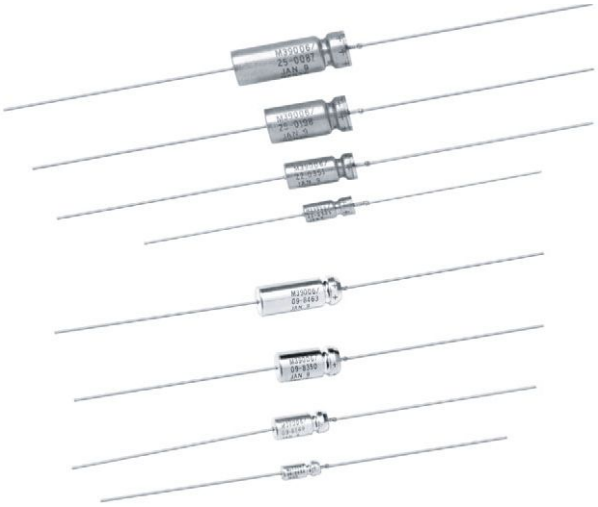
Wet Tantalum Capacitors, Space Level, Established Reliability, DLA Land and Maritime Drawings 06013, 06014, 06015, 06016



FEATURES

- Screened for space level applications
- Tantalum case, hermetically sealed, axial leaded
- Screened M39006/22/25/30/31 capacitors
  - "R" or 0.01 %/1000 h failure rate
  - "H" or high shock and vibration rated
  - Enhanced 100 % or group A testing
  - Enhanced production lot testing - group b prior to shipment
    - Stability
    - Thermal shock
    - 1000 h life at +85 °C

LINKS TO ADDITIONAL RESOURCES

3D Models

CROSS REFERENCE		
DLA LAND AND MARITIME DRAWING	**MIL SPECIFICATION**	**STYLE**
DLA 06013	M39006/22	CLR79
DLA 06014	M39006/25	CLR81
DLA 06015	M39006/30	CLR90
DLA 06016	M39006/31	CLR91

Established Reliability "Space Level" Wet Tantalum Capacitors

In accordance with the DLA land and maritime drawings, all parts are up-screened from "R" failure rate, "H" characteristic, MIL-PRF-39006/22/25/30/31 capacitors. Parts are marked with the appropriate DLA land and maritime drawing number and PIN (dash number). For information on the exact performance of these capacitors, please refer to the latest issue of the DLA land and maritime drawing and appropriate military specification.

For technical questions, contact: tantalum@vishay.com
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ORDERING INFORMATION

0601X
DLA LAND AND MARITIME DRAWING
Indicates the basic specification; in this case MIL-PRF-39006

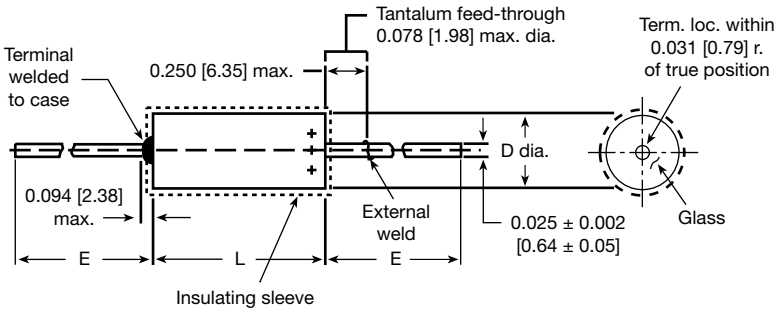
XXXXH
PIN OR DASH NUMBER
(see Standard Ratings tables)

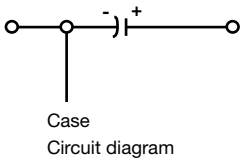
Note

- Material in this section has been abstracted from DLA 06013, DLA 06014, DLA 06015, DLA 06016

DIMENSIONS in inches [millimeters]

DLA 06013 (CLR79 style)
DLA 06014 (CLR81 style)
DLA 06015 (CLR90 style)
DLA 06016 (CLR91 style)





CASE CODE	BARE CASE		WITH INSULATING SLEEVE		E LEAD LENGTH	WEIGHT (oz./g) (Max.)
	D	L	D (Max.)	L (Max.)		
T1	0.188 ± 0.016 [4.78 ± 0.41]	0.453 + 0.031 / - 0.016 [11.51 + 0.79 / - 0.41]	0.219 [5.56]	0.515 [13.08]	1.500 ± 0.250 [38.10 ± 6.35]	0.09 [2.6]
T2	0.281 ± 0.016 [7.14 ± 0.41]	0.641 + 0.031 / - 0.016 [16.28 + 0.79 / - 0.41]	0.312 [7.92]	0.704 [17.88]	2.250 ± 0.250 [57.15 ± 6.35]	0.22 [6.2]
T3	0.375 ± 0.016 [9.53 ± 0.41]	0.766 + 0.031 / - 0.016 [19.46 + 0.79 / - 0.41]	0.406 [10.31]	0.828 [21.03]	2.250 ± 0.250 [57.15 ± 6.35]	0.41 [11.6]
T4	0.375 ± 0.016 [9.53 ± 0.41]	1.062 + 0.031 / - 0.016 [26.97 + 0.79 / - 0.41]	0.406 [10.31]	1.126 [28.60]	2.250 ± 0.250 [57.15 ± 6.35]	0.62 [17.7]

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STANDARD RATINGS: DLA 06013

CAPACITANCE (µF)	CASE CODE	CAP. TOL. (± %)	PIN FOR DLA 06013 (1)	MAX. DCL (µA) AT +25 °C	MAX. DCL (µA) AT +85 °C +125 °C	MAX. DF AT +25 °C (%)	MAX. IMP. AT -55 °C (Ω)	MAX. CAPACITANCE CHANGE (%) AT -55 °C	MAX. CAPACITANCE CHANGE (%) AT +85 °C	MAX. CAPACITANCE CHANGE (%) AT +125 °C	MAX. RIPPLE CURRENT AT +85 °C 40 kHz (mA) (2)
6 V_{DC} AT +85 °C; 4 V_{DC} AT +125 °C											
30	T1	20	0441H	1.0	2.0	9	100	-40	+10.5	+12	820
30	T1	10	0442H	1.0	2.0	9	100	-40	+10.5	+12	820
30	T1	5	0443H	1.0	2.0	9	100	-40	+10.5	+12	820
68	T1	20	0444H	1.0	2.0	15	60	-40	+14	+16	960
68	T1	10	0445H	1.0	2.0	15	60	-40	+14	+16	960
68	T1	5	0446H	1.0	2.0	15	60	-40	+14	+16	960
140	T2	20	0447H	1.0	3.0	21	40	-40	+14	+16	1200
140	T2	10	0448H	1.0	3.0	21	40	-40	+14	+16	1200
140	T2	5	0449H	1.0	3.0	21	40	-40	+14	+16	1200
270	T2	20	0450H	1.0	6.5	45	25	-44	+17.5	+20	1375
270	T2	10	0451H	1.0	6.5	45	25	-44	+17.5	+20	1375
270	T2	5	0452H	1.0	6.5	45	25	-44	+17.5	+20	1375
330	T3	20	0453H	2.0	7.9	36	20	-44	+14	+16	1800
330	T3	10	0454H	2.0	7.9	36	20	-44	+14	+16	1800
330	T3	5	0455H	2.0	7.9	36	20	-44	+14	+16	1800
560	T3	20	0456H	2.0	13.0	55	25	-64	+17.5	+20	1900
560	T3	10	0457H	2.0	13.0	55	25	-64	+17.5	+20	1900
560	T3	5	0458H	2.0	13.0	55	25	-64	+17.5	+20	1900
1200	T4	20	0459H	3.0	14.0	90	20	-80	+25	+25	2265
1200	T4	10	0460H	3.0	14.0	90	20	-80	+25	+25	2265
8 V_{DC} AT +85 °C; 5 V_{DC} AT +125 °C											
25	T1	20	0461H	1.0	2.0	7.5	100	-40	+10.5	+12	820
25	T1	10	0462H	1.0	2.0	7.5	100	-40	+10.5	+12	820
25	T1	5	0463H	1.0	2.0	7.5	100	-40	+10.5	+12	820
56	T1	20	0464H	1.0	2.0	14	59	-40	+14	+16	900
56	T1	10	0465H	1.0	2.0	14	59	-40	+14	+16	900
56	T1	5	0466H	1.0	2.0	14	59	-40	+14	+16	900
120	T2	20	0467H	1.0	2.0	20	50	-44	+17.5	+20	1220
120	T2	10	0468H	1.0	2.0	20	50	-44	+17.5	+20	1220
120	T2	5	0469H	1.0	2.0	20	50	-44	+17.5	+20	1220
220	T2	20	0470H	1.0	7.0	37	30	-44	+17.5	+20	1370
220	T2	10	0471H	1.0	7.0	37	30	-44	+17.5	+20	1370
220	T2	5	0472H	1.0	7.0	37	30	-44	+17.5	+20	1370
290	T3	20	0473H	2.0	6.0	34	25	-64	+17.5	+20	1770
290	T3	10	0474H	2.0	6.0	34	25	-64	+17.5	+20	1770
290	T3	5	0475H	2.0	6.0	34	25	-64	+17.5	+20	1770
430	T3	20	0476H	2.0	14.0	46	25	-64	+17.5	+20	1825
430	T3	10	0477H	2.0	14.0	46	25	-64	+17.5	+20	1825
430	T3	5	0478H	2.0	14.0	46	25	-64	+17.5	+20	1825
850	T4	20	0479H	4.0	16.0	60	22	-80	+25	+25	2330
850	T4	10	0480H	4.0	16.0	60	22	-80	+25	+25	2330
10 V_{DC} AT+85 °C; 7 V_{DC} AT +125 °C											
20	T1	20	0481H	1.0	2.0	6	175	-32	+10.5	+12	820
20	T1	10	0482H	1.0	2.0	6	175	-32	+10.5	+12	820
20	T1	5	0483H	1.0	2.0	6	175	-32	+10.5	+12	820
47	T1	20	0484H	1.0	2.0	13	100	-36	+14	+16	855
47	T1	10	0485H	1.0	2.0	13	100	-36	+14	+16	855
47	T1	5	0486H	1.0	2.0	13	100	-36	+14	+16	855
100	T2	20	0487H	1.0	4.0	15	60	-36	+14	+16	1200
100	T2	10	0488H	1.0	4.0	15	60	-36	+14	+16	1200
100	T2	5	0489H	1.0	4.0	15	60	-36	+14	+16	1200
180	T2	20	0490H	1.0	7.0	30	40	-36	+14	+16	1365

Notes

(1) Dash number will include the letter "H" to indicate the vibration and shock requirements (i.e., 51 *g* random vibration, 80 *g* sinusoidal vibration and 500 *g* shock)

(2) For ripple current limits at various temperatures, voltages and frequencies, see Ripple Current table

