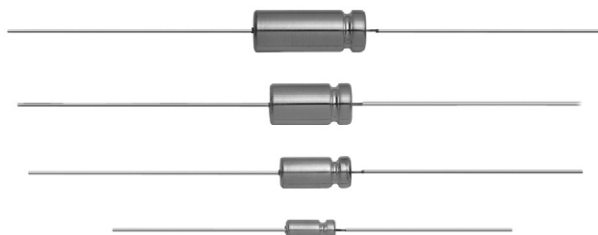


Wet Tantalum Capacitors Sintered Anode TANTALEX™ Capacitors for Operation to +125 °C, Elastomer-Sealed



LINKS TO ADDITIONAL RESOURCES



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.

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



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

Following the life test:

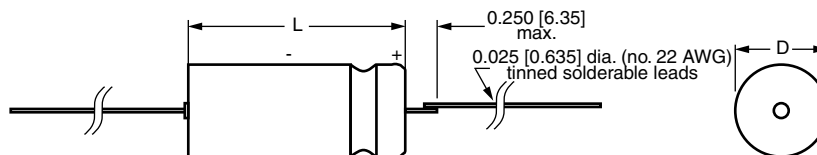
1. DCL shall not exceed the initial requirements or 1 µA, whichever is greater.
2. The ESR shall meet the initial requirement.
3. Change in capacitance shall not exceed 10 % from the initial measurement. For capacitors with voltage ratings of 15 V_{DC} and below, change in capacitance shall not exceed + 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 ⁽¹⁾	
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 ⁽²⁾	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]

Notes
⁽¹⁾ For reference only

⁽²⁾ 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	150 V
1.7													C	C
2.5												C		
3.0												C		C
3.5											C			
3.6													C	
4.0										C				
4.5									C					
4.7												C		
5.0									C					
6.8											C			F
7.0							C							
8.0							C							
8.2										C				
9.0													F	
10						C			C			F		
11												F		F
13											F			
14													F	
15				C			C				F			
18													T	
20			C							F				
22		C				C			F			F		F
25		C							F				T	
27					C	C								
30	C											T		
33				C							F			
39										F				T
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	150 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	F								
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												T	
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	MAX. IMP.	MAX. DCL		MAX. CAPACITANCE			MAX. RMS
			AT +25 °C	AT -55 °C	(μA) AT		CHANGE (%) AT			RIPPLE
			120 Hz (Ω)	120 Hz (Ω)	+25 °C	+85 °C +125 °C	-55 °C	+85 °C	+125 °C	CURRENT 120 Hz (mA)
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	109D757X0010K0	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	MAX. IMP.	MAX. DCL		MAX. CAPACITANCE			MAX. RMS
			AT +25 °C 120 Hz (Ω)	AT -55 °C 120 Hz (Ω)	(μA) AT	CHANGE (%) AT			RIPPLE CURRENT	
					+25 °C	+85 °C +125 °C	-55 °C	+85 °C	+125 °C	120 Hz (mA)
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
220	F	109D227X0025F0	2.6	36	3.2	16	-60	+13	+16	300
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 $\pm 20\%$ 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 (μF)	CASE CODE	PART NUMBER ⁽¹⁾	MAX. ESR	MAX. IMP.	MAX. DCL		MAX. CAPACITANCE			MAX. RMS
			AT +25 °C	AT -55 °C	(μA) AT	CHANGE (%) AT			RIPPLE	
			120 Hz	120 Hz	+25 °C	+85 °C	-55 °C	+85 °C	+125 °C	CURRENT
			(Ω)	(Ω)		+125 °C				120 Hz
										(mA)
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
150 V _{DC} AT +85 °C; 100 V _{DC} AT +125 °C										
1.7	C	109D175X0150C2	42	1100	1.0	3.0	-14	7	8	110
3.0	C	109D305X0150C2	15	600	1.0	3.0	-14	7	10	140
6.8	F	109D685X0150F2	15	300	2.0	10	-14	10	12	250
11	F	109D116X0150F2	12	250	2.0	10	-14	10	12	250
22	F	109D226X0150F2	4.0	100	5.0	25	-20	12	15	250
39	T	109D396X0150T2	2.2	60	10	40	-16	14	16	400

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"



EXTENDED RATINGS

CAPACITANCE (μF)	CASE CODE	PART NUMBER ⁽¹⁾	MAX. ESR	MAX. IMP.	MAX. DCL		MAX. CAPACITANCE			MAX. RMS
			AT +25 °C	AT -55 °C	(μA) AT		CHANGE (%) AT			RIPPLE
			120 Hz	120 Hz	+25 °C	+85 °C	-55 °C	+85 °C	+125 °C	CURRENT
			(Ω)	(Ω)		+125 °C				120 Hz
										(mA)
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	109D157X0010C0	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	MAX. IMP.	MAX. DCL		MAX. CAPACITANCE			MAX. RMS
			AT +25 °C 120 Hz (Ω)	AT -55 °C 120 Hz (Ω)	(μA) AT	CHANGE (%) AT			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	109D477X0035K0	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
82	T	109D826X0075T2	2.5	45	5.0	20	-25	+16	+20	400
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 $\pm 20\%$ 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"



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	T	109D866X0100T0	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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109D157X9010C2	109D157X9030F2	109D226X0100F2	109D227X0030F2	109D336X9050C2	109D337X0030T2
109D337X9050K2	109D367X9050K2	109D476X0050F2	109D476X9050F2	109D476X9075F2	109D685X9075C2
109D826X9075F2	109D106X9100C2	109D107X9015C2	109D108X9010T2	109D117X9075K2	109D158X9006T2
109D158X9010K2	109D226X9025C2	109D226X9075C2	109D336X9075F2	109D336X9100F2	109D436X0100T2
109D455X9050C2	109D476X9030C2	109D477X9030T2	109D506X9060T2	109D566X9030C2	109D567X9025T2
109D686X9025C2	109D686X9030F2	109D686X9060F2	109D687X9025K2	109D227X9060T2	109D247X9075K2
109D256X9050F2	109D277X9050T2	109D396X9100F2	109D397X9015F2	109D406X9075T2	109D477X9010F2
109D566X0125K2	109D567X9010F2	109D826X0050T2	109D107X0025F2	109D117X0075K2	109D127X0050F2
109D127X9050F2	109D156X9030C2	109D156X9075C2	109D866X9100K2	109D106X9050C2	109D107X9025F2
109D107X9060F2	109D117X9075T2	109D126X9075C2	109D127X9010C2	109D128X9010T2	109D187X9025T2
109D187X9030F2	109D187X9075T2	109D226X9100F2	109D227X9030F2	109D277X9025F2	109D337X9030T2
109D475X9100C2	109D566X9075F2	109D685X0075C2	109D827X9015T2	109D337X9015F2	109D355X0075C0
109D336X0050C2	109D307X0030K2	109D476X0010C2	109D827X9006F2	109D476X0125T2	109D686X9100T2
109D175X9125C2	109D127X9010F2	109D277X9060K0	109D157X0030F2	109D337X0050K0	109D206X0050F2
109D566X0075T2	109D306X0100T2	109D685X9125C2	109D147X0060T2	109D277X9015T2	109D560X9030K2
109D146X9125F2	109D686X0030F2	109D476X0075F0	109D106X0030F2	109D226X0075C0	109D336X0015C2
109D107X9030T2	109D167X0050K2	109D227X9050T2	109D825X0100C2		