Wet Tantalum Capacitors, Military Established Reliability, MIL-PRF-39006/30/31 Qualified Styles CLR90, CLR91



FEATURES

- Hermetically sealed
- Metal cased
- Low ESR
- Axial lead
- Tubular

STYLE, MILITARY SPECIFICATION

- CLR90, M39006/30 MIL-PRF-39006/30
- CLR91, M39006/31 MIL-PRF-39006/31

LINKS TO ADDITIONAL RESOURCES

3D Models

PERFORMANCE CHARACTERISTICS

www.vishay.com/doc?40188

Operating Temperature: -55 °C to +125 °C

Capacitance Range: M39006/30 - 1.7 µF to 1200 µF; M39006/31 - 6.8 µF to 2200 µF

Capacitance Tolerance: ± 5 %, ± 10 %, ± 20 %

Voltage Rating: 6 V_{DC} to 125 V_{DC}

Established Reliability Tantalum Capacitors to Military Specification MIL-PRF-39006: In accordance with the military specification MIL-PRF-39006 all capacitors are marked with the military part number (M39006/xx-xxxx) rather than the older style designation (CLR90, CLR91) and should be ordered as such.

For information on the performance characteristics of these capacitors, please refer to the latest issue of the Military Specification. MIL-PRF-39006 establishes 1000 h failure rate levels of 1 %, 0.1 %, and 0.01 %. When ordering these parts, care must be exercised that the correct part number expressing the appropriate failure level be specified.

Each order for military style capacitors requiring government inspection must state whether inspection is to be at the destination or at the Vishay plant. Orders requiring source inspection cannot be shipped until this has been accomplished.

ORDERING INFORMATION

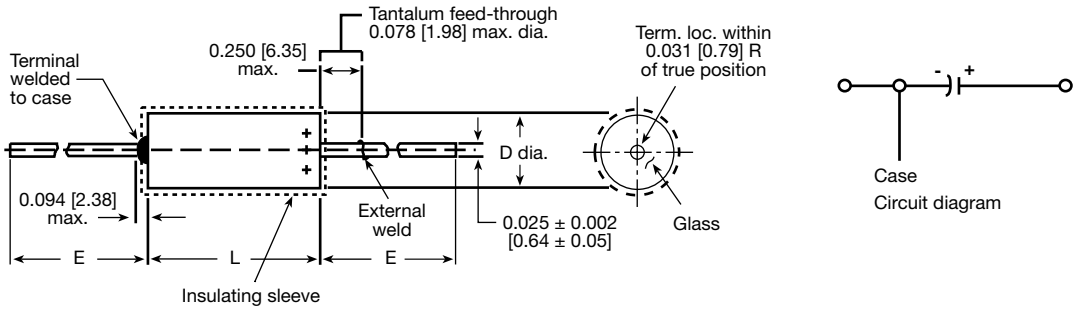
M39006	/30	-0512	H
BASIC DOCUMENT NUMBER	SLASH SHEET	DASH NUMBER	DESIGNATION OF HIGH VIBRATION (OPTIONAL)
Indicates the basic specification; in this case MIL-PRF-39006	Indicates the specification sheet of the basic military specification	Taken from Standard / Extended Ratings tables	H, optional, if specified

For technical questions, contact: tantalum@vishay.com

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DIMENSIONS in inches [millimeters]

Style CLR90
Style CLR91



CASE CODE	BARE CASE		WITH INSULATING SLEEVE		E LEAD LENGTH	WEIGHT (oz. / g) (MAX.)
	D	L	D (MAX.)	L (1)		
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]	0.565 [14.35]	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]	0.785 [19.94]	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]	0.95 [24.13]	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]	1.31 [33.27]	2.250 ± 0.250 [57.15 ± 6.35]	0.62 [17.7]

Note

(1) Typical length, for reference only

RATINGS AND CASE CODES - M39006/30

µF	6	8	10	15	25	30	50	60	75	100	125
1.7											T1
2.5										T1	
3.5									T1		
3.6											T1
4.0								T1			
4.7										T1	
5.0							T1				
6.8									T1		
8.0						T1					
8.2								T1			
9											T2
10					T1		T1				
11										T2	
14											T2
15				T1		T1			T2		
18											T3
20			T1					T2			
22					T1					T2	
25		T1					T2				T3
30	T1									T3	
33				T1					T2		
39								T2			
40						T2			T3		
43										T3	
47			T1				T2				
50					T2			T3			
56		T1							T3		T4
60							T3				
68	T1					T2		T3			
70				T2							

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RATINGS AND CASE CODES - M39006/30											
µF	**6**	**8**	**10**	**15**	**25**	**30**	**50**	**60**	**75**	**100**	**125**
82							T3				
86										T4	
100			T2		T2	T3					
110									T4		
120		T2		T2	T3						
140	T2							T4			
150						T3					
160							T4				
170				T3							
180			T2		T3						
220		T2									
250			T3								
270	T2			T3							
290		T3									
300						T4					
330	T3										
350					T4						
390			T3								
430		T3									
540				T4							
560	T3										
750			T4								
850		T4									
1200	T4										

RATINGS AND CASE CODES - M39006/31											
µF	**6**	**8**	**10**	**15**	**25**	**30**	**50**	**60**	**75**	**100**	**125**
6.8											T1
10										T1	
22									T1		
27								T1			T2
33							T1				
39										T2	
47											T3
56						T1					
68					T1					T3	
82									T2		T4
100				T1				T2			
120							T2			T4	
150			T1								
180		T1							T3		
220	T1					T2		T3	T4		
270					T2		T3	T4			
330							T4				
390				T2							
470						T3					
560			T2		T3	T4					
680		T2			T4						
820	T2			T3							
1000				T4							
1200			T3								
1500	T3	T3	T4								
1800		T4									
2200	T4										

