

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.
- Compliant to RoHS directive 2002/95/EC



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 h 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.

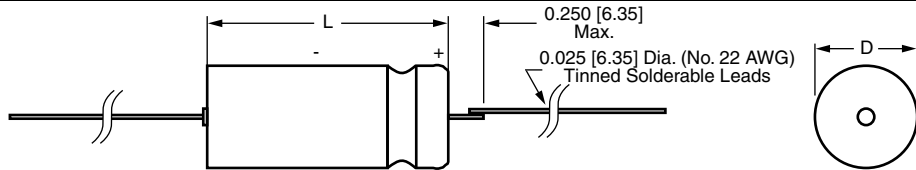
ORDERING INFORMATION

109D	207	X0	006	C	0	E3
MODEL	CAPACITANCE	CAPACITANCE TOLERANCE	DC VOLTAGE RATING AT + 85 °C	CASE CODE	STYLE NUMBER	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 V)	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)

Note

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 ⁽¹⁾	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]

Note

⁽¹⁾ 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

STANDARD RATINGS									
CAPACITANCE (μ F)	CASE CODE	PART NUMBER (1)	MAX. ESR	MAX. IMP.	MAX. DCL (μ A)		MAX. CAPACITANCE CHANGE (%)		
			at + 25 °C 120 Hz (Ω)	at - 55 °C 120 Hz (Ω)	at		at		
					+ 25 °C	+ 85 °C + 125 °C	- 55 °C	+ 85 °C	+ 125 °C
6 WVDC at + 85 °C . . . 4 WVDC at + 125 °C									
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
8 WVDC at + 85 °C . . . 5 WVDC at + 125 °C									
22	C	109D226X0008C0	6	115	1	2	-40	+ 10.5	+ 12
220	F	109D227X0008F0	4	30	1	7	- 44	+ 17.5	+ 20
10 WVDC at + 85 °C . . . 7 WVDC at + 125 °C									
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
15 WVDC at + 85 °C . . . 10 WVDC at + 125 °C									
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
25 WVDC at + 85 °C . . . 15 WVDC at + 125 °C									
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
30 WVDC at + 85 °C . . . 20 WVDC at + 125 °C									
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

Note

(1) 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".



STANDARD RATINGS									
CAPACITANCE (μ F)	CASE CODE	PART NUMBER ⁽¹⁾	MAX. ESR	MAX. IMP.	MAX. DCL (μ A)		MAX. CAPACITANCE CHANGE (%)		
			at +25 °C 120 Hz (Ω)	at -55 °C 120 Hz (Ω)	at		at		
			+25 °C	+85 °C +125 °C	+25 °C	+85 °C	-55 °C	+85 °C	+125 °C
50 WVDC at +85 °C . . . 30 WVDC at +125 °C									
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
60 WVDC at +85 °C . . . 40 WVDC at +125 °C									
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
75 WVDC at +85 °C . . . 50 WVDC at +125 °C									
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
100 WVDC at +85 °C . . . 65 WVDC at +125 °C									
2.5	C	109D255X0100C0	26.5	950	1	2	-16	+7	+8
3.0	C	109D305X0100C0	10	800	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
125 WVDC at +85 °C . . . 85 WVDC at +125 °C									
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

Note

⁽¹⁾ 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

EXTENDED RATINGS									
CAPACITANCE (µF)	CASE CODE	PART NUMBER (1)	MAX. ESR	MAX. IMP.	MAX. DCL (µA)		MAX. CAPACITANCE CHANGE (%)		
			at +25 °C 120 Hz (Ω)	at -55 °C 120 Hz (Ω)	at		at		
					+25 °C	+85 °C +125 °C	-55 °C	+85 °C	+125 °C
6 WVDC at +85 °C . . . 4 WVDC at +125 °C									
140	C	109D147X0006C2	3	54	2	9	-45	+13	+16
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
8 WVDC at +85 °C . . . 5 WVDC at +125 °C									
680	F	109D687X0008F0	2.5	22	3	14	-83	+16	+20
10 WVDC at +85 °C . . . 7 WVDC at +125 °C									
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
15 WVDC at +85 °C . . . 10 WVDC at +125 °C									
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
510	T	109D517X0015T0	1.8	25	6	24	-65	+20	+25
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
25 WVDC at +85 °C . . . 15 WVDC at +125 °C									
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
750	K	109D757X0025K2	1.0	18	8	29	-60	+25	+25
30 WVDC at +85 °C . . . 20 WVDC at +125 °C									
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

Note

(1) Part Numbers shown are for units with ± 20 % capacitance tolerance and uninsulated capacitors. For ± 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".

EXTENDED RATINGS									
CAPACITANCE (μ F)	CASE CODE	PART NUMBER ⁽¹⁾	MAX. ESR	MAX. IMP.	MAX. DCL (μ A)		MAX. CAPACITANCE CHANGE (%)		
			at + 25 °C 120 Hz (Ω)	at - 55 °C 120 Hz (Ω)	at + 25 °C	+ 85 °C + 125 °C	- 55 °C	+ 85 °C	+ 125 °C
50 WVDC at + 85 °C . . . 30 WVDC at + 125 °C									
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
60 WVDC at + 85 °C . . . 40 WVDC at + 125 °C									
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
75 WVDC at + 85 °C . . . 50 WVDC at + 125 °C									
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
270	K	109D277X0075K2	1.3	24	10	40	- 40	+ 20	+ 25
100 WVDC at + 85 °C . . . 65 WVDC at + 125 °C									
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
125 WVDC at + 85 °C . . . 85 WVDC at + 125 °C									
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

Note

⁽¹⁾ Part Numbers shown are for units with ± 20 % capacitance tolerance and uninsulated capacitors. For ± 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".



Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.