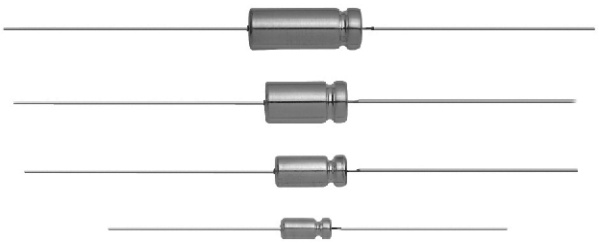
Wet Tantalum Capacitors Sintered Anode TANTALEX® Capacitors for Operation to +125 °C, Elastomer-Sealed



FEATURES

- Axial through-hole 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.
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free Available

RoHS* Available

HALOGEN FREE GREEN (5-2008) Available

Note

* This datasheet provides information about parts that are RoHS-compliant and / or parts that are non-RoHS-compliant. For example, parts with lead (Pb) terminations are not RoHS-compliant. Please see the information / tables in this datasheet for details.

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 V_{DC} and below, change in capacitance shall not exceed + 10 %, - 25 % from the initial measurement.

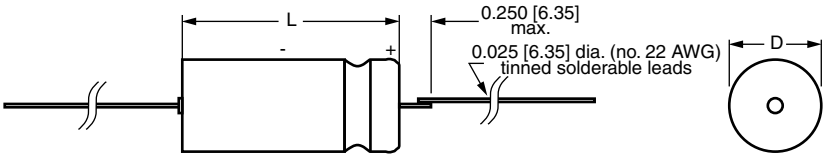
ORDERING INFORMATION

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 available 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

RATINGS AND CASE CODES (Standard)

µF	6 V	8 V	10 V	15 V	20 V	25 V	30 V	35 V	50 V	60 V	75 V	100 V	125 V
1.7													C
2.5												C	
3.0												C	
3.5											C		
3.6													C
4.0										C			
4.5									C				
4.7												C	
5.0									C				
6.8											C		
7.0							C						
8.0							C						
8.2										C			
9.0													F
10						C			C			F	
11												F	
13											F		
14													F
15				C			C				F		
18													T
20			C							F			
22		C				C			F			F	
25		C							F				T
27					C	C							
30	C											T	
33				C							F		
39										F			
40							F				T		
43												T	
47			C						F				
50						F				T			
56		C									T		K
60									T				

RATINGS AND CASE CODES (Standard)

µF	6 V	8 V	10 V	15 V	20 V	25 V	30 V	35 V	50 V	60 V	75 V	100 V	125 V
68	C						F	F		T			
70				F									
82									T				
86												K	
100			F			F / T	T						
110											K		
120				F				T					
140	F									K			
150							T						
160									K				
170				T									
180			F			T							
220		F			T								
250			T										
270	F			T				K					
290	T	T											
300							K						
330	T												
350						K							
390			T										
430		T											
540				K									
560	T												
750			K										
850		K											
1200	K												

RATINGS AND CASE CODES (Extended)

µF	6 V	8 V	10 V	15 V	20 V	25 V	30 V	35 V	50 V	60 V	75 V	100 V	125 V
2.0												C	
6.8													C
8.2												C	
10												C	
12											C		
15											C		
18										C			
22									C		C		
27										C			F
33								C	C			F	
39							C					F	T
47						C	C	C			F		T
56					C		C				F	T	K
68				C		C				F		T	
82				C	C				F		F		K
86												K	
100			C	C						F			
110											T		
120			C					F	F			K	
140	C									T			
150			C				F						
160									T				

RATINGS AND CASE CODES (Extended)

µF	6 V	8 V	10 V	15 V	20 V	25 V	30 V	35 V	50 V	60 V	75 V	100 V	125 V
180		C				F	F				T		
200											T		
220					F		F	T		T	K		
250									T				
270				F		F			T	K	K		
330				F	F		T		K				
350						T							
390			F	F			T	T					
470		F	F				T	K					
510				T									
540				T									
560			F			T	K						
680		F				K							
750						K							
820	F			T / K									
1000			T	K									
1200			T / K										
1500	T		K										
1800		K											
2200	K												

