Ohms)	at		at		
					+ 25 °C	+ 85 °C + 125 °C	+ 55 °C	+ 85 °C	+ 125 °C
<b>50 WVDC at + 85 °C . . . 30 WVDC at + 125 °C</b>									
4.5	C	109D455X0050C0	9	400	1	2	- 16	+ 5	+ 6
5	C	109D505X0050C0	9	400	1	2	- 16	+ 5	+ 6
10	C	109D106X0050C0	8	250	1	2	- 24	+ 8	+ 9
22	F	109D226X0050F0	7	95	1	4	- 20	+ 10.5	+ 12
25	F	109D256X0050F0	6	95	1	5	- 20	+ 10.5	+ 12
47	F	109D476X0050F0	6	70	1	9	- 28	+ 13	+ 15
60	T	109D606X0050T0	3	45	2	12	- 16	+ 10.5	+ 12
82	T	109D826X0050T0	4	45	2	16	- 32	+ 13	+ 15
160	K	109D167X0050K0	2.2	27	8	32	- 50	+ 25	+ 25
<b>60 WVDC at + 85 °C . . . 40 WVDC at + 125 °C</b>									
4	C	109D405X0060C0	10	550	1	2	- 16	+ 5	+ 6
8.2	C	109D825X0060C0	8	275	1	2	- 24	+ 8	+ 9
20	F	109D206X0060F0	5	105	1	5	- 16	+ 10.5	+ 12
39	F	109D396X0060F0	7	90	1	9	- 28	+ 10.5	+ 12
50	T	109D506X0060T0	4	50	2	12	- 16	+ 10.5	+ 12
68	T	109D686X0060T0	6	50	2	16	- 32	+ 10.5	+ 12
140	K	109D147X0060K0	2.4	28	8	32	- 40	+ 20	+ 20
<b>75 WVDC at + 85 °C . . . 50 WVDC at + 125 °C</b>									
3.5	C	109D355X0075C0	10	650	1	2	- 16	+ 5	+ 6
6.8	C	109D685X0075C0	8	300	1	2	- 20	+ 8	+ 9
13	F	109D136X0075F0	6	160	1	4	- 16	+ 8	+ 9
15	F	109D156X0075F0	6.5	150	1	5	- 16	+ 8	+ 9
33	F	109D336X0075F0	7	90	1	10	- 24	+ 10.5	+ 15
40	T	109D406X0075T0	5	60	2	12	- 16	+ 10.5	+ 12
56	T	109D566X0075T0	6	60	2	17	- 28	+ 10.5	+ 15
110	K	109D117X0075K0	3.1	29	9	36	- 35	+ 20	+ 20
<b>100 WVDC at + 85 °C . . . 65 WVDC at + 125 °C</b>									
2.5	C	109D255X0100C0	26.5	950	1	2	- 16	+ 7	+ 8
4.7	C	109D475X0100C0	10	500	1	2	- 16	+ 7	+ 8
10	F	109D106X0100F0	6	215	1	4	- 16	+ 7	+ 8
11	F	109D116X0100F0	6	200	1	4	- 16	+ 7	+ 8
22	F	109D226X0100F0	7	100	1	9	- 16	+ 7	+ 8
30	T	109D306X0100T0	4	80	2	12	- 16	+ 7	+ 8
43	T	109D436X0100T0	6	70	2	17	- 20	+ 7	+ 8
<b>125 WVDC at + 85 °C . . . 85 WVDC at + 125 °C</b>									
1.7	C	109D175X0125C0	54.6	1250	1	2	- 16	+ 7	+ 8
3.6	C	109D365X0125C0	15	600	1	2	- 16	+ 7	+ 8
9	F	109D905X0125F0	15	240	1	5	- 16	+ 7	+ 8
14	F	109D146X0125F0	12	167	1	7	- 16	+ 7	+ 8
25	T	109D256X0125T0	10	93	2	13	- 16	+ 7	+ 8

\* Part Numbers shown are for units with  $\pm 20\%$  capacitance tolerance and uninsulated capacitors. For  $\pm 10\%$  units, change the digit following the letter "X" from "0" to "9". For units with outer plastic-film insulation, substitute "2" for "0" at the end of the Part Number. For RoHS compliant add "E3".