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STANDARD RATINGS / EXTENDED RATINGS: CLR90, M39006/30-XXXX

CAPACITANCE (µF)	CASE CODE	CAP. TOL. (± %)	PART NO. M39006/30- [1] FAILURE RATE LEVEL (%/1000 h)			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)
			M 1.0	P 0.1	R 0.01	+25 °C	+85 °C +125 °C			-55 °C	+85 °C	+125 °C	
6 V_{DC} AT +85 °C; 4 V_{DC} AT +125 °C													
30	T1	20	0001	0221	0441	1.0	2.0	4.5	100	-40	+10.5	+12	1.99
30	T1	10	0002	0222	0442	1.0	2.0	4.5	100	-40	+10.5	+12	1.99
30	T1	5	0003	0223	0443	1.0	2.0	4.5	100	-40	+10.5	+12	1.99
68	T1	20	0004	0224	0444	1.0	2.0	7.5	60	-40	+14	+16	1.58
68	T1	10	0005	0225	0445	1.0	2.0	7.5	60	-40	+14	+16	1.58
68	T1	5	0006	0226	0446	1.0	2.0	7.5	60	-40	+14	+16	1.58
140	T2	20	0007	0227	0447	1.0	3.0	10.5	40	-40	+14	+16	0.99
140	T2	10	0008	0228	0448	1.0	3.0	10.5	40	-40	+14	+16	0.99
140	T2	5	0009	0229	0449	1.0	3.0	10.5	40	-40	+14	+16	0.99
270	T2	20	0010	0230	0450	1.0	6.5	22.5	25	-44	+17.5	+20	1.11
270	T2	10	0011	0231	0451	1.0	6.5	22.5	25	-44	+17.5	+20	1.11
270	T2	5	0012	0232	0452	1.0	6.5	22.5	25	-44	+17.5	+20	1.11
330	T3	20	0013	0233	0453	2.0	7.9	18.0	20	-44	+14	+16	0.73
330	T3	10	0014	0234	0454	2.0	7.9	18.0	20	-44	+14	+16	0.73
330	T3	5	0015	0235	0455	2.0	7.9	18.0	20	-44	+14	+16	0.73
560	T3	20	0016	0236	0456	2.0	13.0	27.5	25	-64	+17.5	+20	0.65
560	T3	10	0017	0237	0457	2.0	13.0	27.5	25	-64	+17.5	+20	0.65
560	T3	5	0018	0238	0458	2.0	13.0	27.5	25	-64	+17.5	+20	0.65
1200	T4	20	0019	0239	0459	3.0	14.0	45.0	20	-80	+25	+25	0.50
1200	T4	10	0020	0240	0460	3.0	14.0	45.0	20	-80	+25	+25	0.50
8 V_{DC} AT +85 °C; 5 V_{DC} AT +125 °C													
25	T1	20	0021	0241	0461	1.0	2.0	3.75	100	-40	+10.5	+12	1.99
25	T1	10	0022	0242	0462	1.0	2.0	3.75	100	-40	+10.5	+12	1.99
25	T1	5	0023	0243	0463	1.0	2.0	3.75	100	-40	+10.5	+12	1.99
56	T1	20	0024	0244	0464	1.0	2.0	7.0	59	-40	+14	+16	1.66
56	T1	10	0025	0245	0465	1.0	2.0	7.0	59	-40	+14	+16	1.66
56	T1	5	0026	0246	0466	1.0	2.0	7.0	59	-40	+14	+16	1.66
120	T2	20	0027	0247	0467	1.0	2.0	10.0	50	-44	+17.5	+20	1.11
120	T2	10	0028	0248	0468	1.0	2.0	10.0	50	-44	+17.5	+20	1.11
120	T2	5	0029	0249	0469	1.0	2.0	10.0	50	-44	+17.5	+20	1.11
220	T2	20	0030	0250	0470	1.0	7.0	18.5	30	-44	+17.5	+20	1.12
220	T2	10	0031	0251	0471	1.0	7.0	18.5	30	-44	+17.5	+20	1.12
220	T2	5	0032	0252	0472	1.0	7.0	18.5	30	-44	+17.5	+20	1.12
290	T3	20	0033	0253	0473	2.0	6.0	17.0	25	-64	+17.5	+20	0.78
290	T3	10	0034	0254	0474	2.0	6.0	17.0	25	-64	+17.5	+20	0.78
290	T3	5	0035	0255	0475	2.0	6.0	17.0	25	-64	+17.5	+20	0.78
430	T3	20	0036	0256	0476	2.0	14.0	23.0	25	-64	+17.5	+20	0.71
430	T3	10	0037	0257	0477	2.0	14.0	23.0	25	-64	+17.5	+20	0.71
430	T3	5	0038	0258	0478	2.0	14.0	23.0	25	-64	+17.5	+20	0.71
850	T4	20	0039	0259	0479	4.0	16.0	30.0	22	-80	+25	+25	0.47
850	T4	10	0040	0260	0480	4.0	16.0	30.0	22	-80	+25	+25	0.47
10 V_{DC} AT +85 °C; 7 V_{DC} AT +125 °C													
20	T1	20	0041	0261	0481	1.0	2.0	3.0	175	-32	+10.5	+12	1.99
20	T1	10	0042	0262	0482	1.0	2.0	3.0	175	-32	+10.5	+12	1.99
20	T1	5	0043	0263	0483	1.0	2.0	3.0	175	-32	+10.5	+12	1.99
47	T1	20	0044	0264	0484	1.0	2.0	6.5	100	-36	+14	+16	1.84
47	T1	10	0045	0265	0485	1.0	2.0	6.5	100	-36	+14	+16	1.84
47	T1	5	0046	0266	0486	1.0	2.0	6.5	100	-36	+14	+16	1.84
100	T2	20	0047	0267	0487	1.0	4.0	7.5	60	-36	+14	+16	0.99
100	T2	10	0048	0268	0488	1.0	4.0	7.5	60	-36	+14	+16	0.99
100	T2	5	0049	0269	0489	1.0	4.0	7.5	60	-36	+14	+16	0.99
180	T2	20	0050	0270	0490	1.0	7.0	15.0	40	-36	+14	+16	1.11
180	T2	10	0051	0271	0491	1.0	7.0	15.0	40	-36	+14	+16	1.11
180	T2	5	0052	0272	0492	1.0	7.0	15.0	40	-36	+14	+16	1.11
250	T3	20	0053	0273	0493	2.0	10.0	15.0	30	-40	+14	+16	0.80
250	T3	10	0054	0274	0494	2.0	10.0	15.0	30	-40	+14	+16	0.80
250	T3	5	0055	0275	0495	2.0	10.0	15.0	30	-40	+14	+16	0.80
390	T3	20	0056	0276	0496	2.0	16.0	22.0	25	-64	+17.5	+20	0.75

Notes

(1) Dash number will include the letter "H" to indicate the optional vibration and shock requirements (i.e., 53.79 *g's* random vibration, 80 *g's* sinusoidal vibration and 500 *g's* shock)