STANDARD RATINGS

CAPACITANCE (µF)	CASE CODE	PART NUMBER [1]	MAX. ESR AT +25 °C 120 Hz (Ω)	MAX. IMP. AT -55 °C 120 Hz (Ω)	MAX. DCL (µA) AT		MAX. CAPACITANCE CHANGE (%) AT			MAX. RMS RIPPLE CURRENT 120 Hz (mA)
					+25 °C	+85 °C +125 °C	-55 °C	+85 °C	+125 °C	
6 V_{DC} AT +85 °C; 7 V_{DC} AT +125 °C										
30	C	109D306X0006C0	4.2	100	1.0	2.0	-40	+10.5	+12	140
68	C	109D686X0006C0	4.0	60	1.0	2.0	-40	+14	+16	160
140	F	109D147X0006F0	2.0	40	1.0	3.0	-40	+14	+16	330
270	F	109D277X0006F0	4.0	25	1.0	7.0	-44	+17.5	+20	270
290	T	109D297X0006T0	2.0	24	2.0	7.0	-70	+20	+20	410
330	T	109D337X0006T0	2.1	20	2.0	7.9	-44	+14	+16	410
560	T	109D567X0006T0	3.0	25	2.0	13	-64	+17.5	+20	340
1200	K	109D128X0006K0	1.6	20	3.0	14	-80	+25	+25	530
8 V_{DC} AT +85 °C; 5 V_{DC} AT +125 °C										
22	C	109D226X0008C0	6.0	115	1.0	2.0	-40	+10.5	+12	130
25	C	109D256X0008C0	4.2	100	1.0	2.0	-40	+10.5	+12	140
56	C	109D566X0008C0	4.0	59	1.0	2.0	-40	+14	+16	160
220	F	109D227X0008F0	4.0	30	1.0	7.0	-44	+17.5	+20	270
290	T	109D297X0008T0	2.0	24	2.0	9.5	-70	+20	+20	410
430	T	109D437X0008T0	3.2	25	2.0	14	-64	+17.5	+20	410
850	K	109D857X0008K0	1.0	22	4.0	16	-80	+25	+25	670
10 V_{DC} AT +85 °C; 7 V_{DC} AT +125 °C										
20	C	109D206X0010C0	5.0	175	1.0	2.0	-32	+10.5	+12	140
47	C	109D476X0010C0	5.0	100	1.0	2.0	-36	+14	+16	160
100	F	109D107X0010F0	2.1	60	1.0	4.0	-36	+14	+16	270
180	F	109D187X0010F0	4.0	40	1.0	7.0	-36	+14	+16	270
250	T	109D257X0010T0	2.0	30	2.0	10	-40	+14	+16	410
390	T	109D397X0010T0	3.0	25	2.0	16	-64	+17.5	+20	340
750	K	109D757X0010T0	1.0	23	4.0	16	-80	+25	+25	670

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".