Wet Tantalum Capacitors Sintered Anode  
**TANTALEX<sup>®</sup>** Capacitors For Operation to + 125 °C,  
 Elastomer-Sealed

<b>STANDARD RATINGS</b>									
CAPACITANCE ( $\mu$ F)	CASE CODE	PART NUMBER*	Max. ESR	Max. IMP.	Max. DCL ( $\mu$ A)		Max. CAPACITANCE CHANGE (%)		
			at + 25 °C 120 Hz (Ohms)	at - 55 °C 120 Hz (Ohms)	at		at		
					+ 25 °C	+ 85 °C + 125 °C	+ 55 °C	+ 85 °C	+ 125 °C
<b>6 WVDC at + 85 °C . . . 4 WVDC at + 125 °C</b>									
820	F	109D827X0006F0	2.5	18	3	14	- 88	+ 16	+ 20
1500	T	109D158X0006T0	1.5	18	5	20	- 90	+ 20	+ 25
2200	K	109D228X0006K0	1	13	6	24	- 90	+ 25	+ 30
<b>8 WVDC at + 85 °C . . . 5 WVDC at + 125 °C</b>									
680	F	109D687X0008F0	2.5	22	3	14	- 83	+ 16	+ 20
<b>10 WVDC at + 85 °C . . . 7 WVDC at + 125 °C</b>									
120	C	109D127X0010C0	4	60	2	9	- 45	+ 13	+ 16
150	C	109D157X0010C0	3	54	2	9	- 55	+ 13	+ 16
470	F	109D477X0010F0	2.5	30	3	16	- 65	+ 16	+ 20
560	F	109D567X0010F0	2.5	27	3	16	- 77	+ 16	+ 20
1000	T	109D108X0010T0	1.5	20	5	20	- 75	+ 20	+ 25
1200	T	109D128X0010T0	1.5	18	5	20	- 88	+ 20	+ 25
1200	K	109D128X0010K0	1	18	7	25	- 75	+ 30	+ 30
1500	K	109D158X0010K0	1	15	7	25	- 88	+ 25	+ 30
<b>15 WVDC at + 85 °C . . . 10 WVDC at + 125 °C</b>									
82	C	109D826X0015C0	4	80	2	9	- 38	+ 13	+ 16
100	C	109D107X0015C0	4	72	2	9	- 44	+ 13	+ 16
330	F	109D337X0015F0	2.5	35	3	16	- 60	+ 16	+ 20
390	F	109D397X0015F0	2.5	31	3	16	- 66	+ 16	+ 20
820	T	109D827X0015T0	1.8	22	6	24	- 77	+ 20	+ 25
820	K	109D827X0015K0	1.2	20	8	32	- 70	+ 30	+ 30
1000	K	109D108X0015K0	1.2	17	8	32	- 77	+ 25	+ 30
<b>25 WVDC at + 85 °C . . . 15 WVDC at + 125 °C</b>									
68	C	109D686X0025C0	4.3	90	2	9	- 40	+ 12	+ 15
270	F	109D277X0025F0	2.7	33	3	16	- 62	+ 13	+ 16
560	T	109D567X0025T0	1.8	24	7	28	- 72	+ 20	+ 25
680	K	109D687X0025K0	1.2	19	8	32	- 72	+ 25	+ 30
<b>30 WVDC at + 85 °C . . . 20 WVDC at + 125 °C</b>									
39	C	109D396X0030C0	5.2	110	2	- 28	+ 10	+ 12	
47	C	109D476X0030C0	5.2	100	2	9	- 30	+ 10	+ 12
56	C	109D566X0030C0	5.2	100	2	9	- 38	+ 12	+ 15
150	F	109D157X0030F0	2.5	40	3	9	- 40	+ 12	+ 15
180	F	109D187X0030F0	2.5	40	3	16	- 45	+ 13	+ 16
220	F	109D227X0030F0	2.5	36	3	16	- 60	+ 13	+ 16
330	T	109D337X0030T0	1.8	28	8	16	- 45	+ 20	+ 25
390	T	109D397X0030T0	1.8	28	8	32	- 50	+ 20	+ 25
470	T	109D477X0030T0	1.8	25	8	32	- 65	+ 20	+ 25
560	K	109D567X0030K0	1.3	20	9	32	- 65	+ 25	+ 30

\* Part Numbers shown are for units with  $\pm$  20 % capacitance tolerance and uninsulated capacitors. For  $\pm$  10 % units, change the digit following the letter "X" from "0" to "9". For units with outer plastic-film insulation, substitute "2" for "0" at the end of the Part Number. For RoHS compliant add "E3".