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STANDARD RATINGS: DLA 06013

CAPACITANCE (µF)	CASE CODE	CAP. TOL. (± %)	PIN FOR DLA 06013 (1)	MAX. DCL (µA) AT		MAX. DF AT +25 °C (%)	MAX. IMP. AT -55 °C (Ω)	MAX. CAPACITANCE CHANGE (%) AT			MAX. RIPPLE CURRENT AT +85 °C 40 kHz (mA) (2)
				+25 °C	+85 °C +125 °C			-55 °C	+85 °C	+125 °C	
10 V_{DC} AT+85 °C; 7 V_{DC} AT +125 °C											
180	T2	10	0491H	1.0	7.0	30	40	-36	+14	+16	1365
180	T2	5	0492H	1.0	7.0	30	40	-36	+14	+16	1365
250	T3	20	0493H	2.0	10.0	30	30	-40	+14	+16	1720
250	T3	10	0494H	2.0	10.0	30	30	-40	+14	+16	1720
250	T3	5	0495H	2.0	10.0	30	30	-40	+14	+16	1720
390	T3	20	0496H	2.0	16.0	44	25	-64	+17.5	+20	1800
390	T3	10	0497H	2.0	16.0	44	25	-64	+17.5	+20	1800
390	T3	5	0498H	2.0	16.0	44	25	-64	+17.5	+20	1800
750	T4	20	0499H	4.0	16.0	50	23	-80	+25	+25	2360
750	T4	10	0500H	4.0	16.0	50	23	-80	+25	+25	2360
15 V_{DC} AT +85 °C; 10 V_{DC} AT +125 °C											
15	T1	20	0501H	1.0	2.0	5	155	-24	+10.5	+12	780
15	T1	10	0502H	1.0	2.0	5	155	-24	+10.5	+12	780
15	T1	5	0503H	1.0	2.0	5	155	-24	+10.5	+12	780
33	T1	20	0504H	1.0	2.0	10	90	-28	+14	+16	820
33	T1	10	0505H	1.0	2.0	10	90	-28	+14	+16	820
33	T1	5	0506H	1.0	2.0	10	90	-28	+14	+16	820
70	T2	20	0507H	1.0	4.0	13	75	-28	+14	+16	1150
70	T2	10	0508H	1.0	4.0	13	75	-28	+14	+16	1150
70	T2	5	0509H	1.0	4.0	13	75	-28	+14	+16	1150
120	T2	20	0510H	1.0	7.0	18	50	-28	+17.5	+20	1450
120	T2	10	0511H	1.0	7.0	18	50	-28	+17.5	+20	1450
120	T2	5	0512H	1.0	7.0	18	50	-28	+17.5	+20	1450
170	T3	20	0513H	2.0	10.0	25	35	-32	+14	+16	1480
170	T3	10	0514H	2.0	10.0	25	35	-32	+14	+16	1480
170	T3	5	0515H	2.0	10.0	25	35	-32	+14	+16	1480
270	T3	20	0516H	2.0	16.0	32	30	-56	+17.5	+20	1740
270	T3	10	0517H	2.0	16.0	32	30	-56	+17.5	+20	1740
270	T3	5	0518H	2.0	16.0	32	30	-56	+17.5	+20	1740
540	T4	20	0519H	6.0	24.0	40	23	-80	+25	+25	2330
540	T4	10	0520H	6.0	24.0	40	23	-80	+25	+25	2330
25 V_{DC} AT +85 °C; 15 V_{DC} AT +125 °C											
10	T1	20	0521H	1.0	2.0	4	220	-16	+8	+9	715
10	T1	10	0522H	1.0	2.0	4	220	-16	+8	+9	715
10	T1	5	0523H	1.0	2.0	4	220	-16	+8	+9	715
22	T1	20	0524H	1.0	2.0	6.6	140	-20	+10.5	+12	825
22	T1	10	0525H	1.0	2.0	6.6	140	-20	+10.5	+12	825
22	T1	5	0526H	1.0	2.0	6.6	140	-20	+10.5	+12	825
50	T2	20	0527H	1.0	2.0	11.0	70	-28	+13	+15	1130
50	T2	10	0528H	1.0	2.0	11.0	70	-28	+13	+15	1130
50	T2	5	0529H	1.0	2.0	11.0	70	-28	+13	+15	1130
100	T2	20	0530H	1.0	10.0	15	50	-28	+13	+15	1435
100	T2	10	0531H	1.0	10.0	15	50	-28	+13	+15	1435
100	T2	5	0532H	1.0	10.0	15	50	-28	+13	+15	1435
120	T3	20	0533H	2.0	6.0	21	38	-32	+13	+15	1450
120	T3	10	0534H	2.0	6.0	21	38	-32	+13	+15	1450
120	T3	5	0535H	2.0	6.0	21	38	-32	+13	+15	1450
180	T3	20	0536H	2.0	18.0	26	32	-48	+13	+15	1525
180	T3	10	0537H	2.0	18.0	26	32	-48	+13	+15	1525
180	T3	5	0538H	2.0	18.0	26	32	-48	+13	+15	1525
350	T4	20	0539H	7.0	28.0	35	24	-70	+25	+25	1970
350	T4	10	0540H	7.0	28.0	35	24	-70	+25	+25	1970

Notes

(1) Dash number will include the letter "H" to indicate the vibration and shock requirements (i.e., 51 *g* random vibration, 80 *g* sinusoidal vibration and 500 *g* shock)

(2) For ripple current limits at various temperatures, voltages and frequencies, see Ripple Current table

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STANDARD RATINGS: DLA 06013

CAPACITANCE (µF)	CASE CODE	CAP. TOL. (± %)	PIN FOR DLA 06013 (1)	MAX. DCL (µA) AT +25 °C	MAX. DCL (µA) AT +85 °C +125 °C	MAX. DF AT +25 °C (%)	MAX. IMP. AT -55 °C (Ω)	MAX. CAPACITANCE CHANGE (%) AT -55 °C	MAX. CAPACITANCE CHANGE (%) AT +85 °C	MAX. CAPACITANCE CHANGE (%) AT +125 °C	MAX. RIPPLE CURRENT AT +85 °C 40 kHz (mA) (2)
30 V_{DC} AT +85 °C; 20 V_{DC} AT +125 °C											
8.0	T1	20	0541H	1.0	2.0	4	275	-16	+8	+12	640
8.0	T1	10	0542H	1.0	2.0	4	275	-16	+8	+12	640
8.0	T1	5	0543H	1.0	2.0	4	275	-16	+8	+12	640
15	T1	20	0544H	1.0	2.0	5	175	-20	+10.5	+12	780
15	T1	10	0545H	1.0	2.0	5	175	-20	+10.5	+12	780
15	T1	5	0546H	1.0	2.0	5	175	-20	+10.5	+12	780
40	T2	20	0547H	1.0	5.0	10	65	-24	+10.5	+12	1120
40	T2	10	0548H	1.0	5.0	10	65	-24	+10.5	+12	1120
40	T2	5	0549H	1.0	5.0	10	65	-24	+10.5	+12	1120
68	T2	20	0550H	1.0	8.0	13	60	-24	+13	+15	1285
68	T2	10	0551H	1.0	8.0	13	60	-24	+13	+15	1285
68	T2	5	0552H	1.0	8.0	13	60	-24	+13	+15	1285
100	T3	20	0553H	2.0	12.0	17	40	-28	+10.5	+12	1450
100	T3	10	0554H	2.0	12.0	17	40	-28	+10.5	+12	1450
100	T3	5	0555H	2.0	12.0	17	40	-28	+10.5	+12	1450
150	T3	20	0556H	2.0	18.0	23	35	-48	+13	+15	1525
150	T3	10	0557H	2.0	18.0	23	35	-48	+13	+15	1525
150	T3	5	0558H	2.0	18.0	23	35	-48	+13	+15	1525
300	T4	20	0559H	8.0	32.0	31	25	-60	+25	+25	1950
300	T4	10	0560H	8.0	32.0	31	25	-60	+25	+25	1950
50 V_{DC} AT +85 °C; 30 V_{DC} AT +125 °C											
5.0	T1	20	0561H	1.0	2.0	3	400	-16	+5	+6	580
5.0	T1	10	0562H	1.0	2.0	3	400	-16	+5	+6	580
5.0	T1	5	0563H	1.0	2.0	3	400	-16	+5	+6	580
10	T1	20	0564H	1.0	2.0	4	250	-24	+8	+9	715
10	T1	10	0565H	1.0	2.0	4	250	-24	+8	+9	715
10	T1	5	0566H	1.0	2.0	4	250	-24	+8	+9	715
25	T2	20	0567H	1.0	5.0	8	95	-20	+10.5	+12	1005
25	T2	10	0568H	1.0	5.0	8	95	-20	+10.5	+12	1005
25	T2	5	0569H	1.0	5.0	8	95	-20	+10.5	+12	1005
47	T2	20	0570H	1.0	9.0	11	70	-28	+13	+15	1155
47	T2	10	0571H	1.0	9.0	11	70	-28	+13	+15	1155
47	T2	5	0572H	1.0	9.0	11	70	-28	+13	+15	1155
60	T3	20	0573H	2.0	12.0	12	45	-16	+10.5	+12	1335
60	T3	10	0574H	2.0	12.0	12	45	-16	+10.5	+12	1335
60	T3	5	0575H	2.0	12.0	12	45	-16	+10.5	+12	1335
82	T3	20	0576H	2.0	16.0	15	45	-32	+13	+15	1400
82	T3	10	0577H	2.0	16.0	15	45	-32	+13	+15	1400
82	T3	5	0578H	2.0	16.0	15	45	-32	+13	+15	1400
160	T4	20	0579H	8.0	32.0	17	27	-50	+25	+25	1900
160	T4	10	0580H	8.0	32.0	17	27	-50	+25	+25	1900
60 V_{DC} AT +85 °C; 40 V_{DC} AT +125 °C											
4.0	T1	20	0581H	1.0	2.0	2.8	550	-16	+5	+6	525
4.0	T1	10	0582H	1.0	2.0	2.8	550	-16	+5	+6	525
4.0	T1	5	0583H	1.0	2.0	2.8	550	-16	+5	+6	525
8.2	T1	20	0584H	1.0	2.0	4	275	-24	+8	+9	625
8.2	T1	10	0585H	1.0	2.0	4	275	-24	+8	+9	625
8.2	T1	5	0586H	1.0	2.0	4	275	-24	+8	+9	625
20	T2	20	0587H	1.0	5.0	7	105	-16	+10.5	+12	930
20	T2	10	0588H	1.0	5.0	7	105	-16	+10.5	+12	930
20	T2	5	0589H	1.0	5.0	7	105	-16	+10.5	+12	930
39	T2	20	0590H	1.0	9.0	10	90	-28	+10.5	+12	1110