STANDARD RATINGS

CAPACITANCE (µF)	CASE CODE	PART NUMBER [1]	MAX. ESR AT +25 °C 120 Hz (Ω)	MAX. IMP. AT -55 °C 120 Hz (Ω)	MAX. DCL (µA) AT		MAX. CAPACITANCE CHANGE (%) AT			MAX. RMS RIPPLE CURRENT 120 Hz (mA)
					+25 °C	+85 °C +125 °C	-55 °C	+85 °C	+125 °C	
15 V_{DC} AT +85 °C; 10 V_{DC} AT +125 °C										
15	C	109D156X0015C0	6.0	155	1.0	2.0	-24	+10.5	+12	130
33	C	109D336X0015C0	5.0	90	1.0	2.0	-28	+14	+16	160
70	F	109D706X0015F0	3.6	75	1.0	4.0	-28	+14	+16	270
120	F	109D127X0015F0	4.0	50	1.0	7.0	-28	+17.5	+20	270
270	T	109D277X0015T0	3.0	30	2.0	16	-56	+17.5	+20	340
540	K	109D547X0015K0	1.2	23	6.0	24	-80	+25	+25	610
20 V_{DC} AT +85 °C; 13 V_{DC} AT +125 °C										
27	C	109D276X0020C0	5.0	100	1.0	2.0	-20	+11	+14	160
220	T	109D227X0020T0	4.0	3	2.0	16	-48	+13	+15	410
25 V_{DC} AT +85 °C; 15 V_{DC} AT +125 °C										
10	C	109D106X0025C0	6.0	220	1.0	2.0	-16	+8	+9	130
22	C	109D226X0025C0	5.0	140	1.0	3.0	-20	+10.5	+12	160
50	F	109D506X0025F0	4.0	70	1.0	5.0	-28	+13	+15	270
100	F	109D107X0025F0	4.0	50	1.0	10	-28	+13	+15	270
100	T	109D107X0025T0	4.0	45	2.0	10	-48	+13	+15	410
180	T	109D187X0025T0	4.0	32	2.0	18	-48	+13	+15	340
350	K	109D357X0025K0	1.3	24	7.0	28	-70	+25	+25	580
30 V_{DC} AT +85 °C; 20 V_{DC} AT +125 °C										
7.0	C	109D705X0030C0	8.0	275	1.0	2.0	-16	+8	+12	110
8.0	C	109D805X0030C0	7.5	275	1.0	2.0	-16	+8	+12	130
15	C	109D156X0030C0	8.0	175	1.0	2.0	-20	+10.5	+12	160
40	F	109D406X0030F0	4.0	65	1.0	5.0	-24	+10.5	+12	270
68	F	109D686X0030F0	6.0	60	1.0	8.0	-24	+13	+15	270
100	T	109D107X0030T0	6.0	40	2.0	12	-28	+10.5	+12	410
150	T	109D157X0030T0	4.1	35	2.0	18	-48	+13	+15	340
300	K	109D307X0030K0	1.6	25	8.0	32	-60	+25	+25	550
35 V_{DC} AT +85 °C; 22 V_{DC} AT +125 °C										
68	F	109D686X0035F0	6.0	60	1.0	8	-24	+12	+15	270
120	T	109D127X0035T0	4.0	38	2.0	16	-30	+13	+15	410
270	K	109D277X0035K0	2.2	23	8.0	32	-45	+20	+25	500
50 V_{DC} AT +85 °C; 30 V_{DC} AT +125 °C										
4.5	C	109D455X0050C0	9.0	400	1.0	2.0	-16	+5	+6	110
5.0	C	109D505X0050C0	9.0	400	1.0	2.0	-16	+5	+6	130
10	C	109D106X0050C0	8.0	250	1.0	2.0	-24	+8	+9	160
22	F	109D226X0050F0	7.0	95	1.0	4.0	-20	+10.5	+12	230
25	F	109D256X0050F0	6.0	95	1.0	5.0	-20	+10.5	+12	270
47	F	109D476X0050F0	6.0	70	1.0	9.0	-28	+13	+15	270
60	T	109D606X0050T0	3.0	45	2.0	12	-16	+10.5	+12	410
82	T	109D826X0050T0	4.0	45	2.0	16	-32	+13	+15	340
160	K	109D167X0050K0	2.2	27	8.0	32	-50	+25	+25	460

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“.

STANDARD RATINGS

CAPACITANCE (µF)	CASE CODE	PART NUMBER [1]	MAX. ESR AT +25 °C 120 Hz (Ω)	MAX. IMP. AT -55 °C 120 Hz (Ω)	MAX. DCL (µA) AT		MAX. CAPACITANCE CHANGE (%) AT			MAX. RMS RIPPLE CURRENT 120 Hz (mA)
					+25 °C	+85 °C +125 °C	-55 °C	+85 °C	+125 °C	
60 V_{DC} AT +85 °C; 40 V_{DC} AT +125 °C										
4.0	C	109D405X0060C0	10.0	550	1.0	2.0	-16	+5	+6	110
8.2	C	109D825X0060C0	8.0	275	1.0	2.0	-24	+8	+9	140
20	F	109D206X0060F0	5.0	105	1.0	5.0	-16	+10.5	+12	270
39	F	109D396X0060F0	7.0	90	1.0	9.0	-28	+10.5	+12	230
50	T	109D506X0060T0	4.0	50	2.0	12	-16	+10.5	+12	410
68	T	109D686X0060T0	6.0	50	2.0	16	-32	+10.5	+12	340
140	K	109D147X0060K0	2.4	28	8.0	32	-40	+20	+20	430
75 V_{DC} AT +85 °C; 50 V_{DC} AT +125 °C										
3.5	C	109D355X0075C0	10.0	650	1.0	2.0	-16	+5	+6	110
6.8	C	109D685X0075C0	8.0	300	1.0	2.0	-20	+8	+9	140
13	F	109D136X0075F0	6.0	160	1.0	4.0	-16	+8	+9	190
15	F	109D156X0075F0	6.5	150	1.0	5.0	-16	+8	+9	270
33	F	109D336X0075F0	7.0	90	1.0	10	-24	+10.5	+15	230
40	T	109D406X0075T0	5.0	60	2.0	12	-16	+10.5	+12	410
56	T	109D566X0075T0	6.0	60	2.0	17	-28	+10.5	+15	300
110	K	109D117X0075K0	3.1	29	9.0	36	-35	+20	+20	400
100 V_{DC} AT +85 °C; 65 V_{DC} AT +125 °C										
2.5	C	109D255X0100C0	26.5	950	1.0	2.0	-16	+7	+8	100
3.0	C	109D305X0100C0	10.0	800	1.0	2.0	-16	+7	+8	110
4.7	C	109D475X0100C0	10.0	500	1.0	2.0	-16	+7	+8	130
10	F	109D106X0100F0	6.0	215	1.0	4.0	-16	+7	+8	190
11	F	109D116X0100F0	6.0	200	1.0	4.0	-16	+7	+8	230
22	F	109D226X0100F0	7.0	100	1.0	9.0	-16	+7	+8	230
30	T	109D306X0100T0	4.0	80	2.0	12	-16	+7	+8	340
43	T	109D436X0100T0	6.0	70	2.0	17	-20	+7	+8	300
86	K	109D866X0100K0	3.1	30	9.0	36	-25	+15	+15	400
125 V_{DC} AT +85 °C; 85 V_{DC} AT +125 °C										
1.7	C	109D175X0125C0	54.6	1250	1.0	2.0	-16	+7	+8	100
3.6	C	109D365X0125C0	15.0	600	1.0	2.0	-16	+7	+8	110
9.0	F	109D905X0125F0	15.0	240	1.0	5.0	-16	+7	+8	210
14	F	109D146X0125F0	12.0	167	1.0	7.0	-16	+7	+8	190
18	T	109D186X0125T0	11.0	129	2.0	9.0	-16	+7	+8	340
25	T	109D256X0125T0	10.0	93	2.0	13	-16	+7	+8	260
56	K	109D566X0125K0	4.1	3.2	10	40	-25	+15	+15	400