Wet Tantalum Capacitors Sintered Anode  
TANTALEX® Capacitors For Operation to + 125 °C,  
Elastomer-Sealed



<b>STANDARD RATINGS</b>									
CAPACITANCE ( $\mu$ F)	CASE CODE	PART NUMBER*	Max. ESR	Max. IMP.	Max. DCL ( $\mu$ A)		Max. CAPACITANCE CHANGE (%)		
			at + 25 °C 120 Hz (Ohms)	at - 55 °C 120 Hz (Ohms)	at		at		
					+ 25 °C	+ 85 °C + 125 °C	+ 55 °C	+ 85 °C	+ 125 °C
<b>50 WVDC at + 85 °C . . . 30 WVDC at + 125 °C</b>									
33	C	109D336X0050C0	5	135	2	9	- 29	+ 10	+ 12
120	F	109D127X0050F0	2.5	49	4	24	- 42	+ 12	+ 15
270	T	109D277X0050T0	1.8	29	8	32	- 46	+ 20	+ 25
330	K	109D337X0050K0	1.5	22	9	36	- 46	+ 25	+ 30
<b>60 WVDC at + 85 °C . . . 40 WVDC at + 125 °C</b>									
27	C	109D276X0060C0	5	144	3	12	- 24	+ 10	+ 12
68	F	109D686X0060F0	3	60	3	20	- 30	+ 12	+ 15
100	F	109D107X0060F0	2.5	54	4	20	- 36	+ 12	+ 15
140	T	109D147X0060T0	2	32	8	32	- 30	+ 16	+ 20
220	T	109D227X0060T0	1.8	29	8	32	- 40	+ 16	+ 20
270	K	109D277X0060K0	1.5	23	9	36	- 45	+ 20	+ 25
<b>75 WVDC at + 85 °C . . . 50 WVDC at + 125 °C</b>									
12	C	109D126X0075C0	5	175	2	12	- 12	+ 8	+ 10
15	C	109D156X0075C0	5	160	2	12	- 14	+ 10	+ 12
22	C	109D226X0075C0	5	157	3	12	- 19	+ 10	+ 12
47	F	109D476X0075F0	3	75	4	24	- 18	+ 10	+ 12
56	F	109D566X0075F0	3	70	4	24	- 20	+ 12	+ 15
82	F	109D826X0075F0	2.5	63	4	24	- 30	+ 12	+ 15
110	T	109D117X0075T0	2	33	9	36	- 25	+ 16	+ 20
180	T	109D187X0075T0	1.8	30	9	36	- 35	+ 16	+ 20
220	K	109D227X0075K0	2.2	24	10	40	- 40	+ 20	+ 25
<b>100 WVDC at + 85 °C . . . 65 WVDC at + 125 °C</b>									
8.2	C	109D825X0100C0	6	250	3	12	- 12	+ 12	+ 12
10	C	109D106X0100C0	6	200	3	12	- 17	+ 10	+ 12
33	F	109D336X0100F0	3.5	85	4	24	- 18	+ 15	+ 15
39	F	109D396X0100F0	3.5	80	5	24	- 20	+ 12	+ 15
56	T	109D566X0100T0	2.2	45	9	36	- 20	+ 15	+ 15
68	T	109D686X0100T0	2.2	40	10	40	- 30	+ 14	+ 16
86	K	109D866X0100K0	3.2	30	10	40	- 25	+ 15	+ 15
<b>125 WVDC at + 85 °C . . . 85 WVDC at + 125 °C</b>									
6.8	C	109D685X0125C0	11.7	300	3	12	- 14	+ 10	+ 12
27	F	109D276X0125F0	3.5	90	5	24	- 18	+ 12	+ 15
47	T	109D476X0125T0	2.2	50	10	40	- 26	+ 14	+ 16
56	K	109D566X0125K0	4.1	32	10	40	- 25	+ 15	+ 15

\* Part Numbers shown are for units with  $\pm$  20 % capacitance tolerance and uninsulated capacitors. For  $\pm$  10 % units, change the digit following the letter "X" from "0" to "9". For units with outer plastic-film insulation, substitute "2" for "0" at the end of the Part Number. For RoHS compliant add "E3".



## Notice

Specifications of the products displayed herein are subject to change without notice. Vishay Intertechnology, Inc., or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies.

Information contained herein is intended to provide a product description only. No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document. Except as provided in Vishay's terms and conditions of sale for such products, Vishay assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of Vishay products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright, or other intellectual property right.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Vishay for any damages resulting from such improper use or sale.