Notes

(1) Dash number will include the letter "H" to indicate the vibration and shock requirements (i.e., 51 *g* random vibration, 80 *g* sinusoidal vibration and 500 *g* shock)

(2) For ripple current limits at various temperatures, voltages and frequencies, see Ripple Current table

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STANDARD RATINGS: DLA 06013

CAPACITANCE (µF)	CASE CODE	CAP. TOL. (± %)	PIN FOR DLA 06013 (1)	MAX. DCL (µA) AT +25 °C	MAX. DCL (µA) AT +85 °C +125 °C	MAX. DF AT +25 °C (%)	MAX. IMP. AT -55 °C (Ω)	MAX. CAPACITANCE CHANGE (%) AT -55 °C	MAX. CAPACITANCE CHANGE (%) AT +85 °C	MAX. CAPACITANCE CHANGE (%) AT +125 °C	MAX. RIPPLE CURRENT AT +85 °C 40 kHz (mA) (2)
60 V_{DC} AT +85 °C; 40 V_{DC} AT +125 °C											
39	T2	10	0591H	1.0	9.0	10	90	-28	+10.5	+12	1110
39	T2	5	0592H	1.0	9.0	10	90	-28	+10.5	+12	1110
50	T3	20	0593H	2.0	12.0	10	50	-16	+10.5	+12	1330
50	T3	10	0594H	2.0	12.0	10	50	-16	+10.5	+12	1330
50	T3	5	0595H	2.0	12.0	10	50	-16	+10.5	+12	1330
68	T3	20	0596H	2.0	16.0	13	50	-32	+10.5	+12	1365
68	T3	10	0597H	2.0	16.0	13	50	-32	+10.5	+12	1365
68	T3	5	0598H	2.0	16.0	13	50	-32	+10.5	+12	1365
140	T4	20	0599H	8.0	32.0	16	28	-40	+20	+20	1850
140	T4	10	0600H	8.0	32.0	16	28	-40	+20	+20	1850
75 V_{DC} AT +85 °C; 50 V_{DC} AT +125 °C											
3.5	T1	20	0601H	1.0	2.0	2.5	650	-16	+5	+6	525
3.5	T1	10	0602H	1.0	2.0	2.5	650	-16	+5	+6	525
3.5	T1	5	0603H	1.0	2.0	2.5	650	-16	+5	+6	525
6.8	T1	20	0604H	1.0	2.0	3.5	300	-20	+8	+9	610
6.8	T1	10	0605H	1.0	2.0	3.5	300	-20	+8	+9	610
6.8	T1	5	0606H	1.0	2.0	3.5	300	-20	+8	+9	610
15	T2	20	0607H	1.0	5.0	6	150	-16	+8	+9	890
15	T2	10	0608H	1.0	5.0	6	150	-16	+8	+9	890
15	T2	5	0609H	1.0	5.0	6	150	-16	+8	+9	890
33	T2	20	0610H	1.0	10.0	10	90	-24	+10.5	+15	1000
33	T2	10	0611H	1.0	10.0	10	90	-24	+10.5	+15	1000
33	T2	5	0612H	1.0	10.0	10	90	-24	+10.5	+15	1000
40	T3	20	0613H	2.0	12.0	9	60	-16	+10.5	+12	1250
40	T3	10	0614H	2.0	12.0	9	60	-16	+10.5	+12	1250
40	T3	5	0615H	2.0	12.0	9	60	-16	+10.5	+12	1250
56	T3	20	0616H	2.0	17.0	11	60	-28	+10.5	+15	1335
56	T3	10	0617H	2.0	17.0	11	60	-28	+10.5	+15	1335
56	T3	5	0618H	2.0	17.0	11	60	-28	+10.5	+15	1335
110	T4	20	0619H	9.0	36.0	12	29	-35	+20	+20	1850
110	T4	10	0620H	9.0	36.0	12	29	-35	+20	+20	1850
100 V_{DC} AT +85 °C; 65 V_{DC} AT +125 °C											
2.5	T1	20	0621H	1.0	2.0	2	950	-16	+7	+8	505
2.5	T1	10	0622H	1.0	2.0	2	950	-16	+7	+8	505
2.5	T1	5	0623H	1.0	2.0	2	950	-16	+7	+8	505
4.7	T1	20	0624H	1.0	2.0	3	500	-16	+7	+8	565
4.7	T1	10	0625H	1.0	2.0	3	500	-16	+7	+8	565
4.7	T1	5	0626H	1.0	2.0	3	500	-16	+7	+8	565
11	T2	20	0627H	1.0	4.0	5	200	-16	+8	+8	835
11	T2	10	0628H	1.0	4.0	5	200	-16	+8	+8	835
11	T2	5	0629H	1.0	4.0	5	200	-16	+8	+8	835
22	T2	20	0630H	1.0	9.0	7.5	100	-16	+8	+8	965
22	T2	10	0631H	1.0	9.0	7.5	100	-16	+8	+8	965
22	T2	5	0632H	1.0	9.0	7.5	100	-16	+8	+8	965
30	T3	20	0633H	2.0	12.0	7	80	-16	+8	+8	1240
30	T3	10	0634H	2.0	12.0	7	80	-16	+8	+8	1240
30	T3	5	0635H	2.0	12.0	7	80	-16	+8	+8	1240
43	T3	20	0636H	2.0	17.0	8.5	70	-20	+8	+8	1335
43	T3	10	0637H	2.0	17.0	8.5	70	-20	+8	+8	1335
43	T3	5	0638H	2.0	17.0	8.5	70	-20	+8	+8	1335
86	T4	20	0639H	9.0	36.0	10	30	-25	+15	+15	1800
86	T4	10	0640H	9.0	36.0	10	30	-25	+15	+15	1800

Notes

(1) Dash number will include the letter "H" to indicate the vibration and shock requirements (i.e., 51 *g* random vibration, 80 *g* sinusoidal vibration and 500 *g* shock)

(2) For ripple current limits at various temperatures, voltages and frequencies, see Ripple Current table

For technical questions, contact: tantalum@vishay.com

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STANDARD RATINGS: DLA 06013

CAPACITANCE (µF)	CASE CODE	CAP. TOL. (± %)	PIN FOR DLA 06013 (1)	MAX. DCL (µA) AT		MAX. DF AT +25 °C (%)	MAX. IMP. AT -55 °C (Ω)	MAX. CAPACITANCE CHANGE (%) AT			MAX. RIPPLE CURRENT AT +85 °C 40 kHz (mA) (2)
				+25 °C	+85 °C +125 °C			-55 °C	+85 °C	+125 °C	
125 V_{DC} AT +85 °C; 85 V_{DC} AT +125 °C											
1.7	T1	20	0641H	1.0	2.0	2	1250	-16	+7	+8	415
1.7	T1	10	0642H	1.0	2.0	2	1250	-16	+7	+8	415
1.7	T1	5	0643H	1.0	2.0	2	1250	-16	+7	+8	415
3.6	T1	20	0644H	1.0	2.0	2.7	600	-16	+7	+8	520
3.6	T1	10	0645H	1.0	2.0	2.7	600	-16	+7	+8	520
3.6	T1	5	0646H	1.0	2.0	2.7	600	-16	+7	+8	520
9.0	T2	20	0647H	1.0	5.0	5	240	-16	+7	+8	755
9.0	T2	10	0648H	1.0	5.0	5	240	-16	+7	+8	755
9.0	T2	5	0649H	1.0	5.0	5	240	-16	+7	+8	755
14	T2	20	0650H	1.0	7.0	6	167	-16	+7	+8	860
14	T2	10	0651H	1.0	7.0	6	167	-16	+7	+8	860
14	T2	5	0652H	1.0	7.0	6	167	-16	+7	+8	860
18	T3	20	0653H	2.0	9.0	5	129	-16	+7	+8	1130
18	T3	10	0654H	2.0	9.0	5	129	-16	+7	+8	1130
18	T3	5	0655H	2.0	9.0	5	129	-16	+7	+8	1130
25	T3	20	0656H	2.0	13.0	6	93	-16	+7	+8	1200
25	T3	10	0657H	2.0	13.0	6	93	-16	+7	+8	1200
25	T3	5	0658H	2.0	13.0	6	93	-16	+7	+8	1200
56	T4	20	0659H	10.0	40.0	6.5	32	-25	+15	+15	1800
56	T4	10	0660H	10.0	40.0	6.5	32	-25	+15	+15	1800

Notes

(1) Dash number will include the letter "H" to indicate the vibration and shock requirements (i.e., 51 *g* random vibration, 80 *g* sinusoidal vibration and 500 *g* shock)

(2) For ripple current limits at various temperatures, voltages and frequencies, see Ripple Current table

STANDARD RATINGS: DLA 06014

CAPACITANCE (µF)	CASE CODE	CAP. TOL. (± %)	PIN FOR DLA 06014 (1)	MAX. DCL (µA) AT		MAX. DF AT +25 °C (%)	MAX. IMP. AT -55 °C (Ω)	MAX. CAPACITANCE CHANGE (%) AT			MAX. RIPPLE CURRENT AT +85 °C 40 kHz (mA) (2)
				+25 °C	+85 °C +125 °C			-55 °C	+85 °C	+125 °C	
6 V_{DC} AT +85 °C; 4 V_{DC} AT +125 °C											
220	T1	20	0177H	2.0	9.0	50	36	-64	+13	+16	1000
220	T1	10	0178H	2.0	9.0	50	36	-64	+13	+16	1000
820	T2	20	0179H	3.0	14.0	155	18	-88	+16	+20	1500
820	T2	10	0180H	3.0	14.0	155	18	-88	+16	+20	1500
1500	T3	20	0181H	5.0	20.0	172	18	-90	+20	+25	1900
1500	T3	10	0182H	5.0	20.0	172	18	-90	+20	+25	1900
2200	T4	20	0183H	6.0	24.0	170	13	-90	+25	+30	2300
2200	T4	10	0184H	6.0	24.0	170	13	-90	+25	+30	2300
8 V_{DC} AT +85 °C; 5 V_{DC} AT +125 °C											
180	T1	20	0185H	2.0	9.0	41	45	-60	+13	+16	1000
180	T1	10	0186H	2.0	9.0	41	45	-60	+13	+16	1000
680	T2	20	0187H	3.0	14.0	130	22	-83	+16	+20	1500
680	T2	10	0188H	3.0	14.0	130	22	-83	+16	+20	1500
1500	T3	20	0189H	5.0	20.0	170	18	-90	+20	+25	1900
1500	T3	10	0190H	5.0	20.0	170	18	-90	+20	+25	1900
1800	T4	20	0191H	7.0	25.0	138	14	-90	+25	+30	2300
1800	T4	10	0192H	7.0	25.0	138	14	-90	+25	+30	2300

Notes

(1) Dash number will include the letter "H" to indicate the vibration and shock requirements (i.e., 51 *g* random vibration, 80 *g* sinusoidal vibration and 500 *g* shock)