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 (µF)	CASE CODE	PART NUMBER (1)	MAX. ESR AT +25 °C 120 Hz (Ω)	MAX. IMP. AT -55 °C 120 Hz (Ω)	MAX. DCL (µA) AT		MAX. CAPACITANCE CHANGE (%) AT			MAX. RMS RIPPLE CURRENT 120 Hz (mA)
					+25 °C	+85 °C +125 °C	-55 °C	+85 °C	+125 °C	
6 V_{DC} AT +85 °C; 7 V_{DC} AT +125 °C										
140	C	109D147X0006C2	3.0	54	2.0	9.0	-45	+13	+16	160
820	F	109D827X0006F0	2.5	18	3.0	14	-88	+16	+20	300
1500	T	109D158X0006T0	1.5	18	5.0	20	-90	+20	+25	480
2200	K	109D228X0006K0	1.0	13	6.0	24	-90	+25	+30	670
8 V_{DC} AT +85 °C; 5 V_{DC} AT +125 °C										
180	C	109D187X0008C0	3.0	45	2.0	9.0	-60	+13	+16	180
470	F	109D477X0008F0	2.5	25	3.0	14	-75	+16	+20	300
680	F	109D687X0008F0	2.5	22	3.0	14	-90	+16	+20	300
1800	K	109D188X0008K0	1.0	14	7.0	25	-60	+20	+30	670
10 V_{DC} AT +85 °C; 7 V_{DC} AT +125 °C										
100	C	109D107X0010C0	3.0	60	2.0	9.0	-50	+13	+16	160
120	C	109D127X0010C0	4.0	60	2.0	9.0	-45	+13	+16	160
150	C	109D477X0010F0	3.0	54	2.0	9.0	-55	+13	+16	180
390	F	109D397X0010F0	2.5	30	3.0	16	-70	+16	+20	300
470	F	109D477X0010F0	2.5	30	3.0	16	-65	+16	+20	300
560	F	109D567X0010F0	2.5	27	3.0	16	-77	+16	+20	300
1000	T	109D108X0010T0	1.5	20	5.0	20	-75	+20	+25	480
1200	K	109D128X0010K0	1.0	18	7.0	25	-75	+30	+30	670
1200	T	109D128X0010T0	1.5	18	5.0	20	-88	+20	+25	480
1500	K	109D158X0010K0	1.0	15	7.0	25	-88	+25	+30	670
15 V_{DC} AT +85 °C; 10 V_{DC} AT +125 °C										
68	C	109D686X0015C0	4.0	80	2.0	9.0	-40	+13	+16	140
82	C	109D826X0015C0	4.0	80	2.0	9.0	-38	+13	+16	160
100	C	109D107X0015C0	4.0	72	2.0	9.0	-44	+13	+16	160
270	F	109D277X0015F0	2.5	35	3.0	16	-60	+16	+20	300
330	F	109D337X0015F0	2.5	35	3.0	16	-60	+16	+20	300
390	F	109D397X0015F0	2.5	31	3.0	16	-66	+16	+20	300
510	T	109D517X0015T0	1.8	25	6.0	24	-65	+20	+25	340
540	T	109D547X0015T0	1.8	22	6.0	24	-77	+20	+25	440
820	T	109D827X0015T0	1.8	22	6.0	24	-77	+20	+25	440
820	K	109D827X0015K0	1.2	20	8.0	32	-70	+30	+30	610
1000	K	109D108X0015K0	1.2	17	8.0	32	-77	+25	+30	610
20 V_{DC} AT +85 °C; 13 V_{DC} AT +125 °C										
56	C	109D566X0020C0	4.3	90	2.0	9.0	-38	+13	+16	140
82	C	109D826X0020C0	4.3	81	2.0	9.0	-43	+13	+16	160
220	F	109D227X0020F0	2.7	35	3.0	16	-60	+16	+20	300
330	F	109D337X0020F0	2.7	31	3.0	16	-66	+16	+20	300
25 V_{DC} AT +85 °C; 15 V_{DC} AT +125 °C										
47	C	109D476X0025C0	4.3	100	2.0	9.0	-35	+12	+15	140
68	C	109D686X0025C0	4.3	90	2.0	9.0	-40	+12	+15	160
180	F	109D187X0025F0	2.7	37	3.0	16	-55	+13	+16	300
270	F	109D277X0025F0	2.7	33	3.0	16	-62	+13	+16	300
350	T	109D357X0025T0	1.8	27	7.0	28	-60	+20	+25	440
560	T	109D567X0025T0	1.8	24	7.0	28	-72	+20	+25	440
680	K	109D687X0025K0	1.2	19	8.0	32	-72	+25	+30	610
750	K	109D757X0025K2	1.0	18	8.0	29	-60	+25	+25	610