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

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STANDARD RATINGS / EXTENDED RATINGS: CLR90, M39006/30-XXXX

CAPACITANCE (µF)	CASE CODE	CAP. TOL. (± %)	PART NO. M39006/30- [1] FAILURE RATE LEVEL (%/1000 h)			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)
			M 1.0	P 0.1	R 0.01	+25 °C	+85 °C +125 °C			-55 °C	+85 °C	+125 °C	
10 V_{DC} AT +85 °C; 7 V_{DC} AT +125 °C													
390	T3	10	0057	0277	0497	2.0	16.0	22.0	25	-64	+17.5	+20	0.75
390	T3	5	0058	0278	0498	2.0	16.0	22.0	25	-64	+17.5	+20	0.75
750	T4	20	0059	0279	0499	4.0	16.0	25.0	23	-80	+25	+25	0.44
750	T4	10	0060	0280	0500	4.0	16.0	25.0	23	-80	+25	+25	0.44
15 V_{DC} AT +85 °C; 10 V_{DC} AT +125 °C													
15	T1	20	0061	0281	0501	1.0	2.0	2.5	155	-24	+10.5	+12	1.99
15	T1	10	0062	0282	0502	1.0	2.0	2.5	155	-24	+10.5	+12	1.99
15	T1	5	0063	0283	0503	1.0	2.0	2.5	155	-24	+10.5	+12	1.99
33	T1	20	0064	0284	0504	1.0	2.0	5.0	90	-28	+14	+16	1.66
33	T1	10	0065	0285	0505	1.0	2.0	5.0	90	-28	+14	+16	1.66
33	T1	5	0066	0286	0506	1.0	2.0	5.0	90	-28	+14	+16	1.66
70	T2	20	0067	0287	0507	1.0	4.0	6.5	75	-28	+14	+16	1.11
70	T2	10	0068	0288	0508	1.0	4.0	6.5	75	-28	+14	+16	1.11
70	T2	5	0069	0289	0509	1.0	4.0	6.5	75	-28	+14	+16	1.11
120	T2	20	0070	0290	0510	1.0	7.0	9.0	50	-28	+17.5	+20	1.12
120	T2	10	0071	0291	0511	1.0	7.0	9.0	50	-28	+17.5	+20	1.12
120	T2	5	0072	0292	0512	1.0	7.0	9.0	50	-28	+17.5	+20	1.12
170	T3	20	0073	0293	0513	2.0	10.0	12.5	35	-32	+14	+16	0.78
170	T3	10	0074	0294	0514	2.0	10.0	12.5	35	-32	+14	+16	0.78
170	T3	5	0075	0295	0515	2.0	10.0	12.5	35	-32	+14	+16	0.78
270	T3	20	0076	0296	0516	2.0	16.0	16.0	30	-56	+17.5	+20	0.71
270	T3	10	0077	0297	0517	2.0	16.0	16.0	30	-56	+17.5	+20	0.71
270	T3	5	0078	0298	0518	2.0	16.0	16.0	30	-56	+17.5	+20	0.71
540	T4	20	0079	0299	0519	6.0	24.0	20.0	23	-80	+25	+25	0.47
540	T4	10	0080	0300	0520	6.0	24.0	20.0	23	-80	+25	+25	0.47
25 V_{DC} AT +85 °C; 15 V_{DC} AT +125 °C													
10	T1	20	0081	0301	0521	1.0	2.0	2.0	220	-16	+8	+9	2.66
10	T1	10	0082	0302	0522	1.0	2.0	2.0	220	-16	+8	+9	2.66
10	T1	5	0083	0303	0523	1.0	2.0	2.0	220	-16	+8	+9	2.66
22	T1	20	0084	0304	0524	1.0	2.0	3.3	140	-20	+10.5	+12	1.99
22	T1	10	0085	0305	0525	1.0	2.0	3.3	140	-20	+10.5	+12	1.99
22	T1	5	0086	0306	0526	1.0	2.0	3.3	140	-20	+10.5	+12	1.99
50	T2	20	0087	0307	0527	1.0	2.0	5.5	70	-28	+13	+15	1.46
50	T2	10	0088	0308	0528	1.0	2.0	5.5	70	-28	+13	+15	1.46
50	T2	5	0089	0309	0529	1.0	2.0	5.5	70	-28	+13	+15	1.46
100	T2	20	0090	0310	0530	1.0	10.0	7.5	50	-28	+13	+15	0.99
100	T2	10	0091	0311	0531	1.0	10.0	7.5	50	-28	+13	+15	0.99
100	T2	5	0092	0312	0532	1.0	10.0	7.5	50	-28	+13	+15	0.99
120	T3	20	0093	0313	0533	2.0	6.0	10.5	38	-32	+13	+15	1.16
120	T3	10	0094	0314	0534	2.0	6.0	10.5	38	-32	+13	+15	1.16
120	T3	5	0095	0315	0535	2.0	6.0	10.5	38	-32	+13	+15	1.16
180	T3	20	0096	0316	0536	2.0	18.0	13.0	32	-48	+13	+15	0.96
180	T3	10	0097	0317	0537	2.0	18.0	13.0	32	-48	+13	+15	0.96
180	T3	5	0098	0318	0538	2.0	18.0	13.0	32	-48	+13	+15	0.96
350	T4	20	0099	0319	0539	7.0	28.0	17.5	24	-70	+25	+25	0.67
350	T4	10	0100	0320	0540	7.0	28.0	17.5	24	-70	+25	+25	0.67
30 V_{DC} AT +85 °C; 20 V_{DC} AT +125 °C													
8	T1	20	0101	0321	0541	1.0	2.0	2.0	275	-16	+8	+12	3.32
8	T1	10	0102	0322	0542	1.0	2.0	2.0	275	-16	+8	+12	3.32
8	T1	5	0103	0323	0543	1.0	2.0	2.0	275	-16	+8	+12	3.32
15	T1	20	0104	0324	0544	1.0	2.0	2.5	175	-20	+10.5	+12	2.21
15	T1	10	0105	0325	0545	1.0	2.0	2.5	175	-20	+10.5	+12	2.21
15	T1	5	0106	0326	0546	1.0	2.0	2.5	175	-20	+10.5	+12	2.21
40	T2	20	0107	0327	0547	1.0	5.0	5.0	65	-24	+10.5	+12	1.66
40	T2	10	0108	0328	0548	1.0	5.0	5.0	65	-24	+10.5	+12	0.66
40	T2	5	0109	0329	0549	1.0	5.0	5.0	65	-24	+10.5	+12	0.66

Notes

[1] Dash number will include the letter "H" to indicate the optional vibration and shock requirements (i.e., 53.79 *g's* random vibration, 80 *g's* sinusoidal vibration and 500 *g's* shock)