(2) For ripple current limits at various temperatures, voltages and frequencies, see Ripple Current table

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STANDARD RATINGS: DLA 06014

CAPACITANCE (µF)	CASE CODE	CAP. TOL. (± %)	PIN FOR DLA 06014 (1)	MAX. DCL (µA) AT		MAX. DF AT +25 °C (%)	MAX. IMP. AT -55 °C (Ω)	MAX. CAPACITANCE CHANGE (%) AT			MAX. RIPPLE CURRENT AT +85 °C 40 kHz (mA) (2)
				+25 °C	+85 °C +125 °C			-55 °C	+85 °C	+125 °C	
10 V_{DC} AT +85 °C; 7 V_{DC} AT +125 °C											
150	T1	20	0193H	2.0	9.0	34	54	-55	+13	+16	900
150	T1	10	0194H	2.0	9.0	34	54	-55	+13	+16	900
560	T2	20	0195H	3.0	16.0	106	27	-77	+16	+20	1450
560	T2	10	0196H	3.0	16.0	106	27	-77	+16	+20	1450
1200	T3	20	0197H	5.0	20.0	137	18	-88	+20	+25	1850
1200	T3	10	0198H	5.0	20.0	137	18	-88	+20	+25	1850
1500	T4	20	0199H	7.0	25.0	114	15	-88	+25	+30	2300
1500	T4	10	0200H	7.0	25.0	114	15	-88	+25	+30	2300
15 V_{DC} AT +85 °C; 10 V_{DC} AT +125 °C											
100	T1	20	0201H	2.0	9.0	30	72	-44	+13	+16	900
100	T1	10	0202H	2.0	9.0	30	72	-44	+13	+16	900
390	T2	20	0203H	3.0	16.0	74	31	-66	+16	+20	1450
390	T2	10	0204H	3.0	16.0	74	31	-66	+16	+20	1450
820	T3	20	0205H	6.0	24.0	111	22	-77	+20	+25	1800
820	T3	10	0206H	6.0	24.0	111	22	-77	+20	+25	180 0
1000	T4	20	0207H	8.0	32.0	92	17	-77	+25	+30	2300
1000	T4	10	0208H	8.0	32.0	92	17	-77	+25	+30	2300
25 V_{DC} AT +85 °C; 15 V_{DC} AT +125 °C											
68	T1	20	0209H	2.0	9.0	22	90	-40	+12	+15	850
68	T1	10	0210H	2.0	9.0	22	90	-40	+12	+15	850
270	T2	20	0211H	3.0	16.0	55	33	-62	+13	+16	1400
270	T2	10	0212H	3.0	16.0	55	33	-62	+13	+16	1400
560	T3	20	0213H	7.0	28.0	76	24	-72	+20	+25	1750
560	T3	10	0214H	7.0	28.0	76	24	-72	+20	+25	1750
680	T4	20	0215H	8.0	32.0	63	19	-72	+25	+30	2100
680	T4	10	0216H	8.0	32.0	63	19	-72	+25	+30	2100
30 V_{DC} AT +85 °C; 20 V_{DC} AT +125 °C											
56	T1	20	0217H	2.0	9.0	22	100	-38	+12	+15	800
56	T1	10	0218H	2.0	9.0	22	100	-38	+12	+15	800
220	T2	20	0219H	3.0	16.0	42	36	-60	+13	+16	1200
220	T2	10	0220H	3.0	16.0	42	36	-60	+13	+16	1200
470	T3	20	0221H	8.0	32.0	64	25	-65	+20	+25	1500
470	T3	10	0222H	8.0	32.0	64	25	-65	+20	+25	1500
560	T4	20	0223H	9.0	36.0	55	20	-65	+25	+30	2000
560	T4	10	0224H	9.0	36.0	55	20	-65	+25	+30	2000
50 V_{DC} AT +85 °C; 30 V_{DC} AT +125 °C											
33	T1	20	0225H	2.0	9.0	12.3	135	-29	+10	+12	700
33	T1	10	0226H	2.0	9.0	12.3	135	-29	+10	+12	700
120	T2	20	0227H	4.0	24.0	22.5	49	-42	+12	+15	1200
120	T2	10	0228H	4.0	24.0	22.5	49	-42	+12	+15	1200
270	T3	20	0229H	8.0	32.0	37	29	-46	+20	+25	1450
270	T3	10	0230H	8.0	32.0	37	29	-46	+20	+25	1450
330	T4	20	0231H	9.0	36.0	38	22	-46	+25	+30	1900
330	T4	10	0232H	9.0	36.0	38	22	-46	+25	+30	1900
60 V_{DC} AT +85 °C; 40 V_{DC} AT +125 °C											
27	T1	20	0233H	3.0	12.0	10.2	144	-24	+10	+12	700
27	T1	10	0234H	3.0	12.0	10.2	144	-24	+10	+12	700
100	T2	20	0235H	4.0	20.0	19	54	-36	+12	+15	1100
100	T2	10	0236H	4.0	20.0	19	54	-36	+12	+15	1100
220	T3	20	0237H	8.0	32.0	30	29	-40	+16	+20	1400
220	T3	10	0238H	8.0	32.0	30	29	-40	+16	+20	1400
270	T4	20	0239H	9.0	36.0	27	23	-45	+20	+25	1850
270	T4	10	0240H	9.0	36.0	27	23	-45	+20	+25	1850

Notes

(1) Dash number will include the letter "H" to indicate the vibration and shock requirements (i.e., 51 *g* random vibration, 80 *g* sinusoidal vibration and 500 *g* shock)

(2) For ripple current limits at various temperatures, voltages and frequencies, see Ripple Current table

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STANDARD RATINGS: DLA 06014

CAPACITANCE (µF)	CASE CODE	CAP. TOL. (± %)	PIN FOR DLA 06014 (1)	MAX. DCL (µA) AT		MAX. DF AT +25 °C (%)	MAX. IMP. AT -55 °C (Ω)	MAX. CAPACITANCE CHANGE (%) AT			MAX. RIPPLE CURRENT AT +85 °C 40 kHz (mA) (2)
				+25 °C	+85 °C +125 °C			-55 °C	+85 °C	+125 °C	
75 V_{DC} AT +85 °C; 50 V_{DC} AT +125 °C											
22	T1	20	0241H	3.0	12.0	8.5	157	-19	+10	+12	600
22	T1	10	0242H	3.0	12.0	8.5	157	-19	+10	+12	600
82	T2	20	0243H	4.0	24.0	15.2	63	-30	+12	+15	1000
82	T2	10	0244H	4.0	24.0	15.2	63	-30	+12	+15	1000
180	T3	20	0245H	9.0	36.0	24.4	30	-35	+16	+20	1300
180	T3	10	0246H	9.0	36.0	24.4	30	-35	+16	+20	1300
220	T4	20	0247H	10.0	40.0	37.0	24	-40	+20	+25	1800
220	T4	10	0248H	10.0	40.0	37.0	24	-40	+20	+25	1800
100 V_{DC} AT +85 °C; 65 V_{DC} AT +125 °C											
10	T1	20	0249H	3.0	12.0	4.5	200	-17	+10	+12	800
10	T1	10	0250H	3.0	12.0	4.5	200	-17	+10	+12	800
39	T2	20	0251H	5.0	24.0	10.4	80	-20	+12	+15	1300
39	T2	10	0252H	5.0	24.0	10.4	80	-20	+12	+15	1300
68	T3	20	0253H	10.0	40.0	11.3	40	-30	+14	+16	1600
68	T3	10	0254H	10.0	40.0	11.3	40	-30	+14	+16	1600
120	T4	20	0255H	12.0	48.0	25	30	-35	+15	+17	2000
120	T4	10	0256H	12.0	48.0	25	30	-35	+15	+17	2000
125 V_{DC} AT +85 °C; 85 V_{DC} AT +125 °C											
6.8	T1	20	0257H	3.0	12.0	6.0	300	-14	+10	+12	700
6.8	T1	10	0258H	3.0	12.0	6.0	300	-14	+10	+12	700
27	T2	20	0259H	5.0	24.0	7.2	90	-18	+12	+15	1200
27	T2	10	0260H	5.0	24.0	7.2	90	-18	+12	+15	1200
47	T3	20	0261H	10.0	40.0	7.9	50	-26	+14	+16	1500
47	T3	10	0262H	10.0	40.0	7.9	50	-26	+14	+16	1500
82	T4	20	0263H	12.0	48.0	17.4	32	-30	+15	+17	1900
82	T4	10	0264H	12.0	48.0	17.4	32	-30	+15	+17	1900

Notes

(1) Dash number will include the letter "H" to indicate the vibration and shock requirements (i.e., 51 *g* random vibration, 80 *g* sinusoidal vibration and 500 *g* shock)

(2) For ripple current limits at various temperatures, voltages and frequencies, see Ripple Current table