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 (µF)	CASE CODE	PART NUMBER [1]	MAX. ESR AT +25 °C 120 Hz (Ω)	MAX. IMP. AT -55 °C 120 Hz (Ω)	MAX. DCL (µA) AT		MAX. CAPACITANCE CHANGE (%) AT			MAX. RMS RIPPLE CURRENT 120 Hz (mA)
					+25 °C	+85 °C +125 °C	-55 °C	+85 °C	+125 °C	
30 V_{DC} AT +85 °C; 20 V_{DC} AT +125 °C										
39	C	109D396X0030C0	5.2	110	2.0	9.0	-28	+10	+12	140
47	C	109D476X0030C0	5.2	100	2.0	9.0	-30	+10	+12	140
56	C	109D566X0030C0	5.2	100	2.0	9.0	-38	+12	+15	140
150	F	109D157X0030F0	2.5	40	3.0	9.0	-40	+12	+15	300
180	F	109D187X0030F0	2.5	40	3.0	16	-45	+13	+16	300
220	F	109D227X0030F0	2.5	36	3.0	16	-60	+13	+16	300
330	T	109D337X0030T0	1.8	28	8.0	16	-45	+20	+25	440
390	T	109D397X0030T0	1.8	28	8.0	32	-50	+20	+25	440
470	T	109D477X0030T0	1.8	25	8.0	32	-65	+20	+25	550
560	K	109D567X0030K0	1.3	20	9.0	32	-65	+25	+30	590
35 V_{DC} AT +85 °C; 22 V_{DC} AT +125 °C										
33	C	109D336X0035C0	5.2	130	2.0	9.0	-30	+10	+12	140
47	C	109D476X0035C0	5.2	115	2.0	9.0	-35	+10	+12	140
120	F	109D127X0035F0	2.5	45	3.0	16	-45	+13	+16	300
220	T	109D227X0035T0	1.8	30	8.0	32	-45	+20	+25	440
390	T	109D337X0035T0	1.8	27	8.0	32	-58	+20	+25	440
470	K	109D477X0035T0	1.3	21	9.0	36	-58	+25	+30	590
50 V_{DC} AT +85 °C; 30 V_{DC} AT +125 °C										
22	C	109D226X0050C0	5.0	150	2.0	9.0	-24	+10	+12	140
33	C	109D336X0050C0	5.0	135	2.0	9.0	-29	+10	+12	140
82	F	109D826X0050F0	2.5	55	4.0	24	-35	+10	+15	300
120	F	109D127X0050F0	2.5	49	4.0	24	-42	+12	+15	300
160	T	109D167X0050T0	1.8	32	6.0	32	-35	+20	+25	420
250	T	109D257X0050T0	1.8	29	8.0	32	-40	+20	+25	440
270	T	109D277X0050T0	1.8	29	8.0	32	-46	+20	+25	440
330	K	109D337X0050K0	1.5	22	9.0	36	-46	+25	+30	550
60 V_{DC} AT +85 °C; 40 V_{DC} AT +125 °C										
18	C	109D186X0060C0	5.0	160	3.0	12	-20	+10	+12	140
27	C	109D276X0060C0	5.0	144	3.0	12	-24	+10	+12	140
68	F	109D686X0060F0	3.0	60	3.0	20	-30	+12	+15	270
100	F	109D107X0060F0	2.5	54	4.0	20	-36	+12	+15	300
140	T	109D147X0060T0	2.0	32	8.0	32	-30	+16	+20	420
220	T	109D227X0060T0	1.8	29	8.0	32	-40	+16	+20	440
270	K	109D277X0060K0	1.5	23	9.0	36	-45	+20	+25	550
75 V_{DC} AT +85 °C; 50 V_{DC} AT +125 °C										
12	C	109D126X0075C0	5.0	175	2.0	12	-12	+8	+10	140
15	C	109D156X0075C0	5.0	160	2.0	12	-14	+10	+12	140
22	C	109D226X0075C0	5.0	157	3.0	12	-19	+10	+12	140
47	F	109D476X0075F0	3.0	75	4.0	24	-18	+10	+12	270
56	F	109D566X0075F0	3.0	70	4.0	24	-20	+12	+15	270
82	F	109D826X0075F0	2.5	63	4.0	24	-30	+12	+15	300
110	T	109D117X0075T0	2.0	33	9.0	36	-25	+16	+20	420
180	T	109D187X0075T0	1.8	30	9.0	36	-35	+16	+20	440
200	T	109D207X0075T0	1.8	29	8.0	32	-40	+20	+25	440
220	K	109D227X0075K0	2.2	24	10	40	-40	+20	+25	450
270	K	109D277X0075K2	1.3	24	10	40	-40	+20	+25	450