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

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STANDARD RATINGS / EXTENDED RATINGS: CLR90, M39006/30-XXXX

CAPACITANCE (µF)	CASE CODE	CAP. TOL. (± %)	PART NO. M39006/30- [1] FAILURE RATE LEVEL (%/1000 h)			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)
			M 1.0	P 0.1	R 0.01	+25 °C	+85 °C +125 °C			-55 °C	+85 °C	+125 °C	
30 V_{DC} AT +85 °C; 20 V_{DC} AT +125 °C													
68	T2	20	0110	0330	0550	1.0	8.0	6.5	60	-24	+13	+15	1.27
68	T2	10	0111	0331	0551	1.0	8.0	6.5	60	-24	+13	+15	1.27
68	T2	5	0112	0332	0552	1.0	8.0	6.5	60	-24	+13	+15	1.27
100	T3	20	0113	0333	0553	2.0	12.0	8.5	40	-28	+10.5	+12	1.13
100	T3	10	0114	0334	0554	2.0	12.0	8.5	40	-28	+10.5	+12	1.13
100	T3	5	0115	0335	0555	2.0	12.0	8.5	40	-28	+10.5	+12	1.13
150	T3	20	0116	0336	0556	2.0	18.0	11.5	35	-48	+13	+15	1.02
150	T3	10	0117	0337	0557	2.0	18.0	11.5	35	-48	+13	+15	1.02
150	T3	5	0118	0338	0558	2.0	18.0	11.5	35	-48	+13	+15	1.02
300	T4	20	0119	0339	0559	8.0	32.0	15.5	25	-60	+25	+25	0.69
300	T4	10	0120	0340	0560	8.0	32.0	15.5	25	-60	+25	+25	0.69
50 V_{DC} AT +85 °C; 30 V_{DC} AT +125 °C													
5	T1	20	0121	0341	0561	1.0	2.0	1.5	400	-16	+5	+6	3.98
5	T1	10	0122	0342	0562	1.0	2.0	1.5	400	-16	+5	+6	3.98
5	T1	5	0123	0343	0563	1.0	2.0	1.5	400	-16	+5	+6	3.98
10	T1	20	0124	0344	0564	1.0	2.0	2.0	250	-24	+8	+9	2.66
10	T1	10	0125	0345	0565	1.0	2.0	2.0	250	-24	+8	+9	2.66
10	T1	5	0126	0346	0566	1.0	2.0	2.0	250	-24	+8	+9	2.66
25	T2	20	0127	0347	0567	1.0	5.0	4.0	95	-20	+10.5	+12	2.13
25	T2	10	0128	0348	0568	1.0	5.0	4.0	95	-20	+10.5	+12	2.13
25	T2	5	0129	0349	0569	1.0	5.0	4.0	95	-20	+10.5	+12	2.13
47	T2	20	0130	0350	0570	1.0	9.0	5.0	70	-28	+13	+15	1.56
47	T2	10	0131	0351	0571	1.0	9.0	5.0	70	-28	+13	+15	1.56
47	T2	5	0132	0352	0572	1.0	9.0	5.0	70	-28	+13	+15	1.56
60	T3	20	0133	0353	0573	2.0	12.0	6.0	45	-16	+10.5	+12	1.33
60	T3	10	0134	0354	0574	2.0	12.0	6.0	45	-16	+10.5	+12	1.33
60	T3	5	0135	0355	0575	2.0	12.0	6.0	45	-16	+10.5	+12	1.33
82	T3	20	0136	0356	0576	2.0	16.0	7.5	45	-32	+13	+15	1.22
82	T3	10	0137	0357	0577	2.0	16.0	7.5	45	-32	+13	+15	1.22
82	T3	5	0138	0358	0578	2.0	16.0	7.5	45	-32	+13	+15	1.22
160	T4	20	0139	0359	0579	6.0	32.0	8.5	27	-50	+25	+25	0.71
160	T4	10	0140	0360	0580	6.0	32.0	8.5	27	-50	+25	+25	0.71
60 V_{DC} AT +85 °C; 40 V_{DC} AT +125 °C													
4.0	T1	20	0141	0361	0581	1.0	2.0	1.4	550	-16	+5	+6	4.65
4.0	T1	10	0142	0362	0582	1.0	2.0	1.4	550	-16	+5	+6	4.65
4.0	T1	5	0143	0363	0583	1.0	2.0	1.4	550	-16	+5	+6	4.65
8.2	T1	20	0144	0364	0584	1.0	2.0	2.0	275	-24	+8	+9	3.24
8.2	T1	10	0145	0365	0585	1.0	2.0	2.0	275	-24	+8	+9	3.24
8.2	T1	5	0146	0366	0586	1.0	2.0	2.0	275	-24	+8	+9	3.24
20	T2	20	0147	0367	0587	1.0	5.0	3.5	105	-16	+10.5	+12	2.32
20	T2	10	0148	0368	0588	1.0	5.0	3.5	105	-16	+10.5	+12	2.32
20	T2	5	0149	0369	0589	1.0	5.0	3.5	105	-16	+10.5	+12	2.32
39	T2	20	0150	0370	0590	1.0	9.0	5.0	90	-28	+10.5	+12	1.70
39	T2	10	0151	0371	0591	1.0	9.0	5.0	90	-28	+10.5	+12	1.70
39	T2	5	0152	0372	0592	1.0	9.0	5.0	90	-28	+10.5	+12	1.70
50	T3	20	0153	0373	0593	2.0	12.0	5.0	50	-16	+10.5	+12	1.33
50	T3	10	0154	0374	0594	2.0	12.0	5.0	50	-16	+10.5	+12	1.33
50	T3	5	0155	0375	0595	2.0	12.0	5.0	50	-16	+10.5	+12	1.33
68	T3	20	0156	0376	0596	2.0	16.0	6.5	50	-32	+10.5	+12	1.27
68	T3	10	0157	0377	0597	2.0	16.0	6.5	50	-32	+10.5	+12	1.27
68	T3	5	0158	0378	0598	2.0	16.0	6.5	50	-32	+10.5	+12	1.27
140	T4	20	0159	0379	0599	8.0	32.0	8.0	28	-40	+20	+20	0.76
140	T4	10	0160	0380	0600	8.0	32.0	8.0	28	-40	+20	+20	0.76

Notes

(1) Dash number will include the letter "H" to indicate the optional vibration and shock requirements (i.e., 53.79 *g's* random vibration, 80 *g's* sinusoidal vibration and 500 *g's* shock)