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STANDARD RATINGS: DLA 06015

CAPACITANCE (µF)	CASE CODE	CAP. TOL. (± %)	PIN FOR DLA 06015 (1)	MAX. DCL (µA) AT +25 °C	MAX. DCL (µA) AT +85 °C +125 °C	MAX. DF AT +25 °C (%)	MAX. IMP. AT -55 °C (Ω)	MAX. CAPACITANCE CHANGE (%) AT -55 °C	MAX. CAPACITANCE CHANGE (%) AT +85 °C	MAX. CAPACITANCE CHANGE (%) AT +125 °C	MAX. ESR AT +25 °C 120 Hz (Ω) (2)	MAX. RIPPLE CURRENT AT 85 °C 40 kHz 3 mA RMS (3)
6 V_{DC} AT +85 °C; 4 V_{DC} AT +125 °C												
30	T1	20	0441H	1.0	2.0	4.5	100	-40	+10.5	+12	1.99	820
30	T1	10	0442H	1.0	2.0	4.5	100	-40	+10.5	+12	1.99	820
30	T1	5	0443H	1.0	2.0	4.5	100	-40	+10.5	+12	1.99	820
68	T1	20	0444H	1.0	2.0	7.5	60	-40	+14	+16	1.58	960
68	T1	10	0445H	1.0	2.0	7.5	60	-40	+14	+16	1.58	960
68	T1	5	0446H	1.0	2.0	7.5	60	-40	+14	+16	1.58	960
140	T2	20	0447H	1.0	3.0	10.5	40	-40	+14	+16	0.99	1200
140	T2	10	0448H	1.0	3.0	10.5	40	-40	+14	+16	0.99	1200
140	T2	5	0449H	1.0	3.0	10.5	40	-40	+14	+16	0.99	1200
270	T2	20	0450H	1.0	6.5	22.5	25	-44	+17.5	+20	1.11	1375
270	T2	10	0451H	1.0	6.5	22.5	25	-44	+17.5	+20	1.11	1375
270	T2	5	0452H	1.0	6.5	22.5	25	-44	+17.5	+20	1.11	1375
330	T3	20	0453H	2.0	7.9	18.0	20	-44	+14	+16	0.73	1800
330	T3	10	0454H	2.0	7.9	18.0	20	-44	+14	+16	0.73	1800
330	T3	5	0455H	2.0	7.9	18.0	20	-44	+14	+16	0.73	1800
560	T3	20	0456H	2.0	13.0	27.5	25	-64	+17.5	+20	0.65	1900
560	T3	10	0457H	2.0	13.0	27.5	25	-64	+17.5	+20	0.65	1900
560	T3	5	0458H	2.0	13.0	27.5	25	-64	+17.5	+20	0.65	1900
1200	T4	20	0459H	3.0	14.0	45.0	20	-80	+25	+25	0.50	2265
1200	T4	10	0460H	3.0	14.0	45.0	20	-80	+25	+25	0.50	2265
8 V_{DC} AT +85 °C; 5 V_{DC} AT +125 °C												
25	T1	20	0461H	1.0	2.0	3.75	100	-40	+10.5	+12	1.99	820
25	T1	10	0462H	1.0	2.0	3.75	100	-40	+10.5	+12	1.99	820
25	T1	5	0463H	1.0	2.0	3.75	100	-40	+10.5	+12	1.99	820
56	T1	20	0464H	1.0	2.0	7.0	59	-40	+14	+16	1.66	900
56	T1	10	0465H	1.0	2.0	7.0	59	-40	+14	+16	1.66	900
56	T1	5	0466H	1.0	2.0	7.0	59	-40	+14	+16	1.66	900
120	T2	20	0467H	1.0	2.0	10.0	50	-44	+17.5	+20	1.11	1220
120	T2	10	0468H	1.0	2.0	10.0	50	-44	+17.5	+20	1.11	1220
120	T2	5	0469H	1.0	2.0	10.0	50	-44	+17.5	+20	1.11	1220
220	T2	20	0470H	1.0	7.0	18.5	30	-44	+17.5	+20	1.12	1370
220	T2	10	0471H	1.0	7.0	18.5	30	-44	+17.5	+20	1.12	1370
220	T2	5	0472H	1.0	7.0	18.5	30	-44	+17.5	+20	1.12	1370
290	T3	20	0473H	2.0	6.0	17.0	25	-64	+17.5	+20	0.78	1770
290	T3	10	0474H	2.0	6.0	17.0	25	-64	+17.5	+20	0.78	1770
290	T3	5	0475H	2.0	6.0	17.0	25	-64	+17.5	+20	0.78	1770
430	T3	20	0476H	2.0	14.0	23.0	25	-64	+17.5	+20	0.71	1825
430	T3	10	0477H	2.0	14.0	23.0	25	-64	+17.5	+20	0.71	1825
430	T3	5	0478H	2.0	14.0	23.0	25	-64	+17.5	+20	0.71	1825
850	T4	20	0479H	4.0	16.0	30.0	22	-80	+25	+25	0.47	2330
850	T4	10	0480H	4.0	16.0	30.0	22	-80	+25	+25	0.47	2330

Notes

(1) Dash number will include the letter "H" to indicate the vibration and shock requirements (i.e., 51 *g* random vibration, 80 *g* sinusoidal vibration and 500 *g* shock)

(2) Maximum ESR is calculated by the following equation:

$$\text{ESR (max.)} = \frac{DF}{2\pi fC}\text{, where}$$

DF = maximum dissipation factor from Standard Ratings table
f = 120 Hz
C = nominal capacitance

(3) For ripple current limits at various temperatures, voltages, and frequencies, see Ripple Current table

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STANDARD RATINGS: DLA 06015

CAPACITANCE (µF)	CASE CODE	CAP. TOL. (± %)	PIN FOR DLA 06015 (1)	MAX. DCL (µA) AT +25 °C	MAX. DCL (µA) AT +85 °C +125 °C	MAX. DF AT +25 °C (%)	MAX. IMP. AT -55 °C (Ω)	MAX. CAPACITANCE CHANGE (%) AT -55 °C	MAX. CAPACITANCE CHANGE (%) AT +85 °C	MAX. CAPACITANCE CHANGE (%) AT +125 °C	MAX. ESR AT +25 °C 120 Hz (Ω) (2)	MAX. RIPPLE CURRENT AT 85 °C 40 kHz 3 mA RMS (3)
10 V_{DC} AT +85 °C; 7 V_{DC} AT +125 °C												
20	T1	20	0481H	1.0	2.0	3.0	175	-32	+10.5	+12	1.99	820
20	T1	10	0482H	1.0	2.0	3.0	175	-32	+10.5	+12	1.99	820
20	T1	5	0483H	1.0	2.0	3.0	175	-32	+10.5	+12	1.99	820
47	T1	20	0484H	1.0	2.0	6.5	100	-36	+14	+16	1.84	855
47	T1	10	0485H	1.0	2.0	6.5	100	-36	+14	+16	1.84	855
47	T1	5	0486H	1.0	2.0	6.5	100	-36	+14	+16	1.84	855
100	T2	20	0487H	1.0	4.0	7.5	60	-36	+14	+16	0.99	1200
100	T2	10	0488H	1.0	4.0	7.5	60	-36	+14	+16	0.99	1200
100	T2	5	0489H	1.0	4.0	7.5	60	-36	+14	+16	0.99	1200
180	T2	20	0490H	1.0	7.0	15.0	40	-36	+14	+16	1.11	1365
180	T2	10	0491H	1.0	7.0	15.0	40	-36	+14	+16	1.11	1365
180	T2	5	0492H	1.0	7.0	15.0	40	-36	+14	+16	1.11	1365
250	T3	20	0493H	2.0	10.0	15.0	30	-40	+14	+16	0.80	1720
250	T3	10	0494H	2.0	10.0	15.0	30	-40	+14	+16	0.80	1720
250	T3	5	0495H	2.0	10.0	15.0	30	-40	+14	+16	0.80	1720
390	T3	20	0496H	2.0	16.0	22.0	25	-64	+17.5	+20	0.75	1800
390	T3	10	0497H	2.0	16.0	22.0	25	-64	+17.5	+20	0.75	1800
390	T3	5	0498H	2.0	16.0	22.0	25	-64	+17.5	+20	0.75	1800
750	T4	20	0499H	4.0	16.0	25.0	23	-80	+25	+25	0.44	2360
750	T4	10	0500H	4.0	16.0	25.0	23	-80	+25	+25	0.44	2360
15 V_{DC} AT +85 °C; 10 V_{DC} AT +125 °C												
15	T1	20	0501H	1.0	2.0	2.5	155	-24	+10.5	+12	1.99	780
15	T1	10	0502H	1.0	2.0	2.5	155	-24	+10.5	+12	1.99	780
15	T1	5	0503H	1.0	2.0	2.5	155	-24	+10.5	+12	1.99	780
33	T1	20	0504H	1.0	2.0	5.0	90	-28	+14	+16	1.66	820
33	T1	10	0505H	1.0	2.0	5.0	90	-28	+14	+16	1.66	820
33	T1	5	0506H	1.0	2.0	5.0	90	-28	+14	+16	1.66	820
70	T2	20	0507H	1.0	4.0	6.5	75	-28	+14	+16	1.11	1150
70	T2	10	0508H	1.0	4.0	6.5	75	-28	+14	+16	1.11	1150
70	T2	5	0509H	1.0	4.0	6.5	75	-28	+14	+16	1.11	1150
120	T2	20	0510H	1.0	7.0	9.0	50	-28	+17.5	+20	1.12	1450
120	T2	10	0511H	1.0	7.0	9.0	50	-28	+17.5	+20	1.12	1450
120	T2	5	0512H	1.0	7.0	9.0	50	-28	+17.5	+20	1.12	1450
170	T3	20	0513H	2.0	10.0	12.5	35	-32	+14	+16	0.78	1480
170	T3	10	0514H	2.0	10.0	12.5	35	-32	+14	+16	0.78	1480
170	T3	5	0515H	2.0	10.0	12.5	35	-32	+14	+16	0.78	1480
270	T3	20	0516H	2.0	16.0	16.0	30	-56	+17.5	+20	0.71	1740
270	T3	10	0517H	2.0	16.0	16.0	30	-56	+17.5	+20	0.71	1740
270	T3	5	0518H	2.0	16.0	16.0	30	-56	+17.5	+20	0.71	1740
540	T4	20	0519 H	6.0	24.0	20.0	23	-80	+25	+25	0.47	2330
540	T4	10	0520H	6.0	24.0	20.0	23	-80	+25	+25	0.47	2330

Notes

(1) Dash number will include the letter "H" to indicate the vibration and shock requirements (i.e., 51 *g* random vibration, 80 *g* sinusoidal vibration and 500 *g* shock)

(2) Maximum ESR is calculated by the following equation:

$$\text{ESR (max.)} = \frac{DF}{2\pi fC}\text{, where}$$

DF = maximum dissipation factor from Standard Ratings table
f = 120 Hz
C = nominal capacitance

(3) For ripple current limits at various temperatures, voltages, and frequencies, see Ripple Current table