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 (µF)	CASE CODE	PART NUMBER [1]	MAX. ESR AT +25 °C 120 Hz (Ω)	MAX. IMP. AT -55 °C 120 Hz (Ω)	MAX. DCL (µA) AT		MAX. CAPACITANCE CHANGE (%) AT			MAX. RMS RIPPLE CURRENT 120 Hz (mA)
					+25 °C	+85 °C +125 °C	-55 °C	+85 °C	+125 °C	
100 V_{DC} AT +85 °C; 65 V_{DC} AT +125 °C										
2.0	C	109D205X0100C0	14.0	870	3.0	12	-20	+12	+12	100
8.2	C	109D825X0100C0	6.0	250	3.0	12	-12	+12	+12	130
10	C	109D106X0100C0	6.0	200	3.0	12	-17	+10	+12	130
33	F	109D336X0100F0	3.5	85	4.0	24	-18	+15	+15	250
39	F	109D396X0100F0	3.5	80	5.0	24	-20	+12	+15	250
56	T	109D566X0100T0	2.2	45	9.0	36	-20	+15	+15	400
68	T	109D686X0100T0	2.2	40	10	40	-30	+14	+16	400
86	K	109D866X0100K0	3.2	30	10	40	-25	+15	+15	370
120	K	109D127X0100K0	2.8	30	12	48	-35	+15	+17	440
125 V_{DC} AT +85 °C; 85 V_{DC} AT +125 °C										
6.8	C	109D685X0125C0	11.7	300	3.0	12	-14	+10	+12	130
27	F	109D276X0125F0	3.5	90	5.0	24	-18	+12	+15	250
39	T	109D396X0125T0	2.2	60	10	40	-16	+14	+16	400
47	T	109D476X0125T0	2.2	50	10	40	-26	+14	+16	400
56	K	109D566X0125K0	4.1	32	10	40	-25	+15	+15	330
82	K	109D826X0125K0	2.8	32	12	48	-30	+15	+17	440

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“.

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