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

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STANDARD RATINGS / EXTENDED RATINGS: CLR90, M39006/30-XXXX

CAPACITANCE (µF)	CASE CODE	CAP. TOL. (± %)	PART NO. M39006/30- [1] FAILURE RATE LEVEL (%/1000 h)			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)
			M 1.0	P 0.1	R 0.01	+25 °C	+85 °C +125 °C			-55 °C	+85 °C	+125 °C	
75 V_{DC} AT +85 °C; 50 V_{DC} AT +125 °C													
3.5	T1	20	0161	0381	0601	1.0	2.0	1.25	650	-16	+5	+6	4.74
3.5	T1	10	0162	0382	0602	1.0	2.0	1.25	650	-16	+5	+6	4.74
3.5	T1	5	0163	0383	0603	1.0	2.0	1.25	650	-16	+5	+6	4.74
6.8	T1	20	0164	0384	0604	1.0	2.0	1.75	300	-20	+8	+9	3.42
6.8	T1	10	0165	0385	0605	1.0	2.0	1.75	300	-20	+8	+9	3.42
6.8	T1	5	0166	0386	0606	1.0	2.0	1.75	300	-20	+8	+9	3.42
15	T2	20	0167	0387	0607	1.0	5.0	3.0	150	-16	+8	+9	2.66
15	T2	10	0168	0388	0608	1.0	5.0	3.0	150	-16	+8	+9	2.66
15	T2	5	0169	0389	0609	1.0	5.0	3.0	150	-16	+8	+9	2.66
33	T2	20	0170	0390	0610	1.0	10.0	5.0	90	-24	+10.5	+15	2.01
33	T2	10	0171	0391	0611	1.0	10.0	5.0	90	-24	+10.5	+15	2.01
33	T2	5	0172	0392	0612	1.0	10.0	5.0	90	-24	+10.5	+15	2.01
40	T3	20	0173	0393	0613	2.0	12.0	4.5	60	-16	+10.5	+12	1.50
40	T3	10	0174	0394	0614	2.0	12.0	4.5	60	-16	+10.5	+12	1.50
40	T3	5	0175	0395	0615	2.0	12.0	4.5	60	-16	+10.5	+12	1.50
56	T3	20	0176	0396	0616	2.0	17.0	5.5	60	-28	+10.5	+15	1.31
56	T3	10	0177	0397	0617	2.0	17.0	5.5	60	-28	+10.5	+15	1.31
56	T3	5	0178	0398	0618	2.0	17.0	5.5	60	-28	+10.5	+15	1.31
110	T4	20	0179	0399	0619	9.0	36.0	6.0	29	-35	+20	+20	0.73
110	T4	10	0180	0400	0620	9.0	36.0	6.0	29	-35	+20	+20	0.73
100 V_{DC} AT +85 °C; 65 V_{DC} AT +125 °C													
2.5	T1	20	0181	0401	0621	1.0	2.0	1.0	950	-16	+7	+8	5.31
2.5	T1	10	0182	0402	0622	1.0	2.0	1.0	950	-16	+7	+8	5.31
2.5	T1	5	0183	0403	0623	1.0	2.0	1.0	950	-16	+7	+8	5.31
4.7	T1	20	0184	0404	0624	1.0	2.0	1.5	500	-16	+7	+8	4.24
4.7	T1	10	0185	0405	0625	1.0	2.0	1.5	500	-16	+7	+8	4.24
4.7	T1	5	0186	0406	0626	1.0	2.0	1.5	500	-16	+7	+8	4.24
11.0	T2	20	0187	0407	0627	1.0	4.0	2.5	200	-16	+8	+8	3.02
11.0	T2	10	0188	0408	0628	1.0	4.0	2.5	200	-16	+8	+8	3.02
11.0	T2	5	0189	0409	0629	1.0	4.0	2.5	200	-16	+8	+8	3.02
22.0	T2	20	0190	0410	0630	1.0	9.0	3.75	100	-16	+8	+8	2.26
22.0	T2	10	0191	0411	0631	1.0	9.0	3.75	100	-16	+8	+8	2.26
22.0	T2	5	0192	0412	0632	1.0	9.0	3.75	100	-16	+8	+8	2.26
30.0	T3	20	0193	0413	0633	2.0	12.0	3.5	80	-16	+8	+8	1.55
30.0	T3	10	0194	0414	0634	2.0	12.0	3.5	80	-16	+8	+8	1.55
30.0	T3	5	0195	0415	0635	2.0	12.0	3.5	80	-16	+8	+8	1.55
43.0	T3	20	0196	0416	0636	2.0	17.0	4.25	70	-20	+8	+8	1.31
43.0	T3	10	0197	0417	0637	2.0	17.0	4.25	70	-20	+8	+8	1.31
43.0	T3	5	0198	0418	0638	2.0	17.0	4.25	70	-20	+8	+8	1.31
86.0	T4	20	0199	0419	0639	9.0	36.0	5.0	30	-25	+15	+15	0.77
86.0	T4	10	0200	0420	0640	9.0	36.0	5.0	30	-25	+15	+15	0.77
125 V_{DC} AT +85 °C; 85 V_{DC} AT +125 °C													
1.7	T1	20	0201	0421	0641	1.0	2.0	1.0	1250	-16	+7	+8	7.81
1.7	T1	10	0202	0422	0642	1.0	2.0	1.0	1250	-16	+7	+8	7.81
1.7	T1	5	0203	0423	0643	1.0	2.0	1.0	1250	-16	+7	+8	7.81
3.6	T1	20	0204	0424	0644	1.0	2.0	1.35	600	-24	+7	+8	4.98
3.6	T1	10	0205	0425	0645	1.0	2.0	1.35	600	-16	+7	+8	4.98
3.6	T1	5	0206	0426	0646	1.0	2.0	1.35	600	-16	+7	+8	4.98
9.0	T2	20	0207	0427	0647	1.0	5.0	2.5	240	-16	+7	+8	3.69
9.0	T2	10	0208	0428	0648	1.0	5.0	2.5	240	-16	+7	+8	3.69
9.0	T2	5	0209	0429	0649	1.0	5.0	2.5	240	-16	+7	+8	3.69
14.0	T2	20	0210	0430	0650	1.0	7.0	3.0	167	-16	+7	+8	2.85
14.0	T2	10	0211	0431	0651	1.0	7.0	3.0	167	-16	+7	+8	2.85
14.0	T2	5	0212	0432	0652	1.0	7.0	3.0	167	-16	+7	+8	2.85

Notes

(1) Dash number will include the letter "H" to indicate the optional vibration and shock requirements (i.e., 53.79 *g's* random vibration, 80 *g's* sinusoidal vibration and 500 *g's* shock)