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STANDARD RATINGS: DLA 06015

CAPACITANCE (µF)	CASE CODE	CAP. TOL. (± %)	PIN FOR DLA 06015 (1)	MAX. DCL (µA) AT +25 °C	MAX. DCL (µA) AT +85 °C +125 °C	MAX. DF AT +25 °C (%)	MAX. IMP. AT -55 °C (Ω)	MAX. CAPACITANCE CHANGE (%) AT -55 °C	MAX. CAPACITANCE CHANGE (%) AT +85 °C	MAX. CAPACITANCE CHANGE (%) AT +125 °C	MAX. ESR AT +25 °C 120 Hz (Ω) (2)	MAX. RIPPLE CURRENT AT 85 °C 40 kHz 3 mA RMS (3)
25 V_{DC} AT +85 °C; 15 V_{DC} AT +125 °C												
10	T1	20	0521H	1.0	2.0	2.0	220	-16	+8	+9	2.66	715
10	T1	10	0522H	1.0	2.0	2.0	220	-16	+8	+9	2.66	715
10	T1	5	0523H	1.0	2.0	2.0	220	-16	+8	+9	2.66	715
22	T1	20	0524H	1.0	2.0	3.3	140	-20	+10.5	+12	1.99	825
22	T1	10	0525H	1.0	2.0	3.3	140	-20	+10.5	+12	1.99	825
22	T1	5	0526H	1.0	2.0	3.3	140	-20	+10.5	+12	1.99	825
50	T2	20	0527H	1.0	2.0	5.5	70	-28	+13	+15	1.46	1130
50	T2	10	0528H	1.0	2.0	5.5	70	-28	+13	+15	1.46	1130
50	T2	5	0529H	1.0	2.0	5.5	70	-28	+13	+15	1.46	1130
100	T2	20	0530H	1.0	10.0	7.5	50	-28	+13	+15	0.99	1435
100	T2	10	0531H	1.0	10.0	7.5	50	-28	+13	+15	0.99	1435
100	T2	5	0532H	1.0	10.0	7.5	50	-28	+13	+15	0.99	1435
120	T3	20	0533H	2.0	6.0	10.5	38	-32	+13	+15	1.16	1450
120	T3	10	0534H	2.0	6.0	10.5	38	-32	+13	+15	1.16	1450
120	T3	5	0535H	2.0	6.0	10.5	38	-32	+13	+15	1.16	1450
180	T3	20	0536H	2.0	18.0	13.0	32	-48	+13	+15	0.96	1525
180	T3	10	0537H	2.0	18.0	13.0	32	-48	+13	+15	0.96	1525
180	T3	5	0538H	2.0	18.0	13.0	32	-48	+13	+15	0.96	1525
350	T4	20	0539H	7.0	28.0	17.5	24	-70	+25	+25	0.67	1970
350	T4	10	0540H	7.0	28.0	17.5	24	-70	+25	+25	0.67	1970
30 V_{DC} AT +85 °C; 20 V_{DC} AT +125 °C												
8	T1	20	0541H	1.0	2.0	2.0	275	-16	+8	+12	3.32	640
8	T1	10	0542H	1.0	2.0	2.0	275	-16	+8	+12	3.32	640
8	T1	5	0543H	1.0	2.0	2.0	275	-16	+8	+12	3.32	640
15	T1	20	0544H	1.0	2.0	2.5	175	-20	+10.5	+12	2.21	780
15	T1	10	0545H	1.0	2.0	2.5	175	-20	+10.5	+12	2.21	780
15	T1	5	0546H	1.0	2.0	2.5	175	-20	+10.5	+12	2.21	780
40	T2	20	0547H	1.0	5.0	5.0	65	-24	+10.5	+12	1.66	1120
40	T2	10	0548H	1.0	5.0	5.0	65	-24	+10.5	+12	0.66	1120
40	T2	5	0549H	1.0	5.0	5.0	65	-24	+10.5	+12	0.66	1120
68	T2	20	0550H	1.0	8.0	6.5	60	-24	+13	+15	1.27	1285
68	T2	10	0551H	1.0	8.0	6.5	60	-24	+13	+15	1.27	1285
68	T2	5	0552H	1.0	8.0	6.5	60	-24	+13	+15	1.27	1285
100	T3	20	0553H	2.0	12.0	8.5	40	-28	+10.5	+12	1.13	1450
100	T3	10	0554H	2.0	12.0	8.5	40	-28	+10.5	+12	1.13	1450
100	T3	5	0555H	2.0	12.0	8.5	40	-28	+10.5	+12	1.13	1450
150	T3	20	0556H	2.0	18.0	11.5	35	-48	+13	+15	1.02	1525
150	T3	10	0557H	2.0	18.0	11.5	35	-48	+13	+15	1.02	1525
150	T3	5	0558H	2.0	18.0	11.5	35	-48	+13	+15	1.02	1525
300	T4	20	0559H	8.0	32.0	15.5	25	-60	+25	+25	0.69	1950
300	T4	10	0560H	8.0	32.0	15.5	25	-60	+25	+25	0.69	1950

Notes

(1) Dash number will include the letter "H" to indicate the vibration and shock requirements (i.e., 51 *g* random vibration, 80 *g* sinusoidal vibration and 500 *g* shock)

(2) Maximum ESR is calculated by the following equation:

$$\text{ESR (max.)} = \frac{DF}{2\pi fC}\text{, where}$$

DF = maximum dissipation factor from Standard Ratings table
f = 120 Hz
C = nominal capacitance

(3) For ripple current limits at various temperatures, voltages, and frequencies, see Ripple Current table

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STANDARD RATINGS: DLA 06015

CAPACITANCE (µF)	CASE CODE	CAP. TOL. (± %)	PIN FOR DLA 06015 (1)	MAX. DCL (µA) AT +25 °C	MAX. DCL (µA) AT +85 °C +125 °C	MAX. DF AT +25 °C (%)	MAX. IMP. AT -55 °C (Ω)	MAX. CAPACITANCE CHANGE (%) AT -55 °C	MAX. CAPACITANCE CHANGE (%) AT +85 °C	MAX. CAPACITANCE CHANGE (%) AT +125 °C	MAX. ESR AT +25 °C 120 Hz (Ω) (2)	MAX. RIPPLE CURRENT AT 85 °C 40 kHz 3 mA RMS (3)
50 V_{DC} AT +85 °C; 30 V_{DC} AT +125 °C												
5	T1	20	0561H	1.0	2.0	1.5	400	-16	+5	+6	3.98	580
5	T1	10	0562H	1.0	2.0	1.5	400	-16	+5	+6	3.98	580
5	T1	5	0563H	1.0	2.0	1.5	400	-16	+5	+6	3.98	580
10	T1	20	0564H	1.0	2.0	2.0	250	-24	+8	+9	2.66	715
10	T1	10	0565H	1.0	2.0	2.0	250	-24	+8	+9	2.66	715
10	T1	5	0566H	1.0	2.0	2.0	250	-24	+8	+9	2.66	715
25	T2	20	0567H	1.0	5.0	4.0	95	-20	+10.5	+12	2.13	1005
25	T2	10	0568H	1.0	5.0	4.0	95	-20	+10.5	+12	2.13	1005
25	T2	5	0569H	1.0	5.0	4.0	95	-20	+10.5	+12	2.13	1005
47	T2	20	0570H	1.0	9.0	5.0	70	-28	+13	+15	1.56	1155
47	T2	10	0571H	1.0	9.0	5.0	70	-28	+13	+15	1.56	1155
47	T2	5	0572H	1.0	9.0	5.0	70	-28	+13	+15	1.56	1155
60	T3	20	0573H	2.0	12.0	6.0	45	-16	+10.5	+12	1.33	1335
60	T3	10	0574H	2.0	12.0	6.0	45	-16	+10.5	+12	1.33	1335
60	T3	5	0575H	2.0	12.0	6.0	45	-16	+10.5	+12	1.33	1335
82	T3	20	0576H	2.0	16.0	7.5	45	-32	+13	+15	1.22	1400
82	T3	10	0577H	2.0	16.0	7.5	45	-32	+13	+15	1.22	1400
82	T3	5	0578H	2.0	16.0	7.5	45	-32	+13	+15	1.22	1400
160	T4	20	0579H	6.0	32.0	8.5	27	-50	+25	+25	0.71	1900
160	T4	10	0580H	6.0	32.0	8.5	27	-50	+25	+25	0.71	1900
60 V_{DC} AT +85 °C; 40 V_{DC} AT +125 °C												
4	T1	20	0581H	1.0	2.0	1.4	550	-16	+5	+6	4.65	525
4	T1	10	0582H	1.0	2.0	1.4	550	-16	+5	+6	4.65	525
4	T1	5	0583H	1.0	2.0	1.4	550	-16	+5	+6	4.65	525
8.2	T1	20	0584H	1.0	2.0	2.0	275	-24	+8	+9	3.24	625
8.2	T1	10	0585H	1.0	2.0	2.0	275	-24	+8	+9	3.24	625
8.2	T1	5	0586H	1.0	2.0	2.0	275	-24	+8	+9	3.24	625
20	T2	20	0587H	1.0	5.0	3.5	105	-16	+10.5	+12	2.32	930
20	T2	10	0588H	1.0	5.0	3.5	105	-16	+10.5	+12	2.32	930
20	T2	5	0589H	1.0	5.0	3.5	105	-16	+10.5	+12	2.32	930
39	T2	20	0590H	1.0	9.0	5.0	90	-28	+10.5	+12	1.70	1110
39	T2	10	0591H	1.0	9.0	5.0	90	-28	+10.5	+12	1.70	1110
39	T2	5	0592H	1.0	9.0	5.0	90	-28	+10.5	+12	1.70	1110
50	T3	20	0593H	2.0	12.0	5.0	50	-16	+10.5	+12	1.33	1330
50	T3	10	0594H	2.0	12.0	5.0	50	-16	+10.5	+12	1.33	1330
50	T3	5	0595H	2.0	12.0	5.0	50	-16	+10.5	+12	1.33	1330
68	T3	20	0596H	2.0	16.0	6.5	50	-32	+10.5	+12	1.27	1365
68	T3	10	0597H	2.0	16.0	6.5	50	-32	+10.5	+12	1.27	1365
68	T3	5	0598H	2.0	16.0	6.5	50	-32	+10.5	+12	1.27	1365
140	T4	20	0599H	8.0	32.0	8.0	28	-40	+20	+20	0.76	1850
140	T4	10	0600H	8.0	32.0	8.0	28	-40	+20	+20	0.76	1850

Notes

(1) Dash number will include the letter "H" to indicate the vibration and shock requirements (i.e., 51 *g* random vibration, 80 *g* sinusoidal vibration and 500 *g* shock)

(2) Maximum ESR is calculated by the following equation:

$$\text{ESR (max.)} = \frac{DF}{2\pi fC}\text{, where}$$

DF = maximum dissipation factor from Standard Ratings table
f = 120 Hz
C = nominal capacitance

(3) For ripple current limits at various temperatures, voltages, and frequencies, see Ripple Current table

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STANDARD RATINGS: DLA 06015

CAPACITANCE (µF)	CASE CODE	CAP. TOL. (± %)	PIN FOR DLA 06015 (1)	MAX. DCL (µA) AT +25 °C	MAX. DCL (µA) AT +85 °C +125 °C	MAX. DF AT +25 °C (%)	MAX. IMP. AT -55 °C (Ω)	MAX. CAPACITANCE CHANGE (%) AT -55 °C	MAX. CAPACITANCE CHANGE (%) AT +85 °C	MAX. CAPACITANCE CHANGE (%) AT +125 °C	MAX. ESR AT +25 °C 120 Hz (Ω) (2)	MAX. RIPPLE CURRENT AT 85 °C 40 kHz 3 mA RMS (3)
75 V_{DC} AT +85 °C; 50 V_{DC} AT +125 °C												
3.5	T1	20	0601H	1.0	2.0	1.25	650	-16	+5	+6	4.74	525
3.5	T1	10	0602H	1.0	2.0	1.25	650	-16	+5	+6	4.74	525
3.5	T1	5	0603H	1.0	2.0	1.25	650	-16	+5	+6	4.74	525
6.8	T1	20	0604H	1.0	2.0	1.75	300	-20	+8	+9	3.42	610
6.8	T1	10	0605H	1.0	2.0	1.75	300	-20	+8	+9	3.42	610
6.8	T1	5	0606H	1.0	2.0	1.75	300	-20	+8	+9	3.42	610
15	T2	20	0607H	1.0	5.0	3.0	150	-16	+8	+9	2.66	890
15	T2	10	0608H	1.0	5.0	3.0	150	-16	+8	+9	2.66	890
15	T2	5	0609H	1.0	5.0	3.0	150	-16	+8	+9	2.66	890
33	T2	20	0610H	1.0	10.0	5.0	90	-24	+10.5	+15	2.01	1000
33	T2	10	0611H	1.0	10.0	5.0	90	-24	+10.5	+15	2.01	1000
33	T2	5	0612H	1.0	10.0	5.0	90	-24	+10.5	+15	2.01	1000
40	T3	20	0613H	2.0	12.0	4.5	60	-16	+10.5	+12	1.50	1250
40	T3	10	0614H	2.0	12.0	4.5	60	-16	+10.5	+12	1.50	1250
40	T3	5	0615H	2.0	12.0	4.5	60	-16	+10.5	+12	1.50	1250
56	T3	20	0616H	2.0	17.0	5.5	60	-28	+10.5	+15	1.31	1335
56	T3	10	0617H	2.0	17.0	5.5	60	-28	+10.5	+15	1.31	1335
56	T3	5	0618H	2.0	17.0	5.5	60	-28	+10.5	+15	1.31	1335
110	T4	20	0619H	9.0	36.0	6.0	29	-35	+20	+20	0.73	1850
110	T4	10	0620H	9.0	36.0	6.0	29	-35	+20	+20	0.73	1850
100 V_{DC} AT +85 °C; 65 V_{DC} AT +125 °C												
2.5	T1	20	0621H	1.0	2.0	1.0	950	-16	+7	+8	5.31	505
2.5	T1	10	0622H	1.0	2.0	1.0	950	-16	+7	+8	5.31	505
2.5	T1	5	0623H	1.0	2.0	1.0	950	-16	+7	+8	5.31	505
4.7	T1	20	0624H	1.0	2.0	1.5	500	-16	+7	+8	4.24	565
4.7	T1	10	0625H	1.0	2.0	1.5	500	-16	+7	+8	4.24	565
4.7	T1	5	0626H	1.0	2.0	1.5	500	-16	+7	+8	4.24	565
11	T2	20	0627H	1.0	4.0	2.5	200	-16	+8	+8	3.02	835
11	T2	10	0628H	1.0	4.0	2.5	200	-16	+8	+8	3.02	835
11	T2	5	0629H	1.0	4.0	2.5	200	-16	+8	+8	3.02	835
22	T2	20	0630H	1.0	9.0	3.75	100	-16	+8	+8	2.26	965
22	T2	10	0631H	1.0	9.0	3.75	100	-16	+8	+8	2.26	965
22	T2	5	0632H	1.0	9.0	3.75	100	-16	+8	+8	2.26	965
30	T3	20	0633H	2.0	12.0	3.5	80	-16	+8	+8	1.55	1240
30	T3	10	0634H	2.0	12.0	3.5	80	-16	+8	+8	1.55	1240
30	T3	5	0635H	2.0	12.0	3.5	80	-16	+8	+8	1.55	1240
43	T3	20	0636H	2.0	17.0	4.25	70	-20	+8	+8	1.31	1335
43	T3	10	0637H	2.0	17.0	4.25	70	-20	+8	+8	1.31	1335
43	T3	5	0638H	2.0	17.0	4.25	70	-20	+8	+8	1.31	1335
86	T4	20	0639H	9.0	36.0	5.0	30	-25	+15	+15	0.77	1800
86	T4	10	0640H	9.0	36.0	5.0	30	-25	+15	+15	0.77	1800

Notes

(1) Dash number will include the letter "H" to indicate the vibration and shock requirements (i.e., 51 *g* random vibration, 80 *g* sinusoidal vibration and 500 *g* shock)

(2) Maximum ESR is calculated by the following equation:

$$\text{ESR (max.)} = \frac{DF}{2\pi fC}\text{, where}$$

DF = maximum dissipation factor from Standard Ratings table
f = 120 Hz
C = nominal capacitance

(3) For ripple current limits at various temperatures, voltages, and frequencies, see Ripple Current table

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STANDARD RATINGS: DLA 06015

CAPACITANCE (µF)	CASE CODE	CAP. TOL. (± %)	PIN FOR DLA 06015 (1)	MAX. DCL (µA) AT +25 °C	MAX. DCL (µA) AT +85 °C +125 °C	MAX. DF AT +25 °C (%)	MAX. IMP. AT -55 °C (Ω)	MAX. CAPACITANCE CHANGE (%) AT -55 °C	MAX. CAPACITANCE CHANGE (%) AT +85 °C	MAX. CAPACITANCE CHANGE (%) AT +125 °C	MAX. ESR AT +25 °C 120 Hz (Ω) (2)	MAX. RIPPLE CURRENT AT 85 °C 40 kHz 3 mA RMS (3)
125 V_{DC} AT +85 °C; 85 V_{DC} AT +125 °C												
1.7	T1	20	0641H	1.0	2.0	1.0	1250	-16	+7	+8	7.81	415
1.7	T1	10	0642H	1.0	2.0	1.0	1250	-16	+7	+8	7.81	415
1.7	T1	5	0643H	1.0	2.0	1.0	1250	-16	+7	+8	7.81	415
3.6	T1	20	0644H	1.0	2.0	1.35	600	-24	+7	+8	4.98	520
3.6	T1	10	0645H	1.0	2.0	1.35	600	-16	+7	+8	4.98	520
3.6	T1	5	0646H	1.0	2.0	1.35	600	-16	+7	+8	4.98	520
9.0	T2	20	0647H	1.0	5.0	2.5	240	-16	+7	+8	3.69	755
9.0	T2	10	0648H	1.0	5.0	2.5	240	-16	+7	+8	3.69	755
9.0	T2	5	0649H	1.0	5.0	2.5	240	-16	+7	+8	3.69	755
14	T2	20	0650H	1.0	7.0	3.0	167	-16	+7	+8	2.85	860
14	T2	10	0651H	1.0	7.0	3.0	167	-16	+7	+8	2.85	860
14	T2	5	0652H	1.0	7.0	3.0	167	-16	+7	+8	2.85	860
18	T3	20	0653H	2.0	9.0	2.5	129	-16	+7	+8	1.85	1130
18	T3	10	0654H	2.0	9.0	2.5	129	-16	+7	+8	1.85	1130
18	T3	5	0655H	2.0	9.0	2.5	129	-16	+7	+8	1.85	1130
25	T3	20	0656H	2.0	13.0	3.0	93	-16	+7	+8	1.59	1200
25	T3	10	0657H	2.0	13.0	3.0	93	-16	+7	+8	1.59	1200
25	T3	5	0658H	2.0	13.0	3.0	93	-16	+7	+8	1.59	1200
56	T4	20	0659 H	10.0	40.0	3.25	32	-25	+15	+15	0.77	1800
56	T4	10	0660H	10.0	40.0	3.25	32	-25	+15	+15	0.77	1800

Notes

(1) Dash number will include the letter “H” to indicate the vibration and shock requirements (i.e., 51 *g* random vibration, 80 *g* sinusoidal vibration and 500 *g* shock)

(2) Maximum ESR is calculated by the following equation:

$$\text{ESR (max.)} = \frac{DF}{2\pi fC}\text{, where}$$

DF = maximum dissipation factor from Standard Ratings table
f = 120 Hz
C = nominal capacitance

(3) For ripple current limits at various temperatures, voltages, and frequencies, see Ripple Current table

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STANDARD RATINGS: DLA 06016

CAPACITANCE (µF)	CASE CODE	CAP. TOL. (± %)	PIN FOR DLA 06016 (1)	MAX. DCL (µA) AT +25 °C	MAX. DCL (µA) AT +85 °C +125 °C	MAX. DF AT +25 °C (%)	MAX. IMP. AT -55 °C (Ω)	MAX.. CAPACITANCE CHANGE (%) AT -55 °C	MAX.. CAPACITANCE CHANGE (%) AT +85 °C	MAX.. CAPACITANCE CHANGE (%) AT +125 °C	MAX. ESR AT +25 °C 120 Hz (Ω) (2)	MAX. RIPPLE CURRENT AT 85 °C 40 kHz 3 mA RMS (3)
6 V_{DC} AT +85 °C; 4 V_{DC} AT +125 °C												
220	T1	20	0177H	2	9	25	36	-64	13	16	1.51	1000
220	T1	10	0178H	2	9	25	36	-64	13	16	1.51	1000
820	T2	20	0179H	3	14	77.5	18	-88	16	20	1.26	1500
820	T2	10	0180H	3	14	77.5	18	-88	16	20	1.26	1500
1500	T3	20	0181H	5	20	86	18	-90	20	25	0.76	1900
1500	T3	10	0182H	5	20	86	18	-90	20	25	0.76	1900
2200	T4	20	0183H	6	24	85	13	-90	25	30	0.52	2300
2200	T4	10	0184H	6	24	85	13	-90	25	30	0.52	2300
8 V_{DC} AT +85 °C; 5 V_{DC} AT +125 °C												
180	T1	20	0185H	2	9	20.5	45	-60	13	16	1.51	1000
180	T1	10	0186H	2	9	20.5	45	-60	13	16	1.51	1000
680	T2	20	0187H	3	14	65	22	-83	16	20	1.27	1500
680	T2	10	0188H	3	14	65	22	-83	16	20	1.27	1500
1500	T3	20	0189H	5	20	85	18	-90	20	25	0.75	1900
1500	T3	10	0190H	5	20	85	18	-90	20	25	0.75	1900
1800	T4	20	0191H	7	25	69	14	-90	25	30	0.51	2300
1800	T4	10	0192H	7	25	69	14	-90	25	30	0.51	2300
10 V_{DC} AT +85 °C; 7 V_{DC} AT +125 °C												
150	T1	20	0193H	2	9	17	54	-55	13	16	1.51	900
150	T1	10	0194	2	9	17	54	-55	13	16	1.51	900
560	T2	20	0195H	3	16	53	27	-77	16	20	1.26	1450
560	T2	10	0196H	3	16	53	27	-77	16	20	1.26	1450
1200	T3	20	0197H	5	20	68.5	18	-88	20	25	0.76	1850
1200	T3	10	0198H	5	20	68.5	18	-88	20	25	0.76	1850
1500	T4	20	0199H	7	25	57	15	-88	25	30	0.51	2300
1500	T4	10	0200H	7	25	57	15	-88	25	30	0.51	2300
15 V_{DC} AT +85 °C; 10 V_{DC} AT +125 °C												
100	T1	20	0201H	2	9	15	72	-44	13	16	1.99	900
100	T1	10	0202H	2	9	15	72	-44	13	16	1.99	900
390	T2	20	0203H	3	16	37	31	-66	16	20	1.26	1450
390	T2	10	0204H	3	16	37	31	-66	16	20	1.26	1450
820	T3	20	0205H	6	24	55.5	22	-77	20	25	0.9	1800
820	T3	10	0206H	6	24	55.5	22	-77	20	25	0.9	1800
1000	T4	20	0207H	8	32	46	17	-77	25	30	0.61	2300
1000	T4	10	0208H	8	32	46	17	-77	25	30	0.61	2300
25 V_{DC} AT +85 °C; 15 V_{DC} AT +125 °C												
68	T1	20	0209H	2	9	11	90	-40	12	15	2.15	850
68	T1	10	0210H	2	9	11	90	-40	12	15	2.15	850
270	T2	20	0211H	3	16	27.5	33	-62	13	16	1.35	1400
270	T2	10	0212H	3	16	27.5	33	-62	13	16	1.35	1400
560	T3	20	0213H	7	28	38	24	-72	20	25	0.9	1750
560	T3	10	0214H	7	28	38	24	-72	20	25	0.9	1750
680	T4	20	0215H	8	32	31.5	19	-72	25	30	0.62	2100
680	T4	10	0216H	8	32	31.5	19	-72	25	30	0.62	2100