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

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STANDARD RATINGS / EXTENDED RATINGS: CLR90, M39006/30-XXXX

CAPACITANCE (µF)	CASE CODE	CAP. TOL. (± %)	PART NO. M39006/30- (1) FAILURE RATE LEVEL (%/1000 h)			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)
			M 1.0	P 0.1	R 0.01	+25 °C	+85 °C +125 °C			-55 °C	+85 °C	+125 °C	
125 V_{DC} AT +85 °C; 85 V_{DC} AT +125 °C													
18.0	T3	20	0213	0433	0653	2.0	9.0	2.5	129	-16	+7	+8	1.85
18.0	T3	10	0214	0434	0654	2.0	9.0	2.5	129	-16	+7	+8	1.85
18.0	T3	5	0215	0435	0655	2.0	9.0	2.5	129	-16	+7	+8	1.85
25.0	T3	20	0216	0436	0656	2.0	13.0	3.0	93	-16	+7	+8	1.59
25.0	T3	10	0217	0437	0657	2.0	13.0	3.0	93	-16	+7	+8	1.59
25.0	T3	5	0218	0438	0658	2.0	13.0	3.0	93	-16	+7	+8	1.59
56.0	T4	20	0219	0439	0659	10.0	40.0	3.25	32	-25	+15	+15	0.77
56.0	T4	10	0220	0440	0660	10.0	40.0	3.25	32	-25	+15	+15	0.77

Notes

(1) Dash number will include the letter "H" to indicate the optional vibration and shock requirements (i.e., 53.79 *g's* random vibration, 80 *g's* sinusoidal vibration and 500 *g's* shock)

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

STANDARD / EXTENDED RATINGS: CLR91, M39006/31-XXXX

CAPACITANCE (µF)	CASE CODE	CAP. TOL. (± %)	PART NO. M39006/31- (1) FAILURE RATE LEVEL (%/1000 h)			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)
			M 1.0	P 0.1	R 0.01	+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	0001	0089	0177	2	9	25	36	-64	+13	+16	1.51
220	T1	10	0002	0090	0178	2	9	25	36	-64	+13	+16	1.51
820	T2	20	0003	0091	0179	3	14	77.5	18	-88	+16	+20	1.26
820	T2	10	0004	0092	0180	3	14	77.5	18	-88	+16	+20	1.26
1500	T3	20	0005	0093	0181	5	20	86	18	-90	+20	+25	0.76
1500	T3	10	0006	0094	0182	5	20	86	18	-90	+20	+25	0.76
2200	T4	20	0007	0095	0183	6	24	85	13	-90	+25	+30	0.52
2200	T4	10	0008	0096	0184	6	24	85	13	-90	+25	+30	0.52
8 V_{DC} AT +85 °C; 5 V_{DC} AT +125 °C													
180	T1	20	0009	0097	0185	2	9	20.5	45	-60	+13	+16	1.51
180	T1	10	0010	0098	0186	2	9	20.5	45	-60	+13	+16	1.51
680	T2	20	0011	0099	0187	3	14	65	22	-83	+16	+20	1.27
680	T2	10	0012	0100	0188	3	14	65	22	-83	+16	+20	1.27
1500	T3	20	0013	0101	0189	5	20	85	18	-90	+20	+25	0.75
1500	T3	10	0014	0102	0190	5	20	85	18	-90	+20	+25	0.75
1800	T4	20	0015	0103	0191	7	25	69	14	-90	+25	+30	0.51
1800	T4	10	0016	0104	0192	7	25	69	14	-90	+25	+30	0.51
10 V_{DC} AT +85 °C; 7 V_{DC} AT +125 °C													
150	T1	20	0017	0105	0193	2	9	17	54	-55	+13	+16	1.51
150	T1	10	0018	0106	0194	2	9	17	54	-55	+13	+16	1.51
560	T2	20	0019	0107	0195	3	16	53	27	-77	+16	+20	1.26
560	T2	10	0020	0108	0196	3	16	53	27	-77	+16	+20	1.26
1200	T3	20	0021	0109	0197	5	20	68.5	18	-88	+20	+25	0.76
1200	T3	10	0022	0110	0198	5	20	68.5	18	-88	+20	+25	0.76
1500	T4	20	0023	0111	0199	7	25	57	15	-88	+25	+30	0.51
1500	T4	10	0024	0112	0200	7	25	57	15	-88	+25	+30	0.51
15 V_{DC} AT +85 °C; 10 V_{DC} AT +125 °C													
100	T1	20	0025	0113	0201	2	9	15	72	-44	+13	+16	1.99
100	T1	10	0026	0114	0202	2	9	15	72	-44	+13	+16	1.99
390	T2	20	0027	0115	0203	3	16	37	31	-66	+16	+20	1.26
390	T2	10	0028	0116	0204	3	16	37	31	-66	+16	+20	1.26
820	T3	20	0029	0117	0205	6	24	55.5	22	-77	+20	+25	0.9
820	T3	10	0030	0118	0206	6	24	55.5	22	-77	+20	+25	0.9
1000	T4	20	0031	0119	0207	8	32	46	17	-77	+25	+30	0.61
1000	T4	10	0032	0120	0208	8	32	46	17	-77	+25	+30	0.61

Notes

(1) Dash number will include the letter "H" to indicate the optional vibration and shock requirements (i.e., 53.79 *g's* random vibration, 80 *g's* sinusoidal vibration and 500 *g's* shock)

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

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STANDARD / EXTENDED RATINGS: CLR91, M39006/31-XXXX

CAPACITANCE (µF)	CASE CODE	CAP. TOL. (± %)	PART NO. M39006/31- [1] FAILURE RATE LEVEL (%/1000 h)			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)
			M 1.0	P 0.1	R 0.01	+25 °C	+85 °C +125 °C			-55 °C	+85 °C	+125 °C	
25 V_{DC} AT +85 °C; 15 V_{DC} AT +125 °C													
68	T1	20	0033	0121	0209	2	9	11	90	-40	+12	+15	2.15
68	T1	10	0034	0122	0210	2	9	11	90	-40	+12	+15	2.15
270	T2	20	0035	0123	0211	3	16	27.5	33	-62	+13	+16	1.35
270	T2	10	0036	0124	0212	3	16	27.5	33	-62	+13	+16	1.35
560	T3	20	0037	0125	0213	7	28	38	24	-72	+20	+25	0.9
560	T3	10	0038	0126	0214	7	28	38	24	-72	+20	+25	0.9
680	T4	20	0039	0127	0215	8	32	31.5	19	-72	+25	+30	0.62
680	T4	10	0040	0128	0216	8	32	31.5	19	-72	+25	+30	0.62
30 V_{DC} AT +85 °C; 20 V_{DC} AT +125 °C													
56	T1	20	0041	0129	0217	2	9	11	100	-38	+12	+15	2.61
56	T1	10	0042	0130	0218	2	9	11	100	-38	+12	+15	2.61
220	T2	20	0043	0131	0219	3	16	21	36	-60	+13	+16	1.27
220	T2	10	0044	0132	0220	3	16	21	36	-60	+13	+16	1.27
470	T3	20	0045	0133	0221	8	32	32	25	-65	+20	+25	0.91
470	T3	10	0046	0134	0222	8	32	32	25	-65	+20	+25	0.91
560	T4	20	0047	0135	0223	9	36	27.5	20	-65	+25	+30	0.65
560	T4	10	0048	0136	0224	9	36	27.5	20	-65	+25	+30	0.65
50 V_{DC} AT +85 °C; 30 V_{DC} AT +125 °C													
33	T1	20	0049	0137	0225	2	9	6.15	135	-29	+10	+12	2.48
33	T1	10	0050	0138	0226	2	9	6.15	135	-29	+10	+12	2.48
120	T2	20	0051	0139	0227	4	24	11.3	49	-42	+12	+15	1.25
120	T2	10	0052	0140	0228	4	24	11.3	49	-42	+12	+15	1.25
270	T3	20	0053	0141	0229	8	32	18.5	29	-46	+20	+25	0.91
270	T3	10	0054	0142	0230	8	32	18.5	29	-46	+20	+25	0.91
330	T4	20	0055	0143	0231	9	36	19	22	-46	+25	+30	0.77
330	T4	10	0056	0144	0232	9	36	19	22	-46	+25	+30	0.77
60 V_{DC} AT +85 °C; 40 V_{DC} AT +125 °C													
27	T1	20	0057	0145	0233	3	12	5.1	144	-24	+10	+12	2.51
27	T1	10	0058	0146	0234	3	12	5.1	144	-24	+10	+12	2.51
100	T2	20	0059	0147	0235	4	20	9.5	54	-36	+12	+15	1.26
100	T2	10	0060	0148	0236	4	20	9.5	54	-36	+12	+15	1.26
220	T3	20	0061	0149	0237	8	32	15	29	-40	+16	+20	0.91
220	T3	10	0062	0150	0238	8	32	15	29	-40	+16	+20	0.91
270	T4	20	0063	0151	0239	9	36	13.5	23	-45	+20	+25	0.67
270	T4	10	0064	0152	0240	9	36	13.5	23	-45	+20	+25	0.67
75 V_{DC} AT +85 °C; 50 V_{DC} AT +125 °C													
22	T1	20	0065	0153	0241	3	12	4.25	157	-19	+10	+12	2.57
22	T1	10	0066	0154	0242	3	12	4.25	157	-19	+10	+12	2.57
82	T2	20	0067	0155	0243	4	24	7.6	63	-30	+12	+15	1.23
82	T2	10	0068	0156	0244	4	24	7.6	63	-30	+12	+15	1.23
180	T3	20	0069	0157	0245	9	36	12.2	30	-35	+16	+20	0.9
180	T3	10	0070	0158	0246	9	36	12.2	30	-35	+16	+20	0.9
220	T4	20	0071	0159	0247	10	40	18.5	24	-40	+20	+25	1.12
220	T4	10	0072	0160	0248	10	40	18.5	24	-40	+20	+25	1.12
100 V_{DC} AT +85 °C; 65 V_{DC} AT +125 °C													
10	T1	20	0073	0161	0249	3	12	2.25	200	-17	+10	+12	2.99
10	T1	10	0074	0162	0250	3	12	2.25	200	-17	+10	+12	2.99
39	T2	20	0075	0163	0251	5	24	5.2	80	-20	+12	+15	1.77
39	T2	10	0076	0164	0252	5	24	5.2	80	-20	+12	+15	1.77
68	T3	20	0077	0165	0253	10	40	5.65	40	-30	+14	+16	1.11
68	T3	10	0078	0166	0254	10	40	5.65	40	-30	+14	+16	1.11
120	T4	20	0079	0167	0255	12	48	12.5	30	-35	+15	+17	1.38
120	T4	10	0080	0168	0256	12	48	12.5	30	-35	+15	+17	1.38

Notes

[1] Dash number will include the letter “H” to indicate the optional vibration and shock requirements (i.e., 53.79 *g’s* random vibration, 80 *g’s* sinusoidal vibration and 500 *g’s* shock)

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

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STANDARD / EXTENDED RATINGS: CLR91, M39006/31-XXXX

CAPACITANCE (µF)	CASE CODE	CAP. TOL. (± %)	PART NO. M39006/31- (1) FAILURE RATE LEVEL (%/1000 h)			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)
			M 1.0	P 0.1	R 0.01	+25 °C	+85 °C +125 °C			-55 °C	+85 °C	+125 °C	
125 V_{DC} AT +85 °C; 85 V_{DC} AT +125 °C													
6.8	T1	20	0081	0169	0257	3	12	3	300	-14	+10	+12	5.86
6.8	T1	10	0082	0170	0258	3	12	3	300	-14	+10	+12	5.86
27	T2	20	0083	0171	0259	5	24	3.6	90	-18	+12	+15	1.77
27	T2	10	0084	0172	0260	5	24	3.6	90	-18	+12	+15	1.77
47	T3	20	0085	0173	0261	10	40	3.95	50	-26	+14	+16	1.12
47	T3	10	0086	0174	0262	10	40	3.95	50	-26	+14	+16	1.12
82	T4	20	0087	0175	0263	12	48	8.7	32	-30	+15	+17	1.41
82	T4	10	0088	0176	0264	12	48	8.7	32	-30	+15	+17	1.41

Notes

(1) Dash number will include the letter "H" to indicate the optional vibration and shock requirements (i.e., 53.79 *g's* random vibration, 80 *g's* sinusoidal vibration and 500 *g's* shock)

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

CLR90, CLR91 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

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Wet Tantalum Capacitors
Military Styles CLR79, CLR81, CLR90, and CLR91

ELECTRICAL PERFORMANCE CHARACTERISTICS			
ITEM	**PERFORMANCE CHARACTERISTICS**		
Operating temperature range	-55 °C to +85 °C (to +125 °C with voltage derating)		
Capacitance tolerance	± 20 %, ± 10 %, at 120 Hz, at +25 °C		
Capacitance change by temperature	Limit per Standard Ratings table		
ESR	For CLR90 and CLR91: limit per Standard Ratings table, at +25 °C, 120 Hz For CLR79 and CLR81: refer to M39006/22		
Impedance	Limit per Standard Ratings table, at -55 °C, 120 Hz		
DCL (leakage current)	Limit per Standard Ratings table		
AC ripple current	Limit per Standard Ratings table, at +85 °C and 40 kHz		
Reverse voltage	Reverse voltage rating at +85 °C is 3 V_{DC} and at +125 °C is 2 V_{DC}		
Maximum operating voltage	Rated (+85 °C) V_{DC}	Derated (+125 °C) V_{DC}	Surge (+85 °C) V_{DC}
	6	4	6.9
	8	5	9.2
	10	7	11.5
	15	10	17.2
	25	15	28.8
	30	20	34.5
	50	30	57.5
	60	40	69.0
	75	50	86.2
	100	65	115.0
	125	85	144.0
Surge voltage	The DC surge voltage is the maximum voltage to which the capacitor can be subjected under any conditions including transients and peak ripple at the highest line voltage. The DC surge voltage is 115 % of rated DC voltage		

PERFORMANCE CHARACTERISTICS		
ITEM	**CONDITION**	**POST TEST PERFORMANCE**
Surge voltage	85 °C 1000 successive test cycles at the applicable DC surge voltage specified in series with a 1 kΩ resistor at the rate of 30 s ON, 5.5 min OFF	The capacitors shall meet the requirements of MIL-PRF-39006: DC leakage — Not to exceed the specified value Capacitance change — Within ± 5 % of initial measurement Dissipation factor — Not to exceed the specified value There shall be no evidence of mechanical damage or leakage of electrolyte
Life testing	Method 108 of MIL-STD-202. Capacitors shall be capable of withstanding a 10 000 h life test at a temperature +85 °C at rated voltage	The capacitors shall meet the requirements of MIL-PRF-39006: DC leakage at 85 °C and 125 °C — Not to exceed 125 % of the specified value DC leakage at 25 °C — Not to exceed the specified value Capacitance change — Within +10 %, -20 % of initial measurement Dissipation factor — Not to exceed 200 % of the specified value Dielectric withstanding voltage — 2000 V_{DC}, min. Insulation resistance — 100 MΩ, min.
AC ripple life	As specified in MIL-PRF-39006: 2000 h, +85 °C	The capacitors shall meet the requirements of MIL-PRF-39006: DC leakage — Not to exceed the specified value Capacitance change — Within ± 10 % of initial measurement Dissipation factor — Not to exceed the specified value There shall be no damage, obliteration of marking, or leakage of electrolyte

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ENVIRONMENTAL CHARACTERISTICS		
ITEM	**CONDITION**	**POST TEST PERFORMANCE**
Stability at low and high temperatures	As specified in MIL-PRF-39006	The capacitors shall meet the requirements of MIL-PRF-39006
Moisture resistance	Method 106 of MIL-STD-202	The capacitors shall meet the requirements of MIL-PRF-39006: DC leakage — Not to exceed 125 % of +25 °C specified value Capacitance change — Within ± 8 % of initial measurement Dissipation factor — Not to exceed 115 % of the specified value
Thermal shock	Method 107 of MIL-STD-202, condition A (with step 3 at +125 °C) Number of cycles: 300 cycles for qualification and group C, subgroup 7; 30 cycles for group B and group C, subgroup 8	The capacitors shall meet the requirements of MIL-PRF-39006: DC leakage — Not to exceed 200 % of +25 °C specified value for qualification and group C DC leakage — Not to exceed 125 % of +25 °C specified value for group B Capacitance change — Within ± 5 % of initial measurement Dissipation factor — Not to exceed 115 % of the specified value
Salt atmosphere (corrosion)	Method 101 of MIL-STD-202, condition B (48 h)	There shall be no harmful corrosion, and the finish shall protect at least 90 % of any exposed metal surface of the capacitor. There shall be no unwrapping of, or mechanical damage to, the insulating sleeving, when applicable. Marking shall remain legible
Low temperature storage	Method 502 of MIL-STD-810, Storage temperature: -62 °C +0 °C, -3 °C. Exposure time: 72 h followed by a 1 h exposure at +125 °C, +7 °C, -0 °C within 24 h after low temperature storage	The capacitors shall meet the requirements of MIL-PRF-39006: DC leakage — Not to exceed the specified value Capacitance change — Within ± 5 % of initial measurement Dissipation factor — Not to exceed the specified value There shall be no evidence of leakage of electrolyte
Seal	Method 112 of MIL-STD-202, conditions A or D, and C	When the capacitors are tested as specified in MIL-PRF-39006, there shall be no evidence of leakage.
Barometric pressure (reduced)	Method 105 of MIL-STD-202, condition E (150 000 ft) (45 720.1 m)	There shall be no flashover, breakdown, or harmful deformation of the case, and mechanical damage, obliteration of marking, or leakage of electrolyte.

MECHANICAL PERFORMANCE CHARACTERISTICS		
ITEM	**CONDITION**	**POST TEST PERFORMANCE**
Shock (specified pulse)	Method 213 of MIL-STD-202, condition I (100 *g's*) or condition D (500 *g's*) for "H" designated units	The capacitors shall meet the requirements of MIL-PRF-39006
Vibration, high frequency	Method 204 of MIL-STD-202, condition D (20 *g's*) or condition H (80 *g's*) for "H" designated units	The capacitors shall meet the requirements of MIL-PRF-39006
Random vibration ("H" designated units only)	Method 214 of MIL-STD-202, condition II-K (53.79 *g's*).	The capacitors shall meet the requirements of MIL-PRF-39006: DC leakage — Not to exceed 125 % of the specified value Capacitance change — Within ± 5 % of initial measurement Dissipation factor — Not to exceed 115 % of the specified value There shall be no evidence of harmful corrosion, mechanical damage, obliteration of marking, or leakage of electrolyte.
Solderability	Method 208 of MIL-STD-202	The capacitors shall meet the requirements of MIL-PRF-39006
Terminal strength	Pull test: method 211 of MIL-STD-202, condition A. Wire-lead bend: in accordance with MIL-PRF-39006	There shall be no loosening of or permanent damage to the terminals, terminal weld or solder, or seal.
Dielectric withstanding voltage	Method 301 of MIL-STD-202, 2000 V_{DC} min.	The capacitors shall meet the requirements of MIL-PRF-39006
Insulation resistance	Method 302 of MIL-STD-202, condition B (500 V_{DC} ± 10 %)	The insulation resistance shall be not less than 100 MΩ
Resistance to solvent	Method 215 of MIL-STD-202	There shall be no mechanical or visual damage to capacitors post-conditioning. Marking shall remain legible, no degradation of the can material.
Resistance to soldering heat	Method 210 of MIL-STD-202, condition C	The capacitors shall meet the requirements of MIL-PRF-39006: DC leakage — Not to exceed the specified value Capacitance change — Within ± 5 % of initial measurement Dissipation factor — Not to exceed the specified value There shall be no evidence of mechanical damage

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