Notes

(1) Dash number will include the letter "H" to indicate the vibration and shock requirements (i.e., 51 *g* random vibration, 80 *g* sinusoidal vibration and 500 *g* shock)

(2) Maximum ESR is calculated by the following equation:

$$\text{ESR (max.)} = \frac{DF}{2\pi fC}\text{, where}$$

DF = maximum dissipation factor from Standard Ratings table
f = 120 Hz
C = nominal capacitance

(3) For ripple current limits at various temperatures, voltages, and frequencies, see Ripple Current table

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STANDARD RATINGS: DLA 06016

CAPACITANCE (µF)	CASE CODE	CAP. TOL. (± %)	PIN FOR DLA 06016 (1)	MAX. DCL (µA) AT		MAX. DF AT +25 °C (%)	MAX. IMP. AT -55 °C (Ω)	MAX.. CAPACITANCE CHANGE (%) AT			MAX. ESR AT +25 °C 120 Hz (Ω) (2)	MAX. RIPPLE CURRENT AT 85 °C 40 kHz 3 mA RMS (3)
				+25 °C	+85 °C +125 °C			-55 °C	+85 °C	+125 °C		
30 V_{DC} AT +85 °C; 20 V_{DC} AT +125 °C												
56	T1	20	0217H	2	9	11	100	-38	12	15	2.61	800
56	T1	10	0218H	2	9	11	100	-38	12	15	2.61	800
220	T2	20	0219H	3	16	21	36	-60	13	16	1.27	1200
220	T2	10	0220H	3	16	21	36	-60	13	16	1.27	1200
470	T3	20	0221H	8	32	32	25	-65	20	25	0.91	1500
470	T3	10	0222H	8	32	32	25	-65	20	25	0.91	1500
560	T4	20	0223H	9	36	27.5	20	-65	25	30	0.65	2000
560	T4	10	0224H	9	36	27.5	20	-65	25	30	0.65	2000
50 V_{DC} AT +85 °C; 30 V_{DC} AT +125 °C												
33	T1	20	0225H	2	9	6.15	135	-29	10	12	2.48	700
33	T1	10	0226H	2	9	6.15	135	-29	10	12	2.48	700
120	T2	20	0227H	4	24	11.3	49	-42	12	15	1.25	1200
120	T2	10	0228H	4	24	11.3	49	-42	12	15	1.25	1200
270	T3	20	0229H	8	32	18.5	29	-46	20	25	0.91	1450
270	T3	10	0230H	8	32	18.5	29	-46	20	25	0.91	1450
330	T4	20	0231H	9	36	19	22	-46	25	30	0.77	1900
330	T4	10	0232H	9	36	19	22	-46	25	30	0.77	1900
60 V_{DC} AT +85 °C; 40 V_{DC} AT +125 °C												
27	T1	20	0233H	3	12	5.1	144	-24	10	12	2.51	700
27	T1	10	0234H	3	12	5.1	144	-24	10	12	2.51	700
100	T2	20	0235H	4	20	9.5	54	-36	12	15	1.26	1100
100	T2	10	0236H	4	20	9.5	54	-36	12	15	1.26	1100
220	T3	20	0237H	8	32	15	29	-40	16	20	0.91	1400
220	T3	10	0238H	8	32	15	29	-40	16	20	0.91	1400
270	T4	20	0239H	9	36	13.5	23	-45	20	25	0.67	1850
270	T4	10	0240H	9	36	13.5	23	-45	20	25	0.67	1850
75 V_{DC} AT +85 °C; 50 V_{DC} AT +125 °C												
22	T1	20	0241H	3	12	4.25	157	-19	10	12	2.57	600
22	T1	10	0242H	3	12	4.25	157	-19	10	12	2.57	600
82	T2	20	0243H	4	24	7.6	63	-30	12	15	1.23	1000
82	T2	10	0244H	4	24	7.6	63	-30	12	15	1.23	1000
180	T3	20	0245H	9	36	12.2	30	-35	16	20	0.9	1300
180	T3	10	0246H	9	36	12.2	30	-35	16	20	0.9	1300
220	T4	20	0247H	10	40	18.5	24	-40	20	25	1.12	1800
220	T4	10	0248H	10	40	18.5	24	-40	20	25	1.12	1800

Notes

(1) Dash number will include the letter "H" to indicate the vibration and shock requirements (i.e., 51 *g* random vibration, 80 *g* sinusoidal vibration and 500 *g* shock)

(2) Maximum ESR is calculated by the following equation:

$$\text{ESR (max.)} = \frac{DF}{2\pi fC}\text{, where}$$

DF = maximum dissipation factor from Standard Ratings table
f = 120 Hz
C = nominal capacitance

(3) For ripple current limits at various temperatures, voltages, and frequencies, see Ripple Current table

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STANDARD RATINGS: DLA 06016

CAPACITANCE (µF)	CASE CODE	CAP. TOL. (± %)	PIN FOR DLA 06016 (1)	MAX. DCL (µA) AT		MAX. DF AT +25 °C (%)	MAX. IMP. AT -55 °C (Ω)	MAX.. CAPACITANCE CHANGE (%) AT			MAX. ESR AT +25 °C 120 Hz (Ω) (2)	MAX. RIPPLE CURRENT AT 85 °C 40 kHz 3 mA RMS (3)
				+25 °C	+85 °C +125 °C			-55 °C	+85 °C	+125 °C		
100 V_{DC} AT +85 °C; 65 V_{DC} AT +125 °C												
10	T1	20	0249H	3	12	2.25	200	-17	10	12	2.99	800
10	T1	10	0250H	3	12	2.25	200	-17	10	12	2.99	800
39	T2	20	0251H	5	24	5.2	80	-20	12	15	1.77	1300
39	T2	10	0252H	5	24	5.2	80	-20	12	15	1.77	1300
68	T3	20	0253H	10	40	5.65	40	-30	14	16	1.11	1600
68	T3	10	0254H	10	40	5.65	40	-30	14	16	1.11	1600
120	T4	20	0255H	12	48	12.5	30	-35	15	17	1.38	2000
120	T4	10	0256H	12	48	12.5	30	-35	15	17	1.38	2000
125 V_{DC} AT +85 °C; 85 V_{DC} AT +125 °C												
6.8	T1	20	0257H	3	12	3	300	-14	10	12	5.86	700
6.8	T1	10	0258H	3	12	3	300	-14	10	12	5.86	700
27	T2	20	0259H	5	24	3.6	90	-18	12	15	1.77	1200
27	T2	10	0260H	5	24	3.6	90	-18	12	15	1.77	1200
47	T3	20	0261H	10	40	3.95	50	-26	14	16	1.12	1500
47	T3	10	0262H	10	40	3.95	50	-26	14	16	1.12	1500
82	T4	20	0263H	12	48	8.7	32	-30	15	17	1.41	1900
82	T4	10	0264H	12	48	8.7	32	-30	15	17	1.41	1900

Notes

(1) Dash number will include the letter "H" to indicate the vibration and shock requirements (i.e., 51 *g* random vibration, 80 *g* sinusoidal vibration and 500 *g* shock)

(2) Maximum ESR is calculated by the following equation:

$$\text{ESR (max.)} = \frac{DF}{2\pi fC}\text{, where}$$

DF = maximum dissipation factor from Standard Ratings table
f = 120 Hz
C = nominal capacitance

(3) For ripple current limits at various temperatures, voltages, and frequencies, see Ripple Current table

DLA 06013, DLA 06014, DLA 06015, DLA 06016 RIPPLE CURRENT MULTIPLIERS VS. FREQUENCY, TEMPERATURE AND APPLIED PEAK VOLTAGE

FREQUENCY OF APPLIED RIPPLE CURRENT		120 Hz				800 Hz				1 kHz				10 kHz				40 kHz				100 kHz			
AMBIENT STILL AIR		TEMP °C				TEMP °C				TEMP °C				TEMP °C				TEMP °C				TEMP °C			
		≤ 55	85	105	125	≤ 55	85	105	125	≤ 55	85	105	125	≤ 55	85	105	125	≤ 55	85	105	125	≤ 55	85	105	125
% OF APPLIED VOLTAGE	100 %	0.60	0.39	-	-	0.71	0.43	-	-	0.72	0.46	-	-	0.88	0.55	-	-	1.0	0.63	-	-	1.1	0.69	-	-
	90 %	0.60	0.46	-	-	0.71	0.55	-	-	0.72	0.55	-	-	0.88	0.67	-	-	1.0	0.77	-	-	1.1	0.85	-	-
	80 %	0.60	0.52	0.35	-	0.71	0.62	0.42	-	0.72	0.62	0.42	-	0.88	0.76	0.52	-	1.0	0.87	0.59	-	1.1	0.96	0.65	-
	70 %	0.60	0.58	0.44	-	0.71	0.69	0.52	-	0.72	0.70	0.52	-	0.88	0.85	0.64	-	1.0	0.97	0.73	-	1.1	1.07	0.80	-
	66 2/3 %	0.60	0.60	0.46	0.27	0.71	0.71	0.55	0.32	0.72	0.72	0.55	0.32	0.88	0.88	0.68	0.40	1.0	1.0	0.77	0.45	1.1	1.1	0.85	0.50

Notes

1. At +125 °C the rated voltage of the capacitors decreases to 66 2/3 % of the +85 °C rated voltage
2. The peak of the applied AC ripple voltage plus the applied DC voltage must not exceed the DC voltage rating of the capacitor either forward or reverse
3. The ripple current listed represents a rating calculated using a maximum internal temperature rise (ΔT) of +50 °C at 40 kHz at +85 °C ambient with a maximum peak rated voltage of 66 2/3 % of the +85 °C peak voltage rating
4. The maximum allowable internal temperature rise (ΔT) decreases linearly to a calculated +10 °C rise at +125 °C ambient
5. The internal temperature rise is directly proportional to the equivalent series resistance of the capacitor and equivalent series resistance increases with decreasing frequency

For technical questions, contact: tantalum@vishay.